

publisher.agency  
Norway

February, 2025

No 9



Oslo, Norway  
6-7.2.2025

International  
Scientific  
Conference

# Theoretical Hypotheses and Empirical Results

UDC 001.1

P 97

Publisher.agency: Proceedings of the 9th International Scientific Conference «Theoretical Hypotheses and Empirical results» (February 6-7, 2025). Oslo, Norway, 2025. 266p



ISBN 978-8-9284-5709-0

DOI 10.5281/zenodo.14848977

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## Economic Sciences

# Коммуникации в современной организации

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Современные организации сталкиваются с рядом вызовов, связанных с глобализацией, быстрыми темпами изменений в технологиях и культурных различиях. В этой связи понимание основных принципов коммуникации, выявление барьеров и разработка методов их преодоления становятся особенно важными. Кроме того, современные технологии и социальные сети приводят к изменению форм и способов коммуникации в организации, что также требует постоянного анализа и исследования. В целом, исследования коммуникаций в организации являются неотъемлемой частью управления персоналом и помогают организациям достигать своих целей более эффективно и успешно.

Коммуникация может быть определена как процесс обмена и понимания информации между двумя и более людьми с целью мотивирования определенного поведения или влияния на него. Цель коммуникационного процесса – обеспечение понимания информации. Однако сам обмен информацией не гарантирует такого понимания и эффективного общения участвующих в обмене сторон. Обмен информацией происходит только в том случае, когда одна сторона предлагает информацию, а другая воспринимает ее. Поэтому эффективные коммуникации требуют от каждой из сторон определенных коммуникативных навыков, умений, взаимопонимания.

Чтобы лучше понять процесс обмена информацией, условия его эффективности, нужно обозначить элементы и стадии процесса коммуникаций. В процессе обмена информацией выделяют четыре элемента.

1. Отправитель, лицо, задумавшее передать информацию (идею, сообщение) или выразить эмоции, чувства.
2. Сообщение, собственно информация, ясно сформулированная мысль, закодированная с помощью символов.
3. Канал, средство передачи информации. Каналами могут быть телефонная линия, радиоволна, воздух, передающий устную речь, компьютерные сети, каналы доставки письменной корреспонденции и т. д.
4. Получатель, лицо, которому предназначена информация и которое интерпретирует ее.

Этапами обмена информацией являются следующие: 376

- 1) зарождение идеи, сообщения;
  - 2) кодирование и выбор канала. Формами кодирования выступают речь, текст, рисунок, поступок, жест, улыбка, интонация и т. д.;
  - 1) передача – использование канала для доставки сообщения;
  - 2) декодирование – перевод символов отправителя в мысли получателя.
- Эффективность обмена информацией повышает обратная связь, при которой отправитель и получатель меняются местами и ролями, и процесс коммуникации осуществляется в



обратном порядке, проходя все этапы обмена информацией. Обратная связь – это реакция получателя на сообщение отправителя и учет этой реакции отправителем.

Управление организационными коммуникациями предполагает знание коммуникативных барьеров и способов их преодоления. Последние связаны с проектированием организации таким образом, чтобы обеспечить и поддерживать эффективные коммуникации как на уровне отдельного человека, так и на уровне подразделений, отделов организации. Такое проектирование включает и развитие индивидуальных навыков, опыта, умения общаться с людьми.

К основным коммуникационным барьерам на уровне подразделений организации относятся: различия в статусах и власти; разные цели и потребности подразделений; несоответствие коммуникативных сетей и задач и дефицит формальных каналов.

Различия в статусах и власти приводят к искажению информации, поступающей от нижних уровней организации вверх по иерархии.

Руководители, обладающие большой властью, могут не почувствовать или не обратить внимания на то, что работники, имеющие низкий статус, не имеют стимулов к сотрудничеству. Устранить такой барьер позволяют «выходы в народ», создание климата доверия, открытости, поощрения инициативы, а порой и ошибок.

Различия целей и потребностей подразделений приводят к возникновению противоречий между ними, борьбе за организационные ресурсы, следованию в первую очередь локальным целям подразделений, а не целям организации в целом. Преодолеть данный барьер помогает совершенствование структуры организации, использование специальных команд, отделов, кураторов, дополнительных каналов связи, направленных на координацию, объединение усилий разных подразделений.

Несоответствие коммуникативных сетей и задач. Количество информации и обмен ею должны соответствовать объему и содержанию решаемых задач. Это означает, что для решения трудной, творческой, инновационной задачи должны использоваться децентрализованные коммуникативные сети типа «круг», которые поощряют участие, обсуждение проблемы, проявление инициативы работников.

Дефицит формальных каналов. Отсутствие формальных каналов сокращает эффективность коммуникаций. В организации должно быть достаточно восходящих, нисходящих и горизонтальных коммуникаций в форме опросов работников, системы сбора предложений, информационных бюллетеней, политики открытых дверей и др.

Опрос работников – это вариант системы обратной связи. Такие опросы можно проводить с целью получения информации от руководителей и рабочих буквально по сотням вопросов:

- 1) четко ли доведены до них цели их деятельности;
- 2) с какими потенциальными или реальными проблемами они сталкиваются или могут столкнуться;
- 3) получают ли они точную и своевременную информацию, необходимую им для работы;
- 4) открыт ли их руководитель для предложений;
- 5) информированы ли они о грядущих переменах, которые отразятся на их работе.

Системы сбора предложений разработаны с целью облегчения поступления информации наверх. Все работники получают при этом возможность генерировать идеи, касающиеся совершенствования любого аспекта деятельности организации. Цель подобных систем – снижение остроты тенденции фильтрации или игнорирования идей на пути снизу– вверх.

Чаще всего такая система реализуется в варианте ящиков для предложений, куда работники фирмы могут анонимно подавать свои предложения.

К сожалению, этот вариант не слишком эффективен, так как нередко отсутствует механизм подтверждения факта рассмотрения предложений, как и стимулирование работников, чьи предложения пошли организации на пользу.

Систему сбора предложений можно создать и по-иному. Организация может развернуть частную телефонную сеть, через которую работники получают возможность анонимно звонить и задавать вопросы о назначениях и продвижениях в должности. Иногда на линии работают менеджеры, тут же отвечающие на задаваемые вопросы.

Ответы направляются либо непосредственно работникам (если вопрос не анонимный), либо печатаются в информационном бюллетене фирмы.

Информационные бюллетени, публикации и видеозаписи организации. Относительно крупные организации, как правило, издают ежемесячные бюллетени, которые содержат информацию для работников. В подобные ежемесячные бюллетени могут входить статьи с обзором предложений по поводу управления, на темы охраны здоровья работников, нового контракта, нового вида продукции или услуг, которые намечено предложить потребителям в скором времени, подборка «работник месяца», ответы руководства на вопросы рядовых сотрудников.

Таким образом, целью коммуникационного процесса является обеспечение понимания информации. Для управления коммуникациями в организациях необходимо знать коммуникативные барьеры и управлять ими. Для эффективной коммуникации между руководителем и подчиненным, руководителю необходимо знать основы правильной коммуникации.

Также можно констатировать наличие многообразных подходов и теорий в исследовании коммуникации в организации. Предметное поле коммуникации создает дополнительную область для его всестороннего исследования, формирования и переосмысления имеющихся подходов в отношении создания эффективной коммуникации в организации и управления персоналом. В организации используют широкий диапазон средств коммуникации в зависимости от поставленных стратегических целей и задач, выбранного стиля руководства и взаимодействия. Исследования коммуникаций в организации направлены на выявление причин и механизмов возникновения барьеров в процессе коммуникации, а также на разработку методов и средств их преодоления. Важно отметить, что эффективная коммуникация является ключевым фактором успеха любой организации, поскольку она способствует установлению доверительных отношений между сотрудниками, повышает эффективность работы и способствует достижению общих целей.



# Қызылорда облысының агроөнеркәсіптік кешенін мемлекеттік басқаруды жетілдіру: экономикалық талдау және даму болашағы

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## Аннотация:

Бұл мақалада агроөнеркәсіптік кешенді мемлекеттік басқарудың негізгі тетіктері мен оны оңтайландыру жолдары қарастырылады. Қызылорда облысы мысалында агроөнеркәсіптік кешеннің қаржылық тұрақтылығы мен тиімділігін арттыру мәселелері талданады. Зерттеу барысында ауыл шаруашылығын басқарудағы заманауи әдістер, соның ішінде мемлекеттік қолдау тетіктері, аграрлық секторды дамытудағы ұйымдастырушылық және экономикалық факторлар қарастырылды. Жүргізілген талдау негізінде агроөнеркәсіптік кешендегі еңбек ресурстарын тиімді пайдалану мәселелері анықталып, оларды жетілдіру бойынша ұсыныстар жасалды. Сондай-ақ, ауыл шаруашылығы саласындағы мемлекеттік реттеу шараларын жақсарту мақсатында әлемдік тәжірибелерге сүйене отырып, саланың тұрақты дамуын қамтамасыз ететін стратегиялық бағыттар ұсынылды. Агроөнеркәсіптік өндірістің тиімділігін арттыруға бағытталған бұл зерттеу аграрлық секторды басқарудың жаңа тәсілдерін енгізу қажеттігін көрсетеді.

**Кілт сөздері:** агроөнеркәсіптік кешен, мемлекеттік басқару, қаржылық тұрақтылық, ауыл шаруашылығы, еңбек ресурстары, мемлекеттік қолдау, аграрлық сектор, тиімділік, стратегиялық басқару, агроөнеркәсіптік саясат, экономикалық даму

Агроөнеркәсіптік кешен – Қазақстан мемлекеті үшін басым салалардың бірі. Оның тұрақты дамуын қамтамасыз ететін негізгі факторлардың бірі – ауыл шаруашылығы өнімдерін өндіру мен өңдеудің экономикалық тиімділігіне бағытталуы. Бұл жер, еңбек, материалдық және шикізат ресурстарын ұтымды әрі кешенді пайдалануды көздейді. Сондай-ақ, негізгі ресурстарды тиімді игеруге ықпал ететін оңтайлы аумақтық дамуға ерекше назар аударылады. Ауыл шаруашылығы өндірісінің тиімділігін арттыру – экономиканың маңызды міндеттерінің бірі. Бұл мәселенің сәтті шешілуі елдің азық-түлік қауіпсіздігін қамтамасыз етумен тікелей байланысты. Ауыл шаруашылығы өндірісінің қарқынды өсуін қамтамасыз ету және халықты сенімді азық-түлікпен қамту – мемлекеттің тұрақтылығының негізгі шарттарының бірі.

Қазақстан тәуелсіздік алғаннан бері агроөнеркәсіптік кешенде айтарлықтай жетістіктерге қол жеткізілді. Нарықтық қатынастар негізінде өндіріс көлемі тұрақты өсіп, еңбек өнімділігі артты, негізгі қорлар кеңейтілді. Сала инфрақұрылымы жаңғыртылып, негізгі азық-түлік өнімдері бойынша өзін-өзі қамтамасыз ету деңгейіне жетті. Сонымен қатар, дәнді дақылдар, майлы дақылдар және теңіз өнімдерінің экспорты едәуір ұлғайды. Қазақстанның агроөнеркәсіптік кешені қарқынды және тұрақты дамуымен ерекшеленеді, бұл елдің азық-түлік қауіпсіздігін қамтамасыз ететін маңызды фактор болып табылады. Экономикалық реформалар жылдарында еліміздің аграрлық секторында айтарлықтай даму әлеуеті қалыптасты.

**Даму басымдықтары:**

- Елдің азық-түлік қауіпсіздігін тұрақты қамтамасыз ету.
- Экспорттық әлеуеті жоғары ауыл шаруашылығы салаларын дамыту.
- Ауыл шаруашылығы өндірісін кеңейту мен қарқындатуға бағытталған ынталандыру шараларын әзірлеу.
- Отандық ауыл шаруашылығы шикізатын уақтылы әрі сапалы өңдеуді қамтамасыз ету.
- Қазақстанның ауыл шаруашылығы өнімдерінің жаһандық бәсекеге қабілеттілігін арттыру.
- Қазақстанның агроөнеркәсіптік кешенін жаңғырту мен инновациялық дамуға инвестициялық ресурстар тарту жолдарын қарастыру.

Бұл міндеттерді іске асыру көпқырлы талдауды қажет етеді. Ауыл шаруашылығы нарығын одан әрі тиімді дамыту сұраныс, ұсыныс, бәсеке, баға белгілеу, ұйымдастыру және басқару сынды негізгі экономикалық элементтерді уақтылы анықтауға байланысты. Қазақстанда жедел индустриялық-инновациялық даму мемлекеттік бағдарламасы аясында агроөнеркәсіптік кешенді жедел дамыту көзделген. Бұл бағдарлама ауыл шаруашылығы, ауыл шаруашылығы шикізатын өңдеу және ауыл шаруашылығы техникасын дамытуды экономикалық басым бағыттардың бірі ретінде қарастырады. Аграрлық сектордың ерекшелігі – оның құрылымдық тұрақсыздығы мен дамуының көпқырлы сипаты. Алайда, Қазақстанның ауыл шаруашылығы саласы бірқатар бәсекелестік артықшылықтарға ие: экологиялық таза өнімдер, шикізат өндірісі мен өңдеудің салыстырмалы төмен шығындары, ішкі тұтынудан асатын өндіріс көлемі және жоғары өндірістік әлеует.

Қызылорда облысы Арал теңізінің шығысында, Сырдария өзенінің төменгі ағысында, Тұран ойпатында орналасқан. Ол Қазақстанның бірнеше облыстарымен, атап айтқанда, шығысы мен оңтүстік-шығысында Түркістан облысымен, солтүстігінде Ұлытау облысымен, солтүстік-батысында Ақтөбе облысымен, оңтүстік-батысында Қарақалпақстанмен және оңтүстігінде Өзбекстанның Навои облысымен шектеседі. Жер көлемі бойынша Қазақстанда үшінші орында.

Қызылорда облысының ауыл шаруашылығы мен инфрақұрылымдық жобалары негізгі басымдықтар болып табылады. Биылғы жылы облыс бойынша 184 739 гектар жерге ауыл шаруашылығы дақылдары егілді. Оның ішінде 99 248 гектары дәнді дақылдарға, 5 631 гектары майлы дақылдарға, 62 335 гектары мал азығына, 17 525 гектары картоп, көкөніс және бақша өнімдеріне бөлінген.

Қызылорда облысында 7 аудан бар, облыс орталығы – Қызылорда қаласы. Ұлттық экономика министрлігі Статистика комитетінің статистикалық мәліметтерін пайдалана отырып, Қызылорда облысындағы өсімдік шаруашылығының базасын құрастырылды (кесте 1).

Кесте 1 - Ауылшарушылығы дақылдарының аудан бойынша түрлері

Аудан	Өсімдік шаруашылығы											
	бидай	арпа	жүгері	күріш	мақсары	Жем-шөп дақылдары	Көкөніс	Бақша дақылдары	Картоп	сұлы	қарақұмық	Бұрашақ дақылдары
Арал	-	-	-	-	-	+	-	-	-	-	-	-
Жалағаш	-	-	-	+	+	+	+	+	-	-	-	-
Жаңақорған	-	+	+	+	+	+	+	+	+	-	-	-
Қазалы	-	+	-	+	-	+	+	+	-	-	-	-
Қармақшы	-	-	-	+	+	+	+	+	-	-	-	-
Қызылорда қ.	-	-	-	+	-	+	+	+	-	+	-	-
Сырдария	+	-	-	+	+	+	+	+	-	-	-	-
Шиелі	-	-	-	+	+	+	+	+	-	-	-	-

Өткен жылмен салыстырғанда дәнді дақылдар 1736 гектарға, мал азықтық дақылдар 2094 гектарға, картоп, көкөніс және бақша дақылдары 79 гектарға артса, ал майлы дақылдар көлемі 2 242 гектарға азайды. Сонымен қатар, егісті әртараптандыру бағытында облыста алғаш рет перспективалы дақылдар қант құмайы 80 гектарға, соя 170 гектарға, жүгері дақылы 1507 гектарға дейін жеткізіліп, ылғал сақтағыш аквагельдерді пайдалану арқылы 80 гектар богарлы жерлерге күздік бидай дақылы егілді. Негізгі дақыл күріштің көлемі 89623 гектарды құрап, егіс көлемі өткен жылмен салыстырғанда 1690 гектарға артып отыр. Облыста аграрлық секторды дамытудың басым бағыттары бойынша шаралар қабылданады: мал шаруашылығы, өсімдік шаруашылығы, құс және балық шаруашылығы мен орман шаруашылығы салалары жақсы дамыған.

Ауыл шаруашылығының жалпы өнімі ағымдағы бағамен Қызылорда облысында 2023 ж. 214171 млн теңгені құрап, 2022 ж. салыстырғанда 1,1 есе өсті. Агроөнеркәсіп кешенінде күріш өндірісін, мал шаруашылығын және балық шаруашылығын дамытуға ерекше мән берілген. Мемлекеттік аграрлық саясатты жүзеге асырудың нәтижесінде соңғы жылдары ауыл шаруашылығы өндірісінің дамуында оң нәтижелер байқалуда. Бүгінгі таңда өңірдің ауыл шаруашылығы қарқынды түрде дамып келеді. Әсіресе егін жинау, мал шаруашылығы, экспорт және инвестициялық жобалар бойынша белсенді өсім байқалды.

Үкіметтің АӨК-дегі ҒЗТҚЖ идеялары мен нәтижелерін пайдалану қажеттілігі туралы түсінігінің деңгейі жоғары болған сайын, технологиялар Қазақстанның аграрлық индустриясына енгізілетін болады. Қызылорда облысында осыған сәйкес, АӨК-ді жандандыру немесе инновациялар енгізу, инновациялар прогрессін арттыратын бірнеше факторлар анықталды. Соған сәйкес, қорытындылай келе, жандандыру жолдары және аграрлық өндірісті кеңейту шарттары да анықталды (сурет 1).



1-сурет. Ауыл шаруашылығындағы инновациялық прогрессті өлшеуші факторлар

Ауыл шаруашылығындағы инновациялық прогрессті келесідей факторлармен өлшеуге болады:

- жобалар мен өнімдер санының ұлғаюымен,
- аграрлық секторға венчурлық инвестициялар көлемімен,
- жоғары технологиялық ауыл шаруашылығы өнімдерінің экспортымен,
- елдегі аграрлардың патенттік өтінімдері санының өсуімен.

Мұның бәрі осы саладағы ауылдық жерлердегі халықтың өмір сүру сапасын арттыру, экологияны жақсарту және климаттың жаһандық өзгерістерінің теріс салдарларын азайту сияқты әлеуметтік проблемаларды шешуге ықпалы зор болмақ. Ауыл шаруашылығындағы негізгі капиталды қаржыландыруды ұлғайту, жаңа жабдықтарды көбірек сатып алу, қолда бар жабдықтарды жаңғыртуды және ескірген жабдықтарды ауыстыруды күшейту, сыртқы маусымдық тәуекелдерді ескере отырып, фермерлер үшін жеңілдікті қаржыландыру көздері ретінде қаржы-кредит институттарын тарту одан әрі ауыл шаруашылығын жандандырады. Бұл аграрлық өндірісті кеңейтуге және ауыл халқы үшін жаңа жұмыс орындарын құруға, нәтижесінде жұмыспен қамтуды кеңейту ауыл шаруашылығы өнімдерін шығарудың өсуіне әкеледі.

Қызылорда облысында агроөнеркәсіптік кешенді және ауылдық аумақтарды дамытуды мемлекеттік реттеу туралы Қазақстан Республикасының 2005 жылғы 8 шілдедегі №66 заңында ауыл шаруашылығы салаларына несиелендіру, субсидиялау, азық-түлік қауіпсіздігін қамтамасыз ету, бәсекеге қабілетті ауыл шаруашылығы өнімін өндіру. Өңдеуші кәсіпорындардың ауыл шаруашылығы өнімдерін тереңдете өңдеп, өнім өндіру үшін оны сатып алу шығындарын субсидиялау қарастырылған. Бұл мемлекеттік қолдауға жергілікті шаруашылықтар да ие болып жатыр. АӨК-ті мемлекеттік реттеу механизмдері: қаржылық қолдау, инфрақұрылымдық қолдау және мемлекеттік бағдарламалардан тұрады.

Облыстың ауыл шаруашылығы және жер қатынастары саласын дамыту Қазақстан Республикасының агроөнеркәсіп кешенін дамытудың 2021-2025 жылдарға арналған ұлттық

жобасы аясында жүзеге асырылып жатыр. Қызылорда облысында аграрлық саланы дамытудың 9 негізгі бағыты белгіленген. Жүргізілген зерттеулер барысында ауыл шаруашылығын дамытудың 2 негізгі категориясы белгіленді – ішкі нарықты толықтыру және экспортқа бағдарланған өндірістерді дамыту. Сонымен қатар табиғи-климаттық және топырақ жағдайларына сәйкес, аграрлық саланы дамытудың 9 негізгі бағыты айқындалды: етті-сүтті мал шаруашылығын дамыту, егін шаруашылығын әртараптандыру, суармалы жерлерді қалпына келтіру, кооперацияны қайта дамыту, балық шаруашылығы, АӨК өнімдерін сату, инфрақұрылымды дамыту және цифрландыру. Бұдан басқа, АӨК дамытудың өңірлік бағдарламасының 148 жобасын іске асыру жоспарланып отыр. Қайта өңдеу өнеркәсібін дамыту экспорт көлемін және еңбек өнімділігін 2,5 есе арттыруға мүмкіндік береді.

Осыған байланысты сүт, ет, жұмыртқа, картоп және ұн өнімдерін, құс еті мен жылыжай көкөністерін өндіруді дамыту қажет. Мәселен, бүгінгі таңда Арал қаласында ұн өндірісі қалпына келтірілді, Қармақшы ауданында құс фабрикасының құрылысы жүріп жатыр, Қызылордада ет комбинаты мен жылыжай салу және көпжылдық жеміс егіндерінің аумағын кеңейту, сондай-ақ Шиелі ауданында және Қызылордада жұмыртқа өндірісі дамуда.

Ұлттық жоба аясында биыл ауыл шаруашылығы тауар өндірушілерін мемлекеттік қолдауға 18,4 млрд теңге бөлінді. Өткен жылмен салыстырғанда 2,2%-ға артты.

Оның ішінде:

- 3,8 млрд теңге егін шаруашылығын қолдауға;
- 3,2 млрд теңге мал шаруашылығын қолдауға;
- 4,2 млрд теңге сыйақы мөлшерлемесін субсидиялау, инвестициялық субсидиялауға;
- 1,2 млрд теңге қолдауларға;
- 5,3 млрд теңге ауылдық елді мекендердегі жобаларды несиелендіруге және ӘМАТ

бағаларын тұрақтандыру үшін мамандандырылған ұйымдарға несие беруге бағытталды.

Облыстың ауыл шаруашылығы өнімдерін өткізу нарықтарын кешенді маркетингтік зерттеулер негізінде облыстың АӨК дамытудың Агрокартасы әзірленіп, іске асырыла бастады. Бірінші кезекте экспорттық әлеуеті жоғары секторлар анықталды. Бұл күріш, бақша дақылдары, балық, жылқы еті, сиыр еті мен қой еті. Экспортталатын өнім түрлері кеңейіп жатыр. Егер 2013 жылы өнімнің тек 3 түрі (балық, күріш және кебек) экспортталған болса, бүгінде бұл көрсеткіш 20-дан астам түрді құрады (балық, күріш, кебек, қауын, қарбыз, картоп, өсімдік шырындары, рапс және күнбағыс тұқымдары, сабан (мякина), көкөністер, арпа, бидай, қой, ірі қара және түйе).

Қызылорда облысынның негізгі саласы – ауыл шаруашылығы. Қазіргі таңда ірі индустриялық жобаларды қолға алу арқылы жоғары сұранысқа ие, экспорттық қабілеті бар өнімдерді шығару бойынша жұмыстар атқарылып жатыр. 2023 жылдың басынан бері өңірде негізгі макроэкономикалық көрсеткіштер өсіп келеді: 2022 жылдың ұқсас кезеңімен салыстырғанда инвестициялар көлемі 11,5%-ға ұлғайды, өңдеу өнеркәсібі 5,5%-ға өскен.

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# Analysis of Community E-commerce Marketing Strategies—Taking Meituan Youxuan as an Example

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## abstract

This article aims to optimize Meituan Youxuan's marketing strategies, continuously seek new growth points, and enhance its core competitiveness. It analyzes the issues present in Meituan Youxuan's marketing process and proposes corresponding solutions to optimize its future development, thereby helping Meituan Youxuan build a moat in an increasingly competitive market. By integrating the 4C theory and SWOT analysis theory, this study delves into Meituan Youxuan's marketing strategies from aspects such as its development background, market positioning, and business performance. It identifies problems in the marketing strategy and proposes specific optimization plans to address these issues, aiming to improve the existing problems in Meituan Youxuan's marketing strategy.

**Key words:** Meituan Youxuan; SWOT analysis; 4C theory

## 1. introduction

The domestic competition in community e-commerce has reached a fever pitch. With the development of community group buying, countless entrepreneurs have focused on and launched their own community group buying businesses. However, from all perspectives, Meituan Youxuan undoubtedly holds significant advantages and resources. According to data released in 2021, Meituan Youxuan's daily order volume exceeded 20 million orders, surpassing other competitors such as Orange Heart Youxuan and Xingsheng Youxuan, becoming a giant in community group buying (Xu Xiang, 2021)[1].

Research how community e-commerce can better provide services and improve efficiency. With the development of the Internet era, online consumption and cloud payment have become the primary means of consumption for the general public. In this context, community group buying, as a new model of e-commerce consumption, stands out due to its strong regional characteristics, high efficiency, and low cost, earning enthusiastic support from citizens[3]. Community group buying is a new business model in the social economy, distinct from the vertical dissemination model of existing fan economy. This paper uses the 4C theory to analyze the issues present in Meituan Youxuan's marketing strategies and proposes improvement measures. It aims to provide reference suggestions for Meituan Youxuan's development and contribute to enhancing its overall service quality.

## 2. Analysis of the current marketing situation of Meituan Youxuan

### 2.1 SWOT analysis of Meituan Youxuan

#### (1) Advantages

The "Guidelines for the Construction of Urban Living Convenience Zones" (hereinafter referred to as the "Construction Guidelines") was jointly issued by the Ministry of Commerce and ten other ministries on July 22, 2021. The goal is to form a number of well-planned, diverse,

functionally complete, intelligent, convenient, high-quality, orderly, harmonious commercial-residential areas by 2025, achieving the "Hundred Cities, Thousand Zones" target. The satisfaction rate in pilot regions exceeds 90%. The "Hundred Cities, Thousand Zones" mentioned in KOD is closely related to the development of community group buying. As the consumption model of community group buying continues to evolve, consumer behavior is also changing. Therefore, how to enhance its influence and improve market penetration has become an urgent issue for major community group buying companies to address.

With the development of community group buying consumption mode and the continuous change of consumption habits, how to expand influence and market penetration is a problem that all large community group buying must take seriously[10].

When talking about the cost of purchasing fresh agricultural products, Meituans biggest advantage is its ability to negotiate with suppliers. In 2021, Meituan launched a "direct farming" project in Yunnan, Guangxi and Guizhou provinces, where it purchases agricultural products locally to contribute lower supply costs for the development of agricultural products in remote areas.

#### (2) Disadvantages

Compared to other companies, Meituans development in warehousing and logistics has been relatively lagging, especially in intercity transportation and procurement from the origin, far behind community group-buying enterprises. Meituan has always had a focus on trading platform attributes and lacks experience in community operations. In terms of community operations, Meituan leans more towards a trading platform, and has not made significant progress in fresh produce transportation. High losses during summer, difficulty in ensuring quality, perishability of fresh agricultural products, high delivery costs, and improper handling of warehousing and distribution can all lead to losses for this batch of group purchases. **Ошибка! Источник ссылки не найден.**

#### (3) Opportunity

As Meituan Youxuan is a functional module of Meituan with a large and stable user group, users have a high degree of trust in the platform, and the dividends of new channel operation on the community promotion chain can effectively reduce customer acquisition costs, which makes Meituan Youxuan have advantages[11] This method is promoted due to the elimination of high rental, labor, and working hours costs, with a relatively smaller workload. Compared to heavy operation models like physical stores, it saves substantial human resources, rent, and store operation time, and its operational model is lighter and simpler, making it very suitable for nationwide distribution.

#### (4) Threat

Meituan Youxuans infrastructure is not well-developed, and the basic warehousing and distribution facilities require a long-term investment process. If the infrastructure cannot keep up, it could significantly impact the companys development. The competition is fierce, and compared to other more mature group-buying platforms, there is a lack of experience in supply chain management. In terms of quality control, as competition intensifies, product categories become highly homogeneous, necessitating more efficient methods to optimize quality control. The turnover rate among group leaders is high, requiring effective measures for continuous operation.

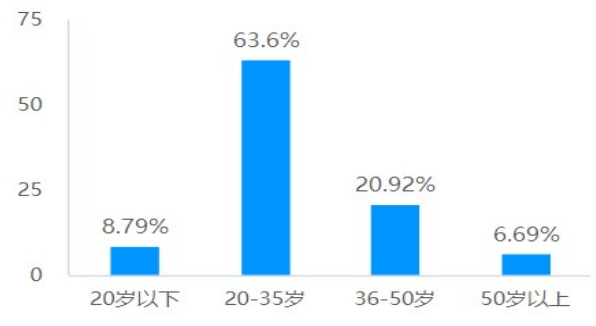
2.2 Questionnaire survey results and analysis

Questionnaire Star was used to make the questionnaire survey and distributed through friends circle. A total of 239 valid questionnaires were collected.



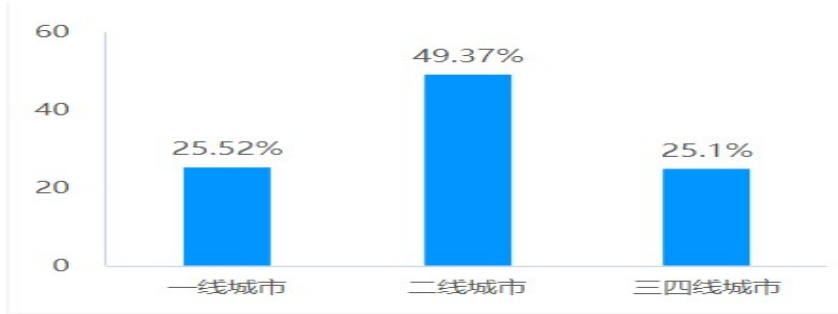
graph 3-1 On gender statistics

As shown in Figure 3-1, the proportion of male students is 44.77%, and that of female students is 55.23%. It can be seen from this that most of the community group buying users are female.



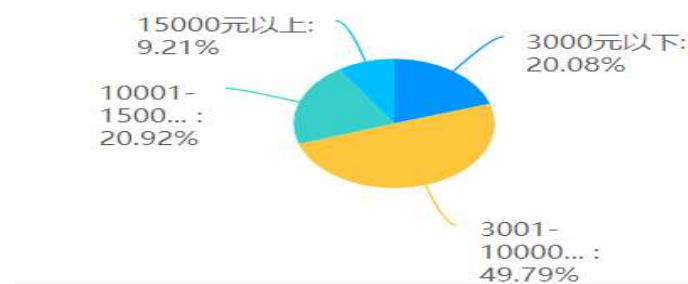
graph 3-2 Statistics on age data

As shown in Figure 3-2, the age distribution of 20-35 years old is the largest, accounting for 63.6%; the second is 36-50 years old, accounting for 20.92%, and those under 20 years old account for 8.79%.



graph 3-3 Statistics on the city where it is located

As shown in Figure 3-3, second-tier cities account for the largest proportion of 49.37%, followed by first-tier cities with 25.52%, and third-tier cities with 25.1%. It can be seen that residents in second-tier cities are more inclined to buy their own food and cook.



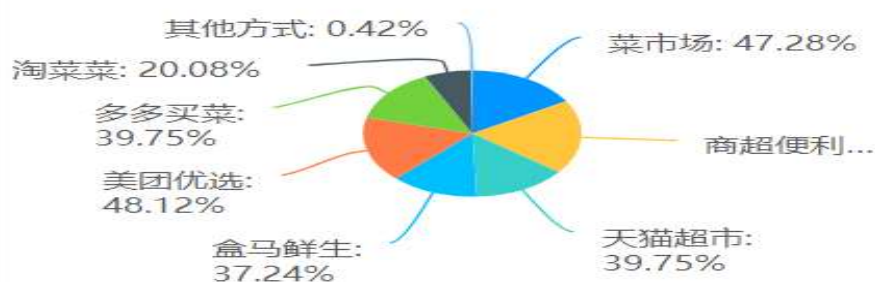
graph 3-4 Statistics on monthly income

As shown in Figure 3-4, the income of 3001-10000 yuan accounted for 49.79%, 10001-15000 yuan accounted for 20.92%, less than 3000 yuan accounted for 20.08%, and more than 15000 yuan accounted for 9.21%.



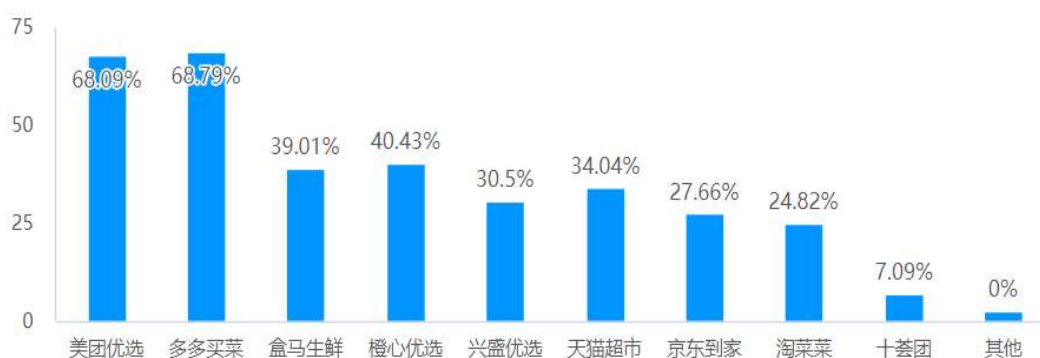
graph 3-5 Statistics on the frequency of community group buying

As shown in Figure 3-5, the frequency of using community group buying is 2-4 times per week accounts for 52.72%, once or less per week accounts for 29.29%, more than 5 times per week is relatively small, accounting for 10.04%, and those who have bought it several times but are not satisfied and will never use it again account for the least, only 7.95%. Through the data, we can find that the freshness of products has an impact on user retention rate.



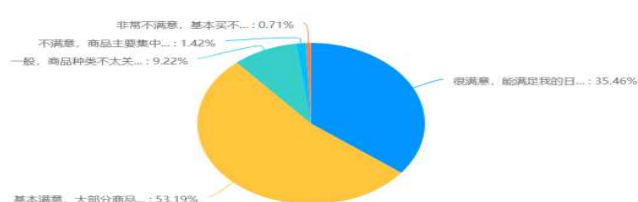
graph 3-6 How the data on fresh fruits and vegetables is purchased is not clear

As shown in Figure 3-6, according to the survey of purchasing channels, supermarkets and convenience stores account for 54.81%, followed by Meituan Youxuan with 48.12%, and then vegetable markets with 47.28%. In general, people still prefer to buy things in supermarkets and convenience stores, but community group buying has occupied a large position in consumers' minds.



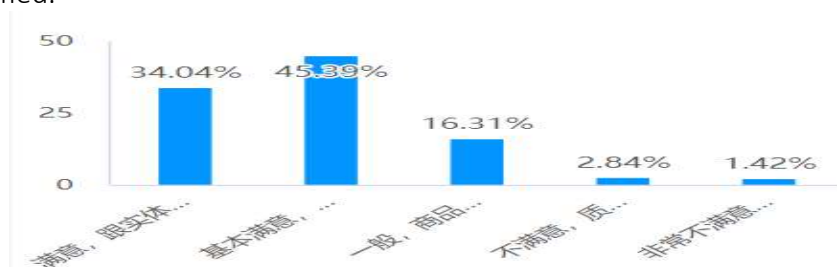
graph 3-7 Statistics on which community group buying platforms have been used

As shown in Figure 3-7, it can be seen that the proportion of those who have used Meituan Youxuan and DuoDuo Maicai is the highest, followed by Orange Heart Youxuan and Hema Fresh.



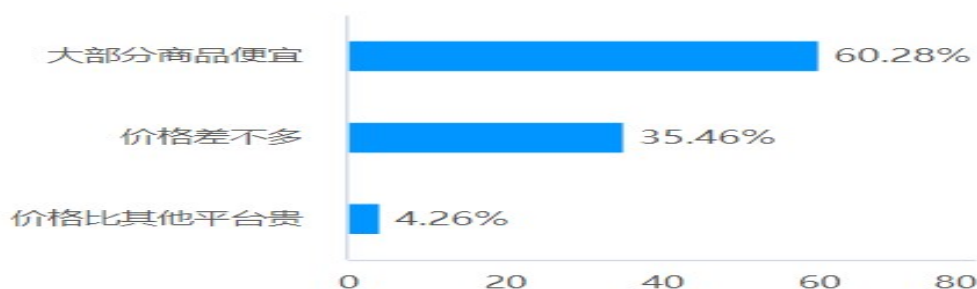
graph 3-8 Statistics on whether the product types of Meituan Youxuan are satisfactory

As shown in Figure 3-8, according to the data, the vast majority of people are satisfied with the variety of goods on Meituan Youxuan, but some people think the goods are average or very unsatisfied.



graph 3-9 Statistics on whether you are satisfied with the quality of goods on Meituan Youxuan

As shown in Figure 3-9, 45.39% of consumers were basically satisfied with the quality of goods from Meituan Youxuan, believing that although the quality of goods was unstable, it did not affect their use; 34.04% of consumers were satisfied, believing that they bought the same as in physical stores, and a small number of consumers were dissatisfied or very dissatisfied.



graph 3-10 Data on whether the price of Meituan's preferred platform is cheaper than other

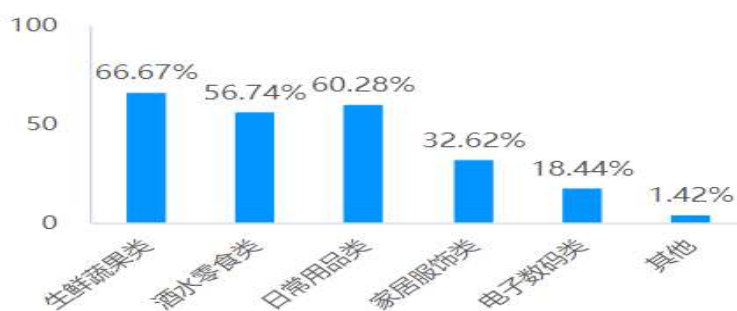
### group buying platforms

As shown in Figure 3-10, 60.28% of consumers think that most of the products on Meituan Youxuan are cheap, 35.46% think that the prices are similar to other group buying platforms, and only 4.26% think that the products on Meituan Youxuan are more expensive than other platforms.



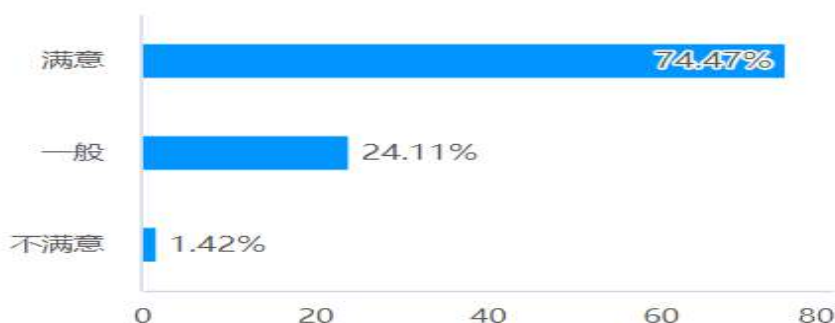
graph 3-11 Statistics on the average unit price of using Meituan Youxiao shopping

As shown in Figure 3-11, the unit price of Meituan Youxuan shopping is the highest at 11-20 yuan, followed by 21-30 yuan. It can be seen that consumers will not give up Meituan Youxuan or low prices, but if they sell products at low prices without paying attention to product quality, they will lose users.



graph 3-12 Statistics on which products in Meituan Youxuan are more affordable

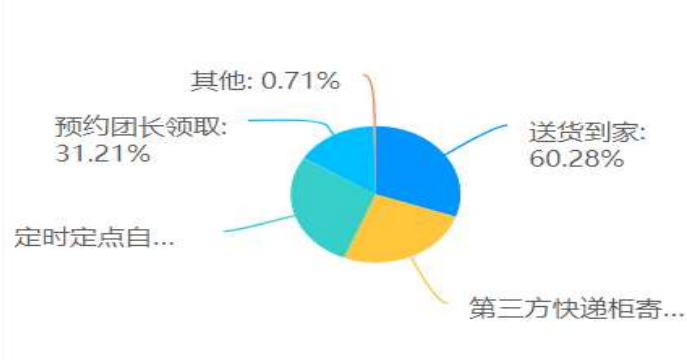
As can be seen from Figure 3-12, 66.67% of users think that the prices of fresh fruits and vegetables are more favorable in Meituan Youxuan, followed by daily necessities at 60.28%, then alcohol and snacks at 56.74%, furniture and clothing are more likely to buy on Taobao, while electronic digital products are more likely to buy on JD.



graph 3-13 Whether you are satisfied with the delivery service of Meituan Youxuan

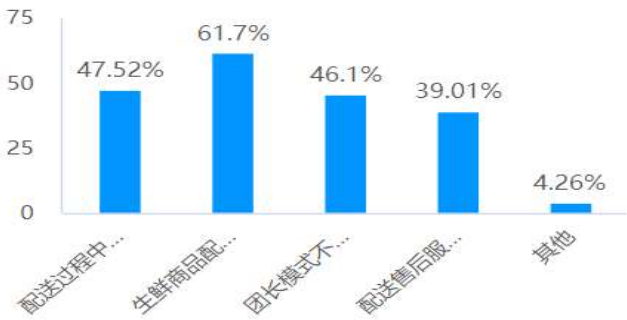
As shown in Figure 3-13, 74.47% of users are satisfied with the delivery of Meituan Youxuan, and 24.11% of users think it is average.





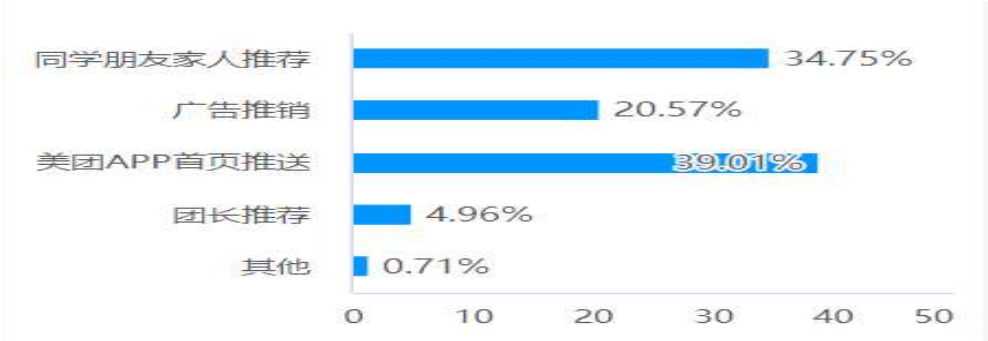
graph 3-14 Statistics on which delivery method is more preferred by Meituan Youxuan

According to Figure 3-14, 60.28% of users prefer home delivery, which can meet their needs without leaving home. Additionally, 51.06% of users prefer third-party parcel lockers for storage, followed by designated pick-up points. A comprehensive analysis shows that home delivery would increase labor and material costs, potentially raising prices. However, using third-party parcel lockers is impractical for many residential areas where such facilities are unavailable.



graph 3-15 Statistics on what are the shortcomings of Meituan Youxuan in distribution channels

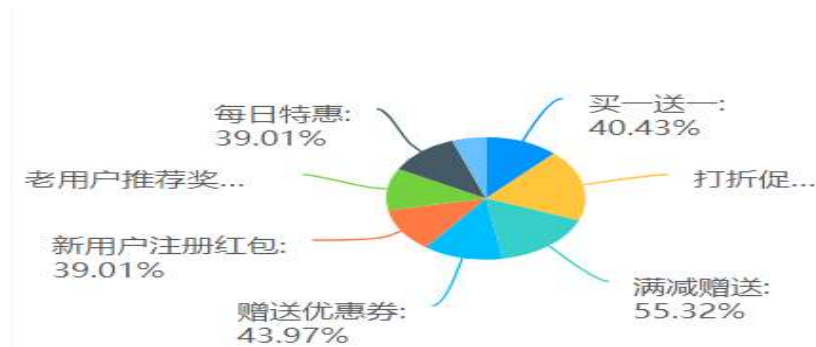
According to Figure 3-15, 61.7% of users believe that fresh goods are not delivered in time and cannot ensure freshness, which raises the question of whether self-service points have refrigeration conditions. 47.52% of users think that products are damaged during delivery, while 46.1% believe that the group leader model is unstable, with frequent changes in self-service points. This could appropriately increase the income of group leaders to retain service personnel. 39.01% of users feel that after-sales service for deliveries is inadequate and need improvements to enhance the shopping experience.



graph 3-16 About what aspects did you first come into contact with the data statistics of Meituan Youxuan

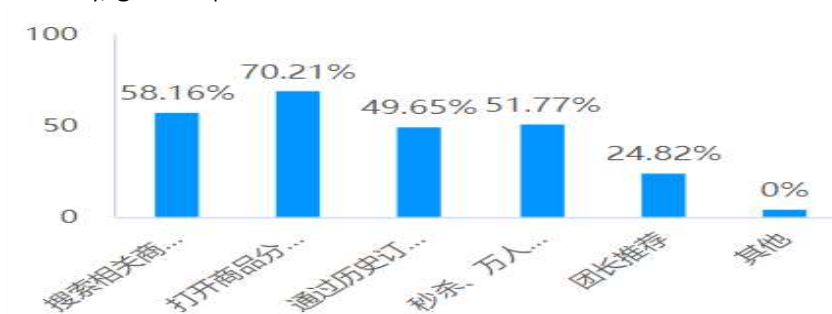
As can be seen from Figure 3-16, the proportion of the first page push of Meituan app is 39.01%, which is the marketing by Meituan using its own user group. The second is the

recommendation from classmates, friends and family, accounting for 34.75%. At the beginning, new people are attracted to recommend to their relatives and friends with red envelopes and goods.



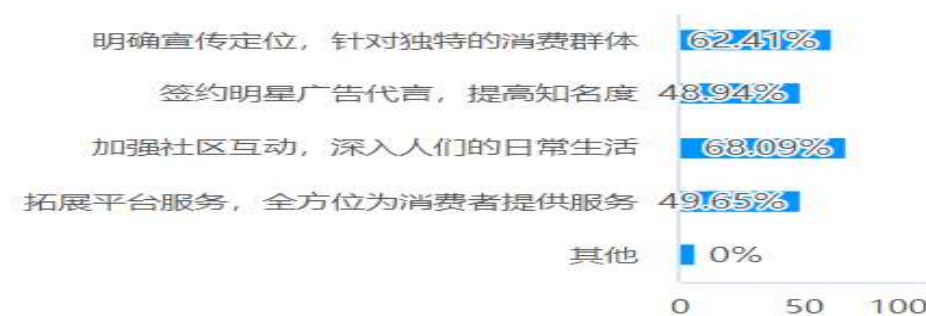
graph 3-17 About what type of promotional activities do you think Meituan Youxuan can do

As shown in Figure 3-17, consumers prefer discount promotions, followed by full reduction gifts, and thirdly, gift coupons.



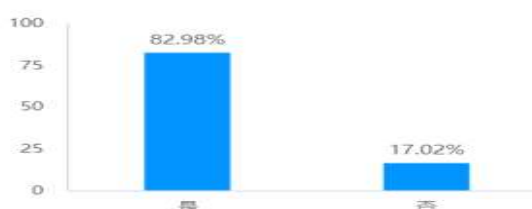
graph 3-18 Statistics on the most commonly used click method to buy goods on Meituan Youxuan

As shown in Figure 3-18, 70.21% of users browse and buy after opening the product category page, 58.16% of users prefer to search for related products and buy, followed by flash sales, 10,000 group activities account for 51.77%.



graph 3-19 What are your expectations for Meituan Youxuan to improve its promotional data statistics?

As shown in Figure 3-19, 68.09% of consumers think that Meituan Youxuan can improve in strengthening community interaction and delving into peoples daily life. Next is clear promotion positioning, targeting unique consumer groups, accounting for 62.41%, and third is expanding platform services to provide comprehensive services for consumers, accounting for 49.65%.



graph 3-20 Do you feel that Meituan Youxuan has data statistics on the phenomenon of big data killing the market?

As shown in Figure 3-20, 82.98% of consumers believe that Meituan Youxuan has the phenomenon of big data price discrimination, which can easily lose old customers.

### **3. Through data investigation and analysis, the existing problems of Meituan Youxuan marketing strategy are as follows**

Meituan Youxuan faces multiple issues, including unguaranteed product quality, unreasonable pricing, inadequate delivery channels, and the risks associated with low-price promotions. First, due to the perishability of fresh produce and immature sorting and distribution technologies, a large number of products spoil, affecting user experience. Second, the platform engages in "big data price discrimination," offering discounts to new users while keeping prices high for existing ones, which undermines customer loyalty. Additionally, the logistics system is underdeveloped, with low sorting efficiency and untimely deliveries, leading to product damage and reduced consumer satisfaction. Finally, Meituan Youxuan has long relied on low-price promotions to attract users, but this strategy has led to declining profitability, compromised quality assurance, and even affected the interests of supervisors, reducing user retention rates and ultimately threatening the platform's long-term development.

### **4. discussion**

Meituan Youxuan faces numerous challenges in the current market environment, but through reasonable strategic adjustments and optimizations, its competitiveness can still be effectively enhanced. First, in terms of product quality, Meituan Youxuan needs to optimize supply chain management to ensure reliable sources of products and improve the freshness and variety of fresh produce to meet users' demand for high-quality, cost-effective products. Additionally, appropriately increasing the commission for group leaders can boost their enthusiasm and service quality, thereby enhancing user loyalty and retention rates. Second, a rational pricing strategy is crucial for Meituan Youxuan's sustainable development. While new customer discounts can attract more customers, long-term satisfaction from existing users is equally important. Meituan Youxuan should maintain fair and transparent pricing strategies, avoiding the phenomenon of "big data price discrimination," ensuring that price adjustments align with market rules and meet the needs of different consumers. In optimizing marketing channels, Meituan Youxuan needs to strengthen coordination between online and offline platforms, improve user experiences on the APP and WeChat mini-program, and establish a more efficient fresh produce logistics system to reduce distribution links, lower costs, and ensure product freshness. Furthermore, launching targeted product recommendations during holidays can enhance user convenience and satisfaction. Diversification and digitalization of advertising and marketing strategies are also essential. Chemical is also a key to Meituan Youxuan's enhanced market competitiveness. By placing ads on public transportation such as subways and buses, and using common household items for brand promotion, Meituan Youxuan can expand its brand influence. At the same time, increasing user engagement through QR codes and websites allows users to easily access and understand Meituan Youxuan's services. Additionally, Meituan Youxuan can adopt diverse marketing strategies. For example, offering different discount models to attract consumers, providing limited-time discounts or gifts to boost their purchasing interest. Meanwhile, the points redemption system should be reasonable, ensuring that consumers feel the platform's benefits and rewards without feeling

discouraged by high thresholds. Finally, Meituan Youxuan can leverage artificial intelligence technology to further optimize big data analysis capabilities. By integrating data from businesses like Meituan Waimai and Dianping, it can accurately analyze user consumption habits and provide personalized services to different user groups. This not only enhances user experience but also improves retention rates, driving the platforms long-term development. In summary, by improving product quality, optimizing pricing strategies, perfecting marketing channels, innovating advertising models, and strengthening AI data analysis capabilities, Meituan Youxuan has the potential to thrive in a highly competitive market environment. In order to further enhance its core competitiveness, obtain a wider user base and a longer-term development prospect.

### **5.conclusion**

This article analyzes Meituan Youxuan's marketing strategies, delving into its performance in market positioning and business outcomes. By integrating the 4C theory and SWOT analysis, it identifies issues present in current marketing processes. In response to these problems, the article proposes a series of optimization solutions to help Meituan Youxuan enhance its core competitiveness in a highly competitive market environment.

First of all, optimizing product quality is an important measure to improve customer satisfaction and loyalty. By strengthening supply chain management, ensuring the freshness of products and enriching product varieties, Meituan Youxuan can better meet the needs of consumers and thus improve user retention rate.

Secondly, a reasonable pricing strategy is crucial for the long-term development of Meituan Youxuan. Avoiding the "big data price discrimination" phenomenon and ensuring fair and transparent prices can enhance user trust and loyalty. Moreover, adjusting prices based on market demand to make the pricing system more competitive helps maintain a balance between new and old users.

In terms of marketing channels, Meituan Youxuan needs to further integrate online and offline resources, improve APP and mini-program functions, and build a more efficient fresh logistics system. By reducing intermediate circulation links, Meituan Youxuan can not only reduce costs, but also improve product freshness and delivery efficiency.

In addition, diversified advertising and marketing strategies can help Meituan Youxuan expand its brand influence. By advertising through media such as public transportation and daily necessities packaging, and using time-limited discounts, gifts and points exchange to enhance users willingness to buy, it can effectively promote sales growth.

Finally, the application of artificial intelligence technology can further optimize user data analysis and enhance personalized service levels, thereby improving user experience and satisfaction. Leveraging big data analytics, Meituan Youxuan can accurately pinpoint user needs and offer more targeted marketing strategies. In summary, optimizing Meituan Youxuan's marketing strategies not only helps boost its market competitiveness but also lays a solid foundation for sustainable corporate development. Through continuous innovation and optimization, Meituan Youxuan is expected to build a strong moat in the community group buying market, achieving long-term growth.

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# Azərbaycanın Davamlı İqtisadi İnkişafı və Ətraf Mühitə Təsiri

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## Giriş

Azərbaycanın iqtisadiyyatı son onilliklərdə əhəmiyyətli dəyişikliklərə uğramışdır. Əsasən neft və qaz sektoruna dayanan iqtisadiyyat, müstəqillik əldə edildikdən sonra bir çox islahatlar və diversifikasiya cəhdləri ilə yeni bir mərhələyə qədəm qoymuşdur. Lakin, iqtisadi artımın davamlı olması üçün yalnız maddi artımın deyil, həm də təbii sərvətlərin qorunması və ətraf mühitin stabil vəziyyətdə saxlanması vacibdir. Bu məqalədə Azərbaycanın davamlı iqtisadi inkişafı və bunun ətraf mühitə təsiri məsələləri ətrafında geniş müzakirələr aparılacaq.

## Açar sözlər:

- Davamlı inkişaf
- İqtisadi şaxələnmə
- Bərpa olunan enerji
- Ətraf mühitin qorunması
- Yaşıl iqtisadiyyat

## Keywords:

- Sustainable Development
- Economic Diversification
- Renewable Energy
- Environmental Protection
- Green Economy

## 1. Davamlı İnkişafın Tərifı və Əhəmiyyəti

Davamlı inkişaf, iqtisadi, sosial və ətraf mühit amillərini nəzərə alaraq inkişafı təmin edən bir anlayışdır. Bu anlayışın əsası 1987-ci ildə Birləşmiş Millətlər Təşkilatının "Dünya gələcəyinə birgə baxış" adlı hesabatında qoyulmuşdur. Bu anlayış, yalnız iqtisadi artımı deyil, həmçinin təbii resursların qorunması, sosial bərabərlik və ətraf mühitin sabit vəziyyətdə saxlanmasını nəzərdə tutur. Azərbaycanda davamlı inkişafın əsas məqsədi təbii sərvətləri qorumaqla yanaşı, əhəlinin yaşam şəraitini yaxşılaşdırmaq və iqtisadiyyatı uzunmüddətli dövrdə inkişaf etdirməkdir.

## 2. Azərbaycanın İqtisadiyyatının Davamlı İnkişafı

Azərbaycanın iqtisadiyyatı əsasən neft və qaz sektoruna əsaslanır. Bu sahənin iqtisadiyyata verdiyi təsir əhəmiyyətli olsa da, uzunmüddətli inkişaf üçün digər sektorlara yönəlmək zəruridir. Son illərdə Azərbaycanın hökuməti iqtisadi şaxələnməyə və qeyri-neft sektorunun inkişafına xüsusi diqqət yetirir. Bu istiqamətdə kənd təsərrüfatı, turizm, informasiya texnologiyaları və digər sektorlarda müxtəlif təşəbbüslər həyata keçirilir.

**Neft Sektorunun Rolunun Çətinlikləri:** Neft sektoru, Azərbaycanın iqtisadiyyatında mühüm yer tutsa da, bu sektorun davamlı inkişafı bir sıra çətinliklərlə üzləşir. Neftin qiymətindəki dalğalanmalar, təbii sərvətlərin tükənməsi və ətraf mühitin qorunması kimi məsələlər bu sektorda qarşıya çıxan əsas problemlərdir.

**Diversifikasiya Cəhdləri:** Azərbaycanın iqtisadiyyatının neftdən asılılığını azaltmaq üçün müxtəlif sahələrdə diversifikasiya təşəbbüsləri həyata keçirilir. Məsələn, kənd təsərrüfatı sahəsində yeni



texnologiyaların tətbiqi və qeyri-neft sahələrinə investisiyaların artırılması məqsədilə layihələr həyata keçirilir. Eyni zamanda, ölkənin turizm və informasiya texnologiyaları sahələrində də inkişaf tendensiyaları müşahidə olunur.

### 3. Ətraf Mühit və Ekoloji Təhlükələr

Azərbaycanın iqtisadi inkişafı ilə yanaşı, ətraf mühitin qorunması da ciddi əhəmiyyət kəsb edir. Neft çıxarılması, sənaye fəaliyyətləri və urbanizasiya ətraf mühitə mənfi təsir göstərir. Bunun nəticəsində hava çirklənməsi, su resurslarının tükənməsi və torpaq istifadəsi ilə bağlı ekoloji problemlər yaranır.

**Hava Çirklənməsi:** Bakı və digər iri şəhərlərdə sənaye fəaliyyətlərinin artması, avtomobil sayının çoxalması və digər faktorlar səbəbindən hava çirklənməsi ciddi problemə çevrilmişdir. Bu problem, həmçinin insanların sağlamlığına mənfi təsir göstərir və ətraf mühitin qeyri-davamlı şəkildə pozulmasına səbəb olur.

**Su Resurslarının Azalması:** Azərbaycanın kənd təsərrüfatında suvarma sistemləri geniş istifadə olunur, lakin su ehtiyatları getdikcə azalır. Xüsusilə Aran bölgəsində bu problem daha da kəskinləşir. Su resurslarının qənaətlə istifadəsi və suvarma texnologiyalarının müasir standartlara uyğunlaşdırılması vacibdir.

**Torpaq Resurslarının İstifadəsi:** Azərbaycanın əkin sahələri müxtəlif ekoloji problemlərlə üzləşir. Həddindən artıq suvarma və torpağın qeyri-düzgün istifadə edilməsi nəticəsində torpaq eroziyası və kimyəvi maddələrin torpağa qarışması kimi hallarla qarşılaşılır.

### 4. Davamlı İnkişafın Azərbaycan Üçün Perspektivləri

Davamlı inkişafın təmin edilməsi üçün bir neçə əsas istiqamətə diqqət yetirilməlidir. Bunlar arasında yaşıl iqtisadiyyatın inkişafı, bərpa olunan enerji mənbələrinin istifadəsi və ətraf mühitin qorunması ön plana çıxır.

**Yaşıl İqtisadiyyat:** Yaşıl iqtisadiyyat, iqtisadi inkişafı ekoloji təhlükələrdən qorumağa yönəlmiş bir yanaşmadır. Azərbaycanda təbii sərvətlərin qorunması və ekoloji balansın bərpası məqsədilə yaşıl iqtisadiyyatın inkişafı çox vacibdir. Bu, həmçinin yeni iş yerlərinin yaradılmasına, texnoloji inkişafın artırılmasına və ətraf mühitin qorunmasına kömək edəcək.

**Bərpa Olunan Enerji Mənbələri:** Son illərdə Azərbaycanın bərpa olunan enerji mənbələrinə, xüsusilə külək və günəş enerjisinə marağı artmışdır. Bu, ölkənin enerji tələbatını daha ekoloji cəhətdən təmiz şəkildə təmin etməyə imkan verir. Bu sahəyə investisiyaların artırılması, ətraf mühitin qorunmasına töhfə verəcəkdir.

**Təhsil və Maarifləndirmə:** Davamlı inkişafın təmin edilməsi üçün ətraf mühitin qorunması haqqında maarifləndirmə və təhsil mühiti vacibdir. İnsanlar arasında ətraf mühitin qorunması ilə bağlı məlumatlılığın artırılması, təbii sərvətlərin daha səmərəli istifadə edilməsini təmin edəcək.

### 5. Azərbaycanın Təcrübəsi və Beynəlxalq Əməkdaşlıq

Azərbaycan, beynəlxalq miqyasda davamlı inkişaf və ətraf mühitin qorunması məsələlərində fəal iştirak edir. Bu sahədə bir çox beynəlxalq təşkilatlarla əməkdaşlıq edir, o cümlədən Birləşmiş Millətlər Təşkilatı, Dünya Bankı və digər qurumlarla müştərək layihələr həyata keçirir.

**Beynəlxalq Müqavilələr:** Azərbaycan bir çox beynəlxalq müqaviləyə qoşulmuşdur. Bunlar arasında Paris Sazişi və digər ekoloji sazişlər Azərbaycana ekoloji təhlükələrə qarşı mübarizədə beynəlxalq dəstək almasına kömək edir.

**Beynəlxalq Əməkdaşlıq və İnvestisiyalar:** Azərbaycanın beynəlxalq maliyyə qurumları ilə əməkdaşlıq edərək davamlı inkişaf sahəsində irəliləyişlər əldə etməsi mümkündür. Bu əməkdaşlıq, həmçinin ekoloji problemlərin həlli üçün lazımlı resursların təmin olunmasında mühüm rol oynayır.

### Nəticə

Azərbaycanın iqtisadiyyatı, təbii sərvətlərin qorunması və ətraf mühitin sabit vəziyyətdə saxlanması arasında düzgün bir tarazlıq qurmaq vacibdir. Dövlətin və özəl sektorun əməkdaşlığı, yaşıl iqtisadiyyat və bərpa olunan enerji sahələrinə investisiyalar artdıqca, ölkənin gələcəkdə davamlı inkişafı təmin edilə bilər. Bu, həmçinin Azərbaycanın beynəlxalq miqyasda ekoloji məsuliyyətini yerinə yetirən və davamlı inkişaf hədəflərinə çatmağa çalışan bir ölkə kimi tanınmasına səbəb olacaqdır.

### Conclusion

It is essential for Azerbaijan's economy to strike a proper balance between the conservation of natural resources and maintaining environmental stability. The cooperation between the government and the private sector, along with increasing investments in green economy and renewable energy sectors, will ensure the country's sustainable development in the future. This will also lead to Azerbaijan being recognized internationally as a country that fulfills its ecological responsibilities and strives to achieve sustainable development goals.

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# DEVELOPMENT OF KAZAKHSTAN'S OIL AND GAS SECTOR: THE EXPERIENCE OF STATE REGULATION IN THE USA AND THE UAE

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## Abstract

The relevance of studying the effectiveness of the current state regulation policy in Kazakhstan's oil and gas sector is determined by the critical role this industry plays in the national economy. The sector constitutes a significant share of Kazakhstan's Gross Domestic Product (GDP), generates substantial revenues for the state budget, and serves as a primary source of foreign currency inflows. Despite its economic importance, the existing regulatory framework faces several challenges that require thorough analysis and continuous improvement. These challenges arise from both internal factors and external pressures, including fluctuations in global markets, stricter environmental regulations, and the need for economic diversification. Given the increasing global economic instability and growing focus on environmental issues, Kazakhstan must enhance the efficiency of its oil and gas sector regulation by incorporating international best practices. This study aims to conduct a comprehensive assessment of the current state regulation of Kazakhstan's oil and gas industry and develop recommendations for its optimization, drawing on foreign experience. The research focuses on identifying existing challenges and proposing solutions to improve regulatory effectiveness, ensuring the sustainable development of the sector and its contribution to the national economy in response to emerging risks and opportunities. The practical significance of this study lies in determining the key factors influencing the development of Kazakhstan's oil and gas industry. The analysis of oil and gas production, infrastructure conditions, and environmental risks enables decision-making at both governmental and business levels. These findings support the development of policies that attract investment and foster international cooperation, ultimately enhancing the investment climate and strengthening the country's economic competitiveness. Additionally, the research highlights the economy's dependence on oil and gas prices, its vulnerability to external market fluctuations, and the urgent need for infrastructure modernization. The adoption of advanced technologies and increased investment will contribute to improving the efficiency of hydrocarbon extraction and processing.

**Keywords:** oil and gas industry, state regulation, Kazakhstan, investment climate, environmental sustainability, international experience, USE, UAE

## Introduction

The study of the effectiveness of Kazakhstan's state regulation policy in the oil and gas sector is a highly relevant issue, as this industry serves as one of the key pillars of the country's economy. The oil and gas sector accounts for a significant share of Kazakhstan's Gross Domestic Product (GDP), generates substantial revenues for the state budget, and serves as a major source of foreign currency inflows. Consequently, this sector plays a crucial role in ensuring economic development and stability. However, despite its importance, the existing system of state regulation faces several challenges that require attention and improvement. These challenges arise from both internal

factors and external influences, such as fluctuations in global markets, the tightening of environmental regulations, and the necessity of economic diversification

The relevance of this study is further reinforced by global economic trends that emphasize the transition to more sustainable development models and the reduction of dependence on fossil fuels. As a country rich in hydrocarbon reserves, Kazakhstan must adapt its policies to align with changing global economic and environmental trends to maintain the competitiveness of its oil and gas industry while ensuring sustainable economic growth. Additionally, enhancing transparency and efficiency in state regulation is a crucial task, as it contributes to attracting foreign investments and fostering technological advancements in the sector.

Currently, Kazakhstan's system of state regulation in the oil and gas sector comprises a set of measures, including licensing, taxation, environmental compliance monitoring, and the creation of investment-friendly conditions. However, these mechanisms do not always meet modern requirements and need to be revised and improved. One of the main challenges is the insufficient integration of innovative technologies into production processes, leading to reduced efficiency in hydrocarbon extraction and processing, as well as increased environmental risks. Moreover, a lack of regulatory transparency and a high level of administrative barriers create additional obstacles to attracting investments and fostering industry development.

International experience demonstrates that effective regulation of the oil and gas sector requires not only the implementation of economic instruments but also the establishment of a favorable institutional environment that promotes sustainable development and innovation. In this context, analyzing international regulatory practices and adapting the best solutions to national conditions is of particular importance. Amid global economic instability and growing interest in environmental issues, Kazakhstan must improve its regulatory mechanisms in the oil and gas sector by incorporating best international practices. This approach will not only enhance economic performance but also mitigate environmental impacts and ensure a more equitable distribution of revenues derived from natural resources. Thus, the study of the effectiveness of state regulation in Kazakhstan's oil and gas sector and the development of recommendations for its improvement based on international best practices is a relevant and significant task from both a scientific and practical perspective. The objective of this research is to conduct a comprehensive analysis of Kazakhstan's state regulation policy in the oil and gas sector and to develop recommendations for its enhancement, taking into account international experience. The study aims to identify existing challenges and determine ways to improve regulatory efficiency, ensuring the sustainable development of the sector and its contribution to the national economy in the face of new challenges and opportunities.

The practical significance of this research lies in its potential application by government agencies for refining and improving existing regulatory mechanisms in the oil and gas sector. The proposed recommendations focus on improving the investment climate, increasing regulatory transparency, optimizing the tax burden, and integrating innovative technologies. These measures will strengthen Kazakhstan's economic position on the international stage and ensure the sustainable development of the oil and gas sector. The research findings indicate the necessity of revising and modernizing the state regulation system in Kazakhstan. Based on the conducted analysis, specific proposals have been developed to reduce administrative barriers, introduce tax incentives for innovation, and enhance environmental oversight. The key outcome of the study is the development of an integrated regulatory model adapted to Kazakhstan's conditions, based on best international practices. This model includes a comprehensive set of measures aimed at fostering innovation, improving transparency, and increasing the efficiency of administrative procedures.

The research methodology includes the analysis of regulatory documents, a comparative study of international practices, and surveys conducted with representatives of the oil and gas

sector and government agencies. This comprehensive approach has made it possible to assess current challenges and identify optimal solutions. The novelty of this study lies in the development of an adapted model for state regulation of Kazakhstan's oil and gas sector, based on best international practices. Unlike existing approaches, this model proposes a holistic set of measures that include economic incentives, administrative reforms, and the integration of innovative technologies, making it more effective and relevant for modern conditions. Additionally, for the first time in Kazakhstan, a comparative analysis was conducted with the regulatory systems of the United States and the UAE, allowing for the identification and adaptation of the most successful practices to national conditions.

## Results and Discussion

Kazakhstan's oil and gas industry plays a key role in the country's economy, accounting for approximately half of its export revenue and a significant share of its Gross Domestic Product (GDP). The country's vast hydrocarbon reserves, along with its strategic geographical position between Europe and Asia, make Kazakhstan an important player in the global energy market. However, economic dependence on hydrocarbons makes Kazakhstan vulnerable to global fluctuations in oil and gas prices, necessitating a well-balanced state policy to ensure stability and sustainable growth.

The total GDP produced in 2023 (according to official data) amounted to 119,808,038.7 million KZT. Compared to the corresponding period of the previous year, GDP increased by 5.1% in real terms. GDP, calculated at the average annual exchange rate of the US dollar set by the National Bank of the Republic of Kazakhstan, amounted to 262,558.4 million USD.

In 2023, compared to the previous year, real growth in goods production, services, and net taxes on products was 4.4%, 5.2%, and 7.4%, respectively. The economy demonstrates moderate growth, as confirmed by GDP data, which increased by 5.1% in real terms, with a deflator of 11.7%. The primary contributors to GDP growth were services (56.4% of total GDP) and goods production (36.2%), with the services sector showing a more dynamic growth rate than goods production. In particular, the trade, transport and warehousing, information, and communications sectors exhibited the highest growth rates. Goods production, including industry and construction, also increased. However, growth dynamics in agriculture have slowed, with the physical volume index declining by 7.4%, likely due to unfavorable climatic conditions or decreased productivity. The manufacturing industry has shown stable growth of 4% in real terms, indicating economic diversification. However, the mining sector experienced a slowdown in growth due to a decline in the physical volume of production, despite maintaining a high share of GDP. Product taxes increased by 7.6%, reflecting a rise in fiscal revenues. However, subsidies on products also increased, suggesting that support measures have been implemented for specific sectors.

The level of the unobserved economy relative to GDP in 2023 decreased by 1.26% compared to the previous year, amounting to 17.52% of GDP, with the share of illegal activities accounting for 1.12% of GDP. The largest shares of the unobserved economy in GDP were recorded in wholesale and retail trade, repair of motor vehicles and motorcycles (3.53%), healthcare and social services (2.04%), and agriculture, forestry, and fishing (1.96%). The smallest shares were observed in water supply; sewerage, waste management, and remediation activities (0.03%), arts, entertainment, and recreation (0.08%), and electricity, gas, steam, and air conditioning supply (0.10%).

Thus, Kazakhstan's economy continues to show steady growth, with the oil and gas sector playing a crucial role, particularly in raw material extraction and trade. However, the processing sector remains underdeveloped, necessitating further growth in the secondary sector. The non-oil sector continues to dominate, indicating economic diversification, but further investment in

agriculture, processing, and services is required to strengthen it. Developing infrastructure and enhancing oil and gas processing efficiency could ensure more balanced growth.

Kazakhstan's traditional gas markets include CIS countries such as Russia and Ukraine. In 2020, Russia accounted for 8.0 billion cubic meters of gas, an 18.4% increase compared to 2019, while Ukraine received 0.6 billion cubic meters. Other major export destinations included China (7.4 billion cubic meters) and Switzerland (3.2 billion cubic meters). According to the Gas Industry Development Strategy for 2022–2026, peak natural gas production at existing facilities is expected in 2024. However, a gas shortage is forecasted by 2025, when domestic demand is projected to exceed available supply by 1.7 billion cubic meters. The main reasons include population gasification projects, increasing demand from the automotive industry, low domestic gas prices, government interventions in pricing policies, and rising consumption by new large industrial consumers, such as petrochemical complexes. According to QazaqGaz CEO S. Zharkeshov, the 2024 shortage will require importing gas from neighboring countries such as Russia, Turkmenistan, and Uzbekistan. The most significant gas deficit is projected within the next five years. In 2023, Kazakhstan produced 90 million tons of oil and gas condensate, of which 70.5 million tons were exported, according to the Ministry of Energy. The Caspian Pipeline Consortium (CPC) remains the main export route, transporting 80% of Kazakhstan's exported oil—over 56.5 million tons. This included 27.5 million tons of marine oil shipments, 9.6 million tons of Karachaganak oil, 17.9 million tons of Kashagan oil, and 1 million tons exported from other fields. In 2022, oil production in Kazakhstan increased by 7%, and exports grew by 10%, including an 8% rise in CPC shipments. About 62% of Kazakhstan's territory contains oil and gas resources. There are 172 oil fields, with over 80 actively developed. Nearly 90% of oil reserves are concentrated in Tengiz, Kashagan, Karachaganak, and 15 other major fields, located in six regions: Aktobe, Atyrau, West Kazakhstan, Karaganda, Kyzylorda, and Mangystau. Approximately 70% of Kazakhstan's hydrocarbon reserves are found in the western regions.

Currently, the Caspian Pipeline Consortium (CPC) remains the most efficient oil export route from Kazakhstan to global markets, as it is shorter and cheaper compared to alternative routes such as BTC (Baku-Tbilisi-Ceyhan), exports to China, or Iran. Kazakhstan is actively seeking alternative export routes due to its dependence on the Tengiz-Novorossiysk pipeline, which passes through Russia, a country currently at war with Ukraine. Russian experts note that CPC also exports Russian oil, revenues from which are used to finance military operations. Additionally, the pipeline has been targeted by attacks, leading to temporary shutdowns of tanker shipments from the CPC terminal in the Black Sea. Another key export point is the Russian port of Sheskhari in Novorossiysk. Kazakhstan's KazTransOil is considering rerouting part of its oil exports to Ust-Luga port on the Baltic Sea if the Black Sea conflict escalates. However, the military situation poses risks to all Russian ports, making the development of alternative routes crucial.

Kazakhstan's share in the global gas market is only 1.2%. However, the domestic gas market faces several challenges. The gas shortage within the country is not due to a physical lack of resources but rather stems from market structural issues and strict price regulations. Price caps and insufficient processing capacity make domestic gas processing inefficient in meeting the growing demand. Exploration, field development, and the construction of new gas processing facilities could significantly increase available resources and commercial gas production, but they require substantial investment. To enhance the attractiveness of gas projects, measures must be taken to improve their economic efficiency and profitability. Karachaganak, Kashagan, and offshore projects are the key sources of natural gas production in Kazakhstan, accounting for more than 75% of total output. Over the past four years, production levels at Karachaganak have remained nearly unchanged, while Tengiz and Kashagan fields have shown gradual production growth over the last three years. Kazakhstan's oil and gas industry is regulated through a comprehensive set of laws, decrees, and regulatory acts aimed at ensuring efficient resource



utilization, environmental sustainability, and attracting foreign investments. The legal framework continues to evolve in response to global trends and current challenges, such as decarbonization and reducing dependency on hydrocarbons. A key regulatory act is the Subsoil and Subsoil Use Code of the Republic of Kazakhstan (2018), which governs all aspects of subsoil utilization, including licensing, field development, and revenue distribution from hydrocarbon extraction. The Code provides incentives for geological exploration and offers flexible conditions for investors, fostering foreign capital attraction. To ensure transparency, licensing and resource development processes are automated.

The environmental code of the Republic of Kazakhstan (2021) establishes environmental responsibility standards for the oil and gas sector. It requires an environmental impact assessment (EIA) for all projects and the implementation of advanced carbon capture and storage (CCS) technologies. The Code strengthens environmental monitoring and enforces corporate liability for preventing and addressing environmental incidents such as oil spills. The law on oil regulates legal aspects related to exploration, production, transportation, and processing of hydrocarbons. It establishes obligations for subsoil users regarding safety regulations, the application of modern technologies, and environmental protection. This law also governs the export of petroleum products, ensuring the strategic management of state revenues from foreign economic activities. The Investment Policy Concept of the Republic of Kazakhstan until 2026 aims to improve the investment climate and develop oil and gas industry infrastructure. It includes tax and customs benefits, state subsidies, and grants for major investment projects. To coordinate interactions with investors, the Foreign Investors' Council under the President of Kazakhstan develops recommendations to enhance investment conditions. Government decrees play a crucial role in regulating the oil and gas industry. For example, decrees on hydrocarbon production and export quotas ensure the rational use of natural resources and maintain domestic market stability. Additionally, modernization programs have been developed to upgrade infrastructure, including pipelines and refineries. To achieve climate goals, Kazakhstan participates in international agreements, including the Paris Agreement, which is reflected in its regulatory framework. These regulations set emission reduction targets and encourage the adoption of renewable energy sources. The government is also developing mechanisms to support green technologies, as part of its program to diversify the energy sector.

The Presidential Decree on Industrial Development Strategy emphasizes economic diversification and reducing dependence on hydrocarbon exports. Under this strategy, measures are being developed to support domestic oil and gas processing and foster the growth of non-extractive industries. The Law on State Regulation of Oil Product Production and Trade sets requirements for the production, storage, and transportation of petroleum products. It establishes licensing procedures for companies operating in this sector and includes measures to maintain stable prices for socially significant fuels.



Figure 1. Gas production and export, billion cubic meters

Over the period from 2014 to 2023, gas production and export in Kazakhstan exhibited varying trends. Gas production increased from 43.2 billion cubic meters in 2014 to a peak of 56.4 billion cubic meters in 2019. This growth reflects the expansion of industrial activity and the development of gas fields. However, during 2020–2022, production started to decline, likely due to the pandemic, a drop in global demand, and technical challenges. Nevertheless, in 2023, gas production reached a record 59.1 billion cubic meters, which may indicate the launch of new projects and the recovery of industry activity. Gas exports also rose from 10 billion cubic meters in 2014 to 18 billion cubic meters in 2019, reflecting increased external demand. However, in the following years, exports began to decline, reaching 14 billion cubic meters in 2022. This decline could be attributed to reduced demand from key partners such as Russia and China, or to increased domestic gas consumption. In 2023, gas exports stabilized at 15 billion cubic meters, indicating a partial recovery in international shipments. Over the past decade, Kazakhstan's oil and gas sector has demonstrated stable financial performance despite the volatility of global oil and gas prices. This sector plays a key role in the national economy, accounting for approximately 16% of the Gross Domestic Product (GDP) and contributing 30% to 50% of the state budget revenues. This underscores its significance for public finance and economic stability. Foreign investments remain a crucial driver for industry development. Over the past decade, about one-third of total foreign direct investment (FDI) inflows have been directed toward the oil and gas sector. These investments support the implementation of major infrastructure projects, modernization of production facilities, and enhance Kazakhstan's competitiveness in the global market.

The state regulation of the oil and gas industry in the USA is based on a set of key legislative acts aimed at ensuring energy security, environmental protection, and the sustainable development of the sector. Key legislative acts regulating environmental and energy aspects play a crucial role in the development of the oil and gas industry. The Clean Air Act, enacted in 1970, establishes strict air quality standards and controls pollutant emissions generated during the extraction and processing of hydrocarbons. Alongside it, the Clean Water Act of 1972 aims to protect water resources by introducing stringent regulations for the discharge of pollutants into natural water bodies, helping to minimize the environmental impact of oil and gas activities. Another important regulatory document is the Toxic Substances Control Act (1976), which governs the use and management of chemicals, including those used in oil extraction and processing. It serves to protect public health and ecosystems from the harmful effects of toxic substances. In the field of energy policy, the Energy Policy Act of 2005 plays a significant role in supporting the development of energy infrastructure, providing tax incentives for new energy projects, and promoting energy efficiency improvements.

The energy independence and security act of 2007 strengthens the focus on renewable energy sources and energy efficiency. This legislation sets targets for increasing the production of alternative fuels and enhancing the economic resilience of the energy system, laying the foundation for the transition to cleaner technologies. Together, these legislative acts establish a comprehensive regulatory framework for the oil and gas sector, ensuring its sustainable development while minimizing environmental risks.

## Let us examine the regulatory features (Figure 2)

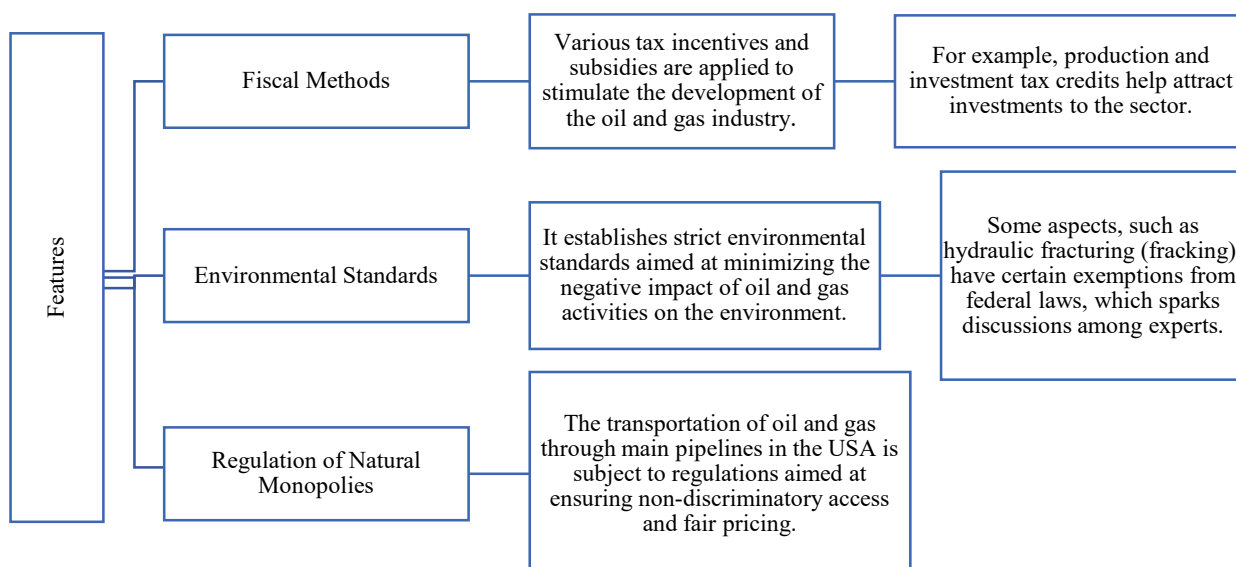


Figure 2. Regulatory Features in the USA

The U.S. government energy policy combines fiscal incentives and environmental restrictions aimed at ensuring the sustainable development of the oil and gas sector. However, certain aspects, such as tax incentives, may lead to market distortions and require regular revisions to ensure their effectiveness. At the same time, exemptions for specific extraction methods, such as hydraulic fracturing (fracking), from certain environmental laws have raised concerns about potential risks to the environment and public health. In recent years, the issue of rising gasoline prices in the U.S. has become more pressing. Previously, the country's political leadership attributed this issue to Russia's actions in Ukraine and Syria, but this claim was later disputed by experts. Furthermore, the U.S. administration's attempts to prevent oil production cuts by OPEC+ countries were unsuccessful. Efforts to sell oil from the Strategic Petroleum Reserve and restrict oil exports from the U.S. also failed to produce the desired results. From our perspective, the increase in oil and gasoline prices in the U.S. is influenced by multiple factors, including global oil prices, infrastructure availability, and geopolitical influences. As of today, the U.S. oil and gas industry faces regulatory constraints imposed by the presidential administration, which has implemented a series of environmental restrictions. The Republican Party has criticized the administration on this issue, while the Democratic Party has responded with a campaign against oil monopolies, accusing them of exploiting the conflict in Ukraine. In this context, S&P Global Commodity Insights reported that the net profit of publicly traded global oil and gas corporations that shape the U.S. oil market amounted to \$200.24 billion in the second and third quarters of 2022. These figures indicate that despite government-imposed restrictions, the American oil industry remains one of the most profitable in the world.

The U.S. oil and gas market is moderately fragmented. Some of the key players in the market include Shell Plc, BP plc, ExxonMobil Corporation, Chevron Corporation, and Total Energies SE. Political decisions can significantly impact the oil market. For instance, policies introduced by the Biden administration in early 2021 led to reduced profits for small companies engaged in shale oil and gas extraction. However, as oil prices surged in Q3 2021, the revenues of these companies began to recover.

It is also worth noting that oil and gas extraction in the U.S. has become more efficient in recent years due to technological innovations and the development of new extraction methods, such as hydraulic fracturing (fracking). Oil companies operating in the U.S. currently face a number

of challenges, including a volatile oil market, declining prices, and increased competition. In response, many companies have reduced investments in further exploration and instead focused on building reserve funds, paying dividends, and executing share buybacks. These strategies have positively impacted stock prices. Following the most profitable quarter in company history, ExxonMobil CEO Darren Woods announced plans to allocate a significant portion of excess profits to increasing dividend payouts. On the other hand, some companies, such as Devon Energy, have opted not to invest heavily in production expansion, instead focusing on creating shareholder value and rewarding investors with high dividend yields.

In general, the U.S. oil market continues to balance investments in growth and shareholder value creation. Despite current challenges, companies remain committed to ensuring stable returns for their investors. Thus, to enhance the effectiveness of state policy in the U.S. oil and gas sector, it is necessary to continue improving the legislative framework, taking into account both economic and environmental factors, while ensuring transparency and accountability of regulatory bodies.

A distinctive feature of the legal system of the United Arab Emirates (UAE) is the division between onshore legal systems and the regulations governing more than 40 free zones. These include financial free zones, such as Abu Dhabi Global Market (ADGM) and Dubai International Financial Centre (DIFC), as well as industrial zones, such as Industrial City of Abu Dhabi and Jebel Ali Free Zone. Free zones offer unique customs, tax, and legal frameworks, creating favorable conditions for businesses, especially in the oil sector. Notably, DIFC and ADGM operate under common law, which contrasts with the predominantly civil law system on the mainland.

The United Arab Emirates has established a highly favorable legal environment for the oil sector, as evidenced by the World Justice Project 2023 rankings. The UAE scored 0.64 and ranked 37th out of 142 countries, leading the region. This ranking reflects the strength of its legal framework compared to regional and global standards. The UAE excels in key areas such as absence of corruption, order and security, regulatory enforcement, civil and criminal justice, creating a business-friendly climate for the oil industry. The UAE's extensive network of bilateral investment treaties, covering more than 73 countries with significant investments in the oil sector, underscores the country's commitment to fair and equitable treatment of foreign investors. This network includes major economies and several member states of the Arab League and the Gulf Cooperation Council (GCC), facilitating international investments and dispute resolution. Article 23 of the UAE Constitution grants each emirate control over its natural resources, including oil. These resources are considered public property, managed in the interest of the national economy, with each emirate's government holding final authority over oil field development. While the Federal Ministry of Energy and Infrastructure is responsible for energy legislation, its authority remains subject to the constitutional rights of the individual emirates. In the United Arab Emirates, licenses for oil exploration, development, and production are typically issued through host government instruments, such as traditional contractual concessions, production-sharing agreements, and, less frequently, service contracts. There are no unified federal laws specifically regulating the oil sector; instead, this sector is primarily governed by the laws of each emirate.

The regulatory framework for oil operations in the United Arab Emirates (UAE) is governed by both federal and emirate-level authorities. The Federal Ministry of Energy and Infrastructure is the UAE's primary federal regulatory body in the oil sector. It is responsible for organizing and developing strategies, general policies, and federal legislation in the fields of energy and mineral resources. The ministry took its current form in 2020 after the merger of the Federal Ministry of Energy and Industry with the Federal Ministry of Infrastructure and Development.

The Federal Ministry of Climate Change and Environment serves as the federal environmental regulator for oil operations in the UAE. It is responsible for developing plans, strategies, policies, programs, initiatives, and legislation aimed at environmental protection and

climate change mitigation. Established in 2016, the ministry assumed the responsibilities of the former Federal Ministry of Environment and Water, except for those related to water resources, which were transferred to the Federal Ministry of Energy (now the Federal Ministry of Energy and Infrastructure).

The Federal Ministry of Industry and Advanced Technology is responsible for setting standards and specifications, particularly for petroleum products, under Federal Decree-Law No. 20 of 2020 on Specifications and Standards. This role was transferred from the Emirates Authority for Standardization and Metrology, making the ministry the key body for developing and implementing standards, specifications, and relevant policies across various sectors, including the oil industry.

The UAE's state policy in regulating the oil and gas sector is a strategically designed and highly efficient management system, allowing the country not only to maintain leadership in the global hydrocarbons market but also to adapt to contemporary global energy challenges. A key feature of this policy is the complete state ownership of natural resources, which enables centralized management of all aspects of exploration, production, processing, and export of oil and gas. The Supreme Petroleum Council and the national oil company ADNOC play pivotal roles in ensuring strict adherence to national interests while maintaining high levels of transparency and accountability.

A crucial element of regulation is the licensing system, which allows foreign companies to participate in oil and gas projects through production-sharing agreements or concession contracts. This approach helps attract international investments and technologies while ensuring full control over national resources. This model enables the UAE to balance economic interests with the need for innovation-driven development. Additionally, the legal framework of the industry includes environmental laws, such as the Federal Environmental Law of 1999, which mandates environmental impact assessments (EIA) before launching major projects. This reflects the UAE's commitment to sustainable development principles.

Special attention is given to economic diversification. Through Vision 2021 and the Energy Strategy 2050, the UAE actively works to reduce its dependence on the oil and gas sector by developing renewable energy, tourism, and technology industries. Key examples of these efforts include the Noor Abu Dhabi solar power plant and the development of nuclear energy, particularly the Barakah Nuclear Power Plant. These initiatives demonstrate the country's commitment to building a more balanced and sustainable energy portfolio.

The environmental aspect of state policy also plays a vital role. The UAE actively invests in carbon capture and storage (CCS) projects, which help minimize greenhouse gas emissions. These technologies not only support the UAE's commitments under the Paris Agreement but also strengthen its position as a global leader in sustainable development. However, despite these achievements, the scale of oil and gas operations continues to have a significant environmental impact, necessitating stricter environmental standards and regulatory oversight, especially in offshore oil extraction.

The effectiveness of UAE policy is confirmed by the economic stability of the country, even amid oil price volatility. However, some challenges remain. The dependence on hydrocarbon revenues is still significant, and despite efforts toward diversification, oil and gas continue to be key contributors to GDP. Increasing competition from other oil-exporting nations also requires the UAE to constantly enhance the efficiency of its oil and gas sector.

In conclusion, the UAE's state regulation of the oil and gas sector has proven highly effective, integrating economic, environmental, and innovation-driven approaches. However, for continued sustainable development, the country must accelerate its transition to renewable energy, strengthen environmental protection measures, and further diversify its economy. These

steps will enable the UAE to maintain its leadership in the global energy sector and successfully adapt to new global challenges.

Since the early 1990s, the UAE's economy has shown consistent growth, as evidenced by the increase in GDP based on purchasing power parity (PPP). Over recent years, this indicator has risen significantly, reflecting the UAE's ability to adapt to changing economic realities. Although inflation has increased in recent years, its level remains relatively low, contributing to economic stability. In many key metrics, such as foreign currency and gold reserves, the UAE ranks among the top quartile in global rankings.

The oil and gas sector remains the foundation of the UAE's economy, but the government is focusing on revenue diversification and the development of new industries. The UAE's energy strategy aims to increase the share of renewable energy and reduce dependence on natural gas. Special attention is being given to solar energy, with the construction of large photovoltaic power plants already underway. Additionally, waste-to-energy projects are being developed, reinforcing the country's commitment to environmental sustainability.

**Table 1. UAE Energy Overview, 2021**

	Crude Oil and Other Petroleum Liquids	Natural Gas	Coal	Nuclear	Hydro power	Renewable Energy and Others	Total
Primary Energy Consumption (Quadrillion BTU)	1.7	2.8	0.1	0.0		0.1	4.6
Primary Energy Consumption (Percentage)	37%	60%	1%	0%		1%	100%
Primary Energy Production (Quadrillion BTU)	7.7	2.4	0.0	0.0		0.1	10.1
Primary Energy Production (Percentage)	76%	23%	0%	0%		1%	0%
Electricity Generation (Terawatt-Hours)	127.1	0.0	1.8	0.0	6.7		135,6
Electricity Generation (Percentage)	94%	0%	1%	0%	5%		100%

The United Arab Emirates (UAE) was the seventh-largest producer of liquid fuels in the world in 2022 and the third-largest within the Organization of the Petroleum Exporting Countries (OPEC). The UAE joined OPEC in 1967 and is currently one of two members with significant spare crude oil production capacity to address potential supply shortages.

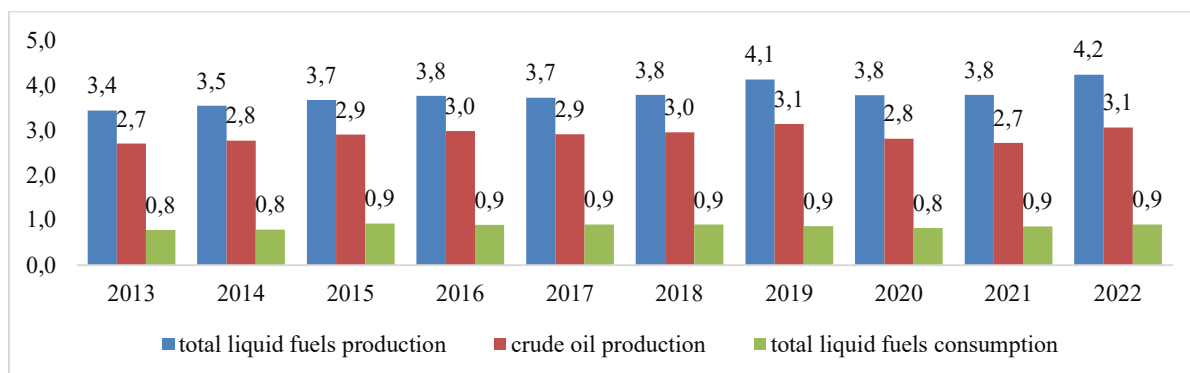


The UAE has invested heavily in expanding hydrocarbon production capacity and developing midstream and downstream infrastructure to support future hydrocarbon production growth. At the same time, the UAE is increasingly focusing on the development of non-hydrocarbon energy sources, such as nuclear and renewable energy, as well as enhancing its leadership in environmental sustainability and climate action. The UAE is the first country in the Middle East to commit to achieving net-zero emissions by 2050 and will host the United Nations Climate Change Conference (COP 28) at the end of 2023.

On June 4, 2023, OPEC member countries and non-OPEC countries (collectively known as OPEC+) announced that the group would extend crude oil production quotas for participating countries until the end of 2024. Additionally, the crude oil production quotas for OPEC and OPEC+ member countries would be adjusted starting January 2024. Unlike other member countries, whose production quotas were reduced, the UAE's current quota was increased by 200,000 barrels per day (b/d), bringing its crude oil production quota for 2024 to 3.22 million b/d.

Between 2013 and 2022, the UAE produced an average of approximately 2.9 million barrels per day of crude oil. UAE oil production steadily increased, reaching a record annual peak of approximately 3.1 million b/d of crude oil and condensate in 2019. However, in 2020, the UAE began limiting crude oil production following the global economic slowdown caused by the COVID-19 pandemic and the April 2020 OPEC+ agreement to significantly cut crude oil output. The voluntary production cuts, outlined in the agreement, have been gradually phased out, allowing for higher production quotas that enable the UAE to increase its output.

The UAE and Saudi Arabia are the only two OPEC producers with substantial spare crude oil production capacity, giving them the potential to scale up production (Figure 3).



**Figure 3. Total annual petroleum and other liquids production and consumption in the UAE, 2013–2022**

The UAE government has set an ambitious goal to achieve 5 million barrels per day (b/d) of crude oil production by 2027, revising its earlier target from 2030. To reach this goal, the government has undertaken efforts to stimulate exploration and field development. In 2018 and 2019, the governments of the emirates Abu Dhabi, Sharjah, and Ras Al Khaimah conducted a series of licensing rounds for exploration blocks, which were offered for the first time to both domestic and international oil companies.

ADNOC Drilling, the exploration and production subsidiary of the larger national oil company, Abu Dhabi National Oil Company (ADNOC), conducted an initial public offering (IPO) in October 2021, listing 11% of its shares on the country's stock exchange, the Abu Dhabi Securities Exchange (ADX). ADNOC has also increased its planned capital expenditures to \$150 billion for the period 2023–2027 and announced expansion plans to increase production.

According to Energy Intelligence, ADNOC reported its official production capacity at 4.5 million b/d, which is approximately 0.5 million b/d higher than our 2023 estimate of 4.0 million b/d. However, it remains unclear whether ADNOC can sustain this production level consistently.



Estimates from other sources, such as Energy Intelligence and Rystad Energy, are higher, placing the UAE's production capacity closer to 4.3–4.4 million b/d.

The UAE also aims to increase natural gas production and become a net exporter of natural gas by 2030. To achieve this goal, the country plans to develop and bring online several natural gas fields.

However, the UAE faces challenges in achieving its net exporter status due to rising domestic demand and technical and financial difficulties in developing some of its natural gas fields, which produce highly sour natural gas.

These fields contain a relatively high concentration of sour gases, such as hydrogen sulfide, which is toxic and corrosive to certain metals. Therefore, it must be separated during natural gas extraction and processing to ensure safe and efficient production.

## Conclusions

The findings of this research emphasize the vital role of the oil and gas sector in Kazakhstan's economy, where it constitutes around 16% of the country's Gross Domestic Product (GDP). This sector is a major contributor to state revenues and serves as a key source of foreign currency inflows. Additionally, it remains an attractive area for foreign investments, driving infrastructure growth and modernization of production. However, the nation's heavy dependence on hydrocarbon exports exposes its economy to fluctuations in global oil prices, highlighting the necessity of a more diversified development strategy for the sector.

The study identified structural imbalances within the industry. Despite Kazakhstan's strong oil and gas production figures, insufficient emphasis is placed on refining and processing, limiting the potential for value-added activities within the country. The secondary sector, which encompasses oil refining, and the tertiary sector, covering transportation and trade, remain underdeveloped compared to resource extraction. Furthermore, outdated infrastructure and the deterioration of equipment at mature oil fields present significant obstacles to the industry's long-term sustainability.

Environmental concerns were another key focus of the study. Although stricter environmental regulations, including the revised Environmental Code, have been introduced, challenges such as oil spills and soil contamination persist. Addressing these issues requires the adoption of advanced technologies and stricter enforcement of environmental standards. The integration of carbon capture and storage (CCS) technologies is one of Kazakhstan's initiatives aimed at minimizing its carbon footprint and aligning with global environmental commitments.

The research underscores the need for reforms in the state regulatory framework for the oil and gas industry. Strategies aimed at reducing bureaucratic barriers, attracting investment in refining and new field development, and fostering innovation would enhance the sector's overall competitiveness. Kazakhstan should also leverage international best practices to establish a more transparent and efficient resource management system, ensuring the industry's sustainable growth in the face of global economic and environmental challenges.

In conclusion, the study reaffirms the importance of economic diversification, strengthening processing capacities, and reinforcing environmental responsibility. Implementing these measures will not only reduce Kazakhstan's reliance on hydrocarbon exports but will also contribute to a more resilient and sustainable economic model, reinforcing the country's position in the global energy market.

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# АНАЛИЗ МАКРОЭКОНОМИЧЕСКИХ ФАКТОРОВ И ТЕНДЕНЦИЙ РАЗВИТИЯ ИНВЕСТИЦИОННОЙ ДЕЯТЕЛЬНОСТИ ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЙ УЗБЕКИСТАНА

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В свете глобальных изменений в мировой экономике и тенденций развития во всех сферах каждое государство должно осознавать необходимость принятия активной инвестиционной политики, которая способствует его экономическому развитию в долгосрочной перспективе, учитывая, что отсутствие такой политики может оказаться неспособным обеспечить его развитие без активной внешней экономической деятельности. В этом контексте в последние годы в Узбекистане наблюдается рост интереса к принятию и дальнейшему улучшению активной инвестиционной политики, соответствующей внешней экономической деятельности.

Опыт мирового сообщества показывает, что страны, которые не создают благоприятную инвестиционную среду и не активно привлекают иностранные инвестиции в свою национальную экономику, не могут успешно интегрироваться в мировое экономическое сообщество. В этой связи для успешной реализации процесса привлечения иностранных инвестиций в национальную экономику Узбекистана проводятся комплексные меры по созданию реальных условий в соответствии с требованиями времени. В результате достигается увеличение объема привлеченных иностранных инвестиций и достижение поставленных целей.

Роль и значение инвестиций в развитии экономики огромны. На общеэкономическом уровне инвестиции требуются для: расширения воспроизводства, структурных преобразований в стране, повышения конкурентоспособности отечественной продукции, решения социально-экономических проблем, в частности, проблем безработицы, образования, здравоохранения, экологии и т.д.

На микроуровне инвестиции способствуют: развитию и укреплению позиций компании, обновлению основных фондов, стабилизации финансового состояния, повышению конкурентоспособности предприятия, повышению квалификации кадров, совершенствованию методов управления.

В рыночной экономике государство активно участвует в регулировании инвестиционной деятельности, которое находит свое проявление в следующем:

*во-первых*, государство выступает в качестве системообразующего фактора, так как создает нормативно правовую базу. Инвестиционное законодательство в Узбекистане является одним из передовых в системе законодательства стран СНГ, который включил в себя основные положения международного инвестиционного права

*во-вторых*, само государство является субъектом инвестиционной деятельности, выделяя бюджетные средства на конкурсной основе непосредственным инвесторам. При этом государство при принятии инвестиционных решений руководствуется иными

принципами, чем коммерческие организации при оценки эффективности реальных проектов. в - третьих, государство определяет стратегию поведения инвесторов на рынке инвестиционных товаров, объем и структуру государственных инвестиций.

Конечные (стратегические) цели определяют степень воздействия данной формы финансовой и денежно - кредитной политики на производство. «...Инвестиционное решение по своей сути является результатом сопоставления предельных выгод и предельных затрат»<sup>1</sup>.

Экспертные мнения и высокие оценки от международных специалистов также свидетельствуют о том, что наша страна продолжает активно проводить эффективную инвестиционную политику, что подтверждает правильность и успешность экономических реформ и достижения поставленных целей правительством. Анализ последних лет показывает, что имеются положительные изменения в организации инвестиций, направленных на развитие региональных и экономических секторов страны, что отражено в таблице 1.

Таблица 1

**Инвестиции, направленные на формирование основных капиталов в соответствии с финансовыми ресурсами страны<sup>2</sup>**

<b>Относительно всех финансовых ресурсов</b>	<b>Инвестиции, которые были централизованы</b>	<b>Инвестиции, которые не были централизованы</b>
Объем инвестиций составляет 269 857,5 млрд. сум. По сравнению с 2021 годом: 100,9%, Доля - 100%.	Объем инвестиций составляет 41 436,4 млрд. сум. По сравнению с 2021 годом: 80,4%. Доля - 15,4%.	Объем инвестиций составляет 228 421,1 млрд. сум. По сравнению с 2021 годом: 105,8%, Доля - 84,6%.
<b>Республиканский бюджет</b>	<b>Развитие системы водоснабжения и канализации</b>	<b>Программа развития и прогресса</b>
Объем инвестиций составляет 20 910,1 млрд. сум. По сравнению с 2021 годом: 84,4% Доля: 7,8%	Объем инвестиций составляет 2 873,6 млрд. сум. По сравнению с 2021 годом: 92,0% Доля: 1,1%	Объем инвестиций составляет 2 470,8 млрд. сум. По сравнению с 2021 годом: 73,5%, Доля: 0,9%
<b>Иностранные кредиты под гарантией</b>	<b>Средства компании</b>	<b>Средства населения</b>
Объем инвестиций составляет 15 181,9 млрд. сум. По сравнению с 2021 годом: 74,9% Доля 5,6%	Объем инвестиций составляет 84 516,0 млрд. сум. По сравнению с 2021 годом: 110,6% Доля 31,3%	Объем инвестиций составляет 25 738,1 млрд. сум. По сравнению с 2021 годом: 103,2%, Доля 9,5%

<sup>1</sup> Брю С.Л., Макконнелл К.Р. Экономикс: краткий курс: пер. 1-го англ.изд. - М., ИНФРА, 2015, 462с.

<sup>2</sup> Агентство по статистике при Президенте Республики Узбекистан. Социально-экономическое положение Республики Узбекистан. Январь-декабрь 2022 г., Ташкент-2023

Прямые и не застрахованные иностранные инвестиции и кредиты	Кредиты коммерческих банков и другие долговые средства	Количество компании
Объем инвестиций составляет 97 037,6 млрд. сум. По сравнению с 2021 годом: 104,3 %, Доля 36,0 %	Объем инвестиций составляет 97 037,6 млрд. сум. По сравнению с 2021 годом: 104,3% Доля 36,0%	Крупные организации: 3650 Малый бизнес (исполнители проектов инвестиционной программы): 1910

В Узбекистане принята комплексная Концепция социально-экономического развития страны до 2030 года, которая предусматривает обеспечение макроэкономической стабильности и устойчивости экономического роста, повышение конкурентоспособности, инвестиционного и экспортного потенциала отраслей экономики, создание благоприятных условий для развития и защиты предпринимательства, снижение уровня напряженности на рынке труда, рост доходов населения и сокращение мало обеспеченности<sup>3</sup>. Поэтому разработанная Концепция, учитывающая тенденции развития мировой экономики, меры по сглаживанию воздействия на экономику страны негативных внешних факторов, демографических тенденций и напряженности на рынке труда, необходимость наращивания производственного потенциала территорий, обеспечение роста занятости и улучшение условий жизни населения рассматривается важным ориентиром в комплексном решении вопросов перехода экономики страны на путь устойчивого развития и повышения благосостояния населения рисунок 1.

По итогам третьего квартала экономика Узбекистана продолжала демонстрировать устойчивость к внутренним и внешним вызовам. По данным Агентства по статистике валовый внутренний продукт (ВВП) Узбекистана вырос на 5,8%, что несколько меньше, чем темпы роста за аналогичный период предыдущего года (6,2%). Несмотря на сохранение геополитической нестабильности, оказывающей воздействие на мировую экономику, в целом, в странах основных-торговых партнерах, складывалась благоприятная экономическая среда. Так, в Казахстане ВВП по итогам 9 месяцев вырос на 4,7%, в Кыргызстане на 4,2%.

<sup>3</sup> Концепция социально-экономического развития Узбекистана до 2030 года – [www. Uza. Uz](http://www.Uza.Uz)



Рисунок 1. Основные макроэкономические показатели развития Республики Узбекистан (за 2023г.)<sup>4</sup>

Инфляция в Узбекистане замедляется. В январе-сентябре цены выросли на 5,1%, что ниже, чем за аналогичные периоды в предыдущие 5 лет. Продовольственная инфляция за рассматриваемый период замедлилась до 5,6% (за 9 месяцев 2022 г. - 10%). Цены на непродовольственные товары выросли на 4,8% (7,9% за аналогичный период 2022 г.), услуги - 4,7% (4,8%). Значительно увеличился рост объемов инвестиций в основной капитал с 3,3% за 9 месяцев 2022 г. до 11,8% за тот же период 2023 г. Двухзначная динамика роста наблюдается по нецентрализованным инвестициям - увеличение за январь-сентябрь текущего года на 13,6%. В частности, высокие показатели роста отмечаются по привлечению прямых иностранных инвестиций и кредитов - 16,3% (при этом, объем прямых иностранных инвестиций вырос на 47%), за счет кредитов коммерческих банков - 27%. Также на 10,6% выросли инвестиции за счет средств населения.

Основные инвестиции в основной капитал отражают совокупные расходы, направленные на приобретение и воспроизводство новых основных фондов. В январе-декабре 2023 года общие основные инвестиции составили 352,1 трлн. сум, что на 122,1% превышает аналогичный период 2022 года. В состав основных инвестиций 66,4% или 233,8 трлн. сум составляют привлеченные средства от инвестиций, а оставшиеся 33,6% или 118,3 трлн. сум мобилизованы из собственных средств предприятий, организаций и населения.



Рисунок 2. Динамика роста инвестиций в основной капитал<sup>5</sup>

<sup>4</sup> Данные Агентства статистики при Президенте Республики Узбекистан.

<https://review.uz/post/infografika-razvitiye-ekonomiki-uzbekistana-v-yanvare-sentyabre-2023>

<sup>5</sup> Данные Агентства статистики при Президенте Республики Узбекистан. Инвестиции в основной капитал в Республике Узбекистан. Январь-декабрь, 2023г.



Централизованные инвестиции выросли на 1,3% за счет увеличения в этом году займов под гарантию правительства на 23,5%. Таким образом, в структуре инвестиций продолжает увеличиваться доля нецентрализованных - 86,9% (в январе-сентябре 2022 г. - 85,5%). За рассматриваемый период все сектора экономики продемонстрировали рост производства. Также, из средств, сосредоточенных из источников мобилизации, сумма основных инвестиций, полученных из централизованных источников финансирования, составляла 44,8 трлн. сум, в то время как 307,3 трлн. сум инвестиций было мобилизовано из не децентрализованных источников финансирования. Сельское хозяйство растет опережающими темпами - 4,1% за 9 месяцев текущего года, против роста на 3,6% в январе-сентябре 2022 г. Темпы производства продукции растениеводства, животноводства и лесного хозяйства ускорились, тогда как рыбного хозяйства несколько замедлились - 10,9% (в январе-сентябре 2022 г. - 18,1%).



Рисунок 3. Показатели по освоению централизованных и нецентрализованных инвестиций,<sup>6</sup> (за 2023 г.)

Промышленность за 9 месяцев 2023 г. выросла на 5,7%, выше, чем в январе-сентябре 2022 г. - 5,3%. Основной драйвер - обрабатывающая промышленность продемонстрировала рост на 6,4% (за 9 месяцев 2022 г. - 5,4%), также выросло производства сектора водоснабжения, сбора и утилизации отходов. В добывающем секторе хоть и отмечается рост на 0,4%, однако он ниже, чем в прошлом году (1,1%). В секторе электроснабжения, подачи газа и кондиционирования темпы роста замедлились с 14,7% в январе-сентябре 2022 г. до 8,9% за 9 месяцев текущего года. Также необходимо отметить замедление роста производства потребительских товаров с 27% за 9 месяцев 2022 г. до 7,7% за аналогичный период в 2023 г. В строительном секторе в текущем году наблюдается небольшое торможение динамики. Так, если за 9 месяцев 2022 г. рост составлял 6,6%, то в январе-сентябре 2023 г. замедлился до 5,6% (Рисунок 4). За рассматриваемый период объем

<sup>6</sup> Данные Агентства статистики при Президенте Республики Узбекистан. Инвестиции в основной капитал в Республике Узбекистан. Январь-декабрь, 2023г.



оказанных рыночных услуг вырос на 12,1% (в январе-сентябре 2022 г. - 15,4%). Рост отмечается по всем секторам. В частности, наибольшие темпы роста продемонстрировали услуги информации и связи - 24,8%, образования - 23,5%, финансовые услуги - 18,2%, услуги проживания и питания - 10,9%, операции с недвижимостью - 10,2%. Объем транспортных услуг вырос на 7,3%. Замедлились темпы роста показателей грузооборота и пассажирооборота.



Рисунок 4. Структура иностранных инвестиций и кредитов по видам экономической деятельности<sup>7</sup>, в % (за 2023 г.)

Объем розничного товарооборота вырос на 7%, однако это ниже, чем за аналогичный период прошлого года - 10,8%. Объем внешней торговли за январь-сентябрь 2023 г. вырос на 22,1% до 44,8 млрд. долл. Несмотря на значительный рост, это меньше, чем за аналогичный период прошлого года - 29,4%. Экспорт вырос на 23,5% до 17,7 млрд. долл., импорт - на 21% до 27 млрд. долл. Рост экспорта обусловлен увеличением поставок за рубеж золота почти на 90%, а также машин и транспортного оборудования на 44%, услуг на 21%, готовой продукции на 20%, пищевых продуктов на 19%. В то же время Узбекистан нарастил импорт машин и транспортного оборудования на 45%, топливной продукции на 45%, готовой продукции на 14%, химической продукции на 14%. В целом, по итогам 9 месяцев экономика Узбекистана продолжала положительную тенденцию роста в рамках запланированного вектора развития. Рост инвестиционной активности способствует преодолению внутренних и внешних вызовов, кроме того, сохраняется тренд на снижение инфляции, что также ведет к стабилизации экономической среды. В то же время, дополнительные риски создают повышенная волатильность курса национальной валюты и

<sup>7</sup> Данные Агентства статистики при Президенте Республики Узбекистан. Инвестиции в основной капитал в Республике Узбекистан. Январь-декабрь, 2023г.

увеличение бюджетного дефицита. К ключевым выводам Макроэкономического анализа за январь-сентябрь 2023 года можно отнести следующие оценки:

- в январе-сентябре 2023 года экономика Узбекистана выросла на 5,8%. По итогам текущего года ожидается сохранение положительного производственного разрыва;
- услуги и сфера промышленности стали основными драйверами экономического развития со стороны общего спроса: данные сферы выросли на 6,5% и 5,7% соответственно;
- как показывает тенденции прошлых лет, если до 2021 года доля поступлений по налогу на прибыль и доходы, а также платы за ресурсы и поступления с налога на недвижимость к ВВП неуклонно росли, в последние годы растет доля внебюджетных фондов и счетов и других доходов;
- по подсчетам, в 2020-2023 годах наблюдалась тенденция роста реальных и нейтральных процентных ставок. По состоянию на сентябрь текущего года, реальная процентная ставка составила 4,4%, а нейтральная процентная ставка - 3,9%;
- на фоне ужесточения глобальной денежно-кредитной конъюнктуры центральные банки основных торговых партнеров России, Казахстана и Турции продолжают политику поддержания жесткой денежно-кредитной политики;
- к началу октября 2023 года общая денежная масса увеличилась на 12% по сравнению с соответствующим периодом предыдущего года. Доля национальной валюты в составе денежной массы составила 77%, а доля депозитов в иностранной валюте - 23%;
- согласно анализу, доля потребительских кредитов и автокредитования в разрезе кредитов населению остается высокой (44% и 40%).
- в январе-сентябре 2023 года объем импорта машин и оборудования составил 11,4 млрд долл., химической продукции - 4,2 млрд долл., продуктов питания - 3 млрд долл., услуг - 1,8 млрд долл. Существенных изменений в доле этих категорий в импорте не произошло.

Современная действительность показывает, что за годы независимости нашей республики общий объем иностранных капиталовложений в экономику превысил 15 млрд. долларов. Как показывает опыт, инвестиции, соединяясь с национальными природными производственными и трудовыми ресурсами, создают высокий совокупный эффект при внедрении прогрессивных технологий, современных методов управления и организации производства, более активном вовлечении в хозяйственный оборот местных, зачастую ранее неиспользованных богатств. Инвестора не только вкладывают свои средства в национальные предприятия, реконструируют и технически перевооружают их, но и открывают доступ к мировым рынкам сбыта, что улучшает адаптацию хозяйствующих субъектов к цивилизованным рыночным отношениям, помогая поднять их производственную и финансово-хозяйственную деятельность до соответствующих мировых стандартов. Поэтому стимулирование инвестиций, помогают повышению эффективности использования и обуславливают их необходимость сохранить и улучшить благоприятные условия и преференциальный рынок в республике.

Мировой опыт достаточно убедительно показывает, что привлечение и использование инвестиций способствует развитию экономики и служит мощным стимулом социально-экономических реформ. Мысль о том, что инвестиции являются двигателем экономики, обеспечивающим ее движение вперед, - это аксиома любой экономической теории. Каждое государство должно прилагать усилия для привлечения в первую очередь в сферу материального производства как отечественных, так и иностранных инвесторов. С этой целью разрабатывается и реализуется определенная инвестиционная политика, формируется соответствующий инвестиционный климат. Экономические реформы, последовательно осуществляемые в независимом Узбекистане, предполагают достижение рациональных отраслевых, воспроизводственных и территориальных пропорций, развитие интеграционных процессов, обеспечение экономического роста и др. Решение всей

совокупности указанных проблем тесно связано с проведением соответствующей инвестиционной политики, формированием действенной системы регулирования и поддержки инвестиционных процессов.

В нормативно-законодательном определении инвестиций капитальные вложения трактуются как инвестиции в основной капитал, в том числе затраты на новое строительство, расширение, реконструкцию и техническое перевооружение действующих предприятий, приобретение машин, оборудования, инструмента, инвентаря, проектно-изыскательские работы и другие затраты. Инвестиции, помимо вложений в основной капитал, могут осуществляться в оборотный капитал (реальные инвестиции) и различные финансовые инструменты, например, акции, облигации, производные ценные бумаги (финансовые инвестиции). Следовательно, инвестиции являются более широким понятием, чем капиталовложения, а значит их отождествление неправомерно.

Приведенные определения инвестиций, данные различными авторами, в основном содержат характеристику способов размещения капитала, в них сравнивается и анализируется эффективность размещения капитала в различные ценные бумаги, но авторами не приводятся выводы о влиянии инвестиций на стоимость капитала предприятия, его развитие и методика расчета такого влияния. Важнейший вид деятельности в социальной сфере - жилищное строительство. За счет всех источников финансирования по этому виду деятельности всего освоено 29,1 трлн. сум инвестиций в основной капитал, доля которой составила 8,3 % от общего объема. Инвестиции, направленные на развитие сельского хозяйства, составили 20,2 трлн. сум, или 5,7 % от их общего объема. По виду деятельности электро- и газоснабжение всего за счет источников финансирования было освоено 42,0 трлн. сум, что составило 11,9 % от их общего объема. В горнодобывающей промышленности было освоено 36,3 трлн. сум, или 10,3 % от их общего объема, из них 3,7 %, или 13,2 трлн. сум инвестиций в основной капитал, было освоено по добыче сырой нефти и природного газа как показано на рисунке 5.



Рисунок 5. Доли и объем инвестиций в основной капитал по Республике Узбекистан по видам экономической деятельности за 2023 год<sup>8</sup>

В региональной структуре инвестиций в основной капитал за счет средств государственного бюджета наиболее высокие показатели отмечены в Сурхандарьинской - 13,4 %, Андижанской - 9,0 % областях и Республике Каракалпакстан - 8,6 %. Наиболее высокая доля инвестиций за счет собственных средств предприятий и организаций отмечена в г. Ташкент, где она составила 44,6 % от их общего объема. В Самаркандской области она составила 26,0 %, Ташкентской области - 24,5 %. Особое место в составе инвестиций за счет привлеченных средств занимают иностранные инвестиции и кредиты.

Если исходить из их долей, то в общем объеме инвестиций в основной капитал высокие показатели отмечены в Сырдарьинской и Бухарской областях, где эти цифры составили 81,6 % и 64,3 % соответственно. В территориальном разрезе инвестиций в основной капитал наиболее высокие темпы роста были отмечены в Джизакской области - 148,8 %, это больше, чем в 2022 году. Данный результат можно объяснить освоением инвестиций по таким крупным проектам, как «Организация производства автомобиля», «Расширение производства минеральных плит из базальта», «Строительство солнечной электростанции мощностью 220 МВт».

Наряду с этим, наблюдались высокие темпы роста и в Сурхандарьинской области - 145,4 %. Здесь реализуются такие крупные инвестиционные проекты, как развитие геологоразведочных работ на месторождении «25 лет Независимости», разработка месторождения на основе соглашения о разделе продукции, строительство газохимического комплекса и солнечной электростанции мощностью 457 МВт. Рост инвестиций на 133,6 % по отношению к 2022 году в Навоийской области прежде всего связан со строительством ветряной электростанции мощностью 500 МВт, а также со строительством комплекса по добыче и переработке золотосодержащих руд.

<sup>8</sup> <https://stat.uz/ru/2020-11-09-05-58-49/infografiki/397-infografika/34599-infografics-2024>

В январе-декабре 2023 года значительная часть, т.е. 55,7 % всех инвестиций в основной капитал, была освоена в пяти регионах республики, в частности в г.Ташкент - 19,3 %, Ташкентской - 12,6 %, Самаркандской - 7,6 %, Бухарской - 8,9 % и Навоийской - 7,3 % областях. Первые позиции по объему инвестиций в основной капитал в расчете на душу населения за январь-декабрь 2023 года занимает Навоийская область - 24 278,9 тыс. сум (или, по сравнению с 2022 годом, 131,0 %), далее, соответственно, идут г. Ташкент - 22 644,8 тыс. сум (или 107,2 %) и Сырдарьинская область - 16 954,7 тыс. сум (или 111,6 %). Сущность и значение инвестиций в современной экономике отражают выполняемые ими функции. Можно выделить следующие функции инвестиций на макроуровне:

- процесс простого и расширенного воспроизводства основных фондов, как в производственной, так и непроизводственной сферах;
- процесс обеспечения и восполнения оборотного капитала;
- перелив капитала из одной сферы в другую посредством купли-продажи финансовых активов;

- перераспределение капитала между собственниками путем приобретения акций и вложения средств в активы других предприятий.<sup>9</sup> Направление инвестиций на увеличение реального капитала общества (приобретение машин, оборудования, модернизацию и строительство зданий, инженерных сооружений), способствует увеличению производственного потенциала экономики. Инвестиции в производство, в новые технологии помогают выжить в жесткой конкурентной борьбе (как на внутреннем, так и на внешнем рынке), идти на шаг вперед, иметь возможность более гибкого регулирования цен на свою продукцию и т.д. В макроэкономическом масштабе текущее благосостояние является в значительной мере результатом вчерашних инвестиций, а современные инвестиции, в свою очередь, закладывают основы завтрашнего роста валового внутреннего продукта и, соответственно, более высокого благосостояния (диаграмма 1). Таким образом, значение инвестиций нельзя переоценить, так как они непосредственно определяют рост экономики. Для экономики Республики Узбекистан инвестиции необходимы, прежде всего, для стабилизации и развития промышленности. На микроуровне инвестиции необходимы, прежде всего, для достижения следующих целей: расширения и развития производства; недопущения чрезмерного морального и физического износа основных фондов; повышения технического уровня производства; повышения качества и обеспечения конкурентоспособности продукции конкретного предприятия; осуществления природоохранных мероприятий; приобретения ценных бумаг и вложения средств в активы других предприятий. В конечном итоге инвестиции необходимы для обеспечения нормального функционирования предприятия в будущем, стабильного финансового состояния и максимизации прибыли.

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<sup>9</sup> Махмудов Н.М., Авазов Н.Р. «Анализ факторов, влияющих на государственный инвестиционный климат». // «Инновация в экономике», № 7, 2019г. стр 4-10.





Диаграмма 1. Динамика объема инвестиций в основной капитал<sup>10</sup>, в трлн. Сум

Весь процесс исследования сущности инвестиций и их роли в развитии предприятия показало, что определения инвестиций, данные различными авторами, в основном содержат характеристику способов размещения капитала, в них сравнивается и анализируется эффективность размещения капитала в различные ценные бумаги, но авторами не приводятся выводы о влиянии инвестиций на стоимость капитала предприятия, его развитие и методика расчета такого влияния. В то же время развитие предприятия напрямую связано с успехом его инвестиционной деятельности.

Сегодня в Узбекистане особое внимание уделяется привлечению инвестиций. Местная политика, обеспечение безопасности и положительные экономические показатели - все эти факторы играют ключевую роль в активизации привлечения иностранных инвестиций. Присутствие такой ситуации также вызывает серьезный интерес у иностранных инвесторов. Наша страна активно проводит широкомасштабные экономические реформы и структурные изменения для обеспечения устойчивого макроэкономического развития и улучшения инвестиционного климата в Республике, в том числе через усиление инвестиционной среды для иностранных инвестиций.

Если взглянуть на темпы роста объема инвестиций за последние пять лет, то становится очевидным, что до 2019 года он увеличивался и достиг 138,1 %, в 2020 году наблюдалось незначительное снижение - 95,6%, в 2021 году он увеличился до 102,9 %, а затем продолжил расти и к настоящему времени составил 122,1 %. (рисунок 6.)

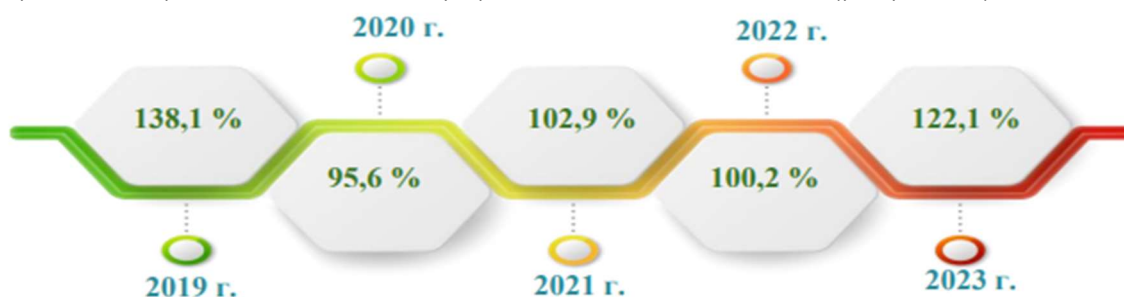


Рисунок 6. Темпы роста объема инвестиций<sup>11</sup>, в %

<sup>10</sup> Данные Агентства статистики при Президенте Республики Узбекистан. Инвестиции в основной капитал в Республике Узбекистан. Январь-декабрь, 2023г.

<sup>11</sup> Данные Агентства статистики при Президенте Республики Узбекистан. Инвестиции в основной капитал в Республике Узбекистан. Январь-декабрь, 2023г.

За счет централизованных источников финансирования за январь-декабрь 2023 года было освоено 44,8 трлн. сум инвестиций в основной капитал, или 12,7 %, что меньше, если сравнить с 2022 годом, на 3,0 п.п. Соответственно за счёт нецентрализованных источников финансирования в указанный период было освоено 307,3 трлн. сум инвестиций, или 87,3 % от их общего объёма, что больше, по сравнению с 2022 годом, на 3,0 п.п.

В 2023 году 66,4 % из числа освоенных инвестиций в основной капитал, или 233,8 трлн. сум, были профинансированы за счет привлеченных средств, остальные 33,6 %, или 118,3 трлн. сум, - за счет собственных средств предприятий и населения. При формировании показателей инвестиционной статистики за 2023 год от крупных предприятий принят 3701 отчет, а от субъектов малого бизнеса - 4409. (рис. 7)



Рисунок 7. Освоенные инвестиции за счет централизованных и нецентрализованных источников финансирования, <sup>12</sup> в трлн.сум. (за 2023г.)

<sup>12</sup> Ашурметова Н.А., Ибрагимова М.Ф.. Анализ инвестиционных проектов в сфере сельского хозяйства в Узбекистане. Journal of Innovations in Scientific and Educational Research 6.4 (2023): 646-651.



# Corporate Decisions: Theory and Practice

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## Abstract

Corporate decisions are a key element of strategic management aimed at improving business efficiency. This article examines the theoretical foundations of corporate decision-making, the methodologies for their implementation, and the application of Kaizen and Lean systems in BI Group's practice. Special attention is given to the impact of digital technologies and modern management approaches on decision-making processes.

## Keywords

Corporate decisions, strategic management, Kaizen, Lean, business analytics, digital transformation

## Introduction

Modern companies must adapt to rapidly changing market conditions by implementing effective corporate management methods. Corporate decisions encompass the selection of strategies, methods, and tools that enable organizations to achieve their goals. BI Group actively employs Kaizen and Lean systems to optimize processes and enhance competitiveness. This article explores the theoretical and practical aspects of corporate decision-making, demonstrating their impact on the company's operations.

## Theoretical Foundations of Corporate Decisions

The theory of corporate decisions includes several key concepts:

- Rational Choice Model (Simon) – based on data analysis and alternative evaluation.
- Lean Management (Womack & Jones) – focused on minimizing waste and improving efficiency.
- Kaizen (Imai) – a philosophy of continuous improvement used in corporate management.
- Digital Transformation – the integration of information technologies to enhance business flexibility and adaptability.

## Kaizen and Lean in Corporate Decisions of BI Group

BI Group implements Kaizen and Lean principles, which allow the company to:

- Reduce production costs and minimize waste.
- Improve the quality of construction projects through process standardization.
- Optimize resource and personnel management.
- Develop a corporate culture of continuous improvement.

The application of these methodologies has enabled the company to increase operational efficiency and introduce innovative approaches to the construction industry in Kazakhstan.

## Analysis of Corporate Decisions in BI Group

To assess the effectiveness of corporate decisions in BI Group, key performance indicators were analyzed. The implementation of Lean methods has reduced project completion time by 15%, while the adoption of Kaizen has increased customer satisfaction by 20%. These results confirm the success of the company's strategic approach.

## Conclusion

Corporate decisions play a crucial role in ensuring companies' competitiveness. The application of Kaizen and Lean in BI Group demonstrates the effectiveness of these methodologies in the

construction industry. The future of corporate management is linked to further digital transformation, process automation, and the strengthening of analytical decision-making.

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# Corporate governance and future skills development through lifelong learning

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## Abstract

Modern organizations strive for sustainable development and competitiveness, which requires effective corporate governance and investments in human capital. One of the key tools for this is continuing education programs that promote the development of future skills. In the context of digital transformation and rapid changes in the labor market, employees must have critical thinking, creativity, digital literacy, adaptability, and the ability to self-learn. Corporate governance plays an important role in creating conditions for professional growth by introducing educational initiatives focused on relevant competencies. Continuous training helps to improve the skills of employees, improve teamwork, productivity and the innovative potential of the company. In addition, such programs help to reduce staff turnover and increase staff motivation. The article discusses corporate governance strategies aimed at developing future skills, as well as the benefits of continuing education for employees and organizations.

## Keywords:

Corporate governance, continuing education, future skills, professional development, digital literacy, adaptability, innovation.

Today, education is acquiring the features of a multi-vector process of improving human activity. This is dictated by the need for society to transition to an innovative path of development with the widespread use of scientific achievements in the real sector of the economy. In turn, the implementation of such an approach requires the training of highly qualified specialists who are not only fluent in their profession, but also oriented in related fields of knowledge, which is an indispensable condition for their high competitiveness in the labor market. Such specialists should be competent in their professional field, no less importantly, demonstrate a readiness for systematic professional growth, and if necessary, for retraining in the face of changing demand in the labor market.

Corporate governance encompasses the mechanisms, structures, and processes that ensure the control and strategic development of a company. The basic principles of corporate governance are included in Table 1.

Table 1. The basic principles of corporate governance

Principles	Description
Transparency	Ensuring the availability of information about the company's activities.
Responsibility	Accountability to stakeholders
Justice	The protection of the rights of shareholders and employees
Efficiency	Decision-making focused on long-term development.

These principles help organizations adapt to changes, including the transformation of the labor market and the emergence of new requirements for the professional skills of employees.

With the development of artificial intelligence, automation, and digital technologies, new requirements for employee competencies are emerging. Figure 1 illustrates future skills.

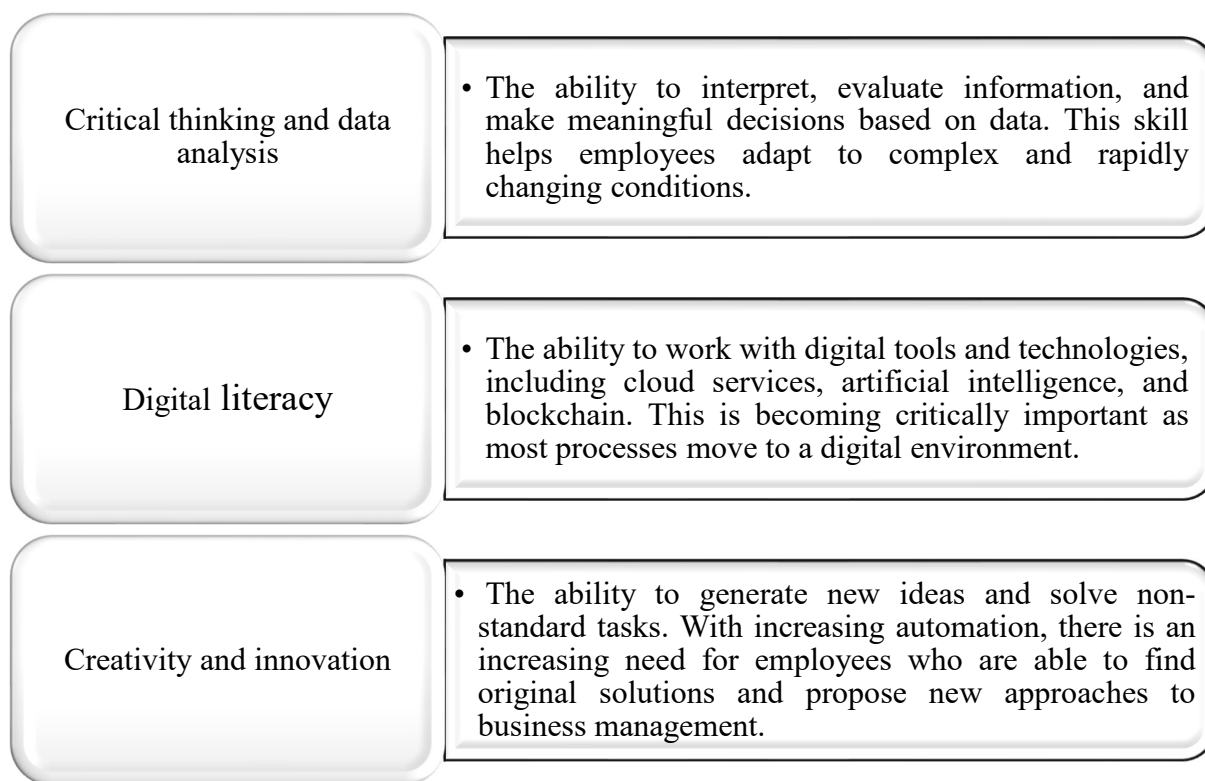


Figure 1. Future skills development

Research shows that successful development in the 21st century requires a combination of technical and soft skills. Future skills are key competencies that will help you adapt to a rapidly changing world and develop in your professional and personal life. Self-learning and lifelong learning are a person's ability to independently acquire knowledge and develop competencies throughout their life. In a rapidly developing world, where technologies, professions and requirements for specialists are constantly changing, the ability to learn is becoming not just a useful, but a necessary skill. Lifelong learning involves the conscious pursuit of new knowledge, the use of various sources of information (books, online courses, trainings, professional communities), as well as the practical application of acquired knowledge. This process requires developed critical thinking, the ability to analyze information and use it effectively. Continuous learning helps a person adapt to changes, be competitive in the labor market, broaden their horizons and improve their quality of life.

The need for lifelong learning is conditioned by the variability of human life and the tasks of adapting to the changes taking place. The emergence of modern ideas about adult continuing education is associated with the intensive development of industry and new technologies, as well as with an increase in average life expectancy in the early twentieth century in economically developed countries in Europe and the United States.

The system of lifelong learning is aimed at implementing the following functions:

- ensuring human adaptation to the constantly changing conditions of not only professional activity, but also the social environment by providing opportunities for organizing an individual educational trajectory throughout life;
- strengthening and pooling the educational resources of society;

- formation of educational social partnership as a component of civil society. Thus, it can be said that continuing education is designed to establish closer ties with life, pave new ways of development in the field of theory and teaching methods, ensure the individualization of learning, use new technologies, the most promising technical means.

The development of the lifelong learning system makes it possible to create all the necessary conditions to ensure the response of the education system to the dynamically changing needs of the individual, society, and economy. In addition, many scientists note that the system of lifelong learning plays an important role in the formation of personnel for the innovative development of the regions of our country.

In modern conditions of globalization and digitalization, Kazakhstan is faced with the need to improve corporate governance and continuing education. The SWOT analysis identifies key strengths and weaknesses, as well as opportunities and threats in this area.

Table 2. SWOT analysis of corporate governance and future skills development through continuing education programs in Kazakhstan

	Strengths	Weaknesses
	The existence of government programs and strategies aimed at the development of continuing education.	Insufficient level of digitalization of educational processes in the corporate sector.
Internal (strengths and weaknesses)	Active development of online learning and educational platforms such as Skills Enbek.	Limited access to quality educational resources in the regions.
	Government support in the development of corporate governance (the concept of lifelong learning).	Insufficient motivation of employees for self-education and professional development.
	Development of partnership between business, government and educational institutions.	Low level of financial investments in staff training on the part of some companies.
	Opportunities	Threats
External (opportunities and threats)	The introduction of modern technologies (artificial intelligence, Big Data, VR) in educational processes.	Rapid technological changes can make current educational programs obsolete.
	Development of corporate universities and staff retraining programs.	Kazakhstan is lagging behind in the implementation of international corporate governance standards.
	Professional development of management personnel through the MBA and EMBA programs.	Competition in the global labor market, requiring accelerated skills development.
	Developing a culture of continuing education among employees and employers.	Lack of qualified specialists and trainers in the field of new technologies.

This SWOT analysis will help assess the current state of corporate governance and continuing education in Kazakhstan, as well as develop strategies to effectively address existing challenges.

Kazakhstan's lifelong learning system is currently undergoing a conceptual formation stage. From a systemic point of view, it is part of the general education system and represents a set of additional educational programs, state educational standards, educational institutions and other organizations implementing additional educational programs, public organizations whose main statutory purpose is educational activities in the field of additional education, associations (associations and unions) of educational institutions of additional education, public and state-public associations, scientific and methodological councils, management bodies of additional education, subordinate enterprises, institutions, organizations, etc.

Corporate interaction in the education system is a certain relationship between the stakeholders of the educational sphere, through which each of the stakeholders directs their efforts to realize their interests in the corporate governance system by combining individual and public goals. The introduction of boards of trustees allows for increased control over the use of resources, which helps reduce investment risks when investing in the educational sector.

The Boards of Trustees include representatives of the public, government authorities and the business community, as well as regional and district councils of the parent community. Almudena Barrientos Báez, Alberto Javier Báez-García, Francisco Flores-Muñoz, and Josué Gutiérrez-Barroso study the status of gender diversity in corporate governance and its implications for corporate performance and emotional intelligence.

Despite the diversity and variability, all existing corporate governance systems are based on four principles: fairness, accountability, responsibility and transparency. The specific forms of implementation of these principles depend on the structure of ownership relations in the corporate sector. We took as a basis the compliance of the principles and provisions of corporate legislation developed by R.A. Zhasarova.

Corporate governance in the modern period is increasingly being used by the teaching community. This is due to the fact that in the conditions of market relations, a significant part of social and professional associations base their activities on corporate relations, therefore, the education system must also keep up with the times and build relationships in the team aimed at achieving corporate goals and corporate interests. Educational institutions themselves, which have received considerable rights and relative economic independence, are subjects of competition, i.e. they are forced to defend their "private" interests in the educational services market. Therefore, educational institutions should not remain outside the field of civil relations when society builds its structures based on the principle of corporate interests. Thus, the preparation of future teachers for corporate governance in the education system should begin at the university.

The implementation of corporate governance in the modern period is an important condition for the successful development of the educational system in Kazakhstan. Therefore, future teachers should start preparing for corporate governance at the university. This led to the need to analyze the presence of the discipline "Management in Education" in the curricula of pedagogical specialties of higher educational institutions, as well as the content of the discipline to address the issue of corporate governance in the education system.

Corporate governance, being an integral part of pedagogical management, can be considered within the framework of disciplines studying management activities in the educational system. The preparation of future teachers for managerial activities has been carried out in different ways over the years.

Table 3. Indicators of the availability of the discipline "Management in education" in the Standard curricula of the Republic of Kazakhstan in the specialties

Number of bachelor's degrees in the field of Education	Availability of the discipline "Management in Education"	The presence of the discipline "Management in education" with a different name	There is no discipline "Management in education"
29 (100%)	22 (75,9%)	3 (10,3%)	4 (13,8%)

Thus, Table 3 shows that of the 29 specialties in the field of "Education", 22 (75.9%) of the specialties have the discipline "Management in Education" included in the Standard Curriculum in the basic disciplines of the compulsory component.

Thus, having studied and analyzed the problem of corporate governance in the education system of the Republic of Kazakhstan, the following conclusions can be drawn:

- the state policy of Kazakhstan in the field of education is aimed at improving education management.

- the essence of corporate education management is determined by the goals of stakeholders, namely: the state, society, employers, parents, etc., i.e. those subjects whose interests overlap in the field of education.

- there is a need to involve various social institutions in education management: business, family to strengthen the corporate component of management, as well as to review the role of educational organizations and students themselves in managing the educational process.

In a rapidly changing global economy, corporate governance and the development of future skills through continuing education programs are becoming key elements of sustainable growth and competitiveness of companies. Following global trends, Kazakhstan is actively implementing the concept of continuous learning aimed at improving the skills of employees, adapting to digital technologies and developing new competencies.

Effective corporate governance plays an important role in shaping lifelong learning strategies. Companies focused on long-term development understand that investing in human capital leads to increased productivity, innovation, and business sustainability.

One of the main objectives of corporate governance is to create a favorable educational environment within the company. This includes:

- 1.The development and implementation of educational strategies aimed at developing key skills of the future.

- 2.Creation of corporate universities, which allows to form individual educational trajectories for employees.

- 3.The use of digital technologies and online learning, providing access to knowledge regardless of geographical location.

Thus, corporate governance becomes not only a tool for improving business efficiency, but also an important factor in social development, contributing to the formation of qualified personnel.

In modern realities, traditional approaches to education are gradually giving way to flexible learning models focused on the development of integrated competencies. Among the key skills of the future are:

- 1.Creative and critical thinking is the ability to find innovative solutions and analyze information.

- 2.Digital literacy and mastery of new technologies – the ability to work with artificial intelligence, big data and automated systems.

- 3.Emotional intelligence and leadership are skills that allow effective teamwork and team management.



4. Flexibility and learning ability – willingness to constantly update knowledge in a rapidly changing labor market.

However, the implementation of continuing education programs in Kazakhstan faces a number of challenges, including insufficient digitalization, a shortage of qualified teachers, and limited funding for educational initiatives in the corporate sector. To successfully overcome these barriers, it is necessary to strengthen government support, develop partnerships between businesses and educational institutions, and actively introduce modern educational technologies.

The prospects for the development of corporate governance and continuing education in Kazakhstan look optimistic. The introduction of innovative educational models, the expansion of the availability of online courses, the use of artificial intelligence to personalize training and the integration of international standards of human resource management will allow the country to reach a new level of training.

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# ECONOMIC ANALYSIS OF MEDICAL ROBOTICS: MANAGING FINANCIAL RISKS IN THE DEVELOPMENT AND DEPLOYMENT OF SURGICAL TECHNOLOGIES

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## ABSTRACT

Medical robotics is revolutionizing healthcare by improving surgical precision and patient outcomes. However, its development and deployment involve substantial financial risks. High research and production costs, regulatory hurdles, and uncertain market adoption present challenges for investors, healthcare providers, and policymakers. Effective financial risk management strategies are essential to mitigate these uncertainties. Diversified investment portfolios, strategic partnerships, and government incentives can help stabilize funding. Additionally, insurance models and value-based pricing can reduce financial burdens on hospitals. This paper examines the economic implications of medical robotics, highlighting risk management approaches that ensure sustainable growth. By addressing financial challenges, stakeholders can maximize the benefits of robotic technology while minimizing potential economic drawbacks in the evolving healthcare landscape.

**Keywords:** Medical Robotics, Financial Risk Assessment, MRI Physics, Image Analysis, Healthcare Costs

## INTRODUCTION

The integration of robotics in medicine has significantly transformed surgical procedures, enhancing precision, efficiency, and patient safety. Robotic-assisted surgeries enable minimally invasive techniques, reducing recovery time and improving patient outcomes. Despite these benefits, the field of surgical robotics faces substantial financial risks that could hinder its widespread adoption and long-term sustainability.

One of the primary financial challenges is the high cost of development and implementation. Research, design, and manufacturing of surgical robots require substantial investment, often leading to high acquisition and maintenance costs for healthcare institutions. Additionally, regulatory approval processes are complex and time-consuming, further increasing financial strain on companies developing these technologies. Compliance with stringent safety and efficacy standards demands continuous research and testing, adding to operational expenses.

Market unpredictability presents another major concern. The demand for surgical robotics depends on factors such as hospital budgets, insurance reimbursement policies, and acceptance by medical professionals. Economic downturns or shifts in healthcare policies can impact investment and adoption rates, making revenue generation uncertain. Furthermore, competition among manufacturers drives the need for continuous innovation, increasing financial pressure on companies to maintain technological superiority.

To mitigate these risks and ensure economic sustainability, strategic approaches must be adopted. Companies should focus on cost-efficient production methods, strategic partnerships,

and scalable business models. Offering leasing options or service-based pricing models can improve affordability for hospitals. Additionally, fostering collaborations between technology developers, healthcare providers, and regulatory bodies can streamline approval processes and reduce financial burdens.

### **FINANCIAL RISKS IN MEDICAL ROBOTICS DEVELOPMENT**

The development of medical robotics is a complex and capital-intensive endeavor that requires significant investments in research and development (R&D), clinical trials, and regulatory approvals. Companies operating in this domain often face financial uncertainties due to the rapid pace of technological advancements and evolving healthcare policies. These factors make it challenging to predict the return on investment (ROI), thereby posing a significant risk to stakeholders.

One of the major cost drivers in medical robotics development is the extensive R&D required to innovate and refine robotic systems. Medical robots must be designed with high precision, incorporating advanced artificial intelligence, machine learning, and real-time data processing capabilities. This necessitates collaboration between multidisciplinary teams of engineers, medical professionals, and software developers, further escalating costs. Unlike traditional medical devices, medical robots undergo rigorous preclinical testing and simulations to ensure their safety and effectiveness before clinical trials can begin. These preliminary phases require substantial funding, yet there is no guarantee of success, adding to financial uncertainties [1].

Clinical trials, another crucial phase in the development of medical robotics, further contribute to cost burdens. These trials are conducted in multiple stages to assess the safety, efficacy, and performance of robotic systems under real-world conditions. The costs associated with clinical trials include patient recruitment, data collection, compliance with ethical standards, and the use of specialized medical facilities. The complexity of these trials extends the timeline for product development, increasing the financial strain on companies. Additionally, unforeseen complications during trials, such as adverse patient reactions or technical malfunctions, can result in further delays and additional investments to address these issues.

Regulatory approvals present yet another significant financial challenge. Institutions such as the U.S. Food and Drug Administration (FDA) have stringent requirements that medical robotic systems must meet before they can be marketed. The approval process often takes several years, requiring companies to invest heavily in regulatory documentation, compliance testing, and legal consultations. Furthermore, the regulatory landscape is continuously evolving, meaning that companies must stay updated with new policies and guidelines, which may necessitate additional modifications to their robotic systems. Delays in regulatory approvals can substantially impact a company's financial standing, as they prolong the time required to generate revenue from their innovations.

The dynamic nature of healthcare policies also contributes to financial uncertainty in medical robotics development. Governments and insurance providers frequently update reimbursement policies, impacting the market adoption of robotic systems. If a medical robot is not covered under insurance plans or reimbursement policies are unfavorable, healthcare providers may hesitate to adopt the technology. This uncertainty can discourage investors and limit funding opportunities for companies developing medical robotics [3].

Despite these challenges, companies continue to invest in medical robotics due to the long-term potential of this technology. The demand for robotic-assisted surgeries and automated healthcare solutions is growing, driven by an aging population and the need for precision in medical procedures. To mitigate financial risks, companies often seek strategic partnerships, government grants, and venture capital funding. Additionally, regulatory agencies are working

towards streamlining approval processes, which may reduce costs and accelerate market entry in the future.

### **COST-BENEFIT ANALYSIS OF SURGICAL ROBOTICS**

The integration of robotic surgical systems into modern healthcare facilities presents significant financial challenges. The initial costs of acquisition, maintenance, and training for robotic-assisted surgery can be prohibitively high, often requiring millions of dollars in capital investment. However, economic analyses suggest that these costs can be mitigated through various efficiency gains and improved patient outcomes. A comprehensive cost-benefit analysis is essential for hospitals and policymakers to evaluate the long-term viability of these investments [2].

**Initial Costs of Robotic Surgical Systems.** The primary financial burden associated with robotic surgical systems arises from their high acquisition costs. A single robotic surgical platform, such as the da Vinci Surgical System, can cost anywhere between \$1 million and \$2.5 million, depending on the model and capabilities. Additionally, ongoing maintenance and servicing fees can reach \$100,000 to \$200,000 annually. Hospitals must also account for the cost of surgical instruments, many of which are disposable and require frequent replacement, further adding to operational expenses.

Another significant cost factor is the training required for surgeons, nurses, and support staff. Proficiency in robotic-assisted surgery demands specialized training programs, which can be expensive and time-consuming. Surgeons must undergo simulation-based training and supervised procedures before they can perform independent robotic surgeries, contributing to the overall financial strain on healthcare institutions.

**Potential Cost Offsets and Long-Term Benefits.** Despite these high initial costs, robotic surgical systems offer numerous advantages that can offset expenditures over time. Studies indicate that robotic-assisted surgeries result in fewer complications compared to traditional open or laparoscopic procedures. Reduced surgical errors, lower rates of infections, and decreased postoperative complications lead to fewer readmissions, ultimately saving healthcare facilities considerable expenses.

Additionally, robotic surgery often results in shorter hospital stays. Minimally invasive robotic procedures cause less trauma to the body, allowing for faster recovery times. Patients undergoing robotic-assisted surgeries typically experience shorter hospitalization periods, reducing bed occupancy rates and freeing up resources for other patients. The ability to discharge patients earlier improves hospital efficiency and generates cost savings by lowering inpatient care costs.

Another key economic advantage is increased operational efficiency. Robotic surgical systems allow for more precise and reproducible surgical techniques, reducing operative time and improving workflow. Some hospitals report a higher volume of surgical cases after adopting robotic technologies, leading to greater revenue generation. By streamlining surgical procedures and optimizing resource utilization, hospitals can enhance their return on investment in robotic surgery.

**The Need for a Comprehensive Cost-Benefit Analysis.** Given the high financial commitment associated with robotic surgical systems, a thorough cost-benefit analysis is essential for hospitals and policymakers. Such an analysis should consider not only direct costs but also indirect economic benefits, such as improved patient satisfaction, lower malpractice risks, and enhanced institutional reputation. Policymakers must weigh these factors when determining whether to allocate funding for robotic surgery programs [4].

## FINANCIAL RISK MANAGEMENT STRATEGIES

The integration of robotics in the medical field has revolutionized healthcare by improving surgical precision, enhancing patient outcomes, and reducing recovery times. However, the development and deployment of medical robotics come with substantial financial risks. To ensure long-term viability, stakeholders must adopt strategic financial planning that includes diversified funding sources, public-private partnerships, insurance and reimbursement policies, and regulatory compliance strategies.

**Diversified Funding Sources.** Relying on a single source of funding can expose medical robotics firms to significant financial vulnerabilities. Diversified funding sources mitigate these risks by ensuring continuous financial support from multiple channels. Public grants, for instance, provide non-dilutive funding that supports early-stage research and development. Private investments, including venture capital and corporate partnerships, offer essential capital to scale innovations. Additionally, government incentives, such as tax breaks and subsidies, reduce the financial burden on firms engaged in medical robotics. A well-balanced funding strategy enables stakeholders to sustain operations even in periods of economic downturn or regulatory delays [5].

**Public-Private Partnerships.** Collaborations between government entities and private sector firms play a critical role in ensuring the financial sustainability of medical robotics. Public-private partnerships (PPPs) allow for shared financial risk while fostering innovation. Governments can provide grants, infrastructure, and regulatory support, while private companies contribute expertise, technology, and operational efficiencies. These partnerships accelerate the commercialization of robotic medical technologies by reducing the time and costs associated with research and development. Moreover, PPPs enable access to larger patient populations, allowing robotic-assisted procedures to be widely implemented in healthcare systems.

**Insurance and Reimbursement Policies.** One of the primary challenges facing medical robotics adoption is the high initial investment cost. Hospitals and healthcare providers may hesitate to invest in robotic systems without clear reimbursement structures in place. To address this, policymakers and insurers must establish transparent reimbursement policies for robotic-assisted surgeries. By recognizing these procedures within insurance frameworks, hospitals can recover a portion of their investment, making the technology more accessible. Additionally, value-based reimbursement models can incentivize the use of robotic systems by linking payments to improved patient outcomes and reduced complications. A well-defined reimbursement strategy not only supports adoption but also enhances the return on investment for medical robotics companies.

**Regulatory Compliance Strategies.** Navigating the complex regulatory landscape is essential for financial stability in medical robotics. Delays in regulatory approvals can lead to significant financial setbacks, making proactive engagement with regulatory bodies crucial. Manufacturers must adopt flexible compliance frameworks that align with evolving regulations. This includes early consultations with regulatory agencies, investing in quality management systems, and adhering to international standards. A proactive regulatory approach not only reduces approval timelines but also minimizes the risk of costly legal challenges and recalls. By embedding compliance into the development process, medical robotics firms can achieve smoother market entry and sustained financial growth.

## CONCLUSION

The economic sustainability of medical robotics hinges on effective financial risk management. As robotic surgical technologies become more prevalent, healthcare systems must adopt strategic investment approaches to ensure cost efficiency and long-term viability. High initial costs and ongoing maintenance expenses present significant financial challenges,

necessitating well-structured investment strategies. By leveraging financing models such as leasing, value-based payment structures, and public-private partnerships, institutions can reduce the financial burden while maximizing returns on investment.

Multi-stakeholder collaborations also play a crucial role in mitigating economic risks. Hospitals, insurance providers, policymakers, and technology developers must work together to establish pricing models that align with healthcare budgets and reimbursement policies. Engaging in joint ventures and shared-resource models can further enhance cost-effectiveness, making robotic-assisted surgeries more accessible to a broader patient base.

Additionally, optimizing cost structures is essential for sustaining medical robotics in healthcare. Streamlining supply chains, reducing operational inefficiencies, and investing in training programs can lower costs and improve financial outcomes. Continuous monitoring of cost-benefit ratios enables hospitals to adjust their robotic surgery programs to align with economic realities.

Future research should prioritize the development of predictive financial models that assess the long-term economic viability of medical robotics. Advanced analytics, machine learning algorithms, and real-world data can help forecast financial risks and identify cost-saving opportunities. By integrating these insights into decision-making processes, healthcare institutions can enhance the financial sustainability of medical robotics while maintaining high standards of patient care.

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## Sociological Sciences

# Sociological, approach to gender and socioeconomic inequalities

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### Abstract

Inequalities speak to, all inclusive, most created impediments to the practicing the Human rights and uniformity. Acquittal Worldwide Reports, WUNRN [1] reports, Worldwide dangers reports appear that there are complex shapes of human flotsam and jetsam, in the modern. Social imbalances speak to unequal openings interior the society, based on the race, gender, and race. Human rights [2] activists, together with the environmental rights activists, and the activists for the rights of the minorities, (coloured, vagrants, and war veterans, 1970-ties had begun campaign, all inclusive, against the persecution and the segregation. Giddens in Humanism, underscores the deconstruction of sex based imbalances that saturate private and open circle, similarly. World Wellbeing Association, characterises the financial disparities as the most complex and risky, for the future: "Socioeconomic imbalances, related to wage, work, instruction, as well as statistic contrasts, such as age or sexual orientation, are related with unequal presentation to natural chance variables. They contribute to the wellbeing disparities and most regularly put impeded bunches at essentially higher hazard for the natural wellbeing effects" [4]. The primary speculation of this examination is that the social disparities are rising each day, and that the way better joint technique of diverse science systems, particularly sociologists, NGO-s, Women's organisations for help offer assistance in their diminishment. Key terms:migrants, gender, race, social inequalities/ financial disparities , financial disparity

### Introduction: Social Inequalities and Postmodern Perspective

The investigation of social inequalities, in sociology, was influenced by the empirical work of Jane Addams, and Hull House project, for homeless and in which there are all forms of life, from the coffee shop, the library, the stores, and where she wanted to, in an empirical way, to examine the relationship of the individual with his environment, always emphasising that the way of organising social relations inside the society, structures the personality. Hull House, however, was not only that, in the framework of this multifunctional house. It had a strong academic activity, and there lived the professional sociologists, and social workers who have studied the ways of life in this well-organised community (how adolescent with poor financial conditions act in the busiest shipping lanes circumstances). Hunger is one of the elementary problems of the modern world, and Giddens examines this in a specific way. Hunger occurs as a result of the uneven distribution of resources in society. Chapter 11, in Giddens's work Sociology [5] entitled *Poverty, social protection and social exclusion*, writes about the global problems of the modern age, emphasising the one of the rarely known social facts, which are focusing on poverty rates in the developed countries, and found that poverty rates are the highest, in Great Britain. Why is the poverty one of the key contemporary social environmental problems. Before I discuss Giddens's designation of such a definition, I'll try to analyse the problem of poverty, in general. Poverty shows the standard of living, of the population of some countries. And therefore through the poverty , Giddens creates an opinion about the manner

of regulating the state, where usually a big differences between the layers in economic status and in power, exist. There are two concepts, absolute and relative poverty. According to Giddens [5], the phenomenon of absolute poverty implies a struggle for mere survival, and the life on the margins of social life, and for people that don't have enough food, natural resources for life, just saying that the poor, relative poverty is determined in relation to the overall standard of living of a country and includes the survival, and property of some basic needs, which are minimal compared to the social status, and standards. Poverty is questioned on some of so that in the global sense the poor man of the modern age, represents completely different concept, than a poor man that once had existed. Measurement of poverty is a reflection of the modern statistical analysis, that shows how to demonstrate social assistance. What are the poorest countries, according to Giddens the Pakistani, Bangladesh family and a British family, in recent times, have experienced feeling of poverty. Giddens mentions statement "culture of poverty" which pointed out sociologist Meyer, who points out that in some cases, dependence on social welfare, destroys people in a way that they are demotivated, and they stop looking for a job, and on the other hand, they feel inadequate, because they depend on welfare, and are therefore unequal to other citizens. The key term in the context of its social exclusion, where marginalised people avoid the concepts such as fridge, TV, dishwasher, a washing machine, and some of the elementary devices which are a reflection of progress, in modern society. It was found that a large number of the population has an exceptionally high standard of living, because almost all households have these natural supplies, [5]. There are a lot of factors, and reasons for the emergence of the problem of poverty, in the global sense, it's a race, class, gender, occupation, education level, and many others. If the problem of poverty, is investigated in the context of Bosnian and Herzegovinian society, there are a number of parameters, that can cause the problems. Post conflict BH society, under the influence of the transition, as a system that involves the transition from socialism, in the centre of collective ownership, toward capitalism, in which it is property of private, and individual ownership of the capitalists, with ownership of the means over the production and of money. Given the fact that the transition process is still going on, conditioned emergence of the economic crisis, in which it is in the centre of unemployment, which is a key factor in measuring the poverty of a country. There are a series of parameters, which caused a transition such as retradicionalisation, repatriarchalisation, ethno political, bio politics, as well as increased rates of violence, then the consideration of family violence, and juvenile delinquency, where it is an established fact. The increasing number of juvenile, and peer violence, that sometimes results in the murders. Giddens mentioned a very important term, social exclusion. The question is what is the relationship to the poor people in society, so the specified term suggests developing mechanisms of individual social instances, that affect individuals, and organisations, from the exclusion from society. Exclusion occurs as a result of not having enough of the high living standards, that produces different relationships between individuals.

### Empirical Investigation

This investigation was conducted among the the students of Faculty of Political Sciences, Department of Social Work. It was anonymous, and the sample was random.p ml

1.Which Social Groups are Mostly Oppressed by Social Inequalities, According to Your Opinion?

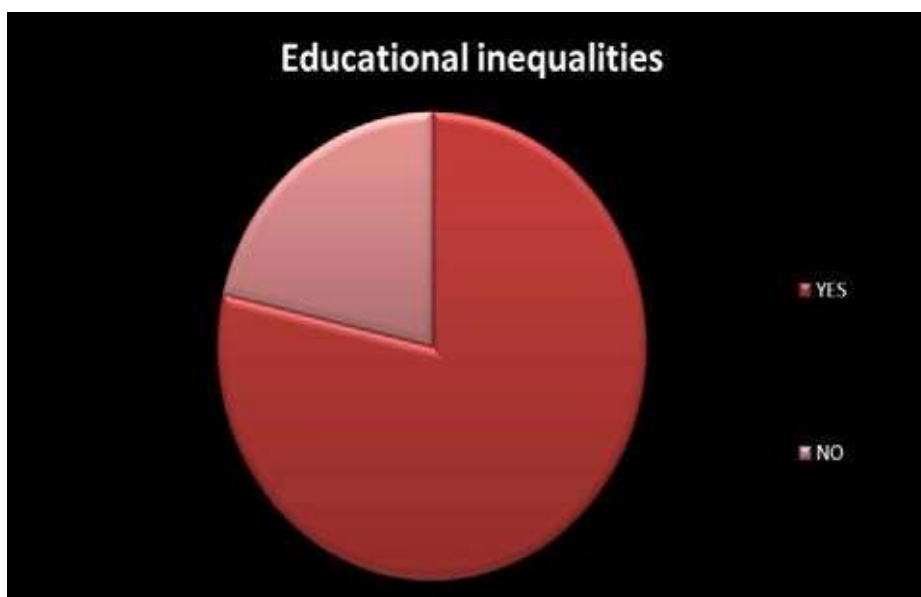


Figure 1. Groups and Social Inequalities

The most oppressed group, according to this survey are migrants with 42, 85% responses, then LGBTQ 28, 57%, after them Women with 14,28% responses . 7,14 % of the students responded that students, and coloured are mostly oppressed group, in the Bosnian and Herzegovinian society[8,9].

2. Do You Think that There Are Educational Inequalities, in Bosnia and Herzegovina?

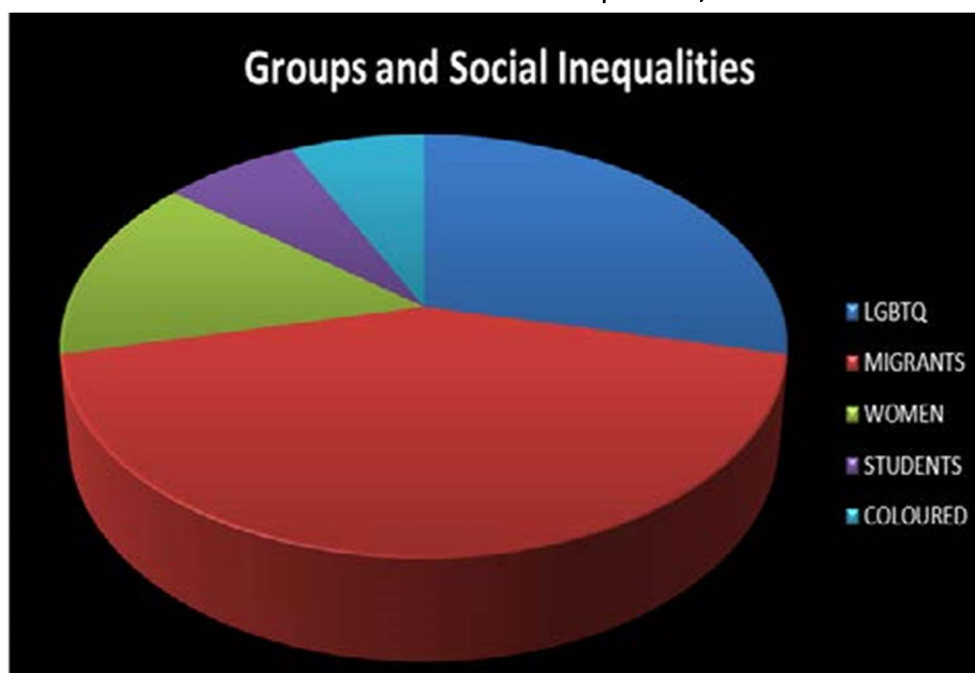
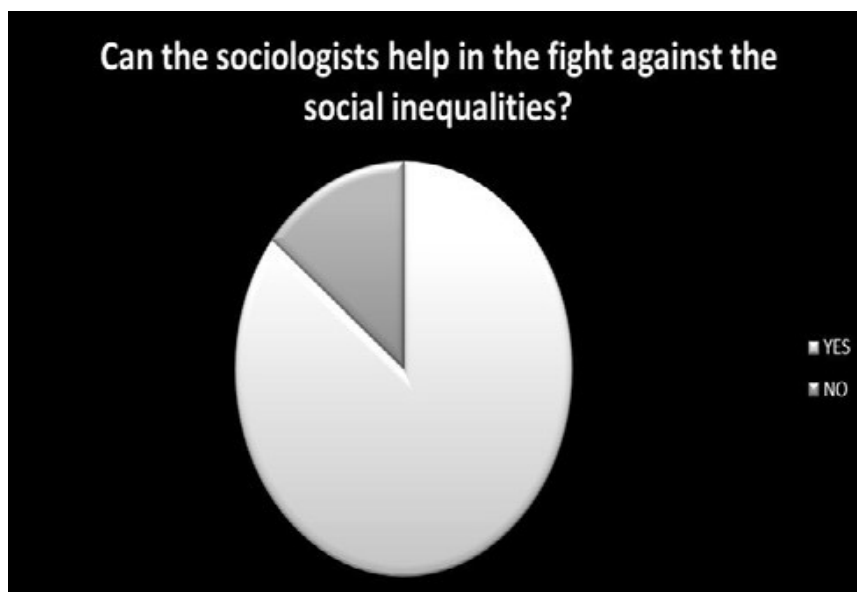


Figure 2. Educational Inequalities

78,57% of the students, in regards to the educational inequalities, stated that on they exist in Bosnia and Herzegovina, and the 21,42% thinks that there are no educational inequalities.

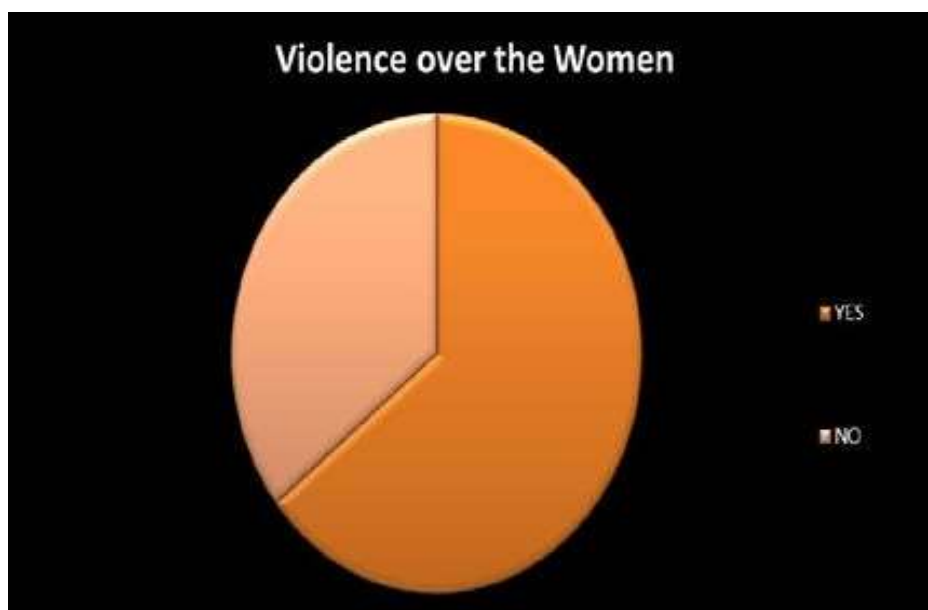
3. Are There Any Cases of Violence over the Women in Your Community?



**Figure 3. Violence over the Women**

Students mainly responded that the violence over the Women still exist 64,28% of them. There is no violence over the women, stated even 35,71%.

4.Can the Sociologists Help in the Fight against the Social Inequalities?



**Figure 4. Can the sociologists help in the fight against the social inequalities?**

Students mainly think that Sociologist can help in the fight against the social inequalities responded 85,71% of the students.

**Conclusions and Recommendations**

This investigation had shown that main hypothesis of the work, is right. The socio-economic problems are complex, and the educational system in Bosnia and Herzegovina is not insufficient. Sociologist, can help in the fight against the social inequalities responded 85,71% of the students. The most oppressed group, according to this survey are migrants with 42, 85% responses, then LGBTQ 28, 57%, after them Women with 14,28% responses . 7,14 % of the students responded that students, and coloured are mostly oppressed group, in the Bosnian

and Herzegovinian society. "Multicultural feminism, and its representatives such Gayatri Ch. Spivak, Nira Yuval Davis, and Uma Narayan in idea of transversal politics of identity, promote supranational identity, over the old concept of nation-states. Therefore, the ecological literacy, eco ethics, bioethics, social reflexivity can be the agents of change in future"[10].

Feminisation of the poverty, and global rise of the rates on Violence over the Women, should be diminished by forcing the implementation of the Laws, with the involvement of the activists in different fields in demonstrating the global need to stop the violence over the Women, as one of the biggest problems, in regards to socio-economic inequalities, by practising the global idea that Human rights are Women's rights as well, in campaigns such as 16 days of Campaign against Violence over the Women, opening the web pages such as WUNRN,[1] that can provide the necessary education, and recent information on state of Women Human rights. Amnesty reports offer concrete perspective on femicide in Latin America, and world as a result of the feminisation of poverty.

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## Physical and Mathematical Sciences

ӘОК 612.081

# МЕКТЕПТЕГІ ЖАРТЫЛАЙ ӨТКІЗГІШТЕРДІ ОҚЫТУ ӘДІСТЕРІ

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**Аннотация:** Мақалада Талдықорған қаласы мектебінің 10 және 11-сыныптарында НЗМ оқушыларының жартылай өткізгіштер физикасын оқытудың заманауи әдістері сипатталған. Инженерия мен ғылымда ең үлкен ғылыми және практикалық маңызы бар жартылай өткізгіштердің электрофизикалық қасиеттерін зерттеу бойынша сұрақтар шеңбері ұсынылған және практикалық, зертханалық сабақтарда жартылай өткізгіштер туралы оқушылардың түсінігі үшін қол жетімді әдістер келтірілген. Оқушыларға жартылай өткізгіштер физикасын оқытудың классикалық әдістерін интерактивті және инновациялық жартылай өткізгіштерді зерттеу сияқты заманауи әдістермен салыстырулар деңгейлері келтірілген.

**Түйін сөздер:** Жартылай өткізгіштер, әдістер, байланыс, меншікті, төрт зонд, құрылғы, кернеу, ток, потенциал, тығыздық.

Жартылай өткізгіштер - қазіргі замандағы электроника мен ақпараттық технологиялардың негізгі құрамдастары. Олар компьютерлер, смартфондар, тұрмыстық техника және көптеген басқа құрылғыларда қолданылады. Жартылай өткізгіштерді мектепте оқыту – оқушылардың ғылыми-техникалық білімін қалыптастырып, оларға заманауи технологияларды терең түсінуге мүмкіндік береді. Мұндай білім жастардың инженерлік, ғылыми және техникалық мамандықтарға қызығушылығын арттыра алады [1].

Жартылай өткізгіштер – бұл электр тогын өткізетін, бірақ толық өткізгіштер мен диэлектриктер арасындағы аралықта орналасатын материалдар. Қарапайым тілмен айтқанда, олардың өткізгіштігі сыртқы факторларға, әсіресе температура мен қоспаларға байланысты.

Жартылай өткізгіштер екі негізгі топқа бөлінеді: элементарлық жартылай өткізгіштер (мысалы, кремний, германий) және қосылыстық жартылай өткізгіштер (мысалы, галлий арсениді). Олардың әрқайсысының қолдану салалары мен қасиеттері бар.

Жартылай өткізгіштерді мектепте оқыту – оқушыларды заманауи технологиялармен таныстырудың және олардың ғылыми білімін арттырудың тиімді жолы. Оқыту барысында оқушылар жартылай өткізгіштерге байланысты негізгі концепцияларды және олардың қазіргі заманғы қолдану орындарын үйренеді.

Оқушыларға жартылай өткізгіштер туралы білім беру барысында практикалық тәжірибе мен зертханалық жұмыстарды енгізу маңызды. Мысалы, эксперименттер арқылы жартылай өткізгіштердің ерекшеліктерін көрсету, олардың электрлік қасиеттерін зерттеу оқушылардың қызығушылығын арттырады.



Жартылай өткізгіштерді оқу, оқушыларға болашақта инженерлік немесе ғылыми-техникалық мамандықтар таңдауға көмек көрсетеді. Бұл білім мен дағдылар, әсіресе, ақпараттық технологиялар, электроника, физика, материалтану салаларында қажет[2].

Дәстүрлі әдістер - бұл лекциялар, семинарлар және оқулықтарды қолдануды қамтиды. Оқушылар жартылай өткізгіштердің теориялық негіздерін түсінеді, бірақ бұл әдіс көбінесе практикалық дағдыларды дамытуға мүмкіндік бермейді.

Интерактивті әдістер - бұл топтық жұмыстар, пікірталастар, және презентациялар. Оқушылар жартылай өткізгіштер туралы білімдерін бір-бірімен бөлісіп, әрі қарай дамытуға мүмкіндік алады. Сонымен қатар, интербелсенді тақталар мен мультимедиялық материалдарды қолдану да тиімді болып табылады. Интерактивті әдістер білім беру процестерінде оқушылар мен мұғалімдер арасындағы белсенді қарым-қатынасты қамтамасыз етеді. Олар оқу материалын тереңірек түсінуге, сыни ойлауды дамытуға және ынтымақтастықты нығайтуға жағдай жасайды [3].

Интерактивті әдістерді толықтыру үшін пайдалануға болатын бірнеше тәсілдер:

-Топтық жұмыс. Оқушыларды шағын топтарға бөліп, бірлесіп мәселені шешуді немесе тақырыпқа қатысты жобаларды орындауды ұсынамыз.

- Ми шабуылы. Оқушылар өз ойларын ортаға салып, шығармашылық шешімдер мен идеяларды ұсынатын әдістерді ұсынады.

- Рөлдік ойындар. Оқушыларға рөлдер беру арқылы оларды әртүрлі жағдайларда ойнауға шақыру. Мысалы, тарихи тұлғалардың рөлін сомдау.

-Дебаттар. Оқушыларды екі топқа бөліп, белгілі бір тақырып бойынша пікір таластыруға мүмкіндік беру. Бұл әдіс сыни ойлауды дамытуға көмектеседі [4].

- Онлайн платформаларды пайдалану.Kahoot, Mentimeter, Google Forms сияқты интерактивті платформалар арқылы сауалнамалар, тестілер жүргізу.

- Кейс-стадилер. Шынайы өмірден алынған жағдайларды талдау. Оқушыларға нақты мәселелерді шешуге мүмкіндік береді.

- Симуляциялар. Нақты жағдайларды немесе процестерді модельдеп, оқушыларға практикалық дағдыларды игеруге мүмкіндік беру.

- Ойын элементтері. Оқуды қызықтыру үшін геймификация әдісін қолдану. Мысалы, оқу барысында ұпай жинау.

- Сұрақ-жауап сессиялары. Оқушылардан сұрақтар қоюды күту және пікір-талас орнату.

- Жобалық жұмыс. Оқушылардың өз бетінше зерттеу жасап, жобалар дайындауына мүмкіндік беру.

- Партнёрлық оқу. Оқушылардың бір-біріне көмектесуі және бірлесіп тапсырмаларды орындауы.

Флеш-карталар. Оқушылар білімдерін тексеру үшін флеш-карталарды пайдалану.Бұл әдістерді оқу процесіне енгізу арқылы оқушылардың қызығушылығын арттыруға, олардың мемлекеттік, әлеуметтік және тұлғалық дағдыларын дамытуға болады.

Зертханалық жұмыстар - жартылай өткізгіштердің қасиеттерін тәжірибе жүзінде зерттеудің тамаша мүмкіндігі. Оқушылар түрлі аспаптар мен құралдарды пайдаланып, жартылай өткізгіштердің өткізгіштік қасиеттерін, р-п ауысымын және т.б. зерттей алады [5].

Жобалық жұмыстар - оқушыларға шығармашылық тұрғыдан зерттеу жүргізуге мүмкіндік береді. Олар жартылай өткізгіштерге негізделген жобаларды жасап, олардың практикалық қолданылуын зерттей алады. Мысалы, шағын электронды құрылғыларды жасау арқылы оқушылар теориялық білімдерін практикада қолдана алады.

Жартылай өткізгіштер физикасы – қазіргі замандағы технология мен электроника саласының негізін қалаушы ғылымның бірі. Мектептегі сыныптарда оқушылардың жартылай өткізгіштер физикасы бойынша жобалық жұмыстарын ұйымдастыру, білім алушылардың ғылыми-зерттеу дағдыларын дамытуға, зерттеу тиімділігін арттыруға ықпал етеді. Біз

өзіміздің Талдықорған қаласындағы НЗМ оқушыларының жартылай өткізгіштер физикасынан жобалық жұмыстарын ұйымдастыруға арналған бірнеше идея мен деректерін ұсынамыз [6]. Алдымен оқушыларымыздың зейіндеріне келесі жобалық жұмыс тақырыптарын ұсынамыз:

- Жартылай өткізгіштердің қасиеттері
- Негізгі жартылай өткізгіштерді (Si, Ge, GaAs) зерттеу
- Жартылай өткізгіштің electrical conductivity (жарықөткізгіштік) және оның температураға тәуелділігі
- Жартылай өткізгіштердің p-типа және n-типа болып бөлуі.
- Допинг агенттерінің (бор, фосфор) әсерін зерттеу.
- Жартылай өткізгіш транзисторлары
- Транзисторлардың жұмыс принциптері: pnp және npn құрылымдары.
- Транзисторлардың электрондық схемалардағы рөлі.
- Жартылай өткізгіш құрылғылары
- Дәрістер мен тәжірибелік жұмыстар арқылы диодтардың жұмыс принциптерін зерттеу.
- Жартылай өткізгішті фотоэлементтер мен олардың энергия өндірудегі қолданылуы.
- Жартылай өткізгіштердің қолданылуы
- Жартылай өткізгіштердің тұрмыстық техникадағы (телефон, компьютер) рөлі.
- Төмен қуатты және энергия тиімді жарықдиодтарды (LED) зерттеу.

Содан кейін екінші этапта біз оларға жобалық жұмыстың құрылымын ұсынамыз:

- Кіріспе.Зерттеу мәселесін және оның өзектілігін анықтау.Жобаның мақсатын және міндеттерін қою.
- Негізгі бөлім.Теориялық бөлім, жартылай өткізгіштер туралы ғылыми деректер, жұмыс принциптері.
- Эксперименталдық бөлім. Тәжірибе жасау, нәтижелерді жинақтау, графиктер мен кестелерді пайдалану.
- Қорытынды.Зерттеу нәтижелерін тұжырымдау. Жұмыстың практикалық маңызы мен болашақта қолдану мүмкіндіктері туралы тұжырымдар.
- Пайдаланылған әдебиеттер.Жобада қолданылған әдебиеттер, ғылыми мақалалар мен интернет-ресурстар тізімі.
- Жобаны қорғау [7].Жобаны қорғау барысында оқушылар өздерінің зерттеу нәтижелерін, тәжірибеден түскен мәліметтерді, сондай-ақ тақырып бойынша алған білімдері мен тәжірибелерін таныстыруы керек. Оқушыларға презентациялар, плакаттар немесе тәжірибелік көрсетілімдер жасауды ұсыну тиімді болады.Жартылай өткізгіштер физикасы бойынша жобалық жұмыстар оқушыларға физикалық құбылыстарды тереңірек түсінуге, ғылыми-зерттеу дағдыларын дамытуға және инновациялық ойлау қабілеттерін арттыруға көмектеседі. Жобалар қарапайым тәжірибелерден бастап күрделі ғылыми зерттеулерге дейін болуы мүмкін.

STEM (ғылым, технология, инженерия, математика) білім беру әдістемесі жартылай өткізгіштерді оқытуды интеграциялаудың тиімді тәсілі болып табылады. STEM-бағдарлама оқушыларды ғылыми-техникалық салада кешенді біліммен қамтамасыз етеді, бұл оларға ғылыми технология, инженерия және математика салаларында заманауи мәселелерді шешуге мүмкіндік береді. Бұл білім беру әдістемесі оқушылардың аналитикалық ойлау қабілетін, шығармашылық дағдыларын және проблемаларды шешу қабілеттерін дамытуға бағытталған.

STEM білім беру оқушыларға теориялық білімді практикада қолдану мүмкіндігін береді [8]. Мысалы, ғылыми эксперименттер, инжиниринг жобалары және математикалық модельдер арқылы оқушылар алған білімдерін шынайы жағдайларда сынап көреді. Бұл, өз

кезегінде, олардың білімді терең түсінуіне және ғылыми-техникалық әлемнің қалай жұмыс істейтінін түсінуіне көмектеседі.

Сонымен бірге, STEM білім беру әлемдегі технологиялық өзгерістерге бейімдеу мен инновациялық ойлауды дамытуға ықпал етеді. Бүгінгі таңда, бәсекеге қабілетті маман болып қалыптасу үшін, жастардың STEM саласындағы білімдері мен дағдыларының болуы өте маңызды. Олар ғылыми зерттеулерге, кәсіпкерлікке, экологияға және басқаларға жаңаша көзқараспен қарап, қоғамның дамуына үлес қосады.

STEM бағдарламаларының тағы бір маңызды аспектісі – топтық жұмыс пен ынтымақтастық. Оқушылар команда ретінде жұмыс істей отырып, бір-бірінен үйренеді, өз идеяларын ортаға салады және бірлесіп шешімдер іздейді. Бұл қабілеттер болашақтағы еңбек нарығында сұранысқа ие, өйткені көптеген жобалар мен тапсырмалар командалық жұмысты талап етеді.

Қазіргі кезде STEM білім беру жүйесі тек мектептермен шектелмей, жоғары оқу орындарында, кәсіптік білім беру мекемелерінде де кеңінен қолданылуда. Сонымен қатар, әлемдегі көптеген елдер STEM білім беруге баса назар аудара отырып, жастардың ғылыми-техникалық білімдерін арттыру үшін түрлі бағдарламалар мен жобаларды жүзеге асыруда.

Қорыта айтқанда, STEM білім беру әдістемесі бүгінгі таңда жастардың болашағы үшін маңызды құрал болып табылады. Ол ғылыми, техникалық, инжинирингтік және математикалық дағдыларды дамыту арқылы жаңа ұрпақты ғылым мен технологияның алдыңғы қатарында тұрғызуға мүмкіндік береді.

Жартылай өткізгіштер физикасын оқытудың жаңа әдістемелері туралы әдебиеттер тізімін жасау үшін, біз кейбір негізгі және заманауи еңбектерді ұсына аламыз.

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УДК 372.853

# ЖАРТЫЛАЙ ӨТКІЗГІШТЕРДІҢ ЭЛЕКТРОФИЗИКАЛЫҚ ҚАСИЕТТЕРІ

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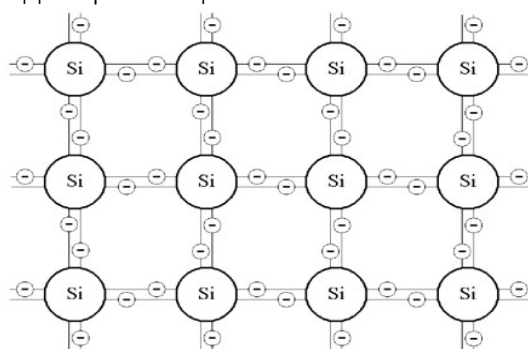
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**Аннотация:** Статъяда жартылай өткізгіштердің электрофизикалық ұасиеттері сипатталған. Мақалада қазіргі кездегі жеке дүниетанымды ескере отырып, зертханалық жұмыстарда физиканы оқыту процесінде орта мектеп оқушыларына жартылай өткізгіш физиканы оқыту әдістері қарастырылған. Жоғары сынып оқушыларын оқыту кезінде Физиканың зерттеу қызметін қалыптастырудың негізгі бағыттары немесе компоненттері көрсетілген.

**Түйінді сөздер:** зерттеу, зоналар, өткізгіштер, жартылай өткізгіштер, әдіс, қалыптастыру, ойлау, бөлшектер, ядро, теория.

Периодтық таблицадағы IV топ элементтері германий (Ge), кремний (Si), қорғасын (Pb), қалайы (Sn) және олардың қоспалары электр өткізгіштігі бойынша металдар мен диэлектриктердің аралығында жататындықтан жартылай өткізгіштер деп аталады. Жартылай өткізгіштердің сыртқы (валенттік) электрондық қабықшаларында ядросымен нашар байланысатын электрондар саны төрт және әрбір атомына ең жақын көрші атомдардың саны да төртке тең

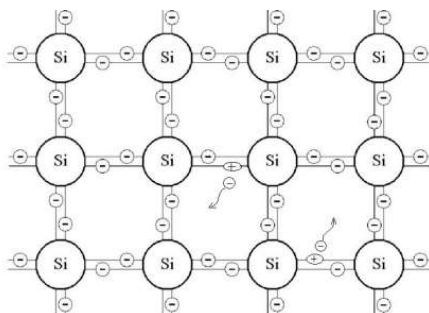


1-ші сурет. Кремнийдің кристалдық торы

Суреттен көрініп тұрғандай (1-суретте кремнийдің кристалдық торы бейнеленген) әрбір атомы сыртқы электрондық қабықшасындағы бір электроны көршілес атомдардың бір электронымен жұптасып, өзара қос электрондық коваленттік байланыс құрайды. Сондықтан кремнийдің (жартылай өткізгіштің) қалыпты жағдайда электр өткізгіштігі төмен болады. Кремнийді қыздырғанда валенттік электрондардың кинетикалық энергиясы артып, коваленттік байланыс бұзыла бастайтындықтан кейбір атомдардың валенттік

электрондары ядродан босап шығады да кристалл ішінде қозғалысқа түсу мүмкіндігіне ие болады.

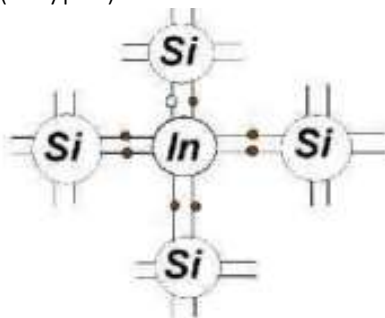
Коваленттік байланыстың бұзылуы салдарынан кремний кристалында электрондар тастап кеткен бос орындар пайда болады (2-сурет).



2-сурет. Кремнийдің кристалдық торынлағы кемтіктер

Жартылай өткізгіштің кристалындағы электрондар тастап кеткен (электрон жетіспейтін) бос орындар кемтіктер деп аталады. Электрон тастап кеткен бос орын болғандықтан кемтіктің заряды оң таңбалы болады, сондықтан ол атомдардың коваленттік байланысын қалпына келтіру үшін электрондардың біреуін өзіне тартып қосып алады, өз кезегінде электрон тастап кеткен орында жаңа кемтік пайда болады[1].

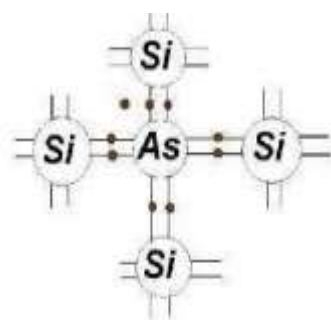
Таза қоспасыз жартылай өткізгіштердің электр өткізгіштігі электрондық-кемтіктік болып табылады, оны жартылай өткізгіштердің меншікті өткізгіштігі деп атайды. Жартылай өткізгіштердің электр өткізгіштігін арттыру мақсатында оларға түрлі қоспалар қосады. Қоспа қосу әсерінен жартылай өткізгіштерде пайда болатын өткізгіштік түрін қоспалық өткізгіштік деп атайды. Егер IV топ элементі кремнийға (Si) III топ элементі индийді (In) қосса, кремний кристалында кемтіктердің бірлік көлеміндегі саны (шоғыры немесе концентрациясы) артады (3-сурет).



3-сурет. Индий торы

Кемтіктері басым қоспалы жартылай өткізгіштер акцепторлы қоспалы жартылай өткізгіштер немесе р-типті жартылай өткізгіш деп аталады. р-типті жартылай өткізгіштердің электр өткізгіштігі негізінен кемтіктік болады, себебі мұндай қоспалы жартылай өткізгіштердің кристалында электрондардың шоғыры азырақ болады.

Егер IV топ элементі кремнийға (Si) V топ элементі мышьяқты (As) қосса, кремний кристалында электрондардың шоғыры артады (4-сурет).

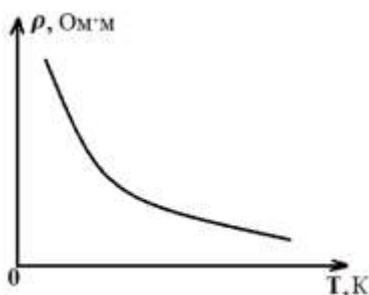


4-сурет. Мышыяк торы

Электрондары басым қоспалы жартылай өткізгіштер донорлы қоспалы жартылай өткізгіштер немесе n-типті жартылай өткізгіш деп аталады. n-типті жартылай өткізгіштердің электр өткізгіштігі негізінен электрондық болады, себебі мұндай қоспалы жартылай өткізгіштердің кристалында кемтіктердің шоғыры азырақ болады [2]. Жартылай өткізгіштердің электр өткізгіштігі төмен болады, сыртқы әсерден, мысалы қыздыру немесе сәулелендіру салдарынан олардың температурасы көтерілсе өткізгіштігі артады, яғни кедергісі кемиді. Жартылай өткізгіштердің электр өткізгіштігінің температураға тәуелділік заңы:

$$\gamma = \gamma_0 \cdot e^{\frac{-\Delta W}{2kT}} \quad (1)$$

мұндағы  $\gamma_0$  – тұрақты шама, ал  $\Delta W$  – заряд тасымалдаушылардың активация энергиясы. Жартылай өткізгіштердің меншікті кедергісі температураға кері пропорционал, қыздырғанда оның меншікті кедергісі кемиді (5-сурет).



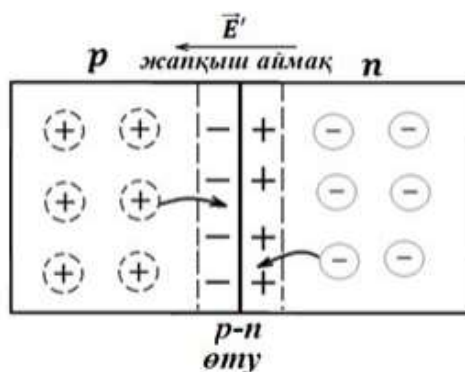
5-сурет. Жартылай өткізгіштердің меншікті кедергісі температураға кері пропорционал.

Донарлы және акцепторлы қоспалы екі жартылай өткізгіштер бір-біріне мықтап түйістірілгенде олардың жанасу шекарасында кемтіктер (оң зарядталған бөлшек) мен электрондарды (теріс зарядталған бөлшектер) бір-біріне тартатын электр өрісі пайда болады. Нәтижесінде n-типті жартылай өткізгіштен p-типті жартылай өткізгішке қарай электрондар орын ауыстырып, p-типті бөліктегі кемтіктердің кейбірін толтыра бастайды, яғни p-типті бөліктегі бөлшектердің концентрациясы артады.

Соның салдарынан бөлшектер концентрациясы артық бөліктен (р-типті бөліктен), бөлшектер концентрациясы кем бөлікке (n-типті бөлікке) «артық» бөлшектерді кері қарай қайтаратын диффузия құбылысы орын алады, екі типті жартылай өткізгіштер түйіскен аймағында (p-типті жартылай өткізгіш жағында теріс зарядталған, ал n-типті жартылай өткізгіш жағында оң зарядталған) жапқыш аймақ пайда болады (6-сурет).

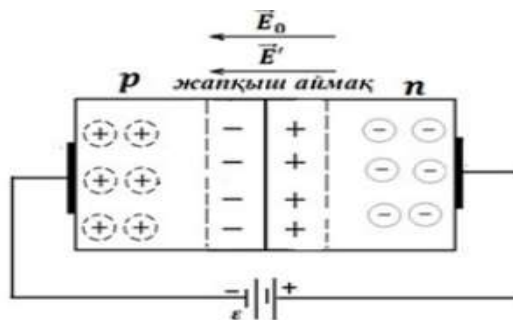


Жапқыш аймақта пайда болған электр өрісі n-типті жартылай өткізгіштен p-типті жартылай өткізгішке қарай электрондардың өтуіне кедергі жасайды.



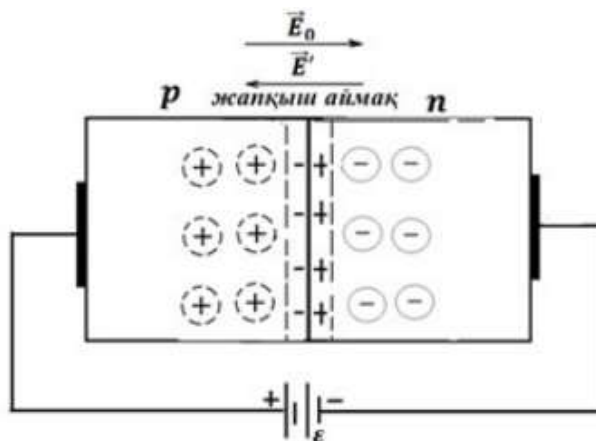
6-сурет. p – n ауысуы

Егер осы жағдайда n-типті жартылай өткізгішті тұрақты ток көзінің оң полюсіне, ал p-типті жартылай өткізгішті тұрақты ток көзінің теріс полюсіне жалғаса, сыртқы электр өрісі кернеулігінің ( $\vec{E}_0$ ) бағыты жапқыш қабатта пайда болған электр өрісі кернеулігінің ( $\vec{E}'$ ) бағытымен сәйкес келеді де (бұл жапқыш режим немесе кері бағыт деп аталады), жапқыш қабаттың кедергісі (жапқыш қабат ені) артып, электрондар мен кемтіктердің реттелген қозғалысы тоқтайды, яғни жартылай өткізгіш арқылы ток жүрмейді (7-сурет)[3].



7-сурет. p – n ауысуы

Егер n-типті жартылай өткізгішті тұрақты ток көзінің теріс полюсіне, ал p-типті жартылай өткізгішті тұрақты ток көзінің оң полюсіне жалғаса, сыртқы электр өрісі кернеулігінің ( $\vec{E}_0$ ) бағыты жапқыш қабатта пайда болған электр өрісі кернеулігінің ( $\vec{E}'$ ) бағытына қарама-қарсы болады да (бұл өткізу режимі немесе тура бағыт деп аталады), жапқыш қабаттың кедергісі (жапқыш қабат ені) кемиді, жартылай өткізгіш арқылы ток жүреді. (8-сурет).



8-сурет. p – n ауысуы

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## Philological Sciences

ӘОЖ 377.791.3

# БАТЫС ҚАЗАҚСТАН ОБЛЫСЫ ГИДРОНИМДЕРІНІҢ ТІЛДІК ЕРЕКШЕЛІКТЕРІ

Сайлауова Әсима Әділбекқызы

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**Аннотация:** В статье анализируются языковые особенности гидронимов Западно-Казахстанской области, их историко-культурное и этнолингвистическое значение. Названия рек и озер региона отражают не только географические объекты, но и быт, историческую память народа. Исследование гидронимов позволяет глубже понять мировоззрение казахского народа и его отношение к природе.

**Ключевые слова:** Гидронимы, Западный Казахстан, языковые особенности, этнолингвистика, историко-культурное значение.

Қазақстанның кең байтақ жерінде сан түрлі географиялық атаулар, әсіресе гидронимдер, халықтың тарихи, мәдени және тілдік ерекшеліктерін бейнелейтін ұлттық мұраның маңызды бөлшегі болып табылады. Географиялық атауларды, соның ішінде гидронимдерді зерттеу – сол аймақтың тұрмыс-салты, дүниетанымы, тарихы мен этникалық ерекшеліктерін түсінуге жол ашады. Батыс Қазақстан облысы еліміздің тарихи-мәдени аймақтарының бірі болғандықтан, оның өзен-көл атауларының өзіндік сипаты бар. Гидронимдер өзара мәдени алмасу мен тарихи ықпалдардың нәтижесі ретінде пайда болып, ұрпақтан-ұрпаққа жеткен мәдени және тілдік мұра ретінде сақталуда.

Бұл зерттеудің негізгі мақсаты – Батыс Қазақстан облысындағы гидронимдердің тілдік ерекшеліктерін, олардың лексикалық, морфологиялық және этнолингвистикалық қырларын талдау арқылы аймақтың тілдік мұрасын анықтау. Бұл мақсатты жүзеге асыру үшін келесі міндеттер қойылады:

- ✓ Гидронимдердің шығу тегін анықтау: Аймақтағы гидронимдердің тарихи және мәдени байланыстарын зерттеу арқылы олардың этимологиялық және лингвистикалық негіздерін анықтау;
- ✓ Лексикалық және морфологиялық ерекшеліктерін талдау: Гидронимдердің сөздік және морфемалық құрылымын зерттеу, олардың табиғи-географиялық белгілерін бейнелейтін сипаттарын ашу;
- ✓ Этнолингвистикалық маңызын көрсету: Гидронимдердің аймақтың тарихи-мәдени өміріндегі орнын, халықтың дүниетанымын және табиғатқа деген қарым-қатынасын айқындау.

Батыс Қазақстан облысындағы гидронимдерді зерттеу қазақ тіл біліміндегі топонимика және гидронимика салаларына қосқан маңызды үлес болып табылады. Бұл зерттеу аймақтағы географиялық атаулардың терең мағынасын түсінуге, олардың ұлттық мәдениеттегі рөлін айқындауға мүмкіндік береді. Сонымен қатар, гидронимдерге қатысты

мәліметтер аймақтық тарихи-мәдени туризмді дамытуда, білім беру саласында және ұлттық мұраны насихаттауда қолданылуы мүмкін.

Батыс Қазақстан облысы Қазақстанның солтүстік-батыс бөлігінде орналасқан және Орал, Жайық, Шыңғырлау, Қараөзен, Сарыөзен сынды ірі өзендермен ерекшеленеді. Бұл аймақ көне заманнан бері әртүрлі тайпалар мен этностардың қоныстанған мекені болған, сондықтан мұндағы гидронимдер тарихи өзгерістердің айқын күәсі болып табылады.

Тарихи тұрғыдан, Батыс Қазақстан территориясы көшпенділердің кең таралған мекені болған, ал өзендер мен көлдер олардың күнделікті өмірінің маңызды бөлігі болды. Осы су көздерінің атаулары халықтың табиғатпен байланысын, су көздеріне қатысты ұғымдар мен дүниетанымын бейнелейді. Мысалы, "Жайық" өзені тек географиялық объект қана емес, көптеген аңыздар мен эпостарда кездесетін ерекше маңызды атау болып табылады.

Жайық өзені – тек географиялық объект қана емес, аңыздар мен эпостарда кездесетін ерекше маңызға ие гидроним.

Жайық атауы қазақ тіліндегі ең көне гидронимдердің бірі болып табылады және көптеген тайпалар мен халықтардың тарихи өмірімен байланысты. Жайық атауы тек географиялық белгі емес, сонымен қатар аймақтың тарихы мен мәдениетінің ажырамас бөлігі болып табылады. Гидроним ретінде бұл атау су объектісі арқылы халықтың тарихи жады мен құндылықтарын сақтауға мүмкіндік береді. Атаудың түбірі "жай" сөзінен туындауы мүмкін, бұл кең, кеңейту деген мағынаны білдіреді, өзеннің кең ағысын, халыққа кеңінен танылған орнын сипаттайды.

Жайық гидронимі туралы аңыздар мен эпикалық жырлар тек өзеннің физикалық сипаттамаларын ғана емес, оның киелі орын ретіндегі мәртебесін де көрсетеді. Батырлар жырларында Жайықтың жағасы ерліктің, жауынгерлік рухтың, халықтың табиғатпен байланысының символы ретінде көрініс табады. Мысалы, «Қобыланды батыр», «Ер Тарғын» эпостарында Жайық өзені батырлардың қақтығыстарында, шайқастарында маңызды орын алады. Бұл жырларда Жайық тек су көзі ретінде ғана емес, тарихи тағдырды бейнелейтін гидроним ретінде беріледі.

Жайық атауы – тек географиялық белгі емес, сонымен қатар аймақ тұрғындарының табиғатқа деген қатынасын, көзқарасын білдіретін символ. Гидронимдік атау ретінде ол халықтың өзенге деген құрметі мен сүйіспеншілігін білдіреді. "Жайық" сөзінің мағынасы кеңдік пен молшылықты білдіреді, бұл өзеннің табиғи ерекшеліктерін айқындап қана қоймай, оны халықтың құнды мұрасына айналдырады. Этнолингвистикалық тұрғыда Жайық қазақ халқының тарихи-мәдени ерекшеліктерін сақтауда маңызды рөл атқарады, өйткені халықтың табиғатқа қатысты ұғымдары гидроним арқылы бейнеленеді.

Жайық өзенінің гидронимі қазақ халқының мәдени мұрасында ерекше орын алғандықтан, оның атауы тарихи оқиғалар мен мәдени естеліктермен байланысты. Жайық бойындағы оқиғалар мен шайқастар арқылы бұл гидроним халықтың тарихи санасында ерліктің, батырлықтың нышаны ретінде қалыптасқан. Мұндай гидронимдер тек табиғи нысан атауы болып қана қоймай, халықтың таным-түсініктегі ерекше қасиеттерді, халықтың дүниетанымын білдіретін рухани символ болып табылады.

Бүгінгі таңда Жайық гидронимі тек тарихи мәнге ие ғана емес, сонымен бірге экологиялық маңызға ие болып отыр. Өзеннің ластануы және экожүйенің бұзылуы мәселелері өзекті болғандықтан, гидроним ретінде Жайықтың атауы оны қорғауға, сақтау қажеттілігін еске салатын символға айналды. Сонымен қатар, гидронимді зерттеу ұлттық мәдениетті сақтауға және жас ұрпаққа тарихи мұраны жеткізуге ықпал етеді. Осы тұрғыдан, Жайық гидронимі экологиялық және мәдени мұраны сақтауда маңызды рөл атқарады.

Жайық гидронимі – қазақ халқының тарихи, мәдени және рухани өмірінің айнасы, халықтың табиғатпен байланысын көрсететін атау. Бұл гидроним тек жер-су атауы емес, халықтың дүниетанымы мен тарихи санасының көрінісі. Жайықтың аңыздар мен

эпостардағы орны оның рухани маңызын айқындай түседі, ал гидроним ретінде оны зерттеу халықтың мәдени құндылықтарын тануға көмектеседі.

Батыс Қазақстан облысының гидронимдерінде түркі, қазақ, монғол, парсы және араб тілдерінің әсері байқалады. Бұл аймақтың атаулары көбінесе көне түркі тілдерінен бастау алып, олардың тарихи, тілдік эволюциясын көрсетеді. Мысалы, "Орал" өзенінің атауы туралы пікірлер көп, оның бастапқыда "жайылып ағады" деген мағынаны бергені туралы болжам бар.

Гидронимдердің лексикасында көбінесе су көздерінің сипаты, олардың орналасуы мен көлемі көрсетіледі. Мысалы, "Шыңғырлау" атауы жоғары және жылдам ағатын өзенді бейнелесе, "Қараөзен" атауы өзен суының түсіне қатысты сипаттама береді.

Гидронимдердің морфологиялық құрылымында су объектісінің түрін, көлемін және оның ерекшеліктерін сипаттайтын түбір мен қосымшалардың қолданылуы байқалады. Мысалы, "Сарыөзен" атауының құрамында су объектісінің түсін көрсететін "сары" сөзі қолданылған, ал "өзен" сөзі объектінің түрін айқындайды. Осылайша, бұл атаулар морфологиялық құрылым арқылы табиғат ерекшеліктерін бейнелейді.

Батыс Қазақстан облысының гидронимдері халық арасында айтылатын аңыздар мен жырлар арқылы да белгілі. Мысалы, Жайық өзені туралы халық аңыздары бұл өзеннің тек су көзі ғана емес, сонымен бірге тарих пен мәдениет көзі екенін көрсетеді. Осы гидронимдер арқылы халық су объектілерімен байланысты тарихи оқиғаларды, батырлар мен аруақтарды еске алады.

Аймақтық ерекшеліктерге байланысты атаулардың мәдени мазмұнына жергілікті халықтың табиғатқа деген көзқарасы, күнделікті өмірде пайдаланған су көздерінің маңызы кіреді. Көптеген гидронимдерге тән ерекшелік – олардың белгілі бір оқиғалар немесе атақты тұлғалармен байланысты болуы. Бұл халықтың өткеніне құрмет көрсету және болашақ ұрпаққа мұра қалдыру ниетінің көрінісі болып табылады.

Батыс Қазақстан облысындағы гидронимдер қазіргі қазақ тілінде жиі қолданылып келеді. Олар тек атаулар ретінде ғана емес, тарихи-мәдени мұра ретінде де сақталуда. Гидронимдер жергілікті халықтың тарихи естелігі ретінде ерекше мәнге ие.

Қазақстанның топонимикалық зерттеулерінде Батыс Қазақстан гидронимдерінің маңызды рөл атқаратыны байқалады. Олар тарихи-мәдени құндылықтарды жеткізудің бір жолы ретінде зерттеушілердің қызығушылығын арттыруда. Гидронимдерді зерттеу арқылы біз тек аймақтың тарихын ғана емес, сонымен бірге халықтың тілдік ерекшеліктерін де түсіне аламыз.

Батыс Қазақстан облысындағы гидронимдер қазіргі қазақ тілінде кеңінен қолданылады және олардың тілдегі қолданысы географиялық атаулар мен жер-су атаулары арқылы көрініс табады.

Мысалы, Батыс Қазақстанда Жайық, Шаған, Қараөзен, Сарыөзен сияқты атаулар жиі кездеседі. Бұл атаулар жергілікті тұрғындардың күнделікті өмірінде қолданылып, кейде басқа аумақтарда да танымал болып келеді. Мұндай гидронимдер тек атау ғана емес, сонымен қатар олардың мағынасы мен шығу тарихы ұлттық құндылықтарды сақтап, ұрпақтан-ұрпаққа жеткізуде маңызды рөл атқарады.

Әр гидронимді тілдік ерекшеліктері жағынан талдайық:

«Жайық» атауы түркі тілдерінде ежелден бері қолданылып келе жатқан көне сөздерге жатады. «Жай» түбірі – «кең», «жазық» деген мағына береді. Сөздің құрамындағы «ық» қосымшасы арқылы кең өзеннің бейнесін сипаттау мақсаты тұр. Жайық атауының этимологиясы өзеннің табиғи ерекшеліктерін бейнелеп қана қоймай, кең мағынасында «дала», «кеңдік» ұғымдарын да қамтиды. Бұл атау қазақ тілінде бейнелілік пен көлемділікті білдіретін теңеулермен де тығыз байланысады.

«Шаған» атауы фонетикалық тұрғыдан қазақ тілінің үндестік заңына сәйкес келеді. Мұндағы «шағ» түбірі жарықтықты, ақтықты білдіретін «шағылу» сөзімен байланысты болуы мүмкін. Кейбір деректерде «шаған» сөзінің «аққан су» деген мағынасы бар екендігі айтылады. «Шағ» түбірінің түбір морфемасы түркі тілдерінде кездеседі, ал «ан» жұрнағы су атауларында қосымша мағына беру үшін қолданылады. Бұл атау қазақ тілінде қысқа әрі ұтымды қолданысқа ие болып, бейнелік мәнді күшейтеді.

«Қараөзен» атауы екі бөліктен тұрады: «қара» және «өзен». Қазақ тілінде «қара» сөзі күрделілікті, қуаттылықты білдіреді және кейде сүмен, табиғатпен байланысты атауларда кеңінен қолданылады (мысалы, Қаратау, Қарасу). Мұндағы «қара» эпитеті су түсінің қарарлау немесе өзеннің мықты ағысы, ерекше қасиеті бар екендігін білдіреді. «Өзен» сөзі «су ағатын жол» деген негізгі мағынасында қолданылады. Бұл атау да қазақ тіліндегі эпитеттер мен географиялық атауларда көрініс табатын ұлттық символизмді көрсетеді.

«Сарыөзен» атауында «сары» эпитеті табиғаттағы түстік ерекшеліктерді бейнелейді. Қазақ тілінде «сары» түс тұрақтылықты, табиғаттың қуаңшылық кезеңдерін немесе күзгі мезгілді сипаттау үшін қолданылады. Мұнда «сары» сөзі өзеннің кей кезеңдерде тартылып, сары түске боялатын табиғи жағдайын немесе айналасындағы шөптердің түсін білдіруі мүмкін. «Өзен» сөзі гидронимнің негізгі мағынасын береді. «Сары» эпитеті қазақ тіліндегі түстік символиканың бір бөлігі бола отырып, атаудың бейнелік қасиетін арттырады.

Әрбір атау қазақ тілінің табиғатқа, түстік реңктерге, кеңістіктегі ерекшеліктерге деген бай көзқарасын көрсетіп, бейнелілік пен ұлттық дүниетанымның көрінісі ретінде сипатталады.

Батыс Қазақстан облысындағы гидронимдер – аймақтың тарихи, мәдени және этнолингвистикалық қырларын ашуға мүмкіндік беретін құнды тілдік мұра. Бұл гидронимдер тек географиялық атаулар ғана емес, сонымен қатар халықтың тұрмыс-салты, дүниетанымы мен тарихи тағдырының айнасы болып табылады. Батыс Қазақстанның өзен-көлдерінің атаулары олардың табиғи ерекшеліктерімен қатар, халықтың мәдени дүниетанымы мен тарихи оқиғаларға деген көзқарасын да бейнелейді.

Зерттеу барысында анықталғандай, аймақтағы гидронимдер бірнеше тілдік қабаттарға бөлінеді және олардың әрқайсысы өз ерекшелігіне ие. Олардың ішінде түркі тілдерінен енген атаулар да, көршілес халықтармен мәдени-тілдік қарым-қатынастардан пайда болған атаулар да кездеседі. Әсіресе, түркілік кезеңдегі атаулар аймақтың тарихи этникалық құрамын көрсетсе, кейінгі атаулардың пайда болуы халықтың тарихи оқиғаларға, табиғи құбылыстарға деген көзқарасын айқындайды.

Сонымен қатар, Батыс Қазақстан облысындағы гидронимдердің морфологиялық құрылымы да айрықша назар аударарлық. Атауларда лексикалық мағынасы терең сөздермен қатар, қысқа және нұсқа құрылымды, табиғаттың белгілі бір ерекшеліктерін суреттейтін тілдік құралдар да қолданылған. Бұл атаулардың көпшілігі өзен-көлдердің кеңдігі мен ағысын, олардың жергілікті халықтың өміріндегі маңыздылығын бейнелейді.

Этнолингвистикалық тұрғыда, Батыс Қазақстан гидронимдері халықтың өзен-көлдерді қасиетті деп тану дәстүрін, табиғатпен үйлесімді өмір сүруге деген ұмтылысын көрсетеді. Жайық, Шаған, Орал сияқты атаулар халық жадында сақталып, аңыздар мен эпостарда кездеседі, бұл олардың тек атау ретінде ғана емес, рухани-мәдени құндылық ретінде маңызды екенін білдіреді.

Қорытындылай келе, Батыс Қазақстан облысының гидронимдері – аймақтың географиялық ерекшелігін ғана емес, сондай-ақ тарихи-мәдени және тілдік мұрасын бейнелейтін маңызды құбылыс. Бұл атауларды зерттеу арқылы біз халықтың дүниетанымы, табиғатқа деген көзқарасы, тарихи оқиғалар мен мәдени құндылықтары туралы тереңірек түсінік ала аламыз. Сондықтан да гидронимдерді сақтау және зерттеу ұлттық мәдениетті дамытуға, жас ұрпаққа рухани мұраны жеткізуге үлкен үлес қосады.



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# PERSIAN VERBS: STRUCTURE & TENSE

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## Abstract

This article delves into the intricate yet systematic nature of language and its role as a fundamental medium of human communication. It highlights how grammar, as a branch of linguistics, underpins our ability to exchange ideas and regulate thought by studying the phonetic, morphological, syntactic, and semantic aspects of language. The discussion focuses particularly on the verb—a central element in both spoken and written discourse—by reviewing its classification within Persian grammar. Various scholarly perspectives are examined, revealing ongoing debates on how verbs should be divided according to structure, including distinctions between simple, prefixed, compound, and group verbs, as well as differing views on the present tense. The article also provides an in-depth analysis of the formation of the absolute past (*mazi-ye motlagh*) in Persian, detailing its derivation from the verb stem, conjugation patterns, and the specialized methods used for negation, which even extend to unique forms found in classical poetry.

**Keywords:** Persian verbs, Tense, Verbs.

## Introduction

Language serves as the most extensive, intricate, and yet one of the simplest means of human communication. As a natural medium, it not only facilitates the exchange of ideas and social interaction but also shapes and regulates human thought. Its unique form—manifested through speech and phonetics—is a human-specific system of communication. In both spoken and written forms, language benefits from an inherent regularity. This systematic organization is evident in the structured components that characterize spoken discourse and are even more rigorously applied in written language. Nonverbal cues such as gestures further complement this communicative system. An understanding of the rules and features of language significantly enhances our ability to use it effectively. Linguistics and grammar, as fields of study, investigate the underlying facts and rules governing language. Specifically, grammar—a branch of linguistics—examines the phonetic, morphological, syntactic, and semantic structures of language, although some scholars extend its scope to include phonetics, syntax, and semantics. Grammarians analyze the grammatical structure of a language, often incorporating elements such as conjugation, structuralism, and various constructions as facets of phonology.

Because grammar is concerned with the rules that govern language, it must account for all of its components. Traditionally, grammar is divided into three primary areas: phonology, syntax (or construction), and semantics. Although natural speech can occur without explicit knowledge of grammar, teaching and learning grammar offer multiple benefits. These include stabilizing the language, minimizing errors and slips in both speech and writing, preventing irregular development, facilitating word formation, improving language instruction for non-native speakers, enhancing comprehension of historical texts, and even aiding in the creation of scientific and technical terminology. Systematic research into each element of language thus contributes to a more scientific and accurate approach to grammar.

## **The Verb in Persian Grammar**

The verb is a central focus in the study of conjugation and syntax, warranting detailed and separate analysis—a subject that has naturally generated various scholarly debates. Recognizing, studying, and describing the verb is essential to understanding the overall grammatical structure. Morphologically and syntactically, the verb is a fundamental unit of language. In the context of Persian grammar or structuralism, the verb is recognized as one of the seven parts of speech—alongside nouns, adjectives, pronouns, conjunctions, particles, and interjections (or pseudo-sentences). Syntactically, the verb occupies a pivotal role in a sentence; it defines the sentence's character and establishes the relationships among its components.

## **Characteristics and Types of Verbs**

Each verb exhibits several key characteristics:

-Tense: Verbs are categorized by time into three primary groups—past, present, and future.

Person and Number: Verbs change form according to the first, second, or third person, and they are further divided into singular and plural forms.

Transitivity: This property distinguishes whether a verb can function without a direct object (intransitive) or requires one (transitive). Some verbs may operate in both capacities depending on the context, while others are strictly intransitive or transitive. This classification often invites scholarly debate.

-Existence: Some classifications distinguish verbs based on whether their forms and usages are well established (known) or not (unknown).

Verb Form: This aspect refers to the manner in which the verb appears. A precise and accurate form may indicate a conditional or probable action, whereas other forms may express commands. Consequently, verbs can be classified as indicative, subjunctive, or imperative.

## **Verb Construction**

A fundamental aspect of verb analysis is the structural composition of the verb. Grammarians typically divide verbs into two main categories: simple and compound, although some propose three or more divisions. A significant point of contention among scholars is the external form of the verb. For instance, the present tense in Persian grammar has been the subject of extensive debate over recent decades. Scholars differ in their acceptance and classification of the present tense, prompting detailed examinations of its historical evolution, various forms, and related structural issues.

## **Classifications of Verbs According to Structure**

One of the most important classifications related to the verb is according to its structure, which has been and continues to be a source of controversy and disagreement, due to differences in both the criteria (especially in conjugated verbs) and the examples. Based on this construction, grammarians have proposed various divisions of the verb, representing their collective opinions. In the last few decades, this classification has attracted increased attention, and many books on the subject have been taught at different levels. In compiling these books, a historical order has largely been followed, while respecting the opinions of all other researchers and writers.

## **Perspectives from Notable Grammarians**

Muhammad Javad Shariat, in his work "Grammar of the Persian Language," classifies verbs based on their external structure into simple and compound forms. Simple verbs consist of a single element, such as "go" or "hit." Compound verbs are formed by combining multiple components, for example, "to open," "to convince," or "to remove." If the first part of the infinitive is a prefix, it is referred to as a prepositional infinitive, and its two parts should be considered as a single unit,

as seen in verbs like "to return," "to stop," and "to force." Some infinitives consist of three components—a preposition, a noun, and a simple infinitive—forming complex infinitives such as "to exist," "to replace," and "to eliminate." Occasionally, infinitives comprise more than three components, exemplified by phrases like "to aim" or "to go head-to-head." Shariat primarily divides verbs into simple and complex categories and further discusses combinations, introducing additional types like two- or three-component compounds. However, he ultimately regards all these as compound verbs. Notably, he does not explicitly mention the present tense, but the second and third groups of compound verbs correspond to what is considered the present tense in this context.

Dr. Parviz Natal Khanlari, in his manual on word structure, categorizes verbs into three types: simple, prepositional, and compound. He defines simple verbs similarly to other grammarians. Regarding prepositional verbs, Khanlari asserts that some verbs are invariably formed by combining the main element with a preceding preposition, deriving meaning solely from the primary element. Examples include verbs like "rise," "return," and similar forms. For compound verbs, he suggests that they are formed by combining a noun or adjective with a verb, resulting in a single meaning, such as "Shatab + Kardan" meaning "to hurry" or "Question + Kardan" meaning "to ask." Khanlari aligns with Dr. Khaypur on the concept of complex verbs in terms of meaning, although Khaypur does not acknowledge prepositional verbs as a separate category. Additionally, Khanlari discusses the present tense in his works "History of the Persian Language" and "The Order of History."

Dr. Khosrow Farshid Ward, in his book "Speech Instead of Preposition," critically evaluates several grammarians, including Dr. Khanlari, and categorizes verbs into three groups. He objects to the classification of the present tense as "simple, prefixed, and complex." Farshid Ward divides verbs into simple and non-simple types based on their structure. Simple verbs consist of a single component, such as "go" or "come," while non-simple verbs comprise two or more components, like "to enter" or "to deceive." He further subdivides non-simple verbs into those with prefixes, such as "varafand" and "varaftan," and compound verbs, like "varalak" and "tadak." Although he criticizes Khanlari, Farshid Ward acknowledges the role of prepositions but considers them components of compound verbs rather than separate forms. He has also discussed compound verbs in detail in two articles, presenting valuable insights. In general, he regards the present tense as a type of compound verb without assigning it a separate designation.

Dr. Hassan Anuri and Dr. Hassan Ahmadi Givi offer a more detailed classification, identifying and naming all components of the verb. They divide Persian verbs into six groups according to their structure: simple verbs, prepositions, compound verbs, compound prepositions, present tenses, and intransitive verbs of the first person. Considering Dr. Khanlari's perspective on the current expression, they state that it comprises words that combine to form a single meaning, often equivalent to the concept of a simple or compound verb, such as "to destroy." This classification is among the earliest in recent times, following Khanlari's historical approach, to propose the term "current expression."

Ghulamrza Arjang, in "Modern Persian Grammar," divides verbs into four structural categories: simple verbs, as seen in basic actions like "I came" or "I sat"; prefixed verbs, illustrated by actions such as "I got up" or "I fell"; compound verbs, expressing meanings like "to say," "to suffer," or "to fight"; and group verbs, exemplified by expressions such as "I lost," "I knelt," or "I lost my foot." He introduces the concept of the group verb, explaining that a combination of words with the present tense can convey a single, unified meaning. Most group verbs are transitive, and their corresponding compound forms are used to express future actions. Arjang considers the present tense in its group verb form to be an independent verb category.

### Formation of the Absolute Past (Mazi-ye Motlagh) in Persian

One of the most common past tense forms in Persian is the mazi-ye motlagh (absolute past), regarded as equivalent to the simple past used in Azerbaijani. In Persian, expressing that an action, state, or movement occurred at various times requires adding specific particles to the verb stem or root. The absolute past is derived directly from the verb stem, known in Persian grammar as the "bon-e mazi." Since the initial forms of all past tense constructions consistently correspond to their verb stems, these forms serve as the foundational base for further derivations. This construction clearly marks an action as having taken place in the past, hence the term absolute past (mazi-ye motlagh). The absolute past is formed by combining the verb base with personal suffixes that indicate past tense, which is why Persian linguists often refer to it as the simple past (qozashte-ye sade or mazi-ye sade).

### Light Verbs in Persian

In Persian linguistics, light verbs are auxiliary verbs that, when combined with a noun, adjective, or prepositional phrase, form a compound verb conveying a specific meaning. These light verbs often carry less semantic weight, allowing the accompanying element to define the core meaning of the compound verb. Common light verbs in Persian include "kardan" (to do), "zadan" (to hit), "dâdan" (to give), and "xordan" (to eat). For example, "faryâd kardan" combines "faryâd" (shout) with "kardan" to mean "to shout," and "negâh andâxtan" combines "negâh" (look) with "andâxtan" (to throw) to mean "to glance."

The use of light verbs is a productive process in Persian, allowing for the creation of numerous compound verbs that enrich the language's expressive capacity. Understanding the function and application of light verbs is essential for grasping the nuances of Persian verb constructions.

### Conclusion

In conclusion, the Persian language's verb system exemplifies a harmonious blend of complexity and regularity, reflecting its rich historical evolution and adaptability. The intricate structures of Persian verbs, encompassing aspects such as tense, person, number, and transitivity, are governed by systematic rules that facilitate both linguistic analysis and practical application.

A notable feature of Persian verbs is their classification into simple and compound forms. Simple verbs consist of a single element, while compound verbs are formed by combining a verb with a non-verbal element, such as a noun, adjective, or preposition. This mechanism allows for the creation of nuanced expressions and contributes to the language's expressive richness. For instance, the combination of a noun with the verb "kardan" (to do) can yield compound verbs like "kar kardan" (to work) or "sohbat kardan" (to talk), each conveying a distinct meaning derived from its components.

The formation of tenses in Persian is notably regular. The simple past tense, or "mazi-ye sade," is constructed by appending personal endings to the past stem of the verb. For example, the verb "neveshtan" (to write) has the past stem "nevesht-," leading to conjugated forms like "neveshtam" (I wrote) and "neveshti" (you wrote). This regularity extends across most Persian verbs, simplifying the learning process for both native speakers and learners.

Negation in Persian is achieved through the prefix "na-" or "ne-" added to the verb. In the present tense, the prefix "mi-" denotes the indicative mood, and negation is formed by placing "na-" before "mi-," resulting in "nami-." For instance, "miravam" (I go) becomes "namiravam" (I do not go) in the negative form. This consistent application of negation rules enhances the language's structural coherence.

The Persian verb system also accommodates nuances of aspect and mood. The imperfective aspect, indicating ongoing or habitual actions, is formed by prefixing "mi-" to the

present stem, as in "mikhoram" (I eat/I am eating). The subjunctive mood, used to express desires, doubts, or possibilities, employs the prefix "be-" with the present stem, exemplified by "bekhoram" (that I may eat). These mechanisms allow speakers to convey subtle distinctions in meaning and intention.

Furthermore, Persian's use of light verbs, such as "kardan" (to do), "zadan" (to hit), and "dadan" (to give), in combination with nouns or adjectives, facilitates the formation of a wide array of compound verbs. This feature not only enriches the vocabulary but also provides flexibility in expression, enabling the language to adapt to new concepts and ideas.

In summary, the Persian verb system is characterized by its methodical structure and adaptability. Its regular conjugation patterns, systematic approach to negation, and capacity for compound verb formation contribute to its clarity and expressive depth. This balance of complexity and regularity not only reflects the language's historical development but also underscores its functionality and elegance as a means of communication.

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## Technical Sciences

# THE PROBLEM OF INTERNAL CORROSION OF FIELD PIPELINES

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### МҰНАЙКӘСІПШІЛІК ҚҰБЫРЛАРЫНЫҢ ІШКІ КОРРОЗИЯ ПРОБЛЕМАСЫ

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#### Abstract

The topic of corrosion protection has not lost its relevance for many decades. The quality of anti-corrosion coating is particularly important in the oil and gas industry. One of the main reasons for the decrease in the resources of almost all types of equipment used in the transportation of well products in the enterprise are corrosive damage and their erosive mechanical wear.

Corrosion of metals, which occurs as a result of chemical or electrochemical interaction with an external corrosive medium, leads to the loss of metals up to 12% of annual production.

#### Аңдатпа

Коррозиядан қорғау тақырыбы көптеген ондаған жылдар бойы өзектілігін жоғалтқан жоқ. Коррозияға қарсы қаптаманың сапасы әсіресе мұнай-газ өнеркәсібінде маңызды болып табылады. Мұнайкәсіпшілікте ұңғыма өнімдерін тасымалдауда пайдаланылатын жабдықтарының барлығы дерлік түрлерінің ресурстарының төмендеуінің негізгі себептері коррозиялық зақымдану және олардың эрозиялық механикалық тозуы болып табылады.

Сыртқы коррозиялық ортамен химиялық немесе электрохимиялық өзара әрекеттесу нәтижесінде пайда болатын металлдардың коррозиясы жыл сайынғы өндірістің 12% - на дейін металдардың жоғалуына әкеледі.

**Key words:** oil field, corrosion of the pipeline, mechanical damage

**Кілттік сөздер:** мұнай кенорны, құбырдың коррозиясы, механикалық зақымдануы

Құбырлардың ішкі коррозиясы - бұл құбырлардың материалы мен құбыр ішіндегі немесе құбыр арқылы өтетін көмірсутектер арасындағы химиялық реакциялар нәтижесінде пайда болатын металл құбырлардың ыдырау процесі.

Бұл процесс ылғалдылық, химиялық компоненттер, температураның өзгеруі және басқа да жұмыс жағдайлары сияқты әртүрлі факторлардан туындауы мүмкін. Бұл



құбырлардың нашарлауына, қабырғаларының жұқаруына, шөгінділердің пайда болуына және тіпті бұзылуларға сонымен қатар, бұл ағып кетулер мен апаттарға әкелуі мүмкін. Сондықтан да құбырлардың жай-күйін үнемі бақылап отыру, оларды коррозиядан қорғау бойынша іс-шаралар жүргізу, қажет болған жағдайда зақымдалған учаскелерді жөндеу немесе ауыстыру маңызды болып табылады [1].

Құбыр коррозиясының дамуының негізгі себептері.

Құбырлардың ішкі коррозиясы әртүрлі себептерге байланысты болуы мүмкін, соның ішінде:

- Химиялық реакциялар. Металдардың қышқылдар, сілтілер, тұздар және басқа да химиялық қосылыстар сияқты коррозиялық орталармен байланысы коррозияға әкелуі мүмкін.

- Электрохимиялық реакциялар. Электролиттік процестер, мысалы, гальваникалық коррозия, құбырдағы әртүрлі металдар жанасқанда пайда болуы мүмкін.

- Микробиологиялық процестерге байланысты коррозия. Кейбір микроорганизмдер құбырларда металдардың коррозиясын тудыруы мүмкін.

- Механикалық зақымданудан коррозия. Сызаттар, жарықтар және басқа да ақаулар сияқты механикалық зақымданулар металдардың коррозиясына әкелуі мүмкін.

- Төмен ағын жылдамдығы. Төмен ағын жылдамдығы құбырлардың қабырғаларында қақтардың пайда болуына әкелуі мүмкін, бұл коррозияға әкелуі мүмкін.

- Жоғары температура. Жоғары температура құбырлардағы металдардың коррозия процесін тездетуі мүмкін.

- Оттегінің болуы. Оттегі құбырларда металдардың коррозиясын тудыруы мүмкін.

- Сумен байланыс. Су құбырлардағы металдарды коррозияға ұшыратуы мүмкін, әсіресе оның құрамында еріген тұздардың мөлшері көп болса.

- Қатты газдардың әсері. Күкіртсутек сияқты кейбір газдар құбырларда металдардың коррозиясын тудыруы мүмкін.

- Ластанудың болуы. Құмдар, саздар және басқа бөлшектер сияқты ластану құбырлардағы металдардың коррозиясына әкелуі мүмкін[2,3].

Мұнай кәсіпшілігі құбырларының ішкі коррозиясының дамуының негізгі белгілері. Құбырлардың ішкі коррозиясының даму белгілері мыналарды қамтуы мүмкін: құбыр диаметрінің төмендеуі. Коррозия құбыр қабырғаларында шөгінділердің пайда болуына байланысты құбыр диаметрінің төмендеуіне әкелуі мүмкін. Жарықтардың негізі. Коррозия құбыр қабырғаларында жарықтар тудыруы мүмкін. Тот басқан дақтардың пайда болуы. Коррозия құбыр қабырғаларында тот басқан дақтардың пайда болуына әкелуі мүмкін. Құбыр қабырғасын азайту. Коррозия құбыр қабырғасының қалыңдығының төмендеуіне әкеледі. Құбырдың өткізу қабілетін арттыру. Коррозия құбырлардың қабырғаларында шөгінділердің пайда болуына байланысты құбырлардың өткізу қабілеттілігінің төмендеуіне әкеледі.

Мұнай кен орындары коррозияның келесі түрлерімен сипатталады:

- Жалпы коррозия; ● жергілікті коррозия; ● нүктелік және саңылаулы коррозия; ● гальваникалық коррозия; ● эрозиялық коррозия; ● микробиологиялық коррозия; ● коррозиялық крекинг.

Химиялық коррозия - бұл фазалар аралық шекарасында электрохимиялық процестердің пайда болуымен бірге жүрмейтін металл бетінің коррозиялық ортамен өзара әрекеттесуі. Коррозиялық ортаның табиғаты бойынша - құрамында оттегі немесе күкірті бар газдарда, күкірт пен басқа бейметалдардың балқымаларында болатын сутегі, галогенид және сұйықтық коррозиясында газ коррозиясын ажыратады. Коррозияның бұл түрлері коррозиялық орта электр өткізгіш болмаса, яғни металл жоғары температурада газдармен жанасқанда және металл бетіндегі ылғалдың конденсациясы алынып тасталса пайда болады. Сондықтан, газ коррозиясы жағдайында пайдалануға жарамды материалдарды

таңдағанда, олардың тотығуға төзімділігі жоғары температурада (ыстыққа төзімділік) жоғары беріктікпен біріктірілуі керек. Құрамында оттегі бар газдар металдардың беткі беріктігінің төмендеуіне әкеледі, нәтижесінде олар қарқынды тозуға ұшырайды. Бұл құбылыстың себептерінің бірі-металдардың беткі қабаттарынан цементитті кетіру болып табылады. Ол реагенттердің бір-біріне диффузиясына кедергі ретінде қызмет етеді және қорғаныс әсеріне ие болады[4].

Сутегі коррозиясы сутегінің жоғары температурада болатқа және басқа материалдарға диффузияланған кезде пайда болады, мысалы, аммиак синтезіне немесе метанды өңдеуге арналған жабдықтарда байқалады. Бұл металдардың механикалық қасиеттерінің өзгеруіне әкеледі: Сутегі коррозиясындағы сыну жоғары беріктік көрсеткіштері бар жоғары көміртекті болатқа тән, ал жұмсақ болаттар үшін қабаттарға бөліну мен көпіршік тән. Галогендік коррозия - бұл сутегі хлориді, хлор, фтор, бром, йодтағы металдардың коррозия процесі, галогенидтер түзеді. Әдетте төмен температурада металдардың көпшілігі мұндай заттармен әлсіз әрекеттеседі, бірақ 200-300 °C температурада бұл реакциялар өздігінен үдейді, ал кейбір металдар «жанып кетеді».

Оттегінің болаттың коррозия жылдамдығына әсері екі қарама-қарсы бағытта да көрінеді. Бір жағынан, оттегі коррозия процесінің жылдамдығын арттырады, өйткені ол катодтық аймақтарды тиімді деполяризациялайды, екінші жағынан, болаттың бетіне пассивті әсер етеді, коррозияны баяулатады. Айта кету керек, ыстық судағы болаттың оттегі коррозиясы негізінен ойық жаралы және ақаулар арқылы пайда болады.



Сурет 1- Құбырдың ішкі коррозиясы - коррозия өнімдерінен тазартуға дейін және кейін

Ішкі оттегі коррозиясын судағы хлоридтер мен сульфаттар тездетуі мүмкін. Бұл заттар коррозия процесінің активаторлары болып табылады, металлдың бетіндегі пассивті қорғаныс қабықшаларын бұзады. Мысалы, кейбір жағдайларда хлорид иондары қорғаныш оксидті пленкадағы оттегін алмастырады, бұл онда тесіктердің пайда болуына әкеледі, жеделдетілген жергілікті коррозиялық бұзылулар басталады. Сульфаттар коррозияны тікелей жылдамдатады, су ортасының электр өткізгіштігін арттырады және жанама түрде биологиялық коррозияның дамуына ықпал етеді. Су ортасының температурасының жоғарылауымен болаттың коррозия жылдамдығы әдетте артады. Бірақ еріген оттегі атмосфераға кетуі мүмкін ашық жүйелер үшін, яғни судағы еріген оттегінің концентрациясы төмендейді, 80 °C-тан кейінгі коррозия жылдамдығы өте төмен мәнге дейін түседі, дегенмен жабық жүйелерде коррозия жылдамдығы сызықтық тәуелділікте өсе береді. Айта кету керек, құбырлардың қызмет ету мерзімін ұзарту және оларды коррозиядан қорғау үшін ыстық судың оңтайлы температурасы 45-тен 50 °C-қа дейін болуы керек[5].

Қабатқа термиялық тәсілдермен әсер еткенде, сұйықтықты орталықтан тепкіш сораптармен айдау кезінде температура галогендік коррозия пайда болатын мөлшерге жетуі мүмкін. Металдардың коррозиясын металлдың потенциалының өзгеруімен, металды

пассивтендірумен, металлдың құрамының өзгеруімен, металлдың бетін тотықтырғыштан оқшаулаумен, тотықтырғыш концентрациясының төмендеуімен және т.б. тежеуге болады.

Пассивті қорғау тәсілдері құбырлардың сыртқы бетін жер асты суларымен жанасудан және кезбе электр тогынан оқшаулауды көздейді, ол су өткізбейтін, металға берік адгезиясы, механикалық беріктігі бар коррозияға қарсы диэлектрлік жабындардың көмегімен жүзеге асырылады. Құбырларды оқшаулау үшін полимерлер мен лактар негізінде битум негізіндегі жабын қолданылады. Электрохимиялық коррозиядан қорғау үшін электрохимиялық қорғаудың белсенді әдістері қолданылады[6]. Құбырларды сыртқы коррозиядан қорғаудың белсенді әдістері электр тогын құруды көздейді, онда құбырдың барлық металы, оның қосындыларының гетерогенділігіне қарамастан, катодқа айналады, ал анод топыраққа қосымша орналастырылған металл болып табылады.

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# water intake facilities of a derivational hydroelectric power station

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**Abstract.** The experience gained in the 1960s and 1990s in the operation of small hydroelectric power plants shows that hydraulic structures, primarily water intake structures, are the most vulnerable part of hydropower nodes.

These structures are designed without taking into account significant intra-daily fluctuations in river flow, which are insufficiently studied.

The performed analysis of the shortcomings of existing structures of water intake facilities allowed us to develop a new design of water intake content for derivational hydroelectric power plants, for which a patent of the Republic of Kazakhstan was obtained.

**Keywords.** Construction, water intake structures, small hydroelectric power plants, hydraulic structures, design.

## ***Introduction***

In the world of renewable energy, small-scale hydropower is the most traditional area. In our country, the development of energy resources of small rivers and streams became the most widespread in the 1960s and 1990s. The experience of operating small hydroelectric power plants shows that hydraulic structures, primarily water intake structures, are the most vulnerable part of hydropower nodes.

One of the promising areas of development of hydropower potential is the use of water runoff from small mountain rivers, which, as a rule, are located in the locations of electricity consumers.

Non-engineering head water intake structures previously used at such waterworks were eroded by floods, and the channels were silted up by sediments. The operation of water intake units is particularly difficult in winter, that is, from negative air temperatures [1-5].

Previously built and currently being designed hydraulic structures in mountainous areas in Central Asian countries pose a threat to the ecology and biodiversity of rivers. Their design is sometimes calculated for a complete, 100% intake of water from rivers and during periods of low water they do not take into account the migration routes of fish through the intake lines and do not have fish protection structures, as a result, the floodplains of rivers, especially in the lower part, dry up and turn into a garbage dump [6-8].

In the 60s of the last century, the former Soviet Union actively introduced bottom-lattice water intake structures of the Tersk type for water supply of small derivational hydroelectric

power plants of mountain rivers. However, designed for the conditions of Western European mountain rivers with insignificant alluvial and mild winter conditions, these structures did not justify their purpose in the mountainous conditions of Kazakhstan and Central Asia. The bottom grate was clogged with debris and allowed almost all bottom sediments with particles with a diameter less than the intertidal distance to pass through the drainage ducts, which led to numerous emergency situations. In addition, during the water intake in winter, the steel grilles were frozen with ice, which reduced the area of the flow holes.[1]

In Germany, where the Tyrolean type of water intake has found the greatest use, researchers also note its disadvantages in operation. In particular, K.Sesen [2, 10, 11] points out that sand traps and sedimentation tanks must be additionally installed behind water intake structures of this type.

The main disadvantage of other known structures with frontal water intake from the middle horizons of the stream is the formation of vortices of individual water jets, which contribute to the capture of sediments from the bottom horizons of the stream and floating inclusions from the surface of the watercourse. Increased values of design pressures in the upper reaches of such structures are necessary for the organization of layered water intake, which requires relatively high construction costs.

Water intake structures with a side water intake located on the concave shore of a curved inlet channel [9, 10, 12], like many other types of mountain water intakes, are not equipped with automation tools to maintain the level and flow of water into the derivation, protection against ice and snow formations and debris, which would ensure reliable drainage in any period of operation.

None of the existing types of water intake structures on small mountain rivers has fish passageways that allow fish to migrate upstream during spawning. Additional fishing trips, sometimes arranged to bypass dams, are long and expensive.

#### **Method of research.**

As the analysis of existing hydropower systems in the mountainous and foothill sections of small mountain rivers shows, the main schemes for creating pressure are damming and derivation. The advantage of the derivation scheme is that the regulation of costs and water levels is carried out without creating reservoirs. An important element of the derivational hydroelectric power plants is water intake facilities. The review and analysis of existing methods and designs of water intake from small mountain rivers made it possible to improve their classification according to technological characteristics, taking into account continuity.

The restoration of previously operating small hydroelectric power plants, and subsequently the new construction of small hydroelectric power plants, allows:

- save fuel resources;
- ensure the reliability and stability of energy supply;
- to optimize the operating modes of various types of energy units due to the characteristic high maneuverability of small hydroelectric power plants and the possibility of the most rational formation of the electric turbine schedule;
- to be able to use all types of watercourses in a comprehensive and more efficient manner;
- to provide additional emergency reserves for particularly important facilities, as well as for facilities with continuous production technology;
- to ensure optimal conditions for the development of small and medium-sized enterprises in rural areas of the country, such as fish farming, tourism and recreation on the water.

These structures are designed without taking into account the significant intra-daily fluctuations in river flow, which has not been sufficiently studied.

#### **Results of research.**

When choosing the design of intake waterworks, it is necessary to take into account the following hydrological features of mountain-foothill sections of rivers [9-12]:

- \* rapidly increasing, short-term floods with water flow rates up to 40-60m<sup>3</sup> .../s or more, carrying a large amount of bottom and suspended sediments containing driftwood of various sizes;
- \* high velocities and kinetics of a river stream with a Froude number  $Fr \geq 1$ ;
- \* shallow water depths relative to the diameter of the natural blind area of the riverbed;
- \* significant fluctuations in flow rates and water levels;
- \* rare ice formation - the presence of a large number of ice formations in the stream.

Analyzing the known means of water intake from mountain rivers and their working conditions, it can be concluded that at the moment the most promising direction for the water supply of small hydroelectric power plants is the organization of layered water intake with alternating flow layers. In particular, it is proposed:

- in the summer, when passing through the river for inter- and mid-year expenses, carry out water extraction from the surface horizons of the river stream, free from entrained sediments;
- in winter, take water into the water draining from the bottom horizons with the lowest content of ice-arc formations;
- during the passage of floods, it is advisable to take water from the middle horizons of the river stream to protect water intakes from floating debris.

The analysis of the shortcomings of the existing structures of water intake facilities made it possible to develop a new design of water intake facilities for derivational hydroelectric power plants.

The purpose of this development is to improve the operational reliability, operational efficiency and environmental safety of water intake facilities for small hydroelectric power plants in the mountainous foothill zone (Fig.1).

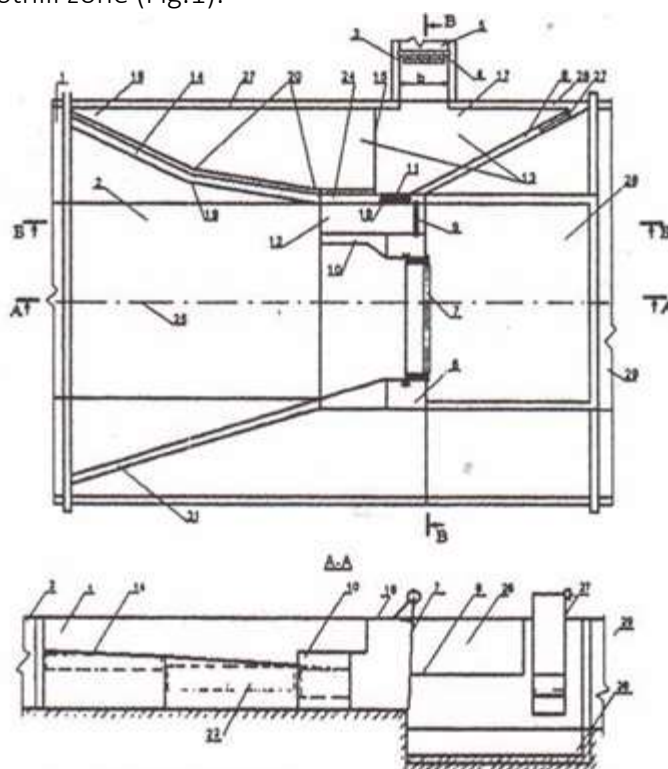


Figure 1 – Layout diagram of a water intake facility for a derivational hydroelectric power station



The proposed water intake works as follows. The river stream flows through the regulated 1 and supply 2 channels to the retaining structure 6, while the autoregulator of the maximum level of the upper stream 7 and the double gate 9 create the necessary pressure for overflowing water through the broken plan of the nanoprotective threshold 14 into the intake chamber 13.

The flow stabilizer 4, set to a certain opening, provides a constant flow of water into the discharge channel 5 in accordance with the needs of the hydroelectric power plant. A power grid 3 is installed in front of the flow stabilizer.

The removal of floating objects entering the intake chamber with the flow is carried out through the lowered upper panel of the double gate 27, eliminated at the end of the catastrophic spillway 8. This is facilitated by a hydraulic jump at the coastal abutment 26, which occurs when flowing through the nanoprotective threshold 14, while the jump shaft continuously shifts towards the lowered part 17 of the intake chamber 13. Bottom sediments from the upper reaches of the structure are transported to the lower reaches due to the circulation of the flow created by the nanoprotective thresholds 14 through a flushing path 12 made parallel to the dynamic axis of the flow.

Such a structural design of the intake structure with an increased water intake coefficient makes it possible to significantly reduce the sediment capture of the intake chamber 13. Thanks to the device of double valves in the flushing hole and at the end of the catastrophic weir and ledge in the bottom of the intake chamber, up to 70% of the sludge formations, floating objects are intercepted and sent for discharge. The use of hydraulic automation tools for water intake processes in the form of an automatic upstream level gate 7 of the sent type, installed on the river spillway span, and a water flow stabilizer 4 on the head section of the supply channel makes it possible to increase the reliability of the intake structure in conditions of sharply changing water flow rates in the river and ensure the necessary accuracy of water supply to HPP units.

The developed design and layout scheme were used for the first time in the reconstruction project of a small hydroelectric power station on the Merke River in the Zhambul region of Kazakhstan. The technical characteristics of the water intake facility built in 2008 are as follows:

- minimum flow rate in rivers of 75% availability  $Q_{75\%}=2.7 \text{ m}^3/\text{s}$ ;
  - maximum flood flow rate of 1% security  $Q_{1\%}=39.7 \text{ m}^3/\text{s}$ ;
  - water intake rate in the derivation during operation of 2 units  $Q_d=2.6 \text{ m}^3/\text{s}$ ;
  - pressure above the threshold of the river (discharge) span  $N_{r.n}=1.65 \text{ m}$ ;
  - the diameter of the fraction of entrained river sediment varies within  $d_{p.h}=0.5500.0 \text{ mm}$ .
- Planned dimensions of the elements of new structures of water intake facilities;
- the length of the curved supply channel is  $l_{n.p}=156.0 \text{ m}$ ;
  - the width of the water intake head of the movable channel, equal to the width of the flow stabilizer,  $b_{st}=1.5 \text{ m}$ ;
  - width of the water intake chamber  $b=3.6 \text{ m}$ ;
  - width of the flushing path  $b_{pr}=1.0 \text{ m}$ ;
  - the width of the river span, blocked by the auto regulator level  $b_{p.n}=3.0 \text{ m}$ ;
  - the length of the broken nanoprotective threshold is  $l_{H.n}=9.0 \text{ m}$ ;
  - the height of the nanoprotection threshold varies from  $h_1=1.8 \text{ m}$  to  $h_2=1.2 \text{ m}$ ;
  - height of the double flushing valve  $h_{c.h}=2.0 \text{ m}$ ;
  - the height of the automatic shutter level  $h_{z.a}=2.2 \text{ m}$ ;
  - construction height of the intake structure  $h_{str}=3.0 \text{ m}$ ;

In the fall of 2010, the construction of a second automated new-type water intake facility on the Merke River in the Zhambul region was completed to replace the old intake, which was destroyed by floods and drifted in. A special feature of this intake structure is the construction of a sand trap in the head of the derivations to increase the efficiency of nano-protection, and is used



to increase the reliability of hydraulic structures, namely, to nano-intercepting devices on rivers and the head.

A further modification of this type of water intake is the new design of a water intake facility for mountain rivers [9], characterized in that to increase the percentage of water intake, the nanoprotective threshold has a longer length due to its polygonal shape, and the discharge threshold is equipped with a frontal nanoprotective opening covered by a flat shutter.

The main difficulties in passing water occur during the winter period of operation, they are associated with both a decrease in runoff and the negative impact of ice and sludge phenomena.

Ice drift is the most frequently observed ice phenomenon on mountain rivers, therefore, the development of methods and structures to combat this phenomenon is one of the priorities in improving the design of water intake facilities for derivational hydroelectric power plants.

As mentioned, the disadvantage of all the water intake structures under consideration is the absence of fish flow devices in their composition. This makes it impossible for fish to spawn annually through the opening of the structure.

### **Conclusion.**

Scientific research is continuing to improve the winter working conditions of a new type of water intake facility, in particular, the methods of passing sludge through the intake gate. At the same time, the model explores options for combining the passage of sludge through the ridge of the enemy's double shutter, through the side and bottom openings of the automatic shutter at the upstream level, and through a special opening in the discharge threshold of the structure.

The experience of research, calculation and design of an automated water intake facility for derivational hydroelectric power plants on the Merke River is used in the planned construction of at least 20 small hydroelectric power plants on mountain rivers in southern Kazakhstan.

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УДК 004.056

# LOG4j осалдығы және жүйелік қауіпсіздікті нығайту жолдары

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**Аннотация:** Бұл мақалада Apache Log4j кітапханасында табылған (CVE-2021-44228) осалдықтың техникалық аспектілері мен оның жаһандық қауіпсіздікке тигізген әсері қарастырылады. Осы осалдық шабуылдаушыларға жүйеде қашықтан код орындау мүмкіндігін беріп, көптеген ұйымдар мен жүйелерге елеулі қауіп төндірді. Мақалада осалдықтың пайда болу себептері, оны пайдалану әдістері және жүйелерді қорғау үшін қолданылатын тиімді шаралар талқыланады. Сонымен қатар, Log4j кітапханасын жаңарту және жүйелік қауіпсіздікті қамтамасыз етуге арналған ұсыныстар ұсынылған.

**Кілтті сөздер:** LOG4j, осалдық, жүйелік қауіпсіздік, CVE-2021-44228, JNDI, қашықтан кодты орындау, ақпараттық қауіпсіздік, қорғау шаралары, жаңарту.

Apache Log4j – Java программалау тілінде жасалған журнал жүргізу үшін кеңінен қолданылатын ашық бастапқы кодты кітапхана. Бұл құрал әсіресе үлкен масштабты қолданбаларда журнал жазбаларын тиімді түрде жинау, сақтау және талдау үшін маңызды болып табылады. Жүйелердегі әртүрлі процестерді бақылау, қателерді тіркеу және қауіпсіздік инциденттерін анықтау үшін Log4j автоматтандырылған журнал жүргізу қызметтерін ұсынады, бұл өз кезегінде желілердегі және қолданбалардағы ықтимал осалдықтарды анықтауға мүмкіндік береді.

Log4j кітапханасы әлемдегі ең танымал журнал жүргізу құралдарының бірі ретінде танылды, себебі оның Java экожүйесімен тығыз байланысы және көпфункционалды мүмкіндіктері бағдарламашыларға журнал жүргізу процесін оңтайландыруға көмектеседі. **Журнал жүргізу (logging)** жүйедегі әрбір әрекет пен оқиғаны тіркеу арқылы болашақта туындауы мүмкін ақауларды жедел шешуге ықпал етеді.

**Apache Log4j** өзінің бастапқы нұсқасы – **Log4j 1.x** қолданыста болған кезде-ақ ауқымды жобаларда көп қолданысқа ие болды. Алайда, 2015 жылы 1.x нұсқасы ескірген (end-of-life) деп жарияланды, себебі ол Java-ның кейінгі нұсқаларымен үйлесімділікке ие болмай, қауіпсіздік тұрғысынан осалдықтарға әкелді. Сондықтан, **2014 жылы** толығымен қайта жазылып, **Log4j 2.x** нұсқасы жарыққа шықты. Жаңа нұсқада көпфункционалды плагиндер жүйесі, қауіпсіздік мүмкіндіктері және журнал жазу барысында деректерді жоғалтусыз сақтау мүмкіндігі енгізілді. Сонымен қатар, жаңа API интерфейсі арқылы қолданушыларға жеке журнал деңгейлерін құруға және динамикалық конфигурациялауға мүмкіндік берілді.

Алайда, **2021 жылдың желтоқсан айында** әлем ақпараттық қауіпсіздік саласында үлкен дағдарысқа тап болды – **CVE-2021-44228** деп аталатын Log4j осалдығы анықталды. Бұл осалдық шабуылдаушыларға **JNDI (Java Naming and Directory Interface)** сұрауларын пайдалану арқылы қашықтан код орындау (Remote Code Execution) мүмкіндігін берді. Бұл

жаһандық деңгейде ақпараттық қауіпсіздікке зор қауіп төндіріп, миллиондаған жүйелердің осалдығын ашты.

Apache Log4j кітапханасындағы **CVE-2021-44228** деп аталатын осалдық жүйеде **қашықтан код орындау** (Remote Code Execution - RCE) шабуылдарын жүзеге асыруға мүмкіндік беретін **JNDI (Java Naming and Directory Interface)** механизміндегі конфигурациялық қателікке негізделген. JNDI – Java негізінде жасалған каталогтық және атау беру қызметтеріне қол жеткізу интерфейсі, ол жүйеге әртүрлі сыртқы деректер көздеріне қосылуға мүмкіндік береді.

Бұл осалдық **JNDI lookup** функциясын пайдалану арқылы шабуылдаушыға сыртқы **LDAP** немесе басқа каталог қызметтеріне сұрау жасап, зиянды кодты жүктеп, оны серверде орындауға мүмкіндік береді. Журнал жүргізу функциясындағы кірістірілген динамикалық деректер Log4j арқылы өңделіп, шабуыл кезінде шабуылдаушы енгізген зиянды сұраулар жүйеде орындалады.

Log4j жүйесімен өзара әрекеттесу кезінде **HTTP** сұраулары арқылы зиянды деректер жіберіледі, оларды жүйе журналға тіркейді және зиянды JNDI сұрауларын орындауға мүмкіндік береді. Нәтижесінде, шабуылдаушы қашықтағы серверден жүктелген кодты жүйеге енгізіп, оны өз мақсатында қолдана алады.

**CVE-2021-44228** осалдығының ең қауіпті тұстарының бірі – оның **zero-day** табиғаты, яғни шабуылдаушылардың осалдық анықталмай тұрып-ақ оны пайдалану мүмкіндігі болды. Бұл шабуылда **RCE** шабуылдарын іске асыру мүмкіндігі шабуылдаушыларға серверге толық бақылау орнатуға, зиянды кодты жүктеп, оны қашықтан орындауға мүмкіндік берді.

**Эксплуатациялық механизм:** шабуылдаушы арнайы пішімделген **HTTP** сұрауларын жүйеге жіберіп, журнал жүргізу процесінде енгізілген зиянды деректер арқылы **JNDI** сұрауларын іске қосады. Бұл сұраулар жүйені сыртқы серверлерге бағыттап, шабуылдаушының **LDAP** серверінен жүктелген зиянды кодты орындайды. Бұл процесті **JNDI injection** шабуылы ретінде сипаттауға болады, себебі журналға енгізілген деректер жүйеде нақты қауіпсіздік тексерулерін айналып өтуге мүмкіндік береді.

**Жаппай эксплуатация:** Көптеген ұйымдар бұл осалдықты пайдаланған шабуылдардан зардап шекті. Әсіресе, **Amazon Web Services (AWS)**, **Microsoft Azure**, және **Cloudflare** сияқты ірі бұлттық қызметтер қысқа мерзімде осалдыққа қарсы патчтарды енгізуге мәжбүр болды. Бұл шабуылдар нәтижесінде жүйелердің толық бақылауға алынуды, деректердің ұрлануы, немесе сервистердің істен шығуы сияқты ауыр зардаптар болды.

**Жаңарту және патч енгізу:** Apache компаниясы бұл осалдықты жабу мақсатында **Log4j 2.15.0** және **2.16.0** нұсқаларын шығарды, бұл нұсқаларда JNDI мүмкіндігі шектеліп, **JNDI lookup** функционалы толығымен ажыратылды. Жүйелерді қорғау үшін осы нұсқаларға дейін жаңарту **мәжбүрлі шара** ретінде қарастырылады.

**JNDI lookup-ті ажырату:** Егер жүйені дереу жаңарту мүмкін болмаса, уақытша қорғану шаралары ретінде **JNDI lookup** функциясын өшіру ұсынылады. Бұл зиянды сұраулардың орындалуына жол бермейді және жүйенің қауіпсіздігін уақытша қамтамасыз етеді.

**Web Application Firewall (WAF) және желі мониторингі:** Желі арқылы келіп түсетін трафикті бақылау және зиянды сұрауларды сүзгілеу үшін **WAF** құралдарын қолдану қажет. WAF жүйелері **HTTP** трафикін бақылап, зиянды әрекеттерді уақытында анықтап, олардың орындалуына тосқауыл қоя алады. Сонымен қатар, желілік трафикті терең талдауға арналған **IDS/IPS (Intrusion Detection/Prevention System)** жүйелерін қолдану да осалдықтарды уақытында анықтауға мүмкіндік береді.

**Үздіксіз мониторинг және қауіпсіздік патчтары:** Қауіпсіздікті қамтамасыз етудің маңызды қадамдарының бірі – жүйені үздіксіз бақылау және жаңартуларды дер кезінде орнату. Бұл үшін **Patch Management** жүйелері қолданылып, осал нұсқаларды автоматты

түрде жаңартып отыру керек. Сонымен қатар, барлық журнал жазбаларын үнемі талдау арқылы зиянды әрекеттерді ертерек анықтау жүйенің қауіпсіздігін күшейтеді.

Apache Log4j жүйесіндегі **CVE-2021-44228** осалдығы ақпараттық қауіпсіздік саласына үлкен әсер етті және көптеген жүйелерге елеулі қауіп төндірді. **JNDI lookup** функциясындағы осалдық жүйелерді бұзуға, зиянды кодты орындауға және серверлерді бақылауға алу мүмкіндігіне жол ашты. Осалдыққа қарсы күресте жүйелерді уақтылы жаңарту және алдын алу шараларын қабылдау шешуші рөл атқарады. Сонымен қатар, жүйені үнемі бақылау және қауіпсіздік патчтарын уақтылы орнату арқылы осындай осалдықтардан қорғауға болады.

Log4j осалдығы CVE-2021-44228 әлемдік деңгейдегі қауіпсіздік дағдарысын туындатты. Бұл оқиға ұйымдардың киберқауіпсіздік шараларын қайта қарастыруының қажеттілігін көрсетті. Жүйелік қауіпсіздікті күшейту үшін келесі ұсыныстар беріледі:

1. **Zero Trust Architecture (ZTA) қолдану:**
  - Барлық жүйелер мен пайдаланушыларды тексеру, сенімсіз трафикті шектеу;
  - Пайдаланушылар мен жүйелердің рұқсаттарын қатаң шектеу.
2. **Үздіксіз қауіптерді анықтау және мониторинг:**
  - SIEM (Security Information and Event Management) жүйелерін енгізу;
  - Log4j осалдығы сияқты жаңа қауіптерді дер кезінде анықтау үшін IDS/IPS жүйелерін пайдалану.
3. **Жаңартуларды автоматтандыру:**
  - Жүйелерді уақтылы жаңарту үшін Patch Management механизмдерін енгізу;
  - Қауіпсіздік патчтарын кешіктірмей орнату.
4. **Жасанды интеллект және машиналық оқыту негізінде қауіптерді анықтау:**
  - Зиянды белсенділікті алдын ала болжау үшін AI негізіндегі құралдарды қолдану;
  - Қолданбалардағы күдікті әрекеттерді автоматты түрде анықтау.
5. **Киберқауіпсіздік бойынша тұрақты оқыту және аудит:**
  - Қызметкерлердің қауіпсіздік туралы хабардарлығын арттыру;
  - Жүйелердің осалдықтарын тұрақты түрде тексеріп, пентест жүргізу.

Log4j осалдығы киберқауіпсіздік саласында маңызды сабақ болды. Ұйымдар бұл жағдайдан қорытынды шығарып, осалдықтарды уақтылы анықтау және жою бойынша кешенді шаралар қабылдауы тиіс. Осындай қауіптердің алдын алу үшін киберқауіпсіздік мәдениетін нығайту – басты міндеттердің бірі.

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# Operating principle of the electromagnetic eight-pole vibrating machine with angular vibrations of armature

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**Abstract:** This paper describes operating principle of the electromagnetic eight-pole vibrating machine with angular vibrations of armature. The vibrating machine comprises an asymmetrical eight-pole armature with a DC winding and eight-pole symmetrical stator with an AC winding with four parallel branches. The amplitude of oscillations of the working element is regulated depending on the distance of the attachment on the lever and the current in the DC winding. This vibrating machine is designed for the use in industry as a drive for feeders, transporters, sorters and for a number of other purposes where a vibratory drive with directional oscillations is needed. The novelty of the design is protected by patent of Georgia.

**Keywords:** vibrating machine, electromagnetic, eight-pole, angularly oscillating

Vibrations are widely used in various technologies, since they make it possible to significantly speed up technological processes. The efficiency of these technologies is largely determined by the technical characteristics of vibration systems, which leads to constant improvement of the designs of vibration machines, as well as control systems, due to the use of the latest achievements in electronics when development and control of vibration installations. new design solutions for the electromechanical part [1,2].

Electromagnetic vibrating machine with angular vibrations of armature belongs to special electric machines for converting electrical energy into mechanical motion by angular oscillations and can be used to transmit periodic oscillations to the working bodies of various devices or vice versa [3].

The aim of the work is to improve the energy and operational performance of an electromagnetic vibrating machine with angular oscillations and to ensure the regulation of the amplitude of mechanical oscillations of the armature.

As a result of research, taking into account the vibration process and analysis of known designs vibrating machines, to achieve the stated goal, we developed an angularly oscillating eight-pole electromagnetic vibrating machine [4].

The stated goals in the electromagnetic vibration machine are achieved by: placing the coils of the AC and DC windings on the poles of the stator and rotor, respectively, and using a circuit diagram of electrical connections that together form a variable pole system; Changing the voltage at the terminals of the DC windings.

The proposed electromagnetic vibration machine (Fig. 1) consists of stator 1 and armature 2, made of sheet electrical steel. On the poles of the Stator 1-1 and 1-2, 1-3 and 1-4, 1-5 and 1-6, 1-7 and 1-8, identical coils of the AC winding are placed, respectively 3-1 and 3-2, 3-3 and 3-4, 3-5 and 3-6, 3-7 and 3-8. Also, 3-1 is connected to 3-2, 3-3 to 3-4, 3-5 to 3-6 and 3-7 to 3-8 in series. On the poles of armature 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7 and 2-8 are placed 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7 and 4-8 are identical DC winding coils connected in series with each other. AC and DC coils 3-1 and 4-1, 3-2 and 4-2, 3-5 and 4-5, 3-6 and 4-6 are wound according to, and 3-3 and 4-3, 3-4 and 4-4, 3-7 and 4-7, 3-8 and 4-8 oppositely, therefore, the DC coils 4-1, 4-2 and 4-5, 4-6 with



each other according to , and 4-3, 4-4 and 4-7, 4-8 are connected to them in opposite directions, which ensures compensation of the self-induction EMF at the DC terminals. The starting points of coils 3-1 and 3-8 are connected to AC terminals 5-1, 5-2, and the starting points of coils 4-1 and 4-8 are connected to DC terminals 5-3, 5-4. One side lever 6 is placed between identical springs 7-1, 7-2 of the elastic system, and the other side is connected by with the aid of a key 8 to the shaft 9 on which the armature is installed. The stator is placed in a housing 10, which is rigidly fixed to a stand 11. To limit parasitic magnetic fluxes in the stator yoke, the stator is divided into four segments with gaps 12-1, 12-2, 12-3, 12-4 filled with nonmagnetic material, resulting in four I, II, III, IV loops magnetic circuit. The stator and armature are symmetrical with respect to axis  $AA'$  and  $BB'$  passing through the centers of nonmagnetic gaps 12-1, 12-2, 12-3, 12-4 [4].

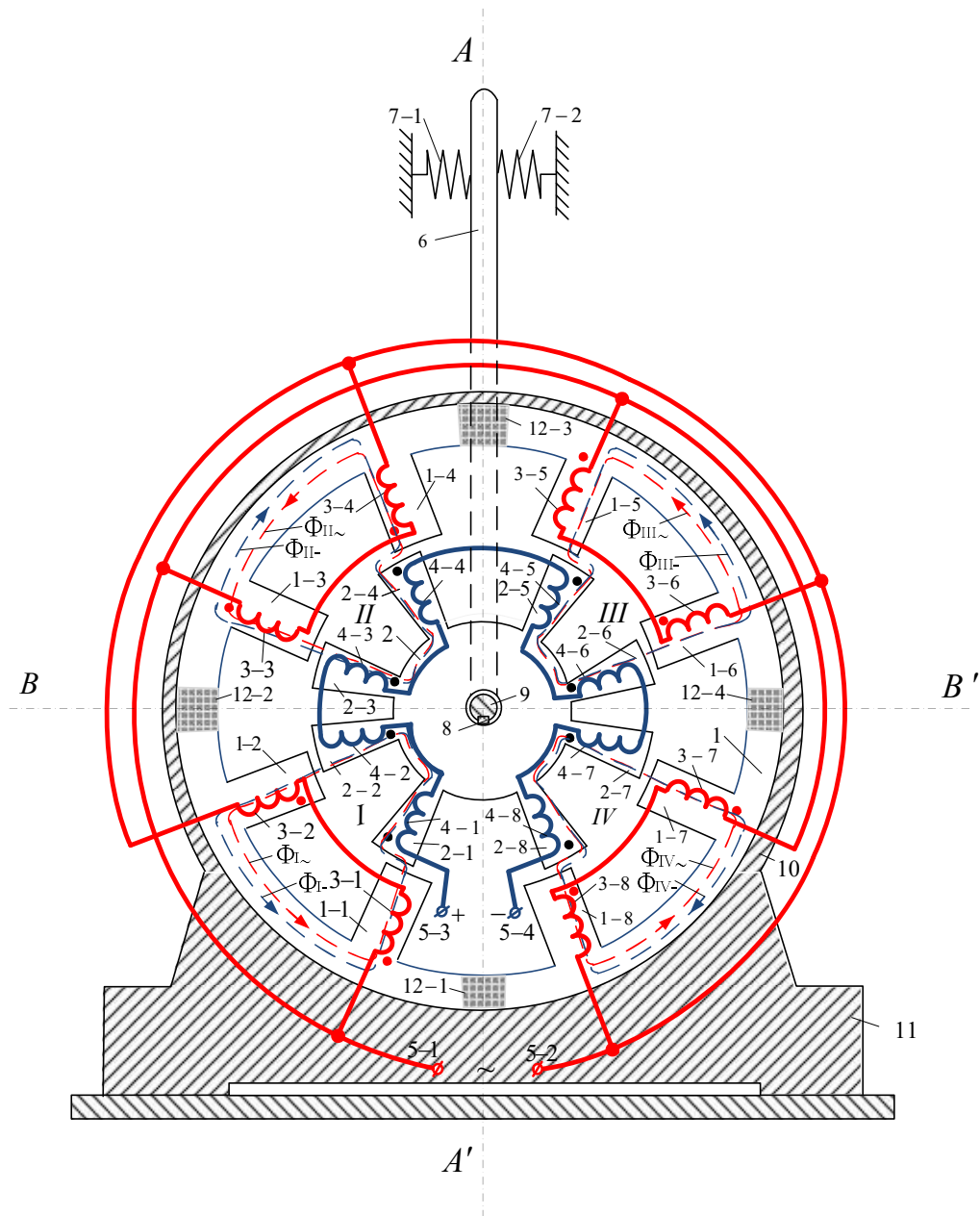


Fig. 1 Schematic drawing of the electromagnetic eight-pole vibrating machine with angular vibrations of armature

The electromagnetic vibrating machine works as follows. When an AC network voltage is supplied to the terminals 5-1, 5-2, the coils placed on the stator poles generate an alternating magnetic flux  $\Phi_{\sim}$ , which attracts the poles of the armature with the same force, due to which no oscillatory movement [4,5].

After applying DC network voltage to terminals 5-3 and 5-4 by coils located on the poles of the armature, a permanent magnetic flux  $\Phi_{\cdot}$  is created. The winding directions of the AC and DC windings on the poles stator and armature and the electrical connection diagrams ensure that during one half-period of the AC, the AC and DC magnetic fluxes  $\Phi_{I\sim}$  and  $\Phi_{I\cdot}$ ,  $\Phi_{III\sim}$  and  $\Phi_{III\cdot}$  of the magnetic circuit in the I and III loops have the same directions, and  $\Phi_{II\sim}$  and  $\Phi_{II\cdot}$ ,  $\Phi_{IV\sim}$  and  $\Phi_{IV\cdot}$  in the II and IV loops have opposite directions. In this case, the stator poles 1-1, 1-2, 1-5 and 1-6 will attract the armature poles 2-1, 2-2, 2-5 and 2-6 respectively, while poles 1-3, 1-4, 1-7 and 1-8 repels poles 2-3, 2-4, 2-7 and 2-8, which causes the armature to rotate counterclockwise. At this time, spring 7-1 will be compressed and spring 7-2 will be stretched [4].

In the second half-period of alternating current, the alternating and permanent magnetic fluxes  $\Phi_{I\sim}$  and  $\Phi_{I\cdot}$ ,  $\Phi_{III\sim}$  and  $\Phi_{III\cdot}$  of the magnetic circuit in the I and III loops are directed oppositely, and  $\Phi_{II\sim}$  and  $\Phi_{II\cdot}$ ,  $\Phi_{IV\sim}$  and  $\Phi_{IV\cdot}$  in the II and IV loops have the same direction, in this case the stator poles 1-1, 1-2, 1-5 and 1-6 repels the poles 2-1, 2-2, 2-5 and 2-6, while poles 1-3, 1-4, 1-7 and 1-8 attract, poles 2-3, 2-4, 2-7 and 2-8, which causes the armature to move clockwise in the direction. At this time, the spring 7-2 will be compressed, and spring 7-1 is stretched [4].

Based on the above, in one half-period of alternating current the armature moves counterclockwise, and in the other half-period - clockwise, i.e. the sign alternating with angular oscillatory motion occurs, and the frequency of oscillations is equal to the frequency of alternating current.

The essence of the operation of an electromagnetic vibrating machine is clearly visible from the curves of the change in magnetic fluxes in the I (a), II (b), III(c) and IV (d) loops of the magnetic circuit in the time (Fig. 2), where  $\Phi_{I\sim}$ ,  $\Phi_{II\sim}$ ,  $\Phi_{III\sim}$  and  $\Phi_{IV\sim}$  are the magnetic fluxes created by the AC windings of the stator,  $\Phi_{I\cdot}$ ,  $\Phi_{II\cdot}$ ,  $\Phi_{III\cdot}$  and  $\Phi_{IV\cdot}$  are the magnetic fluxes created by the DC windings of the coil, and  $\Phi_I$ ,  $\Phi_{II}$ ,  $\Phi_{III}$  and  $\Phi_{IV}$  are the total magnetic fluxes, respectively, in the I, II, III and IV loops,  $t$  - time,  $\omega$  - angular velocity of rotation of the magnetic flux [4,5].

In the time interval from 0 to  $\pi$  (Fig. 2), in one half-period of alternating current, in the I loop, the magnetic flux  $\Phi_{I\sim}$  created by the alternating current winding coils (Fig. 1, 3-1, 3-2) is added (Fig. 2,a) to the magnetic flux  $\Phi_{I\cdot}$  created by the DC winding coils (Fig. 1, 4-1, 4-2). A similar process takes place in the III loop, the magnetic flux  $\Phi_{III\sim}$  created by the alternating current winding coils (Fig. 1, 3-5, 3-6) is added (Fig. 2,c) to the magnetic flux  $\Phi_{III\cdot}$  created by the DC winding coils, while the total fluxes  $\Phi_I$  and  $\Phi_{III}$  in the I and III loops are conditionally positive (Fig. 2,a,c). In the II loop as for the magnetic flux  $\Phi_{II\sim}$  created by the AC winding coils (Fig. 1, 3-3, 3-4), the magnetic flux  $\Phi_{II\cdot}$  created by the DC winding coils (Fig. 1, 4-3, 4-4) is subtracted (Fig. 2,b). A similar process occurs in the IV loop, the magnetic flux  $\Phi_{IV\sim}$ , created by the coils of the AC winding (Fig. 1, 3-7, 3-8) the magnetic flux created by the coils of the DC winding  $\Phi_{IV\cdot}$  is subtracted (Fig. 2,d), while the total fluxes  $\Phi_{II}$  and  $\Phi_{IV}$  in the II and IV loops during normal operation are almost equal to 0 (Fig. 2,b,d) [4,5].

In the time interval from  $\pi$  to  $2\pi$  (Fig. 2), the reverse process occurs, namely, in the second half-period of alternating current, in the I loop the magnetic flux  $\Phi_{I\sim}$ , created by the coils of the AC winding (Fig. 1, 3-1, 3-2) the Magnetic flux  $\Phi_{I\cdot}$ , created by the coils of the DC winding (Fig. 1, 4-1, 4-2), is subtracted (Fig. 2,a), a similar process occurs in the III loop, from the magnetic flux  $\Phi_{III\sim}$ , created by the coils of the AC winding (Fig. 1, 3-5, 3-6), the magnetic flux  $\Phi_{III\cdot}$  created by the DC winding coils (Fig. 1, 4-5, 4-6) is subtracted (Fig. 2,c), the total fluxes  $\Phi_I$  and  $\Phi_{III}$  in the I and III loops during normal operation are practically equal to 0 (Fig. 2,a,c). In the II loop as for the magnetic flux  $\Phi_{II\sim}$ , created by the coils of the AC winding (Fig. 1, 3-3, 3-4), is added (Fig. 2,b) to

the magnetic flux  $\Phi_{II-}$ , created by the DC winding coils (Fig. 1, 4-3, 4-4). a similar process occurs in the IV loop, the magnetic flux  $\Phi_{IV\sim}$  created by the coils of the AC winding (Fig. 1, 3-7, 3-8) is added (Fig. 2,d) to the magnetic flux  $\Phi_{IV-}$  created by the DC winding coils (Fig. 1, 4-7, 4-8), magnetic flux  $\Phi_{IV-}$ , and the total fluxes  $\Phi_{II}$  and  $\Phi_{IV}$ , in loops II and IV, are conditionally negative (Fig. 2,b,d) [4,5].

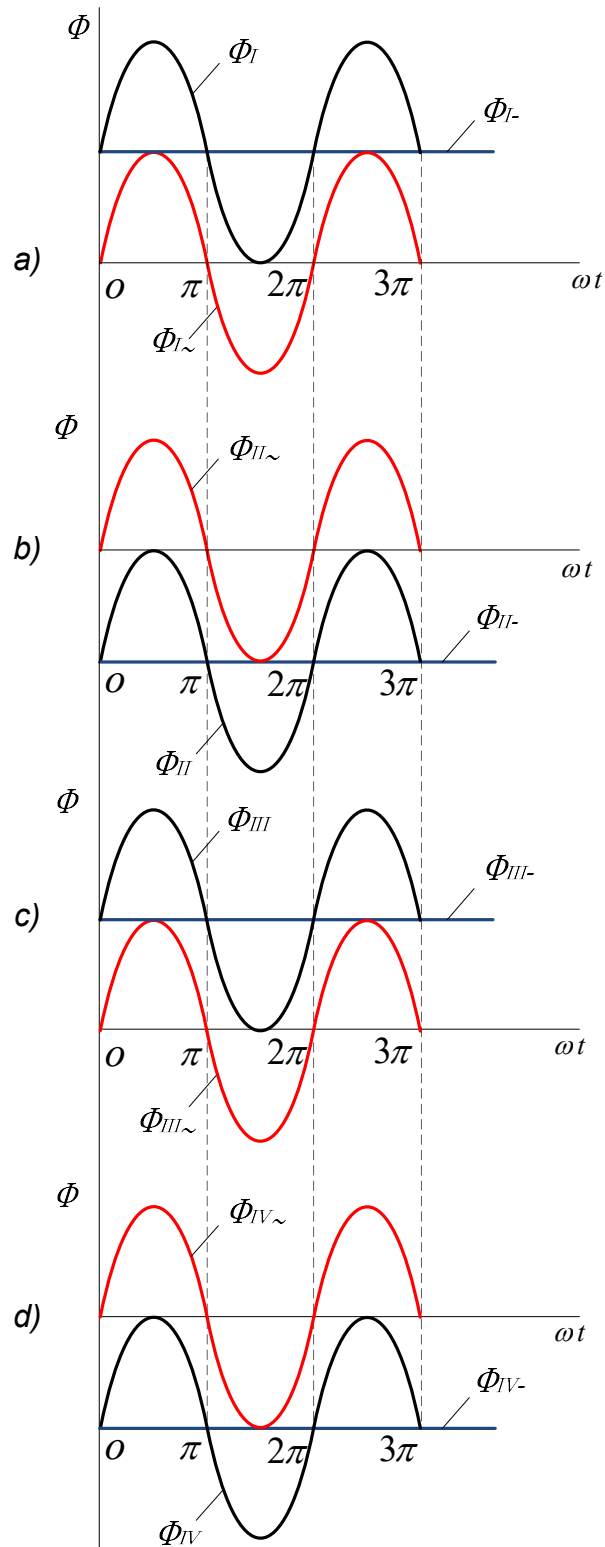


Fig.2 The curves of the change in magnetic fluxes in the I (a), II (b), III(c) and IV (d) loops of the magnetic circute in the time

As a result, there is created a sign-variable driving torque causing angular oscillations of the armature according to the harmonic law [5].

Thus, in the proposed electromagnetic vibration machine, the oscillatory mechanical movement of the armature, the improvement of energy and operational indicators is achieved due to the location of the DC and AC windings on the poles of the stator and armature and the proposed electrical connection diagram, which ensures the symmetry of the sign alternating moment and changing the voltage at the terminals of the DC windings, which makes it possible to regulate the amplitude of mechanical vibrations.

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# REVOLUTIONIZING AUTOMOTIVE SHIPPING: THE ROLE OF INFORMATION TECHNOLOGIES IN MODERN LOGISTICS

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In today's rapidly evolving logistics industry, modern information technologies play a crucial role in optimizing transportation processes, particularly in the automotive shipping sector in the United States. The efficiency, safety, and transparency of car transportation rely heavily on digital solutions such as Electronic Proof of Delivery (ePOD) systems, Electronic Logging Devices (ELD), and GPS tracking technologies. These innovations not only streamline operations but also ensure compliance with regulatory requirements, enhance communication between stakeholders, and improve overall service quality.

ePOD systems digitize the process of delivery confirmation by replacing traditional paper-based documentation with electronic records. These systems allow drivers to generate, store, and share delivery documents, including invoices and bills of lading, using mobile apps or specialized software. ePODs improve efficiency, reduce paperwork errors, and enhance transparency by providing real-time updates on deliveries, including time-stamped confirmations and photographic proof of cargo condition.

The driver plays a crucial role in the entire cargo delivery process, and with the help of an ePOD (Electronic Proof of Delivery) system, they can efficiently manage every stage, from order placement to the final unloading of the vehicle from the trailer. These systems digitize logistics workflows, ensuring that all necessary information is easily accessible and securely stored, reducing paperwork and improving overall efficiency.

Using an advanced ePOD system like Super Dispatch, drivers have real-time access to critical order details through a smartphone application. The system provides precise pickup and drop-off addresses, along with an interactive map view for easy navigation. Any special instructions related to the pickup or delivery process are also displayed, ensuring a smooth and well-coordinated operation.

In addition to location details, the ePOD system contains comprehensive information about the transported vehicle, including its make, model, VIN (Vehicle Identification Number), and condition. This ensures that all stakeholders are aware of the cargo specifications and any pre-existing damage or special handling requirements.

One of the key features of ePOD systems is photo documentation, which allows drivers to take and store high-quality images of the cargo at both the pickup and drop-off points. These photos serve as proof of condition, protecting the driver from liability in case of disputes regarding damages. Since they are time-stamped and geotagged, they provide a clear and accurate record of the vehicle's condition before and after transportation.

Beyond these core functionalities, modern ePOD systems also facilitate seamless communication by providing instant updates on schedule changes and delivery statuses. They

allow drivers to collect electronic signatures from customers and personnel at both ends of the transportation process, ensuring that all necessary documentation is securely recorded. Additionally, they enable the automatic generation and submission of invoices and bills of lading (BOLs) directly through the app, streamlining the payment process.

By integrating ePOD systems into daily operations, logistics companies significantly improve efficiency, accuracy, and security in vehicle transportation. These digital solutions ensure a transparent and well-documented process, benefiting both drivers and customers while optimizing overall workflow.

An Electronic Logging Device (ELD) is a critical piece of technology used in commercial transportation to automatically record a driver's Hours of Service (HOS). This system is designed to ensure compliance with federal regulations, particularly in countries like the United States, where strict limitations on driving hours are enforced to enhance road safety and reduce fatigue-related accidents. By accurately tracking driving time, rest breaks, and vehicle movement, ELDs play a vital role in modern fleet management and logistics operations.

The primary function of an ELD is to replace traditional paper logs, which were often prone to errors, manipulation, or inconsistencies. Unlike manual logbooks, which require drivers to record their working hours by hand, ELDs provide automated, real-time tracking, ensuring that data is accurate and tamper-proof. The system is directly connected to the vehicle's engine, enabling it to record driving status and movement without driver input. This automation reduces administrative workload, minimizes the risk of falsified records, and ensures that fleet operators and regulatory bodies can access precise and reliable HOS data at any time.

One of the key benefits of ELDs is their impact on driver safety. Fatigue is a leading cause of road accidents, particularly in the trucking industry, where long hours behind the wheel can lead to decreased concentration and slower reaction times. By enforcing compliance with federally mandated work-hour limits, ELDs help prevent drivers from exceeding safe driving thresholds. In the U.S., for example, regulations dictate that truck drivers can operate their vehicles for a maximum of 11 hours within a 14-hour work period, after which they must take at least 10 consecutive hours off-duty. ELDs automatically track this data, alerting drivers when they are approaching their legal driving limit and helping them plan their rest breaks accordingly.

From a fleet management perspective, ELDs offer numerous advantages. By integrating with telematics and GPS tracking systems, they provide fleet operators with real-time insights into vehicle locations, driver performance, and overall operational efficiency. Fleet managers can monitor compliance, identify inefficiencies, and optimize routes based on driving patterns and regulatory constraints. Additionally, many ELD systems include reporting and analytics tools, allowing companies to analyze historical data and make informed decisions to improve fuel efficiency, reduce operational costs, and enhance overall productivity.

The transition to mandatory ELD use in the United States was driven by federal legislation, specifically the ELD Mandate, which was enforced by the Federal Motor Carrier Safety Administration (FMCSA). This regulation requires most commercial truck drivers to use an ELD instead of traditional paper logs, ensuring uniform compliance across the industry. The mandate has had a significant impact on the transportation sector, improving regulatory oversight, reducing paperwork burdens, and increasing accountability for both drivers and fleet operators.

Despite the benefits, the implementation of ELDs has not been without challenges. Some drivers and smaller carriers initially resisted the transition, citing concerns over privacy, cost, and flexibility. However, as the technology has evolved, ELD providers have developed more user-friendly and cost-effective solutions that cater to businesses of all sizes. Today, ELDs are widely recognized as an essential tool in modern commercial transportation, providing greater transparency, improved safety, and enhanced operational efficiency.

As the transportation industry continues to evolve, ELD technology is expected to advance even further, integrating with artificial intelligence, predictive analytics, and automation to create smarter, more efficient fleet management solutions. In the long run, the adoption of ELDs is not just about regulatory compliance—it represents a fundamental shift toward a safer, more accountable, and data-driven future for commercial transportation.

As well as ELD and ePOD systems, tracking systems are essential in modern transportation, utilizing GPS and telematics technology to provide real-time visibility into vehicle location, movement, and operational status. These systems help fleet operators monitor performance, optimize routes, reduce fuel costs, and improve overall efficiency.

One of the key benefits of tracking systems is real-time location tracking, allowing dispatchers to monitor vehicle positions and respond to delays caused by traffic, weather, or mechanical issues. This ensures timely deliveries and enables dynamic rerouting when necessary. Additionally, tracking systems provide detailed performance data, including speed, fuel consumption, idle time, and driver behavior. By analyzing this data, fleet managers can address inefficiencies, improve driving habits, and lower operational costs.

Tracking technology also enhances customer service by offering accurate delivery estimates and real-time shipment tracking, increasing transparency and trust. Additionally, it plays a crucial role in security and theft prevention—features like geofencing alerts help prevent unauthorized vehicle movement, while real-time GPS tracking aids in quick asset recovery.

For companies in regulated industries, tracking systems simplify compliance and reporting, automatically logging driving hours, vehicle inspections, and maintenance schedules to meet legal requirements. With the integration of AI and predictive analytics, modern tracking solutions can even anticipate maintenance needs and traffic patterns, further optimizing fleet management.

Modern information technologies have transformed the transportation and logistics industry, particularly in the automotive shipping sector in the United States. Electronic Proof of Delivery (ePOD) systems, Electronic Logging Devices (ELDs), and GPS tracking technologies have revolutionized how vehicles are transported, making the process more efficient, transparent, and secure. These digital solutions not only enhance workflow automation but also ensure compliance with strict regulations, reduce paperwork burdens, and improve coordination among all stakeholders.

The implementation of ePOD systems has significantly streamlined the documentation and delivery confirmation process, providing drivers and fleet managers with real-time access to critical information. By digitizing invoices, bills of lading, and photographic proof of cargo condition, ePOD solutions have improved operational efficiency, accuracy, and customer satisfaction while protecting drivers from liability disputes.

ELD technology, on the other hand, has played a crucial role in ensuring regulatory compliance and road safety. By automatically recording Hours of Service (HOS), ELDs prevent driver fatigue-related accidents, enhance accountability, and enable fleet managers to optimize schedules while adhering to federal driving limits. Despite initial resistance, these devices have become an essential tool in commercial transportation, contributing to a safer and more efficient industry.

Meanwhile, tracking systems have provided businesses with real-time visibility into vehicle movement and performance. By leveraging GPS and telematics technology, companies can monitor fleet activity, improve route optimization, enhance security, and provide customers with accurate delivery estimates. The integration of AI and predictive analytics has further advanced these systems, allowing for proactive fleet management and maintenance planning.

In conclusion, the adoption of ePOD, ELD, and tracking systems has reshaped the transportation industry, making it more data-driven, compliant, and customer-centric. As technology continues to evolve, the industry will see further advancements in automation, AI



integration, and predictive analytics, ensuring that logistics operations remain competitive and efficient. Ultimately, embracing modern digital solutions is not just an option but a necessity for businesses striving for safety, efficiency, and long-term success in the transportation sector.

УДК 621.311

# ПЕРЕДАЧА ЭЛЕКТРОЭНЕРГИИ ПОСТОЯННЫМ ТОКОМ КАК ПЕРСПЕКТИВНОЕ НАПРАВЛЕНИЕ РАЗВИТИЯ МИРОВОЙ ЭНЕРГЕТИКИ

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**Аннотация.** В последние десятилетия передача электроэнергии постоянным током становится одним из ключевых элементов современной энергетики. Основной тенденцией применения технологии постоянного тока является передача электроэнергии большой мощности на дальние расстояния с использованием передач постоянного тока ультравысокого напряжения (ППТ УВН). Несмотря на высокие затраты на преобразовательные подстанции, меньшая стоимость возведения опор, увеличение пропускной способности линии, снижение потерь при передаче электроэнергии и возможность синхронизации энергетической системы играют определяющую роль в выборе технологии электропередачи постоянного тока.

Цели работы заключаются в обзоре технологии ППТ. Для этого произведен анализ развития электропередач постоянного тока, выполнено технико-экономическое сравнение технологий передачи электроэнергии, выявлены основные достоинства и недостатки ППТ и осуществлен обзор мирового применения ППТ.

**Ключевые слова:** ППТ, ЛЭП, преобразование электроэнергии.

## Введение

Первые опыты по передаче электрической энергии на расстояние относятся к 70-80-м годам XIX столетия [1]. В то время уже было известно два рода электрического тока – постоянный и однофазный переменный. При этом в качестве основного энергоносителя рассматривался только постоянный ток, поскольку известные тогда однофазные двигатели переменного тока имели очень низкий, практически нулевой пусковой момент и для их пуска приходилось использовать дополнительные механизмы.

В 1882 году между Мисбахом и Мюнхеном в Германии была построена первая линия электропередачи постоянного тока длиной в 50 километров на напряжение 2 кВ [2]. Электроэнергия передавалась по стальным проводам диаметром 4,5 мм, поэтому коэффициент полезного действия (КПД) передачи не превышал 25 %. Несмотря на столь низкий КПД, эта передача имела очень большое значение, поскольку она показала принципиальную возможность передачи электроэнергии на достаточно большое, в десятки километров расстояние.

В настоящее время для выработки электрической энергии, ее передачи, распределения и потребления в основном используется переменный ток [3]. Это

объясняется способностью переменного тока к трансформации, т.е. к изменению напряжения с помощью достаточно простых аппаратов, а также тем, что электродвигатели переменного тока по своей конструкции значительно проще электродвигателей постоянного тока. Однако, в последние десятилетия специалисты разных стран все чаще применяют постоянный ток для решения ряда задач, таких как передача больших объёмов электроэнергии между несинхронизированными сетями и подключения удалённых источников возобновляемой энергии. Электропередача постоянного тока выступает ключевым компонентом для межрегиональных и международных соединений, обеспечивая надёжную и эффективную передачу электроэнергии на большие расстояния.

### **Развитие электропередач постоянного тока**

По историческим меркам на решение проблемы передачи электроэнергии постоянным током высокого напряжения ушел сравнительно небольшой срок [4]. Ниже приведены некоторые важные этапы развития технологии передачи постоянного тока:

- Ртутно-паровой выпрямитель Хьюитта, появившийся в 1901 году.
- Эксперименты с тиратронами в Америке и ртутно-дуговыми вентилями в Европе до 1940 года.
- Первая коммерческая ППТ, Готланд 1 в Швеции в 1954 году.
- Первые твердотельные полупроводниковые вентили в 1970 году.
- Первое оборудование управления ППТ на базе микрокомпьютеров в 1979 году.
- Самое высокое напряжение в сети постоянного тока ( $\pm 600$  кВ) в Итайпу, Бразилия, 1984 г.
- Первые активные фильтры постоянного тока с выдающимися характеристиками фильтрации в 1994 году.
- Первый преобразователь с конденсаторной коммутацией в соединении Аргентина-Бразилия, 1998 г.
- Первый преобразователь напряжения для передачи электроэнергии на Готланде, Швеция, 1999 г.

С момента первой коммерческой установки в 1954 году по всему миру было установлено большое количество систем передачи постоянного тока. По приблизительным подсчётам за пять десятилетий с начала 50-х по конец 90-х годов прошлого века в мире введено в эксплуатацию около 100 объектов постоянного тока на напряжение выше 50 кВ общей мощностью в 100 ГВт [5], а за два десятилетия в период с 2000-2020 гг. – около 120 объектов постоянного тока, где установленная мощность объектов последней декады составила 250 ГВт (рисунок 1).

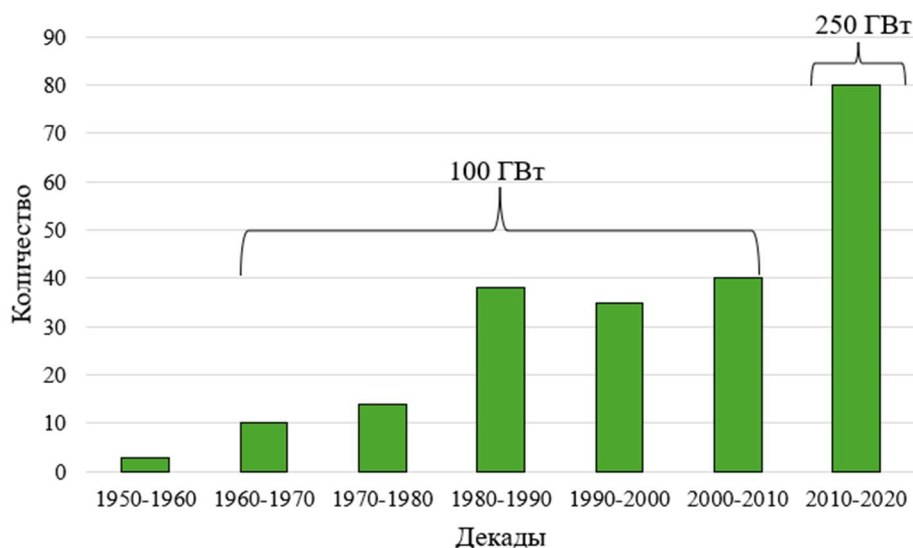


Рисунок 1 – Количество введенных в эксплуатацию объектов постоянного тока по десятилетиям

### Технико-экономические различия в технологии передачи электроэнергии

Передача постоянного тока имеет меньшие по сравнению с ВЛ переменного тока затраты на передачу киловатт часа электроэнергии при равных условиях надежности в случае превышения некоторой длины линии. Стоимость воздушной линии электропередачи определяется стоимостью проводов, опор, их фундаментов, линейной изоляции, условиями прокладки трассы, монтажа. По современным данным стоимость 1 км линии постоянного тока примерно на 20-25 % меньше стоимость 1 км линии переменного тока. Поскольку затраты на линию определяются ее длиной, то в результате для протяженных линий постоянного тока экономия на их сооружении компенсирует избыточные затраты на сооружение преобразовательных подстанций. При длине, называемой критической затраты на сооружение электропередачи постоянного и переменного тока становятся одинаковыми (рисунок 2).

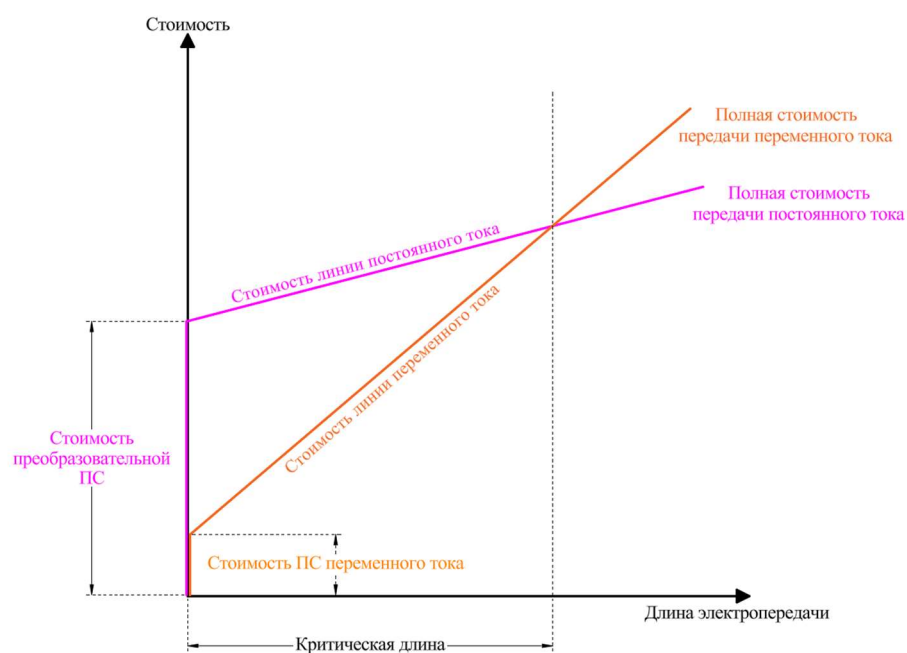


Рисунок 2 – Критическая длина ЛЭП

При расчете критической длины нужно учитывать, что по показателям надежности биполярная передача постоянного тока соответствует двухцепной передаче переменного тока. Передача постоянного тока требует меньшего количества проводов: у биполярной ППТ два провода – в случае возврата через землю, три – при металлическом возврате. Для обеспечения эквивалентной надежности нужна двухцепная передача переменного тока с шестью проводами (рисунок 3).

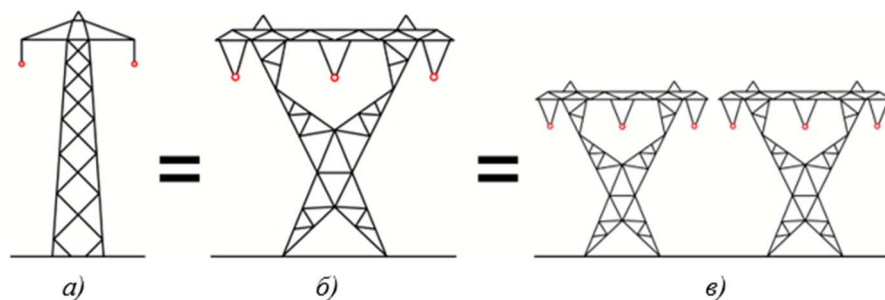


Рисунок 3 – Промежуточные опоры линий электропередачи переменного и постоянного тока

а – промежуточная свободностоящая опора для биполярной ВЛ на 500 кВ; б – промежуточная опора ЛЭП переменного тока на 800 кВ; в – двухцепная промежуточная опора переменного тока на 500 кВ

Как правило, общие потери при передаче постоянного на 30-50% меньше, чем при передаче переменного тока [6]. Хотя в процессе преобразования переменного тока в постоянный возникают потери мощности, линейные потери в линиях постоянного тока меньше, чем в линиях переменного тока. При использовании постоянного тока на больших расстояниях более низкие потери в линии компенсируют более высокие потери при преобразовании рода тока. Обычно на расстояниях более 300 км общие потери при передаче постоянным током меньше, чем при передаче переменным. На графике ниже показаны общие потери в зависимости от расстояния передачи (рисунок 4).

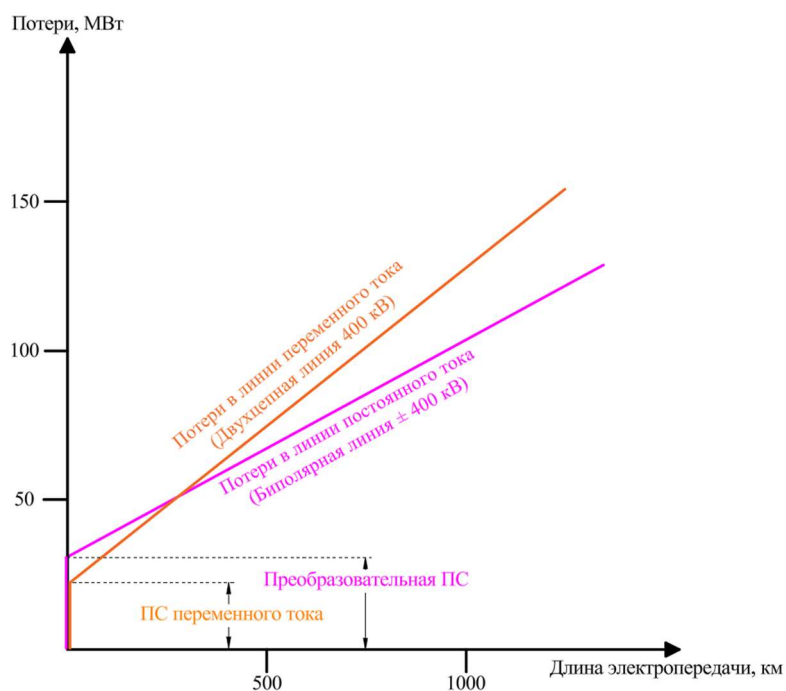


Рисунок 4 – Зависимость потерь электроэнергии от длины электропередачи

#### Достоинства и недостатки ППТ

Как было упомянуто выше, одним из основных преимуществ высоковольтных ЛЭП постоянного тока является возможность передавать большие объёмы электроэнергии на большие расстояния с меньшими потерями, чем у ЛЭП переменного тока. В зависимости от напряжения линии и способа преобразования тока потери могут быть снижены до 3 % на 1000 км. Передача энергии по высоковольтной ЛЭП постоянного тока позволяет эффективно использовать источники электроэнергии, удаленные от энергоузлов нагрузки.

В ряде случаев высоковольтная ЛЭП постоянного тока более эффективна, чем ЛЭП переменного тока:

- Передача энергии в энергосистеме напрямую от электростанции к потребителю, без дополнительных отводов, например, в удаленные районы.
- Увеличение пропускной способности существующей энергосистемы в случаях, когда установить дополнительные ЛЭП переменного тока сложно или слишком дорого;
- Передача энергии и стабилизация между несинхронизированными энергосистемами переменного тока;
- Уменьшение стоимости линии за счет уменьшения количества проводников. Кроме того, могут использоваться более тонкие проводники, так как ППТ не подвержены поверхностному эффекту;
- Упрощается передача энергии между энергосистемами, использующими разные стандарты напряжения и частоты переменного тока;
- Синхронизация с сетью переменного тока энергии, производимой возобновляемыми источниками энергии.

Основным недостатком высоковольтной ЛЭП постоянного тока является необходимость преобразования типа тока из переменного в постоянный и обратно [7]. Используемые для этого устройства требуют дорогостоящих запасных частей, инструментов и принадлежностей, так как фактически являются уникальными для каждой линии. Преобразователи тока дороги и имеют ограниченную перегрузочную способность. На малых

расстояниях потери в преобразователях могут быть больше чем в аналогичной по мощности ЛЭП переменного тока.

### Обзор мирового использования ППТ

Перед тем как произвести обзор мирового применения ППТ следует отметить, что в преобразовательной части большинства функционирующих и проектируемых ППТ используются два типа преобразователей [8]:

- Преобразователь тока (ПТ) с тиристорными вентилями;
- Преобразователь напряжения (ПН) с вентилями на основе полностью управляемых полупроводниковых приборов.

Различием между технологиями применяемых преобразователей является то, что ПТ используются для создания ППТ, которая будет передавать большие объемы мощности от электростанций в энергосистему и производить оптимизированное распределение выдаваемых в нее мощностей. В свою очередь ПН используются для повышения надежности электроснабжения автономных энергосистем (нефтяные и газовые платформы, ВИЭ) и сохранения напряжения в сети переменного тока. Отталкиваясь от этих особенностей, рассмотрим применение обеих технологий в мировой энергетике.

Преобразователи тока получили широкое распространение при сооружении электропередачи постоянного тока ультравысокого напряжения (ППТ УВН). Лидерами в области эксплуатации ППТ УВН являются Китай, Индия, Бразилия, где использование связано с неравномерностью распределения энергоресурсов и центров потребления электроэнергии по территории страны [9]. Например, в Китае в настоящее время функционируют 16 ППТ УВН с напряжением  $\pm 800$  кВ [10]. В таблице 1 приведены примеры введенных в эксплуатацию ВЛ и КЛ ППТ с преобразователями тока.

Таблица 1 – Примеры введенных в эксплуатацию ВЛ и КЛ ППТ с преобразователями тока

Наименование, страна	Напряжение, кВ	Пропускная способность, МВт	Длина ВЛ/КЛ, км
Changji – Guquan, Китай	$\pm 1100$	12000	3324 (ВЛ)
North East – Agra, Индия	$\pm 800$	6000	1725 (ВЛ)
Western HVDC Link, Англия	$\pm 600$	2250	422 (КЛ)
Bipole III, Manitoba Hydro, Канада	$\pm 500$	2000	1400 (ВЛ)
BeloMonte 1, Бразилия	$\pm 800$	4000	2092 (ВЛ)
Champa – Kurukshetra, Индия	$\pm 800$	2×3000	1300 (ВЛ)
Buk-Dangjin – Godeok, Южная Корея	$\pm 500$	1500	34 (КЛ)
Matiari – Lahore, Пакистан	$\pm 660$	4000	1192 (ВЛ)

На рисунке 5 представлен внешний вид преобразовательной подстанции ППТ Changji – Guquan. Линия электропередачи берет начало на преобразовательной станции Changji, расположенной в автономной префектуре Чанцзи-Хуэй Синьцзян-Уйгурского автономного района на северо-западе Китая. Ожидается, что проект позволит сократить годовое потребление угля электростанциями в восточном Китае на 38 млн тонн в год [11]. При полном



функционировании преобразовательная подстанция сможет обеспечить электроэнергией восемь линий переменного тока напряжением 500 кВ и две линии напряжением 1000 кВ.



Рисунок 5 – Внешний вид преобразовательной подстанции Changji

Одним из направлений применения преобразователей напряжения является создание автономных систем электроснабжения удаленных от единой энергосистемы потребителей. В отличие от ПТ, ПН имеют возможность функционировать с любыми значениями мощностей, когда в свою очередь ПТ не могут функционировать при мощностях менее 10 % от номинальной передаваемой мощности. Это позволяет заменить дизель-генераторные установки (ДГУ), которые используются для электроснабжения автономных энергосистем и создать ППТ при помощи кабельной передачи, что позволит сократить суммарное потребление топлива на выработку электроэнергии [12].

Также существует возможность использования преобразователей тока и напряжения в одной системе ППТ. Такие электропередачи постоянного тока называют гибридными. Наличие в таких ППТ ПН позволит [13]:

- оптимизировать переходные процессы при коротких замыканиях (к.з.) в сети переменного тока;
- снизить риск дальнейшего развития аварийных процессов и обеспечить стабилизацию напряжения в примыкающей сети.

В таблице 2 приведены примеры введенных в эксплуатацию ВЛ и КЛ ППТ с преобразователями напряжения.

Таблица 2 – Примеры введенных в эксплуатацию ВЛ и КЛ ППТ с преобразователями напряжения

Наименование, страна	Напряжение, кВ	Пропускная способность, МВт	Длина ВЛ/КЛ, км
Dolwin 3, Германия	$\pm 320$	900	162 (КЛ)
Caithness Moray, Шотландия	$\pm 320$	1200	160 (КЛ)
Estlink, Эстония-Финляндия	$\pm 150$	350	105 (КЛ)
Caprivi Link, Намибия-Замбия	$\pm 350$	300	950 (ВЛ)
NordLink, Норвегия — Германия	$\pm 525$	1400	570 (ВЛ)
Maritime Link, Канада	$\pm 200$	500	140 (ВЛ), 220 (КЛ)

На рисунке 6 изображены конверторы ППТ Dolwin 3, преобразующие постоянное напряжения одной величины в постоянное напряжение иной величины. Преобразовательная подстанция установлена на платформе в Северном море [14]. Вырабатываемая ветроэлектростанцией (ВЭС) электроэнергия направляется в трансформаторную подстанцию. Оттуда электроэнергия транспортируется на морскую преобразовательную платформу по трехфазным кабелям переменного тока напряжением 155 кВ. На морской преобразовательной станции происходит преобразование переменного тока в постоянный. Затем электроэнергия транспортируется по подводным и подземным кабелям на соответствующую наземную станцию. Здесь электроэнергия снова преобразуется в переменный ток и подается в сеть сверхвысокого напряжения.



Рисунок 6 – Конверторы ППТ Dolwin 3 размещенные в клапанном зале

### Заклучение

Работа посвященная электропередаче постоянным током является обзором развития этой технологии сквозь десятилетия. Для этого авторами описаны первые опыты по передаче электрической энергии, дан краткий исторический ликбез развития ППТ, продемонстрированы технико-экономические различия родов тока, успешно описаны основные достоинства и недостатки электропередачи постоянным током и произведен небольшой обзор мирового использования данной технологии с примерами из различных уголков планеты.

Основной идеей работы является преподнесение подробной, сжатой тематической информации как для обывателей технических организаций, так и людей желающих расширить свой кругозор знаний.

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# Development of an automated water supply management system

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**Abstract.** This study focuses on the development of an automated water supply system specifically designed for rural areas, integrating modern monitoring and control technologies to enhance the efficiency of pumping stations. By utilizing water level sensors, the system can automatically adjust pump operations in response to varying water consumption needs and environmental conditions. The use of programmable logic controllers and remote control interfaces significantly improves resource efficiency, reliability, and system adaptability. This development not only enhances the quality of life in rural communities but also promotes sustainable water resource management amid growing scarcity concerns.

**Keywords:** water supply system, rural areas, water level sensors, programmable logic controllers, remote control, resource optimization, sustainable water use.

## Introduction

In rural areas, water supply systems are typically spatially dispersed. For the purpose of this study, we focus on Shelek village and present a schematic representation of its water supply system. The system is required to meet the following criteria:

1. It must ensure the dependable activation and deactivation of pumps based on the condition of the water tower and other influencing factors.
2. The system should be robust against external challenges such as high humidity and temperature fluctuations.
3. It needs to monitor additional parameters, including the integrity of the equipment and fire safety conditions.

The current electrical supply scheme for the well is essentially the pump's power supply chain, as depicted in Figure 1. In this setup, the power from the three-phase network is delivered to an automatic circuit breaker (QF) that safeguards against short circuits and overloads. The system is implemented using a magnetic starter (KM) equipped with a direct-commutation thermal relay (KK).

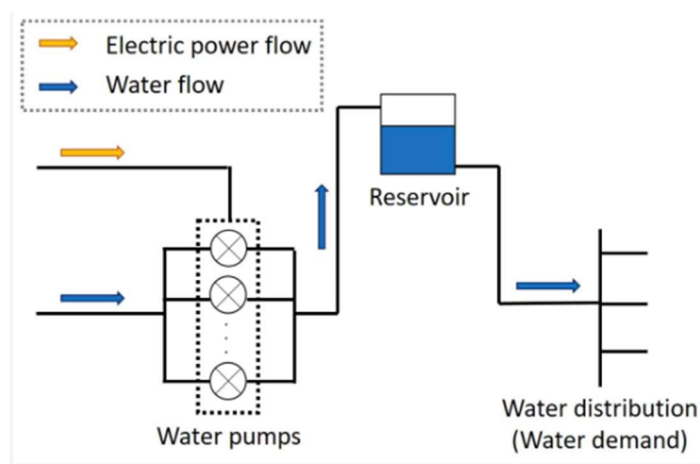


Figure 1. Proposed Water Distribution System

Despite the inclusion of a thermal trip in the automatic circuit breaker, the protection against overload is frequently insufficient due to nearly 100% humidity conditions, which adversely affect its performance. The incorporation of a thermal relay partially mitigates this issue by addressing the challenges posed by high humidity.

Therefore, especially in light of the seasonal fluctuations in water levels and the corresponding variations in pump loads, there is a pressing need for more effective overload protection. This research paper aims to develop an automated water supply management system that not only meets these operational requirements but also enhances the overall reliability and safety of rural water supply infrastructures.

The magnetic starter operates with four groups of contacts. Three of these groups are used to control the motor, while the fourth is connected in parallel with the contacts of the "Start" button. Pressing this button allows the control current to pass through the normally closed contacts of the "Stop" button and the thermal relay. This circuit is equipped with two fuses that protect against short circuits. The circuit is interrupted when either the "Stop" button is pressed or the thermal relay is activated.



Figure 2. Components of the Submersible Pump

Several key disadvantages of this configuration have been identified:

- The pumps are operated manually, which creates difficulties during adverse or inclement weather conditions:
- In environments with high humidity, the reliability of the switching mechanism diminishes. This can lead to malfunctions in the pump equipment, such as the inadvertent activation of only two phases of a three-phase system.
- Rural electrical networks often experience considerable voltage fluctuations, particularly during winter months when the increased load from heating devices further strains the system.

$$C = \epsilon_0 \epsilon \frac{S}{d}, \quad (1)$$

$S$  - is the area of the capacitor plates, and

$d$  - олардың арасындағы қашықтық,

$\epsilon_0$  - is the vacuum permittivity,

$\epsilon$  - is the relative permittivity of the dielectric medium (which varies depending on whether the space between the plates is filled with air or liquid).

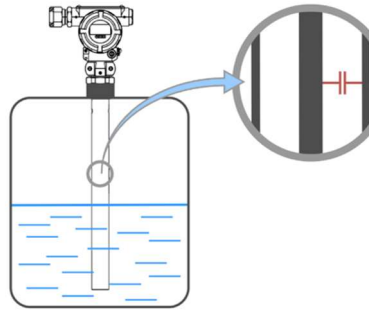


Figure 3. capacitive sensor device

For water, the dielectric constant is approximately  $\epsilon \approx 34.5$ , which is much larger than that of air ( $\epsilon \approx 1$ ). This significant difference enables the system to clearly distinguish between regions filled with water and those filled with air, thereby accurately detecting the liquid level. For instance, if the area of the capacitor plates is  $S = 0.01 \text{ m}^2$  and the distance between them is  $d = 0.001 \text{ m}$ , the capacitance increases by several tens of times when the medium changes from air to water.



Figure 4. Designed system

Sensors of this type measure the time during which the sound pulse passes to the surface of the water and back. Since the speed of sound in the air ( $\sim 340 \text{ M/S}$ ) and its dependence on temperature and humidity are well studied, it is easy to correct the environmental conditions. The ultrasonic sensor does not come into contact with water, which reduces the risk of icing. With a tower height of 20 m, the signal delay is about 0.06 s (40 m back and forth), which is easily handled by modern electronics.



Figure 5. Ultrasonic liquid level meter



A comparative analysis of different types of sensors shows that for the conditions of Kazakhstan, in particular for a village with harsh winters, non-contact sensors (ultrasonic or capacitive), as well as heated posistor elements, are more rational. This reduces the chance of equipment failure due to ice or mechanical damage.

To automate the water tower, in addition to sensors, you need a controller that makes decisions based on incoming signals. He will:

- shut off pumps when the set water level is reached, avoiding overflow;
- connecting pumps when they are below the minimum limit;
- take into account the temperature and pressure of the environment to adjust the operating mode;

-transmission of data on the state of the system to the control room and providing Television Control and programs.

Suppose that 1 m<sup>3</sup> of water is lost per day due to overflow. An artesian well at a depth of 100 m requires about 1-1.5 kw·h of energy to lift 1 m<sup>3</sup> of water (taking into account costs), when the pump efficiency is about 60%. According to the tariff, for example, 20 tenge/kw·h, the daily costs for the heating season (about 150 days) will amount to 150 m<sup>3</sup> of water and about 150-225 kw·h of electricity, or up to 4500 tenge per season. This is a minimal estimate, the actual savings in large overflow volumes can be high. The cost of sensors and controllers will pay off in a few seasons, and the costs of ice cleaning and equipment repair will also be reduced.

### Methodology

Let's define the equations and parameters necessary to calculate the power requirements for a power supply system that supports water pumps. The formula for determining the power of the pump P<sub>motor</sub> electric motor is given:

$$P_{\text{motor}} = \frac{\rho \times g \times Q \times H}{\eta_p \times \eta_m \times 3600} \times k_z \quad (2)$$

Here:  $\rho$  = density of pumped liquid (kg / m<sup>3</sup>),

$g$  = acceleration due to gravity (9.81 m / s<sup>2</sup>),

$Q$  = pump flow rate (m<sup>3</sup> / s),

$H$  = static head (m),

$\eta_p$  = pump efficiency (dimensionless),

$\eta_m$  = efficiency of manual transmission, usually in the range of 0.90-0.95,

$k_z$  = safety factor that takes into account additional unexpected power requirements,

3600 = conversion factor from hour to second.

$$P_{\text{loss}} = I^2 \times R \quad (3)$$

Here :  $I$  = Current (Amperes),

$R$  = cable resistance ( $\Omega$ ).

The resistance of the cable to 100 meters can be calculated using  $r$ :

This process yields the amount of power lost due to cable resistance, thus affecting the overall efficiency and operating costs of the pumping system. Choose a cable with a rating sufficient to control current and reduce costs while adjusting the costs. Additional calculations may be required to ensure that the voltage drop through the cable is within acceptable limits and does not affect the operation of the pump.

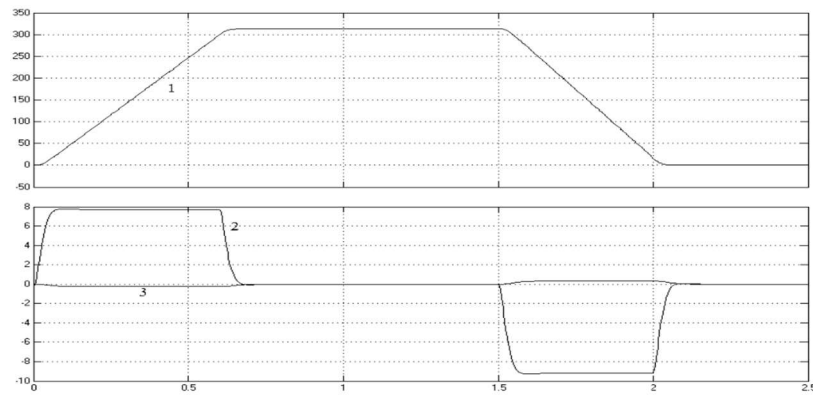


Figure 6. Load on the shaft of the water pump during water injection and changes in dynamic moments

The rated load force that the pump can generate must meet the optimal flow rate required for water lifting.

Useful power of the electric motor (kW), required for pump operation:

$$P_{\text{HOM}} = \frac{\rho Q H \cdot 10^3}{86400 \cdot 102 \cdot \eta} \quad (4)$$

where Q is the water flow (m<sup>3</sup> / sec), H is the required height; η is the electric pump of the KPD, according to the working description

$$P_{\text{HOM}} = P_{\text{HOT}} + \frac{\Delta P_{\text{K}} \cdot L}{100}, \text{кВт} \quad (5)$$

where ΔP<sub>{K}</sub> is the loss power along the length, L is the provide length to the electric motor.

The basis for choosing a cable: between the substation and the engine (6...12 M) to select a cable by load, a thin technical cable is selected one size larger.

Power loss along the cut and length of the cable, including and KPD devices.

$$\Delta P_{\text{K}} = 3I^2 R \cdot 10^{-3} \cdot L, \text{кВт} \quad (6)$$

where I is the working flow, R is the resistance of 100 m of the provod.

$$R = \frac{\rho \cdot 100}{q}, \text{ОМ/М} \quad (7)$$

where ρ is the permeable resistance of the conductor at temperature TC; q is the shank size of the cable.

Cable temperature resistance:

$$\rho_t = \rho_l [1 + \alpha(t_k - t_{20})] \quad (8)$$

where ρ = 0.0175 Ohms \* mm<sup>2</sup>/M is the resistance of the cable at a temperature of 20 °C; α = 0.004 is the temperature coefficient.

Table 1. Calculated results

Setting	Value	Measurement
Well flow rate (Q)	250	m <sup>3</sup> /day
Napor (H)	50	m
Pump efficiency ( $\eta$ )	0.85	—
Useful power (R <sub>pide</sub> )	14.71	kW
Cable length (L)	100	m
Cable cross section (q)	16	mm <sup>2</sup>
Cable resistivity ( $\rho_t$ )	0.0203	Ohms·mm <sup>2</sup> /m
Cable resistance (R)	0.1125	Ohms
Working Current (I)	35	A
Power loss ( $\Delta P_k$ )	0.138	kW

To install the pump, an electric motor with a useful power of  $r_{pid} \geq 14.71$  kW is required, which corresponds to the nominal power of  $R_{nom}=15$  kW. A cable with a length of 100m, a section of 16 mm<sup>2</sup>, taking into account power losses, is considered acceptable.

Initially, the phase control used three relays, this method is too simplified for modern needs, since it does not show an even distribution of the load over the phases necessary for the correct operation of the motor. Modern phase control devices are usually based on microprocessors, but they can be expensive and complex for rural budgets. To provide an economical and reliable solution, a proprietary design using an experimental handmade measuring transformer has been developed. The signals from these transformers are processed by ultra-low power CMOS integrated circuits, supplying only milliwatts of power to the secondary winding, thus allowing any suitable black-closed material to be used as a magnetic core.

This innovative approach not only fulfills functional requirements, but also meets the budget constraints inherent in rural water supply systems. The control and control schemes presented here are shown in the following diagrams and operational graphs included in the Annexes of this study. These images demonstrate the practical application and effectiveness of the developed control strategies in ensuring the smooth and reliable operation of rural water supply systems.

### Results and Analysis

Our study showed that an important issue in water supply systems in rural areas is the remote control of pumps due to limited physical access. The proposed solution includes remote control of pumps for both wired networks and radio communications. While wired controls may seem easy to use, this poses significant challenges, especially in situations where lines can be buried under snow, making it difficult to detect and repair interruptions. Therefore, radio control appears as a more comprehensive and forward-looking method. It solves reliability issues related to wired controls and provides flexibility when working remotely.

A reliable method has been introduced to reduce the risk of atmospheric and technological interference, which can lead to misunderstanding of control signals. The transmitted signal includes a check combination to check the integrity of the connection. This protocol increases the reliability of telemetry and tele ision signals, ensures the accuracy of commands received and executed by pump control systems.

The remote control scheme for controlling the power of the well is shown in the schematic diagrams. When the radio signal is received, it is converted to a high-level pulse (5V) type Command. In order to avoid continuous signal switching, a differentiation circuit is used before the signal is inserted into the RS flip-flop. The direct output of the flip-flop activates a

semiconductor optical switch with a zero-cross detector, controlling a power thyristor in the main circuit of the magnetic starter.

The diagram presents a sophisticated automated water pump system that is an integral part of our research to improve water supply management in rural areas. This sensor, located next to the flow meter, monitors the water pressure inside the system. Pressure management is very important to ensure the integrity of the pipeline and prevent defects that can be caused by pressure imbalances.

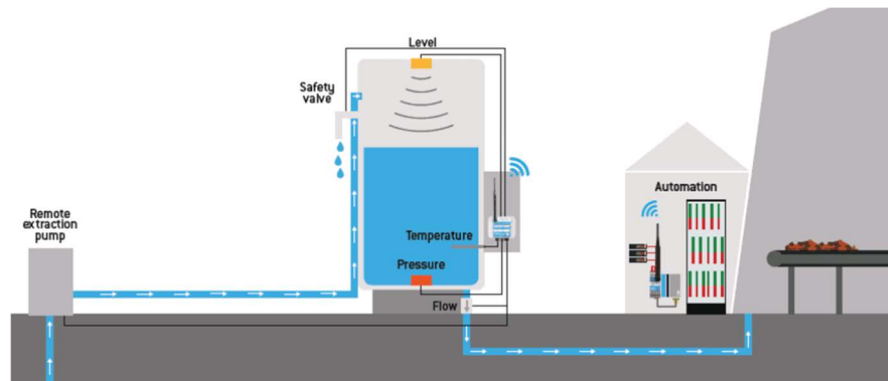


Figure 6. Diagram of an Automated Water Pump System

This diagram illustrates the architecture of an advanced, automated pump control system for efficient water management in agricultural or remote areas. The system integrates various hardware and software components to improve operational efficiency and accuracy. The main elements include:

1. SCADA system. A computer equipped with SCADA (tracking control and data collection) software controls all pump operation, allowing real-time monitoring and control of pump parameters. This installation allows you to make adjustments based on immediate data entry, increase response time and efficiency.

2. Wireless Adapter and communication links. These components facilitate remote communication between field devices and the Control Center. A wireless adapter, possibly using a cellular or satellite connection, ensures reliable data transmission even in remote or rural areas.

3. Remote electrical control panels and circuit protection. They ensure the safe operation of the pumps, protect against electrical problems and, if necessary, provide manual control.

4. Transfer of pump parameters to client mode. This part of the system transmits pump performance data to the central control system, which is very important to maintain optimal operation by adjusting the parameters as needed based on the data received.

5. Flow meters and valve control. These are directly related to the pump output, controlling the flow rate and the direction of the water to the different distribution points. The valves can be automatically adjusted according to the requirements of the system, which ensures the efficient use of water.

6. Processors and digital interfaces. These components process data from various sensors and execute control commands sent from the SCADA system. They represent the decision-making framework of the system, adjusting operations in real time in accordance with the established parameters.

The radio signal is converted into an activation command in the form of a pulse at the level of 5 V in the decoder (PC). In order to avoid fixing the switching signal, the R1-C1 differential circuit is used. The signal is then fed to the S input of the RS-trigger, for example, 561TM2. At its direct output, a high level is formed, which, through the coupling device (us), activates the simistor

optocouple MOS-3063 with a zero detector, which controls the powerful simistor VTA-41, in the circuit of which the main magnetic starter PM is located.

Since a current of 5 MA is required to control the optocouple led, any set of transistors or, more easily, inverters of the 561In2 microcircuit can be used as a coupling device, the load capacity of which is more than 10 MA.

Power off can be done via a radio channel, i.e. when a high level is applied to the R input of the trigger or from the emergency signal sensors. Their fixation is carried out using the property of the thyristor to remain open when powered by a continuous voltage. There is a relay in the thyristor circuit that, when triggered, transmits a stripping signal to the trigger input R. Its other contacts can be used for local signaling.

The data visualized in the graphs provide valuable insight into the behavior of the system in various situations, reflecting both the reliability and adaptability of the installation. The graph "comparison of pressure values" shows a cyclic pattern of pressure changes within the system. These fluctuations can be explained by the pump's response to different water demands throughout the day. For example, peaks are usually common at times associated with high usage (such as morning or evening), and lows may correspond to off-peak hours. This cyclic behavior demonstrates system efficiency in responding to real-time demand fluctuations without manual intervention, emphasizing the benefits of automation in resource allocation.

Iron closed shapes are used as magnetic conductors, for example, washer bags with a hole diameter of 12 to 24 mm, which correspond to different currents and wires. These washers are used depending on the power of the engine, they can range from several hundred watts to 100 kW or more. The primary winding consists of a regular power supply wire of the electric motor, which passes through the washers three to ten times. The secondary winding has about ten times as many turns, which allows a voltage of about 100 MV.

Secondary signals are fed to the input of the comparator, where they are compared with the reference voltage. If the measured signal exceeds the reference voltage, high-level pulses will appear at the comparator output, indicating that the current exceeds the set limit. The circuit allows you to effectively control the presence of all phases in the system.

### Discussion

This integrated system shows how modern technologies can be used to manage water resources more efficiently, while meeting the needs of Agriculture and ensuring sustainability. It demonstrates the potential for significant improvement of resource management through automation, demonstrates its relevance and necessity in modern agricultural practices.

Automated pumping stations represent a complex hydroelectric technical system in which electrical energy is converted into mechanical energy to facilitate the supply of water. The liquid enters through the inlet manifold and accumulates in the tank, where water is pumped into the outlet manifold, and then distributed to consumers through the main pipeline.

Uninterrupted water supply to rural settlements is of great importance as the Prevention of various types of epidemiological diseases. Providing rural areas with the necessary amount of water will improve their living conditions. The uninterrupted supply of clean water facilitates the labor of farmers, which makes it possible to directly provide water to livestock stables and meet the technological needs necessary for the development of Agriculture. With the help of an automated water supply system, it becomes possible to implement various systems with strict requirements for various agricultural machinery. This requires certain modes of water supply, climatic and hydrological conditions and other energy-related conditions.

Water supply in rural areas provides:

- 1) water supply to villages for private and agricultural activities;
- 2) support the construction of new farms and already existing ones;

- 3) water supply of pastures;
- 4) watering plants.

The introduction of an automated water supply system guarantees the provision of clean water to every citizen of the Russian Federation in the required amount at affordable prices. This program is the main direction of the social policy of the Russian state, since it significantly determines the well-being of the rural population. In addition, this system allows you to monitor the use of water for various purposes in the future. Such regulation of Water Resources will be an effective economic tool for the rational use of Natural Resources.

1. Calculation of electrical loads for power supply systems of pumping equipment allows you to optimize the selection of cables, protective devices and power parameters, which reduces energy consumption and increases the reliability of pumping stations.

2. Introduction of automated water supply control systems based on telemetry and radio channel data transmission provides operational monitoring of the state of the network and equipment, prevents accidents, including dryness, and allows you to remotely control the operation of pumps.

3. Use of automated pumping stations contributes to the rational use of water resources, reduces operating costs, increases the quality and stability of water supply in rural areas.

4. water supply automation creates the prerequisites for the development of rural areas, improving living conditions and increasing the efficiency of agricultural production through more accurate and reliable water supply management.

### Conclusion

This study is aimed at improving the quality of water supply, one of the most pressing problems facing modern rural areas. By analyzing the existing water supply systems, it was concluded that a radical modernization is needed on the basis of an automated pumping station, supplemented by a sensor system. In the course of the study, various sources of water and methods of raising water to the surface, as well as options for managing well equipment and water towers, were studied. It was found that electrical equipment in wells operating in conditions of high humidity often fails. To increase reliability, it is recommended to replace electromagnetic switching devices with electronic ones based on thyristors and triacs.

An important point identified by the above systems is the management of wells in the autumn and winter periods when snow and mud interfere with them. A solution was proposed in the form of a remote control over a radio channel using error-resistant signal encoding. The novelty of this work lies in the use of electronic switching devices instead of electromechanical ones, in the developed algorithm for the operation of the entire water supply system and in a reliable method of transmitting information via a radio channel

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## Literature

# NİTQ MƏDƏNİYYƏTİNİN NORMALARI

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### GİRİŞ

**Açar sözlər:** dil sistemi, dialekt, nitq mədəniyyəti, fonetik

**Key words:** language system, dialect, speech culture, phonetics

Dil bütövlükdə informasiya verən və informasiya qəbul edən mexanizm çərçivəsində özünün fəaliyyətini həyata keçirir. Norma olmayanda bu funksiyanın yerinə yetirilməsi mümkün deyil. Dilin informasiya mexanizmi nitqlə tənzim olunur. Ona görə də dildəki bütün normalaşma prosesi nitqin fəaliyyəti vasitəsilə həyata keçirilir. Nitq dil vasitəsi ilə ifadə edilən fikri tək-tək fərdlərə yox, həmçinin kollektivə çatdırılır. Ona görə də nitq ifadəsi kollektiv üzvlərinin hər biri üçün həll olan vasitələrlə çatdırılmalıdır. Əgər nitq ixtiyarı qurulsa, kollektiv üzvlərinin onu qəbul etmək imkanları mövcud deyilsə, o zaman nitqlə verilən informasiya nəticə etibarilə faydasız qalır. Ona görə də eyni bir dil hüduunda, nitq vasitələri bu dilin daxili elementlərinin müvafiq strukturuna uyğun şəkildə qurulmalıdır. Belə bir halda nitq dinləyici tərəfindən başa düşülür və informasiya funksiyası yerinə yetirilir. Nitq prosesində ixtiyari elementlərdən sərbəst, istənilən kimi istifadə edildikdə nitq rəbəsi pozulur. Norma dil sistemində baş verən daimi bir prosesdir. Norma hər bir dilin daxili və ən zəruri atributlarından sayılır. Normanın zəruriliyi onda özünü göstərir ki, dil normasız informasiya mənbəyinə çevrilə bilməz.

Nəzərə almaq lazımdır ki, nitq təkcə bir an üçün deyil, bir gün üçün deyil və heç bir müəyyən vaxt, zaman kəsiyi ilə məhdudlaşmır. Nitq insan cəmiyyəti üçündür. İnsan cəmiyyəti isə daimidir. İnsan cəmiyyəti mövcud olduqca cəmiyyətin inkişaf proseslərinə müvafiq olaraq dildə də zənginləşmə, dəyişmə prosesləri baş verir. Ona görə də normanın vacibliyi informasiyaların ötürülməsi prosesləri ilə bilavasitə əlaqəlidir. İnformasiyaların bilavasitə və birbaşa ötürülməsi sinxron prosesdir, hazırkı zamanda baş verir və şifahi nitqlə həyata keçirilir. İnformasiyaların zamandan-zamana, nəsillərdən-nəsillərə ötürülməsi prosesində isə nitq prosesinin bilavasitə iştirakı mümkün deyildir. Belə informasiyalar ancaq yazı və ya digər texniki vasitələrlə yerinə yetirilə bilər. İnformasiyalar hazırkı zamanda bilavasitə nitqlə yerinə yetirildiyi üçün belə bir prosesdə norma sabitliyi daha çox saxlanılır. Ona görə də belə informasiya zamanı mənimsəmə, emosionallıq, ifadəlilik, ahəng ton və s. təsiredici vasitələr nitq prosesində birbaşa iştirak edir. Yazı və ya texniki vasitələrlə zamandan və məsafədən ötürülən informasiyalarda isə sinxroniya vəziyyəti qeyri-mümkün olduğundan norma sabitliyi pozula bilər, təsiredici vasitələrin isə effektivliyi azalır. Dil üçün vacib olan normalarda müəyyən dəyişikliyin baş verməsi isə informasiya verilməsi şəraitini zəiflədir, bir sıra çətinliklər yaranmasına səbəb olur. Çünki insan cəmiyyətinin özünün mövcudluğu prosesində bir çox tarixi hadisələr və dəyişikliklər baş verir ki, bu da dildə özünün bu və ya digər təsirini açıq-aydın göstərir. Məsələn, Azərbaycan dilinin quruluşunu təhlil edərkən belə nəticəyə gəlmək olur ki, aqlütinativ quruluşlu bu dil öz inkişafı tarixində zəngin bir mərhələ keçmişdir. Dilin daşıyıcısı olan xalq tarixən nüfuzlu olmasa idi, sərbəst, müstəqil inkişaf imkanlarına malik olmasa idi, ictimai həyatda fəal mövqe qazanmasa idi onun dilində intensiv şəkilçi ardıcılığı formalaşma bilməzdi. Ən qədim nümunələrimizdə ilkin sintetik mexanizmin mövcudluğu bu dildə həmin quruluşun yaranmasının bir neçə min illər boyu baş verən təkmilləşmə prosesinin mövcudluğu barədə fikir söyləmək imkanı yaradır. Eramızdan sonrakı I və II minilliklər ərzində isə Azərbaycan

cəmiyyəti bir çox təsir və təzyiqlərə məruz qalmışdır. I minillik ərzində Azərbaycan cəmiyyətində yazılı ənənələr süquta uğradı.

## NİTQ MƏDƏNİYYƏTİNİN NORMALARI

M.Ş.Şirəliyev ayrı-ayrı dil arealları kimi mövcud olan dialekt və şivələrin özünəməxsus normalılığını səciyyələndirən fonetik, leksik, morfoloji, sintaktik əlamətləri ümumiləşdirir.

Məsələn, Şərq qrupu dialekt və şivələri üçün fonetik cəhətdən ədəbi dil üçün norma olan *a* səsinin *e*-yə çevrilməsinin, (qayçı-qeyçi, qaymaq-qeymaq), *a* səsinin *o*-yə çevrilməsinin (baba-boba, barmaq-bormaq), *o* səsinin *u*-yə çevrilməsinin (odun-udun, dodaq-dudaq), *ə* səsinin *ə* səsinin *e*-yə çevrilməsinin (səməd-səmed, çörək-çörək) və s. səciyyəvi olduğunu göstərir. [13, 7]

Morfoloji cəhətdən Şərq qrupu dialekt və şivələri üçün indiki zamanda *-adu*, (*-ədü*) (yazadu, gedədü), birinci şəxsin inkarında *-man*, *-mən* (almanam, bilmənəm), ikinci şəxsin inkarında *-mar*, *-mər* (gəlmərsən, almarsan) kimi şəkilçilərin işlədilməsi səciyyəvidir.

Şərq qrupu dialekt və şivələri üçün aşağıdakı kimi leksik vahidlər səciyyəvi hesab olunur: *tuğ* (bayraq), *xır* (bostan), *becid* (tez), *qənbər* (çaydaşı), *əbə* (körpə uşaq), *mətəl* (yun corab), *göyçi* (xəsis), *işıqlıq* (pəncərə) və s.

Qərb qrupu dialekt və şivələrinin normasındakı aşağıdakı kimi əlamətlər səciyyəvidir:

Fonetik normalılıq üçün *ə* səsinin *a* ilə əvəzlənməsi (zəif-zayıf, idarə-idara, xəbər-xavar), *i* əvəzinə *ı* işlədilməsi (ışıq-ışq, ılıq-ıllıq, ılxı-ılxı), söz tərkibində velyar *η* (*n*) işlədilməsi, *b* səsi əvəzinə *v* işlədilməsi (çoban-çovan, baba-bava, qabaq-qavax), *c* əvəzinə *j* işlədilməsi (bacı-bacı, qoca-qoja), *v* əvəzinə *y* işlədilməsi (yovşan-yoyşan, dovşan-doyşan) xarakterikdir.

Qərb qrupu dialekt və şivələrinin morfoloji normasında *-nı* (təsirlik hal şəkilçisi) əvəzinə *-yı* işlədilməsi quzunu-quzu, körpünü-körpüyü *-ır* (indiki zaman şəkilçisi əvəzinə *-or*, *-er*, *-ör* şəkilçilərinin işlədilməsi *olur-olar*, *ötür-öter*, *gedir-geder*) işlədilməsi səciyyəvidir.

Nəqli keçmiş III şəxsin təkində *-ıtdı*, *-itdi* şəkilçisi işlədilir: *albı(dir)-alıtdı*, *gəzib (dir) - gəzitdi* və s. İndiki zamanın analitik forması işlədilir: *gələ durur* (gəlir), *baxa durur* (baxır). Nə inkar ədati əvəzinə ya işlədilir: *ya yazır-ya oxuyur* (nə yazır, nə oxuyur).

Şimal qrupu dialekt və şivələrində aşağıdakı kimi leksik vahidlər işlədilir: *tabun* (ailə), *quştuqur* (pəhləvan), *xıdl* (həvə), *yüyürmək* (hürmək), *ataqar* (meşə), *bəbərcin* (qaranquş) və s.

Cənub qrupu dialekt və şivələri üçün aşağıdakı kimi əlamətlər səciyyəvidir. Sözün fonetik tərkibində *e* səsi *ə* kimi işlədilir: *əv* (ev), *həyə* (elə), *a* səsi *ə* ilə əvəzlənir: *qəyiş* (qayış), *qəmçi* (qamçı), *qəyqənax* (qayqanax), *o* əvəzinə *a* işlədilir: *av* (ov), *davşan* (dovşan), *qavırma* (qovurma), *alov* (alov), *təvlə* (tövlə), *kösəv* (kösov) və s. İndiki zamanda *ır* əvəzinə *-iy*, *-io*, *-iri* şəkilçiləri işlədilir: *gəlir*, *gedio*, *seviri* və s. İndiki zaman şəkilçisi bəzi hallarda ixtisar edilərək *r* elementi kimi ifadə olunur: *tanıyır-tanır*, *oxuyur-oxur*.

Gələcək zamanda *-as*, *-əs* forması işlədilir: *alassan*, *gələssən*.

Lüğət tərkibində aşağıdakı sözlərin işlədilməsinə rast gəlmək olur: *ayama* (ləqəb), *yey* (yaxşı), *qatıx* (qovurma), *mavrı* (pişik balası), *mayıf* (şikəst), *xapan* qalmaq (ümitsiz və kimsəsiz qalmaq), *xım* (özül), *yaxınkeş* (dərindən qab) və s. [13, 20-21].

A.Axundov, XVIII əsrdə Azərbaycan ədəbi dilinin inkişafında Vəqif və Vidadinin böyük rol oynadığını göstərərək həmin dövr ədəbi dilinin formalaşmasında Qarabağ dialektinin dayandığını qeyd edir.

Milli ədəbi dilin formalaşdığı sonuncu mərhələdə isə ədəbi dilin formalaşmasında Bakı şəhərinə istinad edildiyini göstərir.

**Ədəbiyyat Siyahısı:**

- Azərbaycan dilində prefikslərlə sözyaratma prinsipi, s.4-19.
- Azərbaycan dilinin söztörəmə prosesində başlanğıc samitlərin prefiksal mövqeyi, s. 19-34.
- Dildə derivativ sistemin təkamül prosesləri, s. 34-51.
- Azərbaycan dilində sözdəyişdirici şəkilçilərin sözdüzəldiciliyə keçid prosesi haqqında, s. 51-68.
- Göytürk abidələrində analitik-flektiv dillərlə müştərək olan kök sözlər, s. 68-91.
- Azərbaycan dilində qoşatərkibli sözlər, s.91-107.
- Nitq mədəniyyətinin prinsipləri, üslubları və linqvistik normaları, s. 107-127.
- Bir neçə yer adının etimologiyası haqqında, s. 127-144.
- Göyçəməzdə qalan izlər, s. 144-160.
- Kişi sözünün etnomədəni mənşəyi haqqında, s. 160-174.

## Architecture

# HISTORICAL FEATURES OF THE USE OF ARCHITECTURE IN THE NOMADIC WAY OF LIFE IN THE DEVELOPMENT OF ARID REGIONS OF KAZAKHSTAN

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### ABSTRACT

This report briefly describes the main ideas and provisions for the restoration of nomadic architecture and urban planning in the arid regions of Kazakhstan, Central Asia, and similar territories and countries. This school of thought offers an alternative solution to environmental problems related to desertification, drought, and dehydration of the steppe and semi-desert regions of Eurasia.

The proposed solution is based on the nomadic civilization that has existed in these areas for thousands of years, with its significant differences: mobile pasture farming, mobile housing, developed transport, etc. With the use of modern technologies in construction, materials, efficient engineering systems, alternative energy sources, communications, information and knowledge exchange, this approach would allow the nomadic economy to reach a new technological level.

The report provides a brief overview of the historical architectural and engineering infrastructure of the nomadic society and its way of life, methods of using nomadic animal husbandry to regenerate soil and natural water resources and produce oxygen, as well as proposals for the introduction of nomadic culture and economy in modern Kazakhstan and similar countries around the world.

### Features of nomadic architecture of Kazakhstan and the region

The peculiarities of Kazakhstan's nomadic architecture have probably influenced mobile architecture in the modern world. The frame yurt and wagons on wheels may have served as

prototypes for the creation of modern wheeled vehicles and automobiles, further transforming it into minivans and minibuses.

Due to the permanent economic crisis, the inability of many to afford the purchase of permanent housing, some citizens of different countries are now forming communities that are trying to solve and solve the issues of survival. One of these solutions is small-sized housing, mobile homes, eco-settlements using permaculture principles, etc.

The creators of eco-settlements face many difficulties in providing housing and work in places remote from civilization, where the necessary infrastructure is often lacking. One of the main problems is finding housing or the possibility of subletting, as well as a job that would allow you to start a family in the same place. Many cannot withstand these conditions, as taxes, rents and the difficulties of finding employment in the city deprive many of the opportunities to create an eco-settlement.

Some choose mobile, prefabricated or collapsible domed houses. All of the above types are suitable for a climate with sufficient summer precipitation, with reservoirs, mountains and pastures, as well as with an abundance of high-quality grass on the ground. In arid and hyper-arid climates, animal husbandry is practiced using camels, cattle, horses, goats, and sheep.

This was once the case in the nomadic steppe civilization of Kazakhstan. Moving in the meridional and horizontal directions across the territory of Kazakhstan and neighboring countries, the nomads grazed cattle throughout the steppes, semi-deserts and deserts. In these harsh conditions, they had to travel long distances to provide the cattle with food and water and protect them from predators and other dangers. The nomads had their own portable and permanent dwellings and settlements. Table 1 below shows the types of nomad dwellings in Kazakhstan. They are divided into portable, stationary and settlement dwellings.

**Table 1**

<b>NOMADIC DWELLINGS OF KAZAKHSTAN:</b> (Portable, stationary, settled, etc.)
<p><b>Nomad dwellings</b> – portable, stationary, settled, etc.</p> <p><b>Nomadic migration distances</b> – meridional, vertical, latitudinal, etc.</p> <p>The composition of domestic animals – sheep, goats, horses, camels, cattle - cows.</p> <p>Economic occupations – the majority are nomadic, semi-nomadic</p> <p><b>Type 1</b> – the arid zone is arid deserts, semi-desert regions without natural reservoirs, with artificial water sources, the organization of production had its own characteristics.</p> <p>There were minimal stationary parking lots in material production, agriculture and fishing were absent.</p> <p>Water was extracted from underground soils using captation (bringing groundwater to the surface).</p> <p><b>Type 2</b> – nomads occupied mountainous and foothill areas, forests, steppe zones with developed, natural surface reservoirs and summer precipitation, and did not build wells. The principle of the right of first capture of reservoirs was in effect.</p> <p>In winter, they wintered and farmed permanently for 3-6 months, and immovable dwellings prevailed – stone, wooden, turf, and raw. Household items and utensils were made from materials unsuitable for transportation (ceramics, clay, stones). They were engaged in agriculture and fishing.</p> <p>The 2nd type of nomads with natural water use, the practice of non-livestock farms, high labor and material costs, stationary dwellings prevail, they live sedentary in winter.</p>

**Nomadic architecture in winter:** special fences made of wood, stone, reeds, brushwood, turf, and tents were built next to the wintering grounds, which were stretched vertically on poles, and yurts were erected. Immature cattle and young animals were housed in wagons with people.

**Movement in spring:** As soon as the youngsters got back on their feet after a couple of days, it was necessary to walk 110-210 km in a short time, the routes of movement were common and the spring pastures were quickly depleted by domestic animals. During the transition, nomads unite into 2-4 villages, 16-32 km per day, short stops for 2-3 days, through 3-4 nomads.

**Stops on the way:** Short stops - yurts were set up for 2-3 days, for short-term ones they put tents out of a yurt, they cover them with a nightmare, they make a number of houses covered with felt out of a yurt, they spend the night there, they did not put up a yurt, because it took a lot of time and was troublesome. If it was hot during the day, then we moved at night (Kuftin, 1926).

**References:** (I. P. Shangin) In summer in the Nura area, 1,000 yurts were gathered at Jailau (summer pastures). Other researchers have found 30 villages, more than 400 villages near Burul-Tokhoy in Jailau, and there were extensive villages of 500-1000 yurts where khans and sultans roamed.

In the summer, they roamed 13-16 km a day, stayed only for the night, did not put up a yurt, they put up "scythes" from the uyks

Winter - Nomads wintering in the sands, snowless places, had to wander from well to well, around the main source. When the kystau (winter camps) were located further into the sands, their wintering tactics consisted of moving deeper into the sands at the beginning until the middle of winter, and back towards the end of the kystau, after the snow cover had disappeared. Parking lots were changed every 15-25 days. For example, the Adai people roamed 3-4 times a month during Kystau

**I - PORTABLE DWELLINGS.** The main type of dwelling of the nomads of Kazakhstan in antiquity and the Middle Ages were portable structures that were mobile and easily assembled/disassembled. this provided the nomads with freedom to move from pasture to pasture.

<p><b>The Yurt</b>  <b>Types of yurts:</b>  <b>Kiiz uy, kigez uy, kiez oi, terme uy, termya uy - different names of the yurt.</b>  <b>YURT is a Russian word, from the Turkic "jurt/yurt".</b></p>	<p><b>A yurt</b> is a traditional portable dwelling of nomads, which is a symbol of the steppe world. It is a circular structure with a frame made of wooden elements and a felt coating. The frame consisted of vertical wall sections and a domed roof. The yurt was comfortable for living and protected from the cold and heat. It was easy to disassemble and assemble, which allowed the nomads to move from place to place.</p> <ul style="list-style-type: none"> <li>- <b>The frame</b> of the yurt consists of wooden lattices, which were installed in a circle. Dome poles and a dome ring were installed on them.</li> <li>- <b>Felt cover</b> protected from rain, wind and cold. The felt was made from sheep's wool, which provided good thermal insulation.</li> <li>- <b>The size and structure</b> of the yurt varied depending on the social status of its owner. For poor nomads, yurts could be small, while the rich and noble had spacious and multi-room yurts.</li> </ul> <p><b>Yurts</b>, due to their mobility and protection from harsh weather conditions, were used not only by the nomads of Kazakhstan, but also by other peoples, for example, the Mongols. An example of the use of yurts is historical evidence, such as descriptions of nomadic tribes that encountered European travelers and conquerors.</p> <p><b>Kiiz uy</b> is a type of yurt that was made of felt and also had a light frame, but</p>
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	had a simpler design and was less convenient for long—term living.
<b>Qos</b>	In summer, they roamed 13-16 km a day. If they stayed only overnight, they did not put up a yurt, but instead used "qos" (incomplete yurt assembly) raised from the uyks.
<b>Temporary field residential structures</b>	Smaller and simpler dwellings were used in the case of short crossings. These could be light tent structures covered with felt, and their variants of These dwellings were most often used in the field.
<b>II – STATIONARY DWELLINGS.</b> In addition to portable dwellings, there were also more stable stationary dwellings, especially in cases where nomads settled in a certain area for pasture recreation, or if there were sufficiently stable resources in the region. They were built especially in places where they stayed for a long time or when natural resources were used (for example, rivers or oases).	
<b>Brick or stone houses.</b>	<b>Brick or stone houses</b> were common in some settled areas of Kazakhstan. With the development of agriculture and settlement, the nomads began to build more durable, nature-resistant dwellings. These houses were more stable and provided better protection from extreme weather conditions.
<b>Aksaray (summer dwelling)</b>	<b>Aksaray</b> is a relatively stationary structure used in the warmer months. Such dwellings were often set up near water or on fertile pastures. These are large semicircular or rectangular structures made of stone, wood or brick and used to house a large family and livestock. Such dwellings were used both in summer and in winter, if the nomads were tied to a certain area.
<b>Urban buildings</b>	In the medieval period, with the development of trade and cities, for example, in such ancient cities as Taraz or Sygnak, nomads began to build more settled dwellings that no longer required constant movement. Materials such as stone, brick, and wood were used here. In such cities, it was possible to find houses with several rooms, courtyards, and specialized rooms for storing goods.
<b>III - SETTLED DWELLINGS.</b> In a later period, when some of the nomadic tribes of Kazakhstan settled in one place, more settled forms of dwellings appeared. With the development of agriculture, economics, trade, and permanent settlements, nomadic peoples began to build settled dwellings, cities and fortresses began to emerge, and some nomadic peoples began to move to a more sedentary lifestyle. During this period, the dwellings became more and more stationary. <b>Features of construction and materials for buildings:</b> Wood was used for the frames of yurts and later houses. Leather, felt, and fabric covered the yurts, creating thermal insulation. Stone and clay were used for the construction of stationary houses. Construction technology: The lightness of the structure, as well as the ability to protect from cold, wind and rain, were the most important principles of construction.	
<b>Timurid houses</b>	<b>Timurid houses</b> are settled houses that were built in later periods of history. They featured improved construction and architectural details, and often included elements of Islamic architecture such as domes, mosaics, and arches.
<b>Small settled houses</b>	<b>Small sedentary houses</b> are typical for many Kazakh settlements of villages, where small houses were built of wood or brick, with elements of national design and a way of life corresponding to the traditions of the Kazakh people.



<b>Stone and brick houses.</b>	<p><b>Semi-settled nomads</b>, for example, in cities or on trade routes, built houses from more durable materials such as stone or brick. For example, in medieval cities in Kazakhstan, such as Taraz, Otrar and Sygnak, where stone buildings with stone roofs and a complex heating system were discovered, which allowed them to survive in cold winters. These buildings had courtyards, food storage facilities, and craft workshops.</p> <p>An example of settled dwellings in Taraz. — one of the largest trade and cultural centers of the Middle Ages, where there were not only houses of artisans, but also palaces of rulers. In the archaeological excavations of the city, residential complexes were found, which included several rooms and courtyards, as well as water supply and sewerage systems, which is evidence of a sedentary lifestyle.</p>
<b>Urban dwellings in the Middle Ages</b>	<p>With the development of trade and the increasing number of cities (for example, in the era of the Karakhanids or during the Great Horde), multi-level houses with courtyards and a complex heating system appeared. In nomad cities, dwellings usually consisted of separate buildings with stone or brick walls covered with tiles.</p>

The dwellings of the nomads of Kazakhstan were functional and comfortable solutions that corresponded to the lifestyle associated with constant movement. The development of settlement and agriculture has led to the construction of more permanent homes. However, mobile traditions such as yurts continued to be preserved in the culture and are still a symbol of Kazakh nomadic culture.

Portable yurts, stationary aksarays and sedentary stone houses reflect not only everyday life, but also the social, economic and climatic features of the era. Each dwelling was associated with the lifestyle of its owners and the nature of their interaction with nature. Studying these dwellings helps to better understand the culture and philosophy of the nomads, as well as the role they played in the history of Central Asia.

### The influence of nature and lifestyle on dwellings

The climate of Kazakhstan in the area of the whole of Eurasia was formed in the Postglacial epoch of the Holocene\* (from about 10,000 years ago), changing significantly over the past millennia. This led to the stabilization of vegetation and soil cover and its composition, as well as the location of water networks, its watercourses, rivers, reservoirs, etc., the duration of 4 seasons, and the formation of horizontal and vertical zonation (Shnitnikov, 1957; Climate of Kazakhstan, 1959; Chupakhin, 1968).

The design and shape of the nomads' dwellings were closely related to the natural conditions of Kazakhstan. The nature of the steppe, harsh winters and hot summer days dictated the need to create dwellings capable of providing comfort and protection in various climatic conditions. The mobility of dwellings remained one of the key factors of nomadic movement, which in turn determined the ease of construction of dwellings and their practicality.

Using the historical aspects of the nomadic economy as a model, their way of life, and lifestyle, it is possible to prepare the future generation for the inevitable future climate changes. The climate will become increasingly arid, and water scarcity will dictate the adoption of new solutions in the field of architectural and engineering innovations, finding alternative sources of energy, heat and water.

At the beginning of 2024, the author of this article conducted a survey of residents of Kazakhstan - 79 participants were interviewed on the topic "are they ready to live in eco-settlements and eco-

villages". Most of the responses were positive - the respondents expressed a desire to move to the countryside, but the final solution was to ensure the infrastructure of these eco-settlements and eco-villages. In general, most people were not against it, but they pointed out the need for access to roads, medicine, schools, kindergartens, and workplaces.

The ideas of eco-farming and living outside the city exist in the form of vague ideas that lack a systematic understanding of the possibilities and prospects of this lifestyle. At the same time, modern Kazakhstani urban planners are faced with the task of relieving overloaded megalopolises from overpopulation and giving them a different direction of development. This can be achieved by applying the achievements of modern mobile and traditional architecture, engineering technologies, plus the historical aspect of nomadic civilization, that is, in fact, to revive nomadic cattle breeding at a new technological and scientific level.

The regeneration of the soil through nomadic farming will make it possible to restore the pasture lands of Kazakhstan from almost 100 years of agricultural experiments, which led to the depletion and disappearance of the green cover, the loss of various grasses. This, in turn, led to the desertification of vast territories and negative environmental changes. For example, Uzbekistan's use of the water resources of the Aral Sea for cotton cultivation has led to the fact that this ancient reservoir has been almost completely lost.

The solution proposed by some domestic and foreign scientists, such as Masanov N. E., A. Savori, M. Akysh, M. Tuayakbayev, is that soil regeneration in arid regions of the planet on a large scale can be carried out through large-scale nomadic farming. The use of this ancient "know-how" leads to the fact that the climate is changing, soils, grasslands and even natural water resources are being restored, and the atmosphere is provided with an additional injection of oxygen purified by pastures.

What should be the strategy of researchers, scientists, practitioners, organizations, movements, communities, and even entire states in order to ensure this process of transition to the nomadic economy of the future in a planned and constructive manner?

To begin with, ensure that targeted information work is carried out by enthusiasts and the state in order to create a positive image of eco-settlements and eco-villages, and their positive impact on the ecology and economy of territories and countries that are located in arid and arid zones. To develop and build the necessary infrastructure, to create conditions for the successful and comfortable functioning of the eco-farm. The analysis of practical world experience, literary sources, and opinion polls will help the process of growing interest of the general population in the prospects of living in rural areas (for example, Kazakhstan).

Further,

Conducting methodical mass campaigns to inform the population about the advantages and prospects of eco - settlements and eco - nomadic animal husbandry;

Purposeful and focused creation of comfortable conditions, construction of infrastructure for living outside the city;

Broadband Internet access, effective distance education, mobile medicine, cheap and eco-friendly vehicles, repair minivans (mobile workshops on wheels),

Conducting a nomadic form of farming, processing, sorting and disposal of waste, development and implementation of affordable technologies for generating and saving electricity, heating, and water extraction, in accordance with the natural and landscape conditions of arid regions of various countries.

Development and creation of conditions for the development of small and medium-sized businesses in the agricultural sector and animal husbandry.

Infrastructure for internal and external ecotourism in eco-settlements and eco-villages.

Creation of educational institutions for children and adults specializing in scientific and technical development of eco-settlements and eco-villages.

Research centers, landfills, laboratories, sites for research and knowledge exchange.

Current positive trends can be significantly enhanced by a regular information campaign, when the appropriate infrastructure is created, as well as necessary reforms in the fields of education, healthcare, economics, transport system, science, etc. are carried out.

Then public institutions will be able to gradually transform society and its attitude to the environment as a whole, practically creating a new kind of "eco-people" who can coexist and thrive in harmony with the environment. How the eco-friendly nomadic civilization of Kazakhstan once existed and flourished, which in fact was in a real symbiosis with the animal and plant world, and formed a single organism with nature, helping it annually resume its processes in the biosphere, as well as creating its own socio-nomadic culture and way of life.

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## Historical Sciences

# Тарих сабағында «Қазақстан мен Түркия қарым-қатынасы» тақырыбында оқытудың инновациялық әдістерін қолдану

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### Аңдатпа

Қазақстан мен Түркия арасындағы қарым-қатынастар қазіргі әлемдік геосаясатта үлкен маңызға ие. Бұл мақалада Қазақстан мен Түркияның тарихи байланыстары мен қазіргі замандағы саяси және мәдени қатынастарын зерттеу мақсатында инновациялық оқыту әдістері қолданылды. Оқушылардың тарихи материалды терең меңгеруін қамтамасыз ету үшін ойын түрінде ұйымдастырылған сабақтар, топтық жұмыс, ақпараттық технологиялар мен интерактивті әдістер қолданылды. Мақалада осы әдістердің тиімділігі мен тәжірибелік нәтижелері қарастырылған.

Бұл мақалада Қазақстан мен Түркия арасындағы қарым-қатынасты оқытуда қолданылатын инновациялық әдістер қарастырылған. Қазіргі білім беру жүйесінде оқушылардың тарихи білімдерін тереңдету үшін дәстүрлі оқыту тәсілдерінен бөлек, жаңа технологиялар мен интерактивті әдістерді пайдалану маңызды. Қазақстан мен Түркияның тарихи байланыстарының терең маңызын ашу мақсатында сабақтарда мультимедиялық құралдар, рөлдік ойындар, топтық жобалар мен дебаттар секілді инновациялық әдістер қолданылды. Бұл әдістер оқушылардың сыни ойлау қабілеттерін дамытып, пәнге деген қызығушылығын арттырады. Мақалада осы әдістердің тиімділігі, олардың сабақ барысында қолданылуы және тарихи білімді меңгерудегі маңыздылығы талқыланады.

XVII XVIII ғғ соңы Осман империясы мұрағатының құжаттары негізінде ашылған қазақ-түрік қарым-қатынасына арналған баяндама. Автордың басты мақсаты Орталық Азиядағы халықаралық қатынастар тарихына жаңаша көзқарас тудырып және оларға сырттан идеологиялық ықпал етуге мүмкіндік беретін архив құжаттарына талдау жасауы. Түркия, Ресей, Қазақстан елдерінің мұрағат құжаттарындағы қазақ-түрік қарым-қатынасына арналған маңызды деректерге талдау жасалған.

**Кілт сөздер.** Тарих, педагогика, оқыту, инновациялық әдістер, саяси және мәдени қарым-қатынас, білім, геосаясат.

**Кіріспе.** Қазақстан мен Түркияның тарихи байланыстары ұзақ уақытқа созылып, екі елдің мәдениеті мен саясатына айтарлықтай ықпал етті. Түркияның Қазақстан тәуелсіздігін алғашқылардың бірі болып танығаны және екі ел арасындағы ынтымақтастықтың нығаюы бүгінгі күнде әртүрлі салаларда байқалады. Тарих сабағында осы қатынастарды оқыту

арқылы оқушылардың халықаралық қатынастарды, мәдениетті және саясатты түсіну қабілеттерін дамыту маңызды. Инновациялық оқыту әдістері – білім беру процесінің тиімділігін арттыру мақсатында жаңа технологиялар мен тәсілдерді қолдану болып табылады. Бұл мақалада Қазақстан мен Түркия арасындағы тарихи байланыстарды зерттеу барысында қолданылған инновациялық әдістерді қарастырамыз.

Қазіргі жаһандану кезеңінде, ұлт тарихының мәдениеті мен құндылықтарын білу, насихаттау әрі сақтау елді бекемдеудің тікелей кепілі. «Рухани жаңғыру» бағдарламасының жалғасы болатын Елбасының тарихи сананы жаңғыртуға бағытталған ұсыныстары мемлекетіміздің нығаюына септігін тигізетініне күмәнданбаймыз. Айтылып өткен мәдени құндылықтарымыздың қоғам санасының тарихи жаңаруы үшін Елбасымыз Н.Ә. Назарбаев ұсынып отырған жобалар өз орнын табуда. Оның ішінде, ежелгі дәуірден қазіргі заманға дейінгі кезеңді қамтитын барлық отандық және шетелдік мұрағаттар дүниесіне елеулі іргелі зерттеулер жүргізу үшін «Архив – 2025» жеті жылдық бағдарламасын іске асыру еліміздің төл тарихын зерделеуге мүмкіндік береді. Қазақстан мен Түркия арақатынасының маңыздылығын айқындай отыра, тең құқықтыққа, өзара түсіністік пен құрметке негізделген және олар өте қарқынды дамып келе жатқандығын атап өту керек. Түркі әлемі ежелден Қазақстанды – күллі түркі халықтарының қасиетті қарашаңырағы ретінде мойындайды. «Түркі өркениеті: түп-тамырынан қазіргі заманға дейін» атты жобаның аясында Түркістан қаласында, тарихи мұраларымыздың негізінде түркі әлемінің орталығын – музейін ашу, өткенмен қазіргі уақыттың тығыз байланысын көрсетумен қатар, келесі ұрпақ үшін де маңызы зор болар еді [1].

**Негізгі бөлім.** Түркия мен Қазақстан арасындағы ресми байланыс 1990 жылдың желтоқсанында орнатылды. Бұл ұзақ уақыт бойы үзіліп қалған мәдени байланысты қайта жандандырды десекте болады. Халықаралық қатынасты дамыту жолында Қазақстан Еуропа мемлекеттеріне қарағанда Азия мемлекеттеріне жақын болып келеді. Олардың ішінде ең маңызды болып этномәдениеттік және тарихи маңызы бар мемлекет – Түркия мемлекеті. Екі елдің тығыз қарым-қатынасы туралы елбасымыз Н. Назарбаев: Қазақстан мен Түркия арасында шектесу нүктелері аз емес: географиялық жағынан қос мемлекетте Еуропа мен Азияның тоғысқан жерінде, этнография жағынан түрік-қазақ халқының мәдениеті, салтдәстүрі, тілдерінің ортақ бір түбірі бар екенін атап өткен болатын. Екі түркі халықтары арасындағы тарихына жүгінсек, КСРО кезінде қос дербес елдің байланысы жүйелі тұрғыда болмады, тек бірен-саран ресми байланыстар ғана орнатылған еді. Бауырлас мемлекеттердің сонау ғасырдағы экономикалық, әлеуметтік-мәдени қарымқатынастарының ұзақ тарихына қарамастан, байланысқа тыйым салынды. Оның үстіне, кеңес басшылығы Қазақстандағы панисламистік көзқарастардың күшеюінен қауіптеніп және Түркиядағы қазақ диаспорасының едәуір көптігін ескере отырып, оларды бір-бірінен оқшаулауға, өзара қарым-қатынастарының табиғи-логикалық сабақтастығын барлық жолдармен тежеуге тырысты.

Қазақстан мен Түркияның тарихи байланыстарын зерттеу кезінде бірнеше кезеңді бөліп қарауға болады:

1. *Түрік империясының ықпалы:* Орта Азия мен Қазақстан жерлерінде Түрік қағанатының саяси және мәдени ықпалы.
2. *Тәуелсіздік алдындағы кезең:* Кеңес Одағының құрамындағы Қазақстан мен Түркияның байланыстары.
3. *Тәуелсіздік алғаннан кейінгі кезең:* Қазақстанның тәуелсіздігін алуымен Түркияның оған көрсеткен алғашқы қолдауы және экономикалық, саяси салалардағы ынтымақтастықтың артуы.

Екі ел арасындағы ынтымақтастықтың басым бағыты сауда-экономикалық қатынастар болып табылады. Бұл сала екіжақты ынтымақтастықтың жетекші бағыттарының бірі болып табылады. 2020 жылдың қорытындысы бойынша Қазақстан мен Түркия арасындағы

екіжақты тауар айналымының көлемі 8 млрд АҚШ долларын құрады. Қазіргі таңда Қазақстан мен Түркия тауар айналымын 10 миллиард долларға жеткізуді көздеп отыр. Қазақстан мен Түркия арасындағы екіжақты сауда-экономикалық қарым-қатынастарды кеңейтудің тиімді тетігі Экономикалық ынтымақтастық жөніндегі үкіметаралық комиссия (ҰАК) болып табылады. Қазақстан-түрік қарым-қатынастары стратегиялық және сенімді сипатқа ие және бұл біздің елдеріміздің кәсіпкерлеріне сенімнің ерекше нысанында экономикалық қарым-қатынастарды құруға мүмкіндік береді. Бүгінгі таңда Қазақстанда 1500-ге жуық түрік компаниясы, түрік капиталының қатысуымен кәсіпорындар, соның ішінде мұнай-газ секторы жұмыс істейді [2].

Түркияның Қазақстан тәуелсіздігін мойындаған алғашқы елдердің бірі болуы және екі ел арасындағы жоғары деңгейдегі байланыстар олардың арасындағы достық пен сенімділіктің айқын дәлелі болып табылады. Осы үш кезеңдік даму сызығы Қазақстан мен Түркия арасындағы ынтымақтастықтың қалай өзгеріп, нығайып келе жатқанын көрсетеді. Алғашқы жылдары негізделген дипломатиялық қатынастар стратегиялық әріптестікті орнатуға, кейіннен институционализациялауға және жүйелендіруге бағытталған қадамдармен толықтырылды. Бұл байланыстардың тұғырын нығайтуда түркі интеграциясы мен ТМҰ-ның рөлі зор, себебі ол екі мемлекеттің ғана емес, бүкіл түркі әлемінің бірлігін күшейтуге бағытталған. Екі елдің басшылары арасындағы жоғары деңгейдегі байланыстар, сондай-ақ екіжақты және көпжақты кездесулер мен келісімдер Қазақстан мен Түркия арасындағы қатынастарды стратегиялық серіктестік деңгейіне көтерді. Түркияның Қазақстандағы білім және экономика саласына белсенді қатысуы, сондай-ақ екі мемлекеттің саяси диалогы олардың ынтымақтастық деңгейінің жоғары екенін көрсетеді. Қазақстан мен Түркия арасындағы достық байланыстар халықаралық саясатта айтарлықтай маңызды орын алады, және олардың қарым-қатынасы түркі әлемінің интеграциялық процестерін ілгерілету мен тұрақты даму жолында маңызды қадамдар болып қала береді.

Бұл тарихты зерттеу кезінде оқушыларға дәстүрлі оқыту әдістерінен тыс, шығармашылық тәсілдер мен инновациялық әдістердің көмегімен танымдық қабілеттерін дамытуды көздедік. Мысалы, «жоспарлы дебат» әдісі арқылы оқушылар екі ел арасындағы маңызды оқиғаларды, келісімдерді талқылай отырып, олардың тарихи маңызын түсінді.

**Зерттеу бөлім.** Қазақстан мен Түркия арасындағы қарым-қатынастардың бірегейлігі, ең алдымен, олардың саяси, сауда-экономикалық және гуманитарлық ынтымақтастықтың белсенді дамуына, ортақ тарихқа, мәдениетке, тілге негізделген. Сонау ғасырда бір-бірімен байланысын жоғалтқан қос мемлекет 20 ғасырдың аяғында үзілген қарым-қатынастарды қалпына келтіруге, ынтымақтастықтың барлық салаларында барлық деңгейлерде көпжақты байланыстар орнатуға мүмкіндік алды. Жаңа тарихи кезеңде Қазақстанға Түркиямен екіжақты негізде де, көпжақты деңгейде өзара іс-қимылда да көпқырлы ынтымақтастықтың әлеуетін толық пайдаланып, маңызды міндетті шешу шарттары тұрды. Қазақстан тәуелсіздігін жариялағаннан кейін алдында даму болашағын айқындау, бағыттың жаңа түрін таңдау қажеттіліктері тұрды. Қазақстан Шығыс елдерімен де, Батыс мемлекеттерімен де қарым-қатынасты дамытуға мүдделі. Дегенмен, Қазақстанның қазіргі жағдайдағы басты міндеті елдегі экономикалық дағдарысты еңсеру және қоғамды табысты реформалау болып отыр. Түркияның 1980 жылдардағы саяси және экономикалық реформалар кезінде жинақтаған тәжірибесі оның пікірі әлемдік қауымдастықпен санасатын аймақтағы ең ықпалды мемлекеттер санатына кіруге мүмкіндік берді. Қазақстан еуразиялық мемлекет бола отырып, шын мәнінде екі өркениетке араласты. Бұл оның Еуропада модернизацияланған зайырлы мемлекет ретінде жылжып келе жатқан Түркия тәжірибесіне деген қызығушылығы мен тартымдылығын түсіндіреді [3].

Оқу процесінде оқытудың инновациялық әдістері ретінде қолданылған әдістер:

1. *Интерактивті тақта және мультимедиялық материалдар:* Түркия мен



Қазақстан арасындағы маңызды келісімдер мен оқиғаларға қатысты бейнемазмұн, инфографика және диаграммалар арқылы түсіндірме жұмыстарын жүргізу.

2. *Топтық жұмыс және жобалар:* Оқушыларға топтарға бөлініп, Түркия мен Қазақстан арасындағы байланыстарды зерттеу тапсырмасы берілді. Әр топ өз зерттеу тақырыбы бойынша презентация дайындап, оны сынып алдында қорғады.

3. *Рөлдік ойындар:* Оқушылар Түркия мен Қазақстанның тарихи тұлғаларының рөлдеріне еніп, тарихи оқиғаларға қатысты пікірталас ұйымдастырды.

4. *Виртуалды саяхат:* Түркия мен Қазақстанның тарихи ескерткіштері мен маңызды орындарына виртуалды саяхат жасау арқылы екі елдің мәдениеті мен тарихына жақынырақ танысу.

**Материал мен әдістер.** Мақалада қарастырылған әдістер мен технологиялар 9-11 сыныптардағы тарих пәніне арналған оқу бағдарламасына негізделген. Интерактивті сабақтар мен жобалық жұмыстар негізінде оқушылардың сыни ойлау қабілеттері мен шығармашылықтарын дамытуға бағытталған материалдар таңдалып, педагогикалық мақсатқа сай қолданылды. Сабақтарда оқушыларға тарихтың маңызды кезеңдері мен оқиғалары туралы толық мәлімет беру үшін түрлі тарихи карталар, архив құжаттары, көрнекі құралдар мен электронды ресурстар пайдаланылды.

Зерттеу барысында интерактивті әдістердің тарих сабағында оқушылардың белсенділігін арттыруға, пәндер арасындағы байланысты түсінуге оң әсерін тигізетіні анықталды [4]. Оқушылардың топтық жұмыстары мен пікірталастарға қатысуы олардың өз ойын еркін білдіруге және өзгенің пікірін тыңдауға мүмкіндік берді. Сонымен қатар, жобалық жұмыстар оқушылардың ізденушілік қасиеттерін дамытуға ықпал етті [5]. Тарих пәні арқылы білім беру оқушылардың ақпаратты толыққанды меңгеруіне жағдай жасады (Сурет - 1).





Сурет 1- Тарих сабағында «Қазақстан-Түркия қарым-қатынасы» тақырыбында инновациялық әдісті пайдалану

**Нәтиже.** Инновациялық әдістердің тиімділігі жоғары болды. Оқушылар топтық жұмыс барысында өз пікірлерін еркін білдіріп, тарихи оқиғаларға қатысты дәлелдер келтіре алды. Рөлдік ойындар мен дебаттар оқушылардың пәнге деген қызығушылығын арттырып, тарихты тек фактілер мен деректер ретінде емес, нақты тұлғалар мен оқиғалар тұрғысынан зерттеуге мүмкіндік берді. Интерактивті тақта мен мультимедиялық құралдар сабақтың қызықты әрі динамикалы өтуін қамтамасыз етті.

Оқытудың инновациялық әдістерін қолданудың нәтижелері зерттеу барысында келесі көрсеткіштермен анықталды:

1. **Оқушылардың пәнге деген қызығушылығының артуы:** 100 оқушы арасында жүргізілген сауалнама нәтижесі бойынша, инновациялық әдістерді қолдану арқылы сабақтарға қызығушылық артқандығы туралы 85% оқушы пікір білдірді.

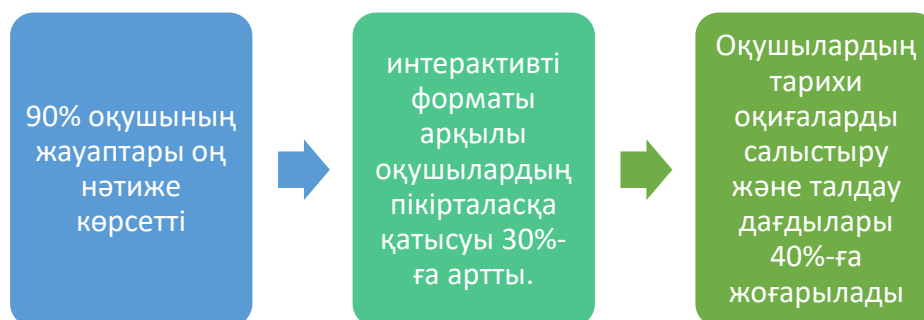
○ Әсіресе, рөлдік ойындар мен топтық жобалар арқылы оқушылардың пәнге деген қызығушылығы 25%-ға артты (сурет – 2).



Сурет 2 - Сауалнама нәтижесі

2. **Оқушылардың сыни ойлау дағдыларын дамыту:** Дебаттар мен пікірталастар арқылы сыни ойлау қабілетін дамыту бойынша 90% оқушының жауаптары оң нәтиже көрсетті. Сабақтың интерактивті форматы арқылы оқушылардың пікірталасқа қатысуы 30%-ға артты.

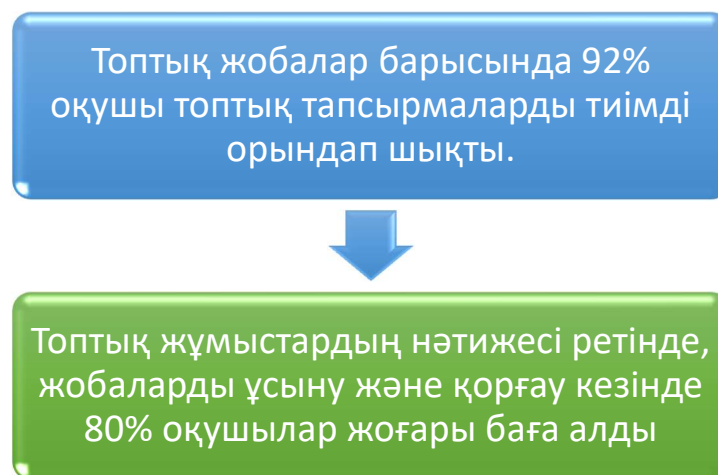
○ Оқушылардың тарихи оқиғаларды салыстыру және талдау дағдылары 40%-ға жоғарылады (сурет – 3).



Сурет 3 – Сыни ойлау дағдысы

3. **Топтық жұмыс нәтижелілігі:** Топтық жобалар барысында 92% оқушы топтық тапсырмаларды тиімді орындап, шығармашылық ойлау мен командалық жұмыстың маңыздылығын түсінді.

○ Топтық жұмыстардың нәтижесі ретінде, жобаларды ұсыну және қорғау кезінде 80% оқушылар жоғары баға алды (Сурет – 4).



Сурет 4 – Топтық жұмыстың нәтижесі

Бұл инновациялық әдістердің тиімділігін дәлелдейді және оқушылардың білім сапасы мен қызығушылығын арттыруға ықпал ететіндігін көрсетеді.

**Талқылау.** Қолданылған инновациялық әдістердің нәтижелері оқушылардың білімін тереңдетуге және оның сапасын жақсартуға әсер етті. Алайда, бұл әдістердің бәрі әрқашан барлық оқушыларға бірдей тиімді болмауы мүмкін. Оқушылардың ерекшеліктері мен оқыту жағдайларына байланысты әдістерді түрлендіріп қолдану қажет. Сонымен қатар, жаңа технологиялар мен әдістерді оқу процесіне енгізу үшін мұғалімдердің кәсіби біліктілігін арттыру да маңызды.

Қазақстан мен Түркия арасындағы тарихи қарым-қатынастарды оқытуда инновациялық әдістерді қолдану оқушылардың пәнге деген қызығушылығын арттыруға және тарихи білімін тереңдетуге ықпал етеді. Тарих сабағында дәстүрлі әдістерден бөлек, жаңа технологиялар мен интерактивті тәсілдерді енгізу арқылы оқушылардың сыни ойлау дағдылары мен шығармашылық қабілеттері дамиды. Мысалы, рөлдік ойындар мен дебаттар оқушыларды тарихи оқиғаларды тереңірек талдауға, дәлелдер келтіруге және өз пікірлерін сенімді түрде білдіруге үйретеді. Бұл әдіс Қазақстан мен Түркия арасындағы тарихи байланыстарды зерттеуге ерекше мән беріп, оқушылардың нақты тарихи контекстке шолу жасап, әртүрлі көзқарастарды бағалауға мүмкіндік береді.

Мультимедиялық құралдардың қолданылуы сабақтың тиімділігін арттырып, оқушылардың ақпаратты көру және тыңдау арқылы меңгеру қабілетін жақсартады. Интерактивті тақталар мен бейнемазмұндар арқылы оқушылар Түркия мен Қазақстанның тарихи ескерткіштері мен маңызды оқиғалары туралы көбірек мәлімет алады. Бұл құралдар тарихи білімді тек теориялық емес, көрнекі түрде жеткізеді.

Бұдан басқа, топтық жұмыстар мен жобалар оқушылардың бір-бірімен пікір алмасуын және командалық жұмыс дағдыларын дамытуға мүмкіндік береді. Жобалық әдіс оқушыларды зерттеу жүргізуге, ақпарат жинауға және оны өңдеуге үйретеді, бұл да тарихи зерттеулердің негізгі элементтері болып табылады.

Алайда, инновациялық әдістерді қолдануда кейбір қиындықтар да туындауы мүмкін. Мысалы, барлық оқушылардың жаңа технологиялар мен әдістерге бірдей бейімделе алмауы немесе техникалық құралдардың қажетті деңгейде болмауы сабақтың сапасына әсер етуі мүмкін. Сондықтан мұғалімдер инновациялық әдістерді тиімді қолдану үшін алдын ала дайындықты және жеке оқушылардың қажеттіліктерін ескеруді қажет етеді.

Оқытудың инновациялық әдістері Қазақстан мен Түркияның тарихи байланыстарын тереңірек зерттеуге мүмкіндік беріп қана қоймай, оқушыларды жан-жақты тұлға ретінде тәрбиелеуге бағытталған маңызды қадам болып табылады.

**Қорытынды.** Мемлекет басшысы Түркия Республикасының Премьер-Министрімен кездесуінде атап өткендей, «Біздің елдеріміздің тарихи өткені ортақ, тілдері, діні мен мәдениеті ұқсас. Бізде ұқсас құндылықтар жүйесі бар. Осы құндылықтарды ұстанатын және дамытқысы келетін қазақ және түрік азаматтарының көбеюі – бүкіл Еуразиядағы тұрақтылыққа қосылған үлесі деп білуге болады. Егемендігіміздің алғашқы күндерінен бастап біз бауырлас халықтарымызды жақындастыруға бар күш-жігерімізді салып келеміз. Осы жылдар бойы сіздердің еліңіздің басшылығымен тығыз жұмыс жасай отырып, біз Қазақстан мен Түркия арасындағы ұзақ жылдар бойы үзіліп қалған байланыстарды қалпына келтірдік. Түркияның Қазақстан үшін маңызы өте зор және біз ынтымақтастық саясатынан ешқашан бас тартпаймыз».

Қазақстан мен Түркия арасындағы тарихи байланыстарды оқыту кезінде инновациялық әдістердің қолданылуы оқушылардың қызығушылығын арттырып, олардың білімін тереңдетуге ықпал етті. Оқытудың жаңа әдістері мұғалімдер мен оқушылар үшін тиімді әрі қызықты білім беру мүмкіндіктерін ашады. Алдағы уақытта мұғалімдер мен мектептер бұл әдістерді кеңінен қолдана отырып, білім беру жүйесін жақсартуға үлес қоса алады.

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# THE NEW STAGE OF ECONOMIC DEVELOPMENT OF SUMQAYIT CITY (2019-2020 YEARS)

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## Abstract

The new stage of economic development in Sumqayit city (2019-2020) focuses on the significant progress made in the industrial and economic sectors. During this period, Sumqayit continued its transformation into a modern industrial hub, with an emphasis on establishing new factories, improving infrastructure, and increasing local production. The city experienced a rise in the manufacturing of chemical, food, and light industry products, contributing significantly to the country's economy.

Key developments include the establishment of new industrial zones, particularly within the Sumqayit Chemical Industrial Park, which has become a major contributor to Azerbaijan's non-oil sector. The city also witnessed an increase in foreign investment, job creation, and the implementation of large-scale infrastructure projects, resulting in a growing GDP and improved social-economic conditions. Overall, Sumqayit's economic growth during 2019-2020 has been driven by modernizing existing industries, boosting manufacturing output, and fostering a competitive business environment, positioning it as one of Azerbaijan's leading industrial cities.

Keywords: Sumqayit, economic situation, stage, development, industry

In recent years, significant steps have been taken towards the creation of industrial and technological parks and industrial estates, with specialization in areas such as chemistry, recycling, shipbuilding, high technologies, light industry, and pharmaceuticals. The Sumqayit Chemical Industry Park has been established [15].

In the first quarter of 2018, the economy grew by 2.3%, the non-oil sector by 3%, industrial production by 2%, and the non-oil industry by 10%. The production of agricultural products increased by 2%. 34,000 new jobs were created. As a result of the economic policy pursued in the country, the implementation of industrialization has led to the creation of new industrial sectors in Sumqayit in recent years. The share of local products in meeting demand has significantly increased, and export potential has grown. Industrial production in comparison to the same period of the previous year (2017) increased by 46.2%, reaching 296 million manat, with production rising by more than 94 million manat.

The share of the private sector in the Gross Domestic Product (GDP) exceeded 85%. The production volume of industrial products in the chemical industry increased by 147%, metallurgy by 8 times, light industry by 149%, food industry by 113%, construction materials by 146%, energy by 210%, and other sectors by 129%. A total of 44.4 million manat was allocated for the development of various sectors from all financial sources. The capital investment increased 3.7 times, and the volume of construction and installation works increased 4 times compared to the previous year's respective period [13].

The social and economic indicators of Sumqayit have been encouraging. In the first half of the current year, GDP production increased by 20% and 157 million manat, reaching 933 million manat compared to the same period of the previous year. Industrial enterprises produced goods worth 705 million manat, which is a 123% increase compared to the previous year. In order to

create a favorable environment for the development of competitive industrial sectors based on innovative and high technologies, support entrepreneurship in this field, ensure the sustainable development of the non-oil sector, and increase employment in the production sector, the construction and installation work of new enterprises in the Sumqayit Chemical Industry Park continues successfully.

This will pave the way for further growth in the city's social and economic indicators. In the Sumqayit Chemical Industry Park, which plays a crucial role in the country's economy, the construction of modern vocational training centers for skilled workers, and plants based on Canadian and Austrian technology for the production of 180,000 tons of polypropylene and 120,000 tons of high-density polyethylene, is ongoing. State support for entrepreneurs remains a priority in the implementation of multi-faceted reforms and the improvement of the business and investment environment. During the reporting period, concessional loans amounting to 4 million 195 thousand manat were allocated for 3 projects. As a result of the implementation of these projects, more than 100 new jobs were created [14].

Currently, 9 enterprises operate in the Sumqayit Chemical Industry Park, and the products produced by these enterprises meet domestic demand while also being exported to foreign markets under the "Made in Azerbaijan" brand [16].

The successful implementation of state programs as a result of the economic and social policies pursued by President Ilham Aliyev has played a significant role in the development of Sumqayit city. The establishment of the Sumqayit Technology Park and Sumqayit Chemical Park is a manifestation of the great support shown by the head of state for the development of industry in the city.

President Ilham Aliyev has specifically outlined the future development path of Sumqayit's economy: Sumqayit should become a modern industrial city. The important steps taken in this direction are already yielding positive results. Recent complex measures developed with the participation of scientists and specialists, as well as scientific and practical conferences regularly held to analyze the city's socio-economic development prospects, have given a boost to the city's industrial potential.

Currently, the newly established enterprises in the city meet the latest standards. The launch of new enterprises, which were previously unusual for the city, has led to the modernization of Sumqayit's industrial landscape. Whereas in the recent past, industrial production was primarily measured by the city's chemical enterprises, today, this dependence has been restructured and removed thanks to the activities of newly established large production facilities.

The development of the city, based on historical traditions, aims to transform Sumqayit into one of the largest industrial centers in Azerbaijan, the South Caucasus, and even Europe, with the potential to compete directly with Baku. This is one of the main goals outlined by President Ilham Aliyev, who continues the development strategy set by the National Leader Heydar Aliyev.

As is known, industrialization and the development of the non-oil sector are key directions of President Ilham Aliyev's economic diversification policy. Special attention is given to the development of industry, the involvement of existing natural and economic resources in production, and the wider application of advanced technologies. In line with the industrialization policy, hundreds of modern industrial enterprises and new production facilities are being created in the country, the share of local products in meeting domestic demand has significantly increased, and export opportunities are expanding [8].

When discussing the industrial potential of Azerbaijan, the significant importance of the Sumqayit industrial center, which forms the basis of this potential, stands out.



Sumqayit has a strong industrial potential, with large production sectors in non-ferrous and ferrous metallurgy, chemistry and petrochemistry, compressors, machine building, polymers, building materials, detergents, food complexes, etc [9].

As part of the implementation of the State Program for the Socio-Economic Development of Regions of the Republic of Azerbaijan (2004-2008), efficient measures have been taken to accelerate entrepreneurship development in the Sumqayit economic region, use labor resources and economic potential more effectively, increase employment, and create a business environment suitable for a market economy [6].

In recent years, a 525 MW power station, Sumqayit-3 substation, has been constructed in Sumqayit. The "Azərkimya" enterprises have been renovated, the Azgüntex plant for alternative and renewable energy sources, the "Sağlam Qida" Agro-Industrial Complex, which includes a bakery, grain warehouse, mill, and logistics center, the "Azərsun Holding" paper and cardboard processing plant and oil production facility, the "Gilan" Textile Park, the Copper Processing Plant, the "Alyans Textile" factory for uniform production, the "Azkontakt" concrete pipe and paving stone production facility, and the "Texnoil" plant for engine oil production have all been established. Additionally, in the Chemical Industry Park, the Construction Chemicals Plant, "Tabaterra" tobacco products manufacturing plant, the Baku Non-Ferrous Metals and Ferroalloys Plant, pesticide and agrochemical products, hoses and fitting assemblies, lubricants, polypropylene plants, electronic educational equipment, glass and pottery production facilities, and Data Processing Center have been constructed. In the Sumqayit Technology Park, there are specialized factories for various production sectors, and the "Azərtexnolayn" plant for the production of steel and polyethylene pipes, mechanical and hydraulic equipment, and the "Aqrokimya Azerbaijan" plant for pesticide production are operational [4].

According to the information provided by the Sumqayit City Executive Authority, there are currently around 150 industrial enterprises operating in the city, which produce nearly 2 billion manat worth of goods annually. The creation of modern industrial infrastructure and the commencement of new enterprises in Sumqayit have increased the city's share in the country's macroeconomic indicators. The establishment of new industrial sectors has also significantly increased the share of local products in meeting the demand for industrial goods in the country.

The development of Sumqayit as an industrial city and the successes achieved in this field have made a significant contribution to the city's overall growth. This development is clearly reflected in statistical figures. For example, since 2003, the total output in Sumqayit has increased by approximately 12.5 times [4].

It is known that since its foundation, Sumqayit has formed as a city of chemists and one of the country's major industrial centers. In the past, this development focused mainly on a one-sided direction, overshadowing other important aspects of the city's life, particularly its cultural life. However, achievements in recent years in this direction are especially encouraging.

In recent years, a new period of revival has begun in the republic's industry, thanks to the attraction of foreign investments in the oil industry, the signing of the "Contract of the Century," and the signing of other contracts for the development of new perspective fields [8].

On November 21, during an event dedicated to the 70th anniversary of Sumqayit, President İlham Aliyev stated: "Sumqayit, of course, is developing as an industrial city. But today's industry responds to the challenges of today. Almost all of the old industrial enterprises have ceased operations... The private sector is also receiving great attention. Today, Sumqayit is a modern industrial city, the second industrial city in the South Caucasus. Enterprises in Sumqayit produce products worth nearly 2 billion manat annually. Therefore, Sumqayit will continue to develop as a modern industrial city." [7]



More effective use of the existing potential of Sumqayit as an industrial center, as well as strengthening reconstruction and modernization activities, is one of the most important directions for future activities.

Despite the challenges posed by the coronavirus pandemic, the development and construction in Sumqayit continue steadily. This is confirmed by statistical data. In the first quarter of this year, the total gross domestic product (GDP) in the city amounted to 636.4 million manat, which is 38.1% higher than the same period last year. In the reporting period, the production of industrial products in the city amounted to 490.5 million manat (42.4% more than the previous year). Notably, there were increases in the production of chemicals, food, and light industries. In the first quarter, investments totaling 53.8 million manat were made, which is 7% higher than in the first quarter of 2019 [9].

During this period, the average monthly wage in the city was 563.4 manat, compared to 433.2 manat in the same period last year. The number of new jobs created was 3,583 in the first three months, which is 2.2 times more than in the corresponding period of the previous year.

In terms of the execution of the city budget, the situation is also satisfactory. In the reporting period, revenues were 11 million 38.5 thousand manat, which is 15.9% higher than the previous year [8].

The modern appearance of Sumqayit reflects the dynamic development of independent Azerbaijan. In his speech evaluating the city's current development stage, President Ilham Aliyev emphasized, "Today, Sumqayit is a modern city with a large industrial potential, rapidly developing, and becoming more prosperous every day."

Efforts in greening the city, creating new parks, implementing environmental measures, and fully cleaning and reconstructing the Acidara Canal, which had long troubled the people of Sumqayit, are of great importance. As a result, the city's appearance has been completely transformed, and today it meets the highest standards [1].

The Sumqayit Chemical Industrial Park, established based on a decree by President Ilham Aliyev on December 21, 2011, is the first and largest industrial park in Azerbaijan. The total area of the park is 508 hectares, with 450 hectares allocated for industrial zones. Currently, 75% of the park is occupied. Thirteen factories are operating in the park, and seven additional factories are expected to start operating next year. There are 20 residents in the Sumqayit Chemical Industrial Park. The investment in the park is in the billions of dollars [3].

Moreover, in recognition of their services to the city's social and economic development, a number of residents were awarded honorary titles, medals, and the "Honorary Diploma of the President of the Republic of Azerbaijan." Four individuals will also receive the President's personal pension. For his services to the city's social and economic development, Zakir Farajov, the head of the Sumqayit City Executive Authority, was awarded the 1st degree "For Service to the Homeland" Order. A total of 66 residents of Sumqayit were awarded honorary titles and medals. These decrees reflect President Ilham Aliyev's high attention and care for Sumqayit and its people [3].

In 2019, the Sumqayit Chemical Industrial Park produced goods worth 823 million manat, of which 276 million manat (about 33%) were exported. In the first half of 2020, the park produced goods worth 534 million manat, with a 9.3% share in the country's non-oil industrial sector (5.7 billion manat) and a 20% share in the export of non-oil industrial products (910 million manat). More than 5,500 people are employed in the park's operating enterprises [12].

Zakir Farajov, the head of the Sumqayit City Executive Authority, stated that due to the high attention and care of President Ilham Aliyev, the improvement, construction, and development work in the city has provided Sumqayit residents with a pleasant mood and peaceful lifestyle. At the same time, the successful large-scale projects have completely transformed the city's appearance [3].

The social and economic indicators of Sumqayıt are also high. In the first quarter of this year, the total output of goods and services in the city amounted to 244.5 million manat, which is an increase of 44.8% or 75.6 million manat compared to the same period last year. The production of goods in different industrial sectors includes: chemical industry – 121.6%; light industry – 125.0%; food industry – 24.6 times; other sectors – 4.8 times; energy – 93.0%. As a result of the implemented measures, 1,933 new jobs were created in the last three months. Additionally, 848 families with 3,297 family members were assigned targeted social assistance [1].

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# SELBIR SETTLEMENT (GABALA DISTRICT)

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**Abstract:** The article is informed about the ancient city of Caucasian Albania. Gabala Selbir area speaking about the presence of residence the author said that at the end of the B.C II millennium and the first half I millennium the ancient city had become the grown main place.

The article notes based on big scientific principles as a result of archeological excavation obtained findings informed that the ancient city belong to IV century.

**Keywords:** Caucasian Albania, Gabala, settlement, Selbir, material culture.

The ancient town of Gabala, history of which is more than two thousand years and was the first capital of the state, had witnessed many events. The material evidence obtained as a result of archaeological excavations conducted in the ancient town of Gabala for many years is of great importance in revealing historical traces left under the ground. Archaeological explorations provide the basis for studying the history of not only the country, but also the entire Caucasus. Depending on the period, each layer is rich in its own historical relics.

Investigations show that the ancient town of Gabala is located not only in the area known as Selbir, but also in a place called “Chaggalli duzu (plain)” by the local population. In this area, which covers about 50 hectares, layers covering the early period of the town have been discovered.

Different types of material and cultural samples discovered during archaeological excavations conducted at the site of this ancient town indicate the existence of highly developed urban life and urban culture in the ancient town of Gabala. Investigations show that there was a settlement here as early as the end of the 2nd millennium BC - first half of the 1st millennium BC, which expanded and turned into a town with a vast territory, becoming the first capital of the state known as Albania. The first excavations in the ancient town of Gabala were conducted in the 1944-1945s under the leadership of S.M.Gaziyev and the first scientific information about the cultural layers was obtained (1 p., 32). Following this, planned archaeological excavations were carried out in Gabala in the 1959-1960s, and valuable finds reflecting all periods of the town were obtained. During the investigations, defensive fortifications were investigated, the sequence of cultural layers and their periods were studied, and different building remains belonging to each period were revealed, and their construction styles were determined (2 p., 21-23). During the excavations, manufacture furnaces and various types of household items were discovered.

The findings, based on great scientific evidence, gives reason to say that the ancient town site was founded in the 4th century BC. In ancient times, the town of Gabala was built on the site of the Early Bronze Age settlement. The ancient area, that is, this site, was the first area of the historical town of Gabala. The town economy was highly developed here. Along with internal and external trade, the basis of the town economy was crafts, agriculture and cattle breeding (3 p., 12-16).

After the settlement in the area called Chaqalli ceased to exist, life gradually revived in the areas called Selbir and Gala of Gabala. In the Middle Ages, the town entirely occupied this area.

The Selbir area of the ancient Gabala town has always attracted the attention of archaeologists. The Selbir settlement was one of the main parts of Gabala in the ancient and medieval ages. Selbir, with an area of 12 ha, is located on a high plateau between two rivers. The town site is divided into 2 parts by a deep and wide dug ditch - the Selbir and the Gala parts. Archaeological excavations have been carried out in Selbir for many years and have attracted

attention with their interesting finds. During the investigations, from the ancient, that is, the antique and early medieval ages excavation site of the town rich material and cultural samples were discovered. The discovery of public buildings, residential houses, and household wells indicates that there was intensive life here. The discovered wells are oval and circular in shape. Grain remains were found in most of them (4 p., 19-26). Most of the grain wells were arranged in a row. Wooden bundles were placed in the holes dug at their bottom, and one end, that is, the upper part of the bundle, remained outside the well. This means that the grain will remain intact and will not rot. This method was used until recently.

Some of the wells are interesting because they are square (four-cornered). It was also not known why the wells were dug. The well was cleaned and dated, and it was probably dug for water. Although there were springs in the vicinity, it would not have been possible to take water from these springs due to the danger of the enemy. At that time, there had not yet built a water line with clay pipes in the town.

During the investigations, pitchers and pots buried in the ground inside the residential buildings, as well as food and garbage wells in the yards of houses, were found. Traces of burning are observed on many of these. Clay pipes found near the wells indicate that the town was supplied with drinking water. Tunnels belonging to the Kehriz (underground water-supply pipe) system were also found during the excavations.

Extensive archaeological excavations were carried out in Selbir under the leadership of F.V.Gadirov in 1974-1978. As a result of the excavations, cultural layers of a large area were discovered, and rich finds reflecting the material and cultural history of Selbir from the ancient period to the 11th century were discovered and studied (5 pp., 62-65; 6, 40-42).

That is, as a result of archaeological excavations in Selbir, the thickness of the cultural layers discovered was determined, and very valuable materials were obtained about the residential houses, fortress walls, craft workshops, production, trade and burial customs of the town. It was clarified that there was continuous habitation here with certain intervals. The development of such craft fields as pottery, blacksmithing, weaving, stoneworking, boneworking, glassmaking, and jewelry shows that domestic and international trade developed here, and economic and cultural relations were established with many countries. The discovery of local coins and brought from foreign countries, along with other valuable finds during archaeological excavations, is proof of this.

Although archaeological excavations in the site of ancient town of Gabala were paused for a while, they have been restored and continued since 2005 thanks to the initiative, organization, participation and financial support of the SEBA (Seoul Baku) Azerbaijan Korea Cultural Exchange Association.

Since 2009, an international expedition (with the participation of Korean archaeologists) has been operating in Gabala under the general leadership of Ilyas Babayev. Extensive excavations have been carried out and are being carried out at the site of the ancient town, together with specialists from the Institute of Archaeology and Ethnography of ANAS and researchers from the Korean Scientific Research Institute. International research works in the Selbir area, dating back to the ancient and early medieval periods, cover various parts of the monument. It is possible to determine the beginning and end of the life in Selbir, based on valuable material and cultural samples obtained as a result of archaeological excavations and, depending on the period, on the materials of the place of residence and grave monuments. As in previous years, very valuable finds were discovered during the investigation works. Remains of buildings, baked bricks, tile remains, remains of pottery furnace (pottery remains), household wells, variously shaped vessel samples, etc. Some of the vessel samples found (ceramics, glass), etc. are striking in their shape and patterns. As the excavation area expanded, more such samples were found. That is, during

archaeological excavations and surface searches, remains of glazed and unglazed clay vessels of various shapes, sizes, and decorated with colorful patterns were discovered and taken (8th-9th).

During the excavations of Selbir, scattered tandoors and pipes were found among the remains of the collapsed wall. These pipes were for the air intake of the tandoors. The direction of the pipes to the south and southwest is typical for the period. The air intakes for the tandoors are still installed today and are called *kulfa* among the people. Undoubtedly, the ongoing archaeological and new searches in Gabala will allow us to study the history of the town in more detail in the future.

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# BAKU-TBLISI-CEYHAN OIL PIPELINE: IMPACT ON ENERGY SECURITY

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## **Abstract**

The "Baku-Tbilisi-Ceyhan (BTC) Oil Pipeline: Impact on Energy Security" focuses on the geopolitical and economic significance of the BTC pipeline, which connects Azerbaijan's oil fields to the Turkish Mediterranean port of Ceyhan. This pipeline, which started operation in 2006, is a critical energy infrastructure project that enhances energy security for both Azerbaijan and its international partners by diversifying oil transportation routes, reducing dependence on Russian and Iranian routes, and promoting regional stability. The BTC pipeline strengthens energy security by offering an alternative to traditional transit routes, minimizing the risks associated with potential disruptions, such as political instability or conflicts. Additionally, it has economic implications, fostering energy cooperation between countries in the region and contributing to the global oil supply. Furthermore, the BTC pipeline plays a key role in the diversification of energy supply for Europe and other markets, mitigating energy security risks related to supply concentration in specific regions. This makes the BTC pipeline an essential element in shaping the energy dynamics of the region and beyond.

**Keywords:** oil, contract, international, economy, development

The Baku-Tbilisi-Ceyhan (BTC) oil pipeline, which began operations in 2005, has become one of the most important and strategic energy infrastructures in the Caspian region. This pipeline directly connects Azerbaijan's Caspian Sea oil reserves to global markets, ensuring the diversification of regional energy supply and enhancing energy security. The BTC pipeline not only contributes to the energy security of Azerbaijan, Georgia, and Turkey but also has a significant impact on global energy markets. This article will examine the effects of the BTC pipeline on energy security from various aspects and assess its impact on the international energy system. Energy security refers to the ability of a country or region to ensure a sustainable and reliable energy supply. This security is not only about the availability of energy resources but also about how these resources are transported and the diversification of supply routes. The BTC pipeline has improved energy security in the region by creating a new route to transport Caspian oil to world markets. The diversification of these routes reduces the risks in energy supply and minimizes the impact of geopolitical tensions. Traditionally, transporting Caspian oil through pipelines controlled by Russia and Iran could have been accompanied by political tensions and trade disputes, posing serious threats to the reliability of energy supply. However, by transporting Caspian oil through South Caucasus and Turkey, the BTC pipeline reduces such risks, opens new energy supply routes, and offers various sources of supply to the global energy market[1].

Furthermore, the BTC pipeline increases competition among different energy producers and consumers. This leads to price stabilization and greater transparency in energy markets. It particularly ensures a freer supply of energy to markets in Asia, Europe, and North America.

The BTC pipeline is not only of economic and commercial significance but also has geopolitical importance. The construction of the pipeline has not only ensured the energy security of Azerbaijan, Georgia, and Turkey but also strengthened the political independence of these countries. This project has reduced their dependency on energy suppliers and transit countries, giving them the opportunity to pursue more independent energy policies. The cooperation



between Turkey, Georgia, and Azerbaijan has been further strengthened by the BTC pipeline. The pipeline's passage through Turkey has strengthened the country's geopolitical position, making it a key transit country for energy supply to Europe and other markets. This has also enhanced Turkey's independent and strategic role in energy transit. Georgia, as a country through which the BTC pipeline passes, has gained significant benefits in terms of energy security. Additionally, it has supported the economic development of the country, strengthening its economy, creating jobs, and developing infrastructure.

Energy security should be assessed not only from economic and geopolitical perspectives but also from ecological and social viewpoints. The construction and operation of the BTC pipeline have raised various discussions regarding environmental impacts and social issues. The potential effects on ecosystems in areas through which the pipeline passes have been minimized through appropriate environmental measures. For example, during the construction of the pipeline, extensive environmental assessments were carried out in accordance with international standards, and measures were taken to avoid harm to local flora and fauna. Socially, the BTC pipeline has created job opportunities in the region and contributed to the development of local communities. New job opportunities and economic possibilities were created for the local population during the construction and operation of the pipeline, while social infrastructure projects were also implemented, improving the welfare of the local population and ensuring the positive social impacts of the pipeline's operation.

The global impact of the BTC pipeline is not limited to the regional scale. The pipeline has integrated the Caspian region's energy market into the global energy market, introducing new energy supply routes to the world. The access of Caspian oil to global markets positively impacts global energy security and offers alternative energy supply lines. This is crucial in terms of the diversity of energy supply, as in the case of any global disruption or supply cutoff, alternative routes like the BTC pipeline ensure more resilient energy supply. The BTC pipeline also creates new perspectives for the future development of the global energy system. With the increasing global demand for energy and the need for broader diversification of energy supply, the BTC pipeline plays a vital role in meeting these demands and supporting the global economy. It also contributes to the creation of a more sustainable energy infrastructure while ensuring regional and global energy security[3].

The construction of the Baku-Tbilisi-Ceyhan (BTC) main oil export pipeline is the result of the implementation of the oil strategy developed by national leader Heydar Aliyev, which is projected to last for several decades. Today, Azerbaijan is recognized as a powerful state with growing political and economic influence on global events. The BTC pipeline, considered one of the largest oil export routes of the millennium, has already proven its worth in the broader global context.

The foundation of Azerbaijan's national oil strategy began with the signing of the "Contract of the Century," which marked the start of implementing the country's independent oil policy. After this contract, the interest of world states in Azerbaijan's economy increased, leading to an expansion of international relations. One of the key components of the "Contract of the Century" was the creation of a multi-route pipeline transportation infrastructure to transport and export the oil extracted in collaboration with foreign companies. Heydar Aliyev, displaying determination in this matter, proposed the idea of the Baku-Tbilisi-Ceyhan oil pipeline to export Azerbaijani oil to global markets via the Mediterranean Sea. Despite attempts by some forces to reject this idea, it was accepted after Heydar Aliyev's efforts and the successful outcome of intense negotiations. As a result, a declaration on the construction of the Baku-Tbilisi-Ceyhan oil pipeline was signed at the OSCE summit held in Istanbul on November 18, 1999. This established the legal basis for the realization of the BTC project.



Subsequently, negotiations were held to finalize certain details of the project and determine the necessary financial resources. BP was chosen as the project operator, and the "BTC Co." company was established for the construction and operation of the pipeline. The shareholders of the company included BP (30.1%), SOCAR (25%), Chevron (8.9%), Statoil (now Equinor) (8.71%), TPAO (6.53%), Eni (5%), Total (5%), Itochu (3.4%), Inpex (2.5%), ConocoPhillips (2.5%), and Amerada Hess (2.36%). The State Oil Company of Azerbaijan (SOCAR) founded the subsidiary company "AzBTC Co." to participate in the BTC project and obtained a 25% stake in the "BTC Company" established by the consortium of oil companies. The financing of the project was decided to be covered by 30% of the participants' own funds, with the remaining 70% financed through international financial institutions, export credit agencies, and commercial bank loans. The financing of Azerbaijan's share in the "BTC Co." was carried out by the State Oil Fund of Azerbaijan. On July 30, 2002, Azerbaijani President Heydar Aliyev signed a decree on the financing of Azerbaijan's participation in the Baku-Tbilisi-Ceyhan main oil export pipeline project. This decree included the fulfillment of obligations related to Azerbaijan's participation in the project and the financing of the country's share. On February 18, 2002, in Baku, at the Sangachal terminal, the foundation of the Baku-Tbilisi-Ceyhan (BTC) main export oil pipeline was laid with the participation of the Presidents of Azerbaijan, Georgia, and Turkey: Heydar Aliyev, Eduard Shevardnadze, and Ahmet Necdet Sezer. This marked the beginning of the realization of the Baku-Tbilisi-Ceyhan project, which is a crucial part of the new oil strategy developed by the national leader Heydar Aliyev. An international tender was announced to determine the contractor for the construction of the pipeline. As a result of the tender, the Greek company Consolidated Contractors International Company (CCIC) won. In February 2003, construction of the pipeline began from the Sangachal terminal near Baku. In October 2004, the Azerbaijani section of the BTC was connected to the section passing through Georgia. The Georgian part of the BTC was completed and commissioned in October 2005[4].

President Ilham Aliyev, who continued the successful oil strategy initiated by Heydar Aliyev, took a personal interest in the progress of the project from the first days of his presidency, regularly visiting and reviewing the construction work. Finally, in April 2005, the construction work was completed. On May 25 of that year, an official event was held at the Sangachal terminal to pump crude oil into the BTC. After the leaders of Azerbaijan, Georgia, and Turkey, Ilham Aliyev, Mikheil Saakashvili, and Ahmet Necdet Sezer, opened the special valve installed at the terminal, oil began to flow through the pipeline[2].

On May 28, 2006, Azerbaijani oil reached the Ceyhan port. On June 14, the first batch of oil from the Azeri-Chirag-Gunashli (ACG) fields was loaded onto the "British Hawthorn" tanker at the Ceyhan marine terminal and sent to the world market. With the departure of this tanker, which carried 600,000 barrels of crude oil, the export of Azerbaijani oil through the BTC pipeline to the global market began. On July 13, 2006, the grand opening ceremony of the BTC pipeline, one of the largest energy projects of the 21st century, was held in Ceyhan, Turkey. By that time, 3.62 billion barrels of oil had been loaded onto 4,729 tankers at the Ceyhan port and sent to the world market. The pipeline stretches from the Sangachal terminal near Baku, passes through Azerbaijan, Georgia, and Turkey, and reaches the Ceyhan marine terminal on the Mediterranean coast of Turkey. From June 2006 to the first quarter of the current year, the total volume of crude oil transported via the BTC exceeded 482 million tons (approximately 3.62 billion barrels). All of these volumes were safely loaded onto 4,729 tankers and sent to the global market from the Ceyhan terminal[5].

In 2006, the BTC pipeline transported 57 million 78 thousand barrels of oil. In 2010, the annual transport volume reached its peak at 286 million 214 thousand barrels. In 2019, approximately 31 million tons, or 233 million barrels of crude oil, were exported through the BTC, and that oil was loaded onto 296 tankers at the Ceyhan port. In the first three months of the current year,

approximately 6.7 million tons, or 51 million barrels, of crude oil were exported via the BTC, with the oil loaded onto 70 tankers at the Ceyhan port. From January to May, 75.6% of the oil transportation through Azerbaijan's main oil pipelines was done via the BTC, with 11 million 124.8 thousand tons of oil transported through it. During the reporting period, 1 million 523.3 thousand tons of transit oil were also transported through BTC.

BTC primarily carries oil from Azerbaijan's Azeri-Chirag-Gunashli (ACG) fields and condensate from the Shah Deniz field. Since October 2013, the BTC pipeline has also been transporting oil from Kazakhstan's Tengiz field in certain volumes. Additionally, the pipeline also carries crude oil and condensate from Turkmenistan and Russia. In the first quarter of this year, BTC's operating expenses amounted to over 41 million dollars, and capital expenditures totaled 6 million dollars. The shareholders of "BTC Co." are: BP (30.1%), AzBTC (25%), MOL (8.9%) (replacing Chevron since April 16 this year), Equinor (8.71%), TPAO (6.53%), Eni (5%), Total (5%), Itochu (3.4%), Inpex (2.5%), ExxonMobil (2.5%), and ONGC (BTC) Limited (2.36%). The BTC pipeline is of great importance for the energy security of the region, Europe, and the world[6].

The operation of this new energy corridor, which connects the Caspian Sea with the Mediterranean Sea, has created favorable opportunities for the large-scale transportation of Azerbaijani oil to international markets and for the implementation of the country's multi-vector export strategy. Additionally, the country's transit potential has increased several times. The BTC, named after the national leader Heydar Aliyev, is an oil transportation pipeline built to ensure access to world markets for crude oil produced in Azerbaijan's sector of the Caspian Sea under the "Contract of the Century". The pipeline is 1,768 kilometers long and passes through 13 regions of Azerbaijan. The pipeline section in Azerbaijan is 443 kilometers long. The BTC passes through 7 regions in Georgia and 9 regions in Turkey. Of the total length, 249 kilometers pass through Georgia and 1,076 kilometers through Turkey.

The operators of the Azerbaijani and Georgian sections of the pipeline are the shareholders of "BTC Co.", led by BP, and the operator of the Turkish section is Botaş International Limited. The pipeline's diameter is 42 inches in Azerbaijan and Turkey, while it is 46 inches in Georgia. On the last section that descends to the Ceyhan marine terminal in Turkey, it reduces to 34 inches. The pipeline crosses more than 1,500 rivers and 13 seismic fault lines. The highest point of the pipeline is located in the mountains, at 2,800 meters above sea level, after which it descends to sea level at Ceyhan.

The operational lifespan of the pipeline is 40 years, and its current average throughput capacity is 1.2 million barrels per day. Approximately 4.5 billion dollars were spent on the construction of the pipeline from the Sangachal terminal to the Ceyhan terminal. Currently, the pipeline has the capacity to transport 60 million tons of oil annually. The Baku-Tbilisi-Ceyhan pipeline is of immense economic, political, and energy security importance to Azerbaijan, the region, Europe, and the world, while also alleviating the excessive load on Turkey's Black Sea straits. It is considered one of the greatest successes of Azerbaijan's economic policy, significantly strengthening the country's position in the Eurasian region and establishing it as a leader in the South Caucasus. Today, the BTC, named after the great leader Heydar Aliyev, is a project of exceptional importance not only for Azerbaijan but also for the countries partnering with Azerbaijan in global energy security and oil exports. The BTC is not only of significant technical and economic importance but also holds great political value. It has played a role in establishing new relationships between Azerbaijan and global powers, contributing to the strengthening and development of the country's foreign policy[3].

The Baku-Tbilisi-Ceyhan oil pipeline plays a strategic role not just as an infrastructure project, but also in ensuring energy security. The pipeline diversifies energy supply, enhancing regional and global energy security. This helps ensure reliable and sustainable energy supply from the Caspian region while also opening new opportunities in international energy markets. The BTC

pipeline not only ensures the reliability of energy supply but also stimulates economic development and social welfare in the region. Its impact on international energy markets can be considered a positive step in ensuring global energy security.

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## Psychological Sciences

# Sağlamlıq imkanları məhdud məktəbəqədər yaşlı uşaqların nitq inkişafının xüsusiyyətləri

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Xülasə:

Əgər biz "Ontogenez" anlayışını daha dar çərçivədə gözdən keçirəiksə görərik ki, ondan ilk səsin yaranmasından başlamış geniş kontekstli nitqin yaranmasına qədər olan dövrü göstərmək üçün istifadə olunur.

Nitqin "Ontogenez" inkişafı dedikdə insanın nitqinin formalaşdığı bütün dövr, onun nitqinin ilk inkişaf anından etibarən mükəmməlləşmə səviyyəsinə qədər, yəni ana dilinin tam şəkildə ünsiyyət və təfəkkür vasitəsinə çevrildiyi dövr nəzərdə tutulur.

Nitq anadangəlmə olmur. O, uşağın ümumi inkişafının göstəricisi olaraq fiziki və əqli inkişafı ilə paralel ontogenez prosesində inkişaf edir. Uşağın ana dilini mənimsəməsi, bütün uşaqlar üçün xarakterik olan bir sıra əlamətləri ilə, çox dəqiq qanunauyğunluqla inkişaf edir. Nitq patologiyasını müəyyən edərək düzgün korreksion-tərbiyəvi işin təşkili üçün uşaqların nitqinin ardıcılıqla inkişaf yollarını, bu prosesin qanunauyğunluqlarını və şəraitini bilmək lazımdır.

Summary:

If we look at the concept of "Ontogeny" in a narrower frame, we will see that it is used to indicate the period from the formation of the first sound to the emergence of broad contextual speech.

"Ontogeny" development of speech refers to the entire period during which a person's speech is formed, from the first moment of his speech development to the level of perfection, i.e., the period when his mother tongue fully becomes a means of communication and thinking.

Speech is not born. It develops in the process of ontogenesis in parallel with physical and mental development as an indicator of the general development of the child. A child's acquisition of his mother tongue develops with a very precise regularity, with a number of signs that are characteristic of all children. In order to organize correct correctional-educational work by identifying speech pathology, it is necessary to know the ways of development of children's speech in sequence, the regularities and conditions of this process.

Açar sözlər:

Nitq inkişafının böhran dövürləri, intellektual inkişaf, sosial ünsiyyət, psixi inkişaf, nitq pozulmaları, tipik və atipik uşaqlar.

Keywords:

Crisis periods of speech development, intellectual development, social communication, mental development, speech disorders, typical and atypical children.

A.N.Leontyev uşaqların nitqinin təşəkkülünü dörd mərhələyə bölür:

- Hazırlıq mərhələsi - 1 yaşa qədər;
- Kiçik məktəbəqədər mərhələ - dilin ilk mənimsənilməsi mərhələsi, 3 yaşa qədər;
- Məktəbəqədər mərhələ - 6 yaşa qədər;
- Məktəb dövrü – 6-17 yaş.

Hazırlıq mərhələsi – bu dövrdə uşaqda nitqin mənimsənilməsi üçün hazırlıq gedir. Anadan olduğu andan uşaqda səs reaksiyaları yaranır: çığırtı, ağlama. Bunlar insanın nitq səslərindən çox fərqlənsə də, artukulyasiya aparatının üç şöbəsində müxtəlif incə hərəkətlərin inkişafına köməklik edir.

İlk həftədən sonra uşaqda danışanın səsinə reaksiya hiss edilir: ona müraciət edildikdə ağlamağı dayandırır, qulaq asır. Daha sonra o, danışana tərəf başını çevirir və öz gözləri ilə onu izləyir. Çox keçmədən körpə intonasiyaya reaksiya verir: nazladığda canlanır, acıqlandıqda ağlayır. Təxminən iki aylığında uğuldamağa, 3 aylığında vağ-vuğ etməyə başlayır.

Beş aylığında uşaq səsləri eşidir, ətrafdakıların dodaqlarından artikulyasiya hərəkətlərini görür və yamsılamağa cəhd edir. Hər hansı bir hərəkətin çoxsaylı təkrarı hərəkətin vərdişinin möhkəmlənməsi ilə nəticələnir.

Altı aylığında uşaq yamsılama yoluyla bəzi hecaları tələffüz edir: “ma-ma-ma”, “pa-papa”. Bundan sonra uşaq yamsılama yolu ilə səslənən nitqin bütün elementlərini - səsin tonu, tempi, ritmi, melodiyası intonasiyasını. tədricən mənimsəyir: Körpə ikinci yarım ildə müəyyən səs birləşmələrini qavrayır və onları əşya və hadisələrlə əlaqələndirir. Lakin bu zaman o, hələ də bütün təsir komplekslərinə reaksiya verir: şəraitə, informasiyaya və sözə. Bütün bunlar müvvəqəti əlaqənin yaranmasına, sözləri yadda saxlamağa və onlara reaksiya verməyə kömək edir. 7-9 aylığında uşaq yaşlıların ardınca daha çox səs birləşmələrini təkrarlamağa başlayır. 10-11 aylığında danışanın şəraitindən və informasiyasından asılı olmayaraq uşaqda sözlərə reaksiya yaranır. Bu dövrdə uşağın nitqinin formalaşmasında şəraitin xüsusi əhəmiyyəti vardır (ətrafdakıların düzgün nitqi, yaşlıları yamsılama və s. ).

Kiçik məktəbəqədər dövr - uşaqda ilk sözün yaranmasıyla nitqin hazırlıq mərhələsi tamamlanır və aktiv nitqin təşəkkül mərhələsi başlanır. Bu vaxt uşaqda ətrafdakıların artikulyasiyasına xüsusi diqqət yaranır. O, danışanı həvəslə çoxlu sayda təkrarlayır və özü sözlər tələffüz edir. Bu zaman körpə səsləri qarışdırır, yerlərini dəyişdirir. İlk sözlər uşaqda ümumiləşdirilmiş məna xarakteri daşıyır. O, bir sözlə və ya səs birləşməsi ilə həm əşyanı, həm də arzu və hisslərini bildirir. Məs: “ata” sözü müxtəlif anları bildirə bilər – ata gəldi, ata getdi, ata yoxdur. Uşaq situativ nitqi jestlə, mimika ilə müşayiət edir. Yaş yarımında nitq ümumiləşmiş xarakter daşıyır. Yeni söz ehtiyatı yaranma imkanı qazanır. 2-3 yaş arası uşağın lüğət ehtiyatı əhəmiyyətli dərəcədə artır. lüğət ehtiyatını müxtəlif miqdarda göstərirlər:

- 1 yaş 6 ay – 10-15 söz;
- 2 yaş sonu – 300 söz;
- 3 yaşda – 1000 sözə qədər (il ərzində 700 söz).

3 yaşdan etibarən uşaqda nitqin qrammatik quruluşu formalaşmağa başlayır. Əvvəlcə uşaq öz arzu və xahişini bir sözlə ifadə edir. Sonra əlaqəsiz primitiv cümlələrlə (“ana çay istə”) ifadə edir. Daha sonra tədricən cümlədə sözlər arasında uzlaşma və əlaqə yaranmağa başlayır. 2 yaşda uşaqların praktik olaraq yaşlıların nitqini başa düşməsi tələffüz imkanlarından çox üstün olur. Məktəbəqədər dövr - adətən yanlış səs tələffüzü ilə müşayiət olunur. Fısıltılı, fışıltılı, sonor, cingiltili səslərin defekt tələffüzünü göstərmək olar. 3 yaşın əvvəlində uşaqda nitqin qrammatik quruluşu formalaşmağa başlayır. Əvvəl uşaq arzu və istəyini eyni bir sözlə, sonra primitiv ifadə ilə (ata, appa, mə, dəd-ata mənimlə gəzməyə gedək), sonra isə uzlaşma və idarə əlaqələrinin əlamətləri olan cümlələrlə bildirir. 3 yaşda artıq uşaqlar isimləri tək və cəmdə, felləri isə şəxs, kəmiyyət və zamana görə dəyişmək vərdişlərinə praktik olaraq yiyələnmiş olurlar.

III mərhələdə – məktəbəqədər yaş dövrüdür. Qeyd etmək lazımdır ki, bu mərhələdə uşaqların çox hissəsində düzgün olmayan səs tələffüzü müşahidə edilir. (s, z, Ʒ, j, f, v, c, y) 3 yaşından 7 yaşına qədər olan mərhələdə uşaqlarda öz tələffüzünə eşitmə vasitəsi ilə nəzarət etmək və müəyyən imkan daxilində onu düzəltmək vərdisləri inkişaf edir. Başqa sözlə lüğət tərkibi çox böyük sürətlə zənginləşir. Belə ki, uşağın 4-6 yaşında aktiv lüğət ehtiyatı 3000- 4000 sözə çatır. Sözlərin mənası daha da dəqiqləşir və çox zənginləşir. Uşaqda «nitq duyumu» - nitqlə ünsiyyət təcrübəsi artdıqca söz yaradıcılığı, sintaktik əlaqələrdən istifadə bacarığı nitqi hissetmə formalaşır. 4 yaşında uşaq sadə və mürəkkəb cümlələrdən istifadə edə bilər. 5 yaşında nisbi olaraq tabeiz və tabeli mürəkkəb cümlələrdən istifadə edir. («sonra biz evə getdik, anam bizə qoğal verdi». «Mən anamı çox sevirəm, çünki o, mənim üçün oyuncaq alır»). Bu yaşdan etibarən, uşaqların danışığı qısa hekayətlərə oxşayır. Söhbət zamanı onların suallara cavabı daha çox cümlələrdən ibarətdir. Məhz 5 yaşında nitqin ən ağır növü monoloji nitq formalaşmağa başlayır. Bu mərhələdə fonetik qavrama daha da yaxşılaşır. Uşaq əvvəl sait və samit səsləri, sonra yumşaq və bərk samitləri, ən nəhayət isə sonor, fitli və fısıltılı səsləri diferensiallaşdırmağa başlayır. Məktəbəqədər yaş dövründə tədricən kontekstli (ümumiləşmiş, yayındırılmış, əyani dayaqdan məhrum) nitq formalaşır. Kontekstli nitq əvvəlcə uşağın nağılları, hekayələri nəql etdiyi zaman sonra isə öz həyat təcrübəsində qarşılaşdığı hər hansı bir hadisəni təsvir edəndə meydana çıxır.

IV mərhələ – məktəb dövrüdür. Bu mərhələdə uşaqların nitq inkişafının xüsusiyyətləri digər mərhələlərdən fərqlənir. Məktəb dövründə nitq şüurlu surətdə ona yiyələnmə ilə, səs təhlili qrammatik qanunları mənimsəmə ilə xarakterikdir. Məhz, bu dövrdə nitqin yeni bir növü-yazılı nitq aparıcı rol oynamağa başlayır. Məktəb dövründə uşaq nitqinin məqsədyönlü yenidən qurulması baş verir, yəni səsləri qavramaqdan və fərqləndirmədən təbütün nitq vasitələrindən şüurlu istifadə edilməsi meydana çıxır. Göstərmək lazımdır ki, bütün adları çəkilən mərhələlər arasında ciddi, dəqiq sərhədlər yoxdur. Bu mərhələlər rəvan olaraq biri digərinə keçir. Nitq funksiyası insanın ən mühüm psixi funksiyalarından biridir. Nitq pozğunluqları bu və ya digər dərəcədə uşağın bütün zehni inkişafına mənfi təsir göstərir, onun fəaliyyətinə və davranışına təsir göstərir. Buna görə uşağın nitq inkişafındakı böhran dövrləri izləmək çox vacibdir.

#### İlk böhran dövrü

1-2 yaşında baş verir. Bu mərhələdə nitq inkişafı başlayır və uşaq ünsiyyət ehtiyacını hiss edir. Beynin qabıqaltı danışma sahələrinin(Broka mərkəzi) intensiv inkişafı baş verir . Ən kritik dövr 14-18 aylıq dövrü hesab olunur - bu zaman hər hansı əlverişsiz amillər nitqin inkişafına təsir göstərə bilər.

Mümkün problemlər: nitqin inkişafının gecikməsi, nitqin inkişaf etməməsi.

#### İkinci böhran dövrü

3 yaşından başlayır. Xatırladığınız kimi, bu, ümumiyyətlə, körpə üçün böhranın pik anıdır. Bu zaman rabitəli nitq intensiv inkişaf edir (situasiya nitqindən kontekstli nitqə keçir). Bu dəyişiklik mərkəzi sinir sisteminin çoxlu əlaqələndirilmiş işini (diqqət, yaddaş, nitq motor mexanizmi) tələb edir. Mərkəzi sinir sistemi, neyroendokrin və damar tənzimləməsinin uyğunsuzluğu uşağın davranışının dəyişməsinə və neqativizmin yaranmasına səbəb olur.

Mümkün problemlər: nitqin inkişafının ləngiməsi, kəkələmə, mutizm (spontan və interaktiv nitqin olmaması).

#### Üçüncü böhran dövrü

6-7 yaşda baş verir. Bu mərhələdə yazılı nitqin inkişafı başlayır və nəticədə uşağın mərkəzi sinir sistemi üçün yük artır. Buna görə də "partlama" baş verə bilər.

Mümkün problemlər: kəkələmə.

Bu kritik dövrlərdə uşağın nitq funksiyasındakı hər hansı bir pozğunluq özünü ən güclü şəkildə göstərir, əlavə olaraq yeni nitq pozğunluqları yaranabilir.

Uşağın sosial mühiti, ona verilən şifahi stimulların keyfiyyəti və miqdarı, xüsusən də ananın uşaq ilə ünsiyyəti dilin mənimsənilməsi prosesinə əhəmiyyətli dərəcədə təsir göstərir. Uşaqlar



evində böyüyən, tez-tez baxıcı dəyişən və çox izdihamlı ev mühitində böyüyən uşaqların dil mənimsəməsinin daha yavaş olduğu bildirilir. Digər tərəfdən, müxtəlif sosial mühitlərdə danışılan, oxuyan və böyüyən uşaqların dil mənimsəmə prosesi sürətlənir. Analar körpələrini əmizdirərkən göz təması qurmağa və körpələri ilə danışmağa diqqət etməlidirlər. Körpələri ilə söhbət edən analar bir müddət sonra körpənin müxtəlif səslər çıxararaq cavab verdiyini müşahidə ediblər. Bu, körpənin dil mənimsəməsində mühüm cavabdır. Qidalanma, geyindirmə, uşaq bezlərinin dəyişdirilməsi və s. Gündəlik fəaliyyətlərdə cari fəaliyyətdən danışmaq uşağın söz ehtiyatını artırmağın ən təbii yoludur. Uşağa təbii olaraq baş verən hadisələri şifahi şəkildə izah etmək onların dil inkişafında da təsirli olur. Məsələn: yerə bir şey düşəndə "aaa düşdü" deyib diqqəti cəlb etmək; hava haqqında danışmaq "külək əsir, buludludur"; Birinin ağladığını görəndə "çox kədərli, bədbəxt" kimi hadisələrə şərh vermək uşağın konkret və mücərrəd anlayışlarla bağlı söz ehtiyatını artıracaq. Valideynlər uşaqları ilə danışarkən sadə sözlər və qısa cümlələr işlətməyə diqqət etməlidirlər. Uşaqlar deyə bilmədikləri bəzi sözlərə yeni sözlər düzəldə bilirlər. Belə hallarda valideynin övladının uydurduğu sözü təkrar etməməsi, sözün əslini söyləyərək uşağa doğru model olması vacibdir. Məsələn, iki yaşlı uşaq avtomobil əvəzinə "bip" deyirsə, valideyn: "hə, o bip səsi çıxarır, o bir maşındır" deyərək onu düzgün istiqamətləndirməlidir. Bununla belə, uşağı doğru sözü deməyə məcbur etmək və ya dediklərini qulaqardına vurmaq olmaz. Bəzi uşaqlar eşitdikləri hər şeyi təkrarlamağa çalışır, bəziləri isə valideynin israrlı söylərinə biganə görünə bilər.

Övladları onlara reaksiya verməsə belə, valideynlər ünsiyyəti kəsməməli, uşaqları ilə müxtəlif yollarla ünsiyyət saxlamalıdırlar. "Mənə qulaq asmır, çox maraqsızdır, başa düşmür" kimi şərhlər edərək uşaq ilə ünsiyyətini heç vaxt azaltmamalıdırlar. Bəzi uşaqlar müəyyən müddətdən sonra valideynlərini təqlid etməyə başlayırlar. Uşaq ilə ünsiyyət qurmaq üçün uşaq mahnıları, kuklalar, oyuncaqlar və s. fəaliyyətlərdən istifadə etmək olar. Valideynlərin bilməli olduğu başqa bir şey isə uşağa özünü ifadə etmək imkanı verməkdir. Uşağın jest və mimikalarını, öz uydurduğu sözləri və ya ağlama davranışını şərh edərək onu anlamağa çalışmaq əvəzinə, onun demək istədiyini sözlərlə ifadə etmək üçün model olmaq lazımdır. Uşaq istədiyini ağlamaq və ya işarə ilə əldə edə bilsə, bu üsuldan ünsiyyət vasitəsi kimi istifadə etməyə davam edəcək. Əgər bu davranışları valideynləri tərəfindən görməməzlikdən gəlinə və onun danışdığı sözləri mükafatlandırılarsa, o, nitqdən ünsiyyət vasitəsi kimi istifadə etməyə başlayacaq.

Uşaqların lüğət ehtiyatının zənginləşməsinə təsir göstərən amillərdən biri də oyundur. Əbəs yerə uşaq illərinin qızıl dövrünün oyun olduğunu adlandırmamışlar. Oyun uşaqların həyatında əsas fəaliyyət növüdür. Uşaqlar 6-7 yaşlarından oyuna meyl edirlər. Oyuna uşaqların həyat və fəaliyyətinin forması kimi baxmaq olar. Oyun hər şeydən əvvəl, uşaqların fəaliyyətini, müstəqilliyini təmin etməyə imkan yaradır. Məktəbəqədər yaşlı uşaqlar çox müxtəlif oyunlar oynayırlar. Bu oyunlardan didaktik, hərəkətli yaradıcı, sujetli-rollu musiqili, tikinti, oyun səhnələşdirmə kimi oyunları misal göstərmək olar. Oyun və əyləncələr uşağın arzu və istəkləri ilə üst-üstə düşdüyündən onun dil açması, nəyin isə adını yaşlılardan xəbər alması, nəyi isə öyrənməsi, fikrini başqalarına çatdırmaq məqsədi ilə müvafiq söz tapması üçün əlverişli şərait yaradır. Oyun uşaqların həyatında sadəcə əyləncə deyil, həm də məzmunlu bir prosesdir. Oyunda uşaq həyatı dərk edir, rəngi, formanı, əşyanın xassəsini, fəza münasibətlərini öyrənir, bitkilər, heyvanlar, adamların həyatı, əməyi ilə tanış olur, onlara öz münasibətini bildirir. Böyüklər üçün iş və digər ictimai davranış nədirsə, uşaqlar üçün də oyun odur. Oyun uşaqların lüğət ehtiyatının zənginləşməsində mənbə rolu oynayır.

Uşaq hər bir sözü eşidərkən onun nəyə aid olduğunu müəyyənləşdirməyə çalışır, həmin sözün arxasında hansı əşya və hadisənin olduğunu bilmək istəyir. Əgər uşaqlarda buna meyil olmazsa, tərbiyəçinin özü maraqlanmalı, uşaqlara belə bir vərdişi aşılamalıdır. Əks halda uşaqlar sözləri yerli-yersiz, mexaniki şəkildə işlətməyə adət edər, mənalarını isə başa düşməzlər. Məktəbəqədər müəssisənin kiçik qrupundan başlayaraq nitqin inkişafı, oyun prosesində lüğət ehtiyatının



zənginləşdirilməsi üzrə işin düzgün təşkili bağca yaşlı uşaqların təfəkkürünün inkişafında əvəzsiz rol oynayır. Nitq və təfəkkürün normal inkişafı vəhdət təşkil etməzsə, onları məktəbə hazırlamaq mümkün olmaz.

Lüğət ehtiyatının zənginləşməsi dedikdə kiçik yaşlı uşaqların nitqinə yeni sözlərin daxil olması üzrə yönəldiləcək, sözlərin mənalılarının genişləndirilməsi, praktik şəkildə sinonimlər cərgəsindən istifadə, sözlərin kontekstdə işlədilməsi, fikrin vasitəli ifadə olunmasında sözdən düzgün istifadə edilməsi böyük rol oynayır.

Uşaqlar dünyanı fərqli şəkildə qavrayırlar. Məktəbəqədər yaş dövründə uşağın təfəkkürü sürətlə inkişaf edir və bu səbəbdən uşağın yeni təcrübə qazanması üçün böyüklərin, xüsusən də valideynlərin məqsədyönlü iştirakı tələb olunur. Uşağın necə düşündüyünü bilərək, onu daha yaxşı başa düşə və körpə ilə daha da xoş və məhsuldar ünsiyyət qura bilərsiniz.

### ***Uşaqlarda təfəkkürün inkişaf mərhələləri***

Məktəbəqədər yaş dövründə uşaqlar üçün təfəkkürün üç növü xarakterikdir:

1. **Əyani-əmali təfəkkür** 3 yaşına qədər uşaqlarda üstünlük təşkil edir. Təfəkkürün bu növü ən çox əşyalar üzərində praktik fəaliyyətlə bağlıdır. Uşaq oyuncaqları atır, əşyaları dəliklərə itələyir, əşyaları hissələrə ayırır, düymələri basır və s. Bu yolla uşaqlar təcrübə qazanır və ilk səbəb-nəticə əlaqələrini qururlar (məsələn, top güclü atılırsa, çox uzaqlaşacaq). Bu cür düşüncə tərzinin inkişafı üçün modelləşdirmə dərsləri, müxtəlif materiallar (qum, su, dənli bitkilər və s.) ilə oyunlar uyğun gəlir. Təfəkkürün inkişafının bu mərhələsində valideynlərin əsas vəzifəsi körpənin dünyanı araşdırmasına mane olmamaq, eyni zamanda bunun üçün evdə təhlükəsiz bir şərait yaratmaqdır.
2. **Əyani-obrazlı təfəkkür** 3-4 yaşda nitqin inkişafı ilə əlaqədar olaraq formalaşır. Yaddaşa saxlanılan görüntülər sayəsində uşağa artıq obyektlər üzərində real hərəkətlər etmək lazım deyil. Bu düşüncə növünün inkişafına, xüsusilə rəsm və konstruktor oyuncaqları ilə oynamaq kimi fəaliyyətlər təsir göstərir.
3. **Məntiqi təfəkkür** məktəbə qədər uşaqlarda obrazlı təfəkkür əsasında formalaşmağa başlayır. 5-7 yaşda uşaq bəzi abstrakt anlayışlar (məsələn, həqiqət, zaman və s.) haqqında mülahizə yürüdə bilir. Səbəb-nəticə əlaqələrini qurmaq, mülahizə yürütmək, müqayisə etmək və ümumiləşdirmək qabiliyyəti məntiqi təfəkkürün əlamətləridir. *Uşaqda həm obrazlı, həm də məntiqi təfəkkür ahəngdar şəkildə inkişaf edərsə, onun üçün müxtəlif problemləri həll etmək daha asan olar.*

Uşağın təfəkkürünün inkişafı təcrübədən asılıdır. Buna görə uşağa dünyanı mümkün qədər geniş görmək, düşüncə qabiliyyətini məşq etdirmək imkanı vermək çox vacibdir. Təfəkkürü inkişaf etdirən məşğələlər oyun şəklində olduqda, əyləncəli və cəlbədicə ola bilər. Maraqlı və əyləncəli olması üçün uşağınızı hər dəfə yeni oyunlar və məşqlər ilə tanış etməyə çalışın.

PNİL olan bir uşaqda hər yaşda tüpürcək ifrazatının artması müşahidə olunur, həmişə ağzı açıq qalır. Belə uşaqlar hiperaktivlik, artan aqressivlik, diqqətsizlik, yorğunluq, zəif yaddaş ilə xarakterizə olunur. Uşaq çox ləng düşünür, inkişaf etməmiş bir təsəvvürə və dar bir emosional təzahürə malikdir, həmyaşıdları ilə ünsiyyətdə böyük çətinliklər yaşayır və buna görə də onlardan çəkinir. Fiziki olaraq, belə uşaqlar da zəif inkişaf etmiş olurlar, hətta serebral iflic də ola bilərlər.

Ümumiyyətlə, uşağın danışma çətinliyi nə qədər uzunmüddətli olarsa, psixi və əqli inkişafı bir o qədər gecikər. Çünki uşaqlar böyüdükcə, başqaları ilə dialoqlarda deyilənlərdən daha çox məlumat əldə edirlər. Bu, PNİL müalicəsini mümkün qədər erkən başlamaq üçün başqa bir səbəbdir.

Nitq inkişafının pozulması ümumi inkişafa təsir göstərir, uşağa onun həmyaşıdları ilə tam ünsiyyət qurmasına və oynamasına icazə vermir; ətrafdakı dünyanı dərk etməyi çətinləşdirir və uşağın emosional və psixi vəziyyətini ağırlaşdırır. Xüsusilə nitqin inkişafının mənfi cəhətləri onun ağır formaları tez-tez uşaqlarda şəxsi problemlərə səbəb olur: onların ünsiyyət imkanlarını azaldır, formalaşmasının qarşısını alır adekvat heysiyyət, zehni inkişafı gecikdirmək, bilik bacarıq və vərdislərin formalaşmasında ləngimə və beləliklə, vaxtında uşaqların sosiallaşmasına mane olur.

Nitq pozğunluqları ilə psixi inkişafın digər aspektləri arasında əlaqə ikinci dərəcəli qüsurların yaranmasına səbəb olur. Beləliklə uşaq zehni əməliyyatların formalaşması üçün ilkin təbii şərtlərə

sahib olsa da nitq pozğunluqları şifahi-məntiqi inkişafdan geri sala bilər düşüncə, zehni əməliyyatları mənimsəməkdə çətinlik törədir. Nitqin inkişafında olan qüsurlar uşağın intellektual inkişafına duyğu və iradə sferasının eləcə də yaddaşın inkişafına mənfi təsir göstərir. Ana dilinin lüğət və qrammatik quruluşunu mənimsəməklə bağlı olan çətinliklər, ardıcıl nitqin inkişafını, onun vaxtında keçidini ləngidir dialoq formasından kontekstli formaya keçidi yavaşdır. Qüsurlu nitq bacarıqlarının nitqin əsas funksiyalarının formalaşmasını çətinləşdirir - kommunikativ, koqnitiv, ümumiləşdirici, nizamlayıcı funksiyalarını.

Atipik inkişafı öyrənmək üçün klinik simptomların əsasında duran normal psixi fəaliyyətin pozulma mexanizmlərini öyrənmək lazımdır. Atipik inkişafın əlamətləri bir növ defekt dairəsindən çox fərqlənir. Tipik və atipik uşaqların Atipik inkişafın psixoloji səciyyəsi psixofiziki inkişafının qanunları eynidir və buna əsaslanaraq, demək olar ki, hər pozulma inkişafın gedişini anomal edərək kökündən dəyişir. Bu dəyişikliklər uşağın yaşından və psixi funksiyanın bu yaşda inkişaf etməsi səviyyəsindən asılı olaraq müxtəlif olur. Anomal inkişafın strukturuna həm də sosial amillər, yəni tərbiyə təlim və korreksiya şəraiti təsir göstərir. İ.P.Pavlovun "Heç bir şey hərəkətsiz, sərt qalmır, hər şey yaxşıya doğru dəyişə bilər, təkcə lazımı şərtlər yardırsa" sözlərinə əsaslanaraq belə nəticəyə gəlmək olar: əgər tərbiyə və korreksiya işi düzgün qurularsa, hər uşaqda anomaliyanın azalması və stabilləşməsi üçün kompensator və potensial imkanlar var. Psixi inkişafın əsas və mühüm əlaməti psixi funksiyaların təkamülə yox həm də keyfiyyətə qarşılaşmalı və qarşıtəsiri dəyişməsidir. Zəif inkişaf etmiş və ya tam inkişafdan qalmış funksiya o biri psixi funksiyaların geridə qalmasının səbəbi olur. Məsələn, məlumdur ki, eşitmə pozulmuş uşağın ünsiyyət yaratmaq imkanları məhdud olduğundan, onda şifahi nitqin inkişafı kobud pozulur. Əgər eşitmə erkən yaşlarında və ya sonradan xeyli pozulubsa, onda ətrafdakıların nitqini təqlid etmək imkanı yox dərəcəsində olur. Nitq inkişafının pozulması uşaq psixikasının ümumi inkişafının gedişinə təsir edir. Erkən yaşından eşitməyən uşaq özü danışmağa başlamayacaq. Ancaq xüsusi təlim zamanı, sağlam hiss üzvlərindən gələn informasiyanı mənimsəyərək, uşaq danışmağa başlaya bilər. Psixi inkişaf nəzəriyyəsinin müəllifi L.S.Viqotski yazır ki, "əsas psixi funksiyalara (mürəkkəb qavrama, fəal yaddaş, iradə yaddaş, məntiqi təfəkkür) inkişaf zamanı özünü biruzə verən daxili xassə və qabiliyyət kimi baxmaq olmaz. Bu mürəkkəb proseslər böyüklərlə ünsiyyətin və mühitin təsiri altında əmələ gəlib, inkişaf edir və mükəmməlləşir. Atipik inkişafda bu proseslərin gedişi prinsipi və proseslərin yaşa aidiyyəti, normada olduğu kimi, eyni qanunlara tabe olur. Atipik inkişafın xüsusiyyəti psixi inkişafın tempinin pozulmasında və bununla əlaqədar yaş dövrləşməsinin dəyişməsidir. Bəzən inkişaf müəyyən istiqamətdə pozularaq psixi fəaliyyətin o biri sahələrində inkişafın gözə çarpan dərəcədə ləngiməsinə gətirib çıxarır. Tipik uşaqda intellektual törəmələr tədricən psixi inkişaf zamanı əmələ gəlir. Atipik uşaqlarda isə hər qeyri-normal proses və ya funksional pozulma şəxsiyyətin bütövlükdə, müntəzəm və arasıkəsilməz psixi inkişafın üzərinə gedərək, öz təsirini göstərir. Məlumdur ki, normal ontogenezdə psixi fəaliyyəti beyin mexanizmlərinin formalaşmasında müəyyən ardıcılıq mövcuddur. Beyin analizator sistemlərinin inkişafını qabaqlayır. Tənzimləyici sistemlərin disfunksiyası bütün psixi inkişafa neqativ təsir göstərir. Xüsusi pozulma isə lokal xarakter daşıyır, çox vaxt salamat qalmış tənzimləyici və digər xüsusi sistemlərin köməyi ilə kompensasiya olunur.

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УДК 159.9

# Зависимость самооценки личности от познавательных мотивов

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## *Аннотация.*

Большой интерес к самооценке в психологической литературе вызван изменениями в концепции психологии обучения. Формирование навыков самооценки у студентов – очень сложный процесс. Однако если этот механизм, применяемый от простого к сложному, выполнять поэтапно, то можно достичь поставленной цели. Реальность такова, что самооценка используется редко. В ряде случаев ее объективность подвергается сомнению, поскольку большинство людей неправильно понимают суть самооценки, склонны переоценивать примеры вопросов и заданий, данных для этой цели. Для успешного проведения самооценки психолог должен обладать достаточными знаниями о данном методе оценивания, знать его средства, виды, а также требования к его организации. Его следует рассматривать как неотъемлемую часть тренировочного процесса и проводить плановым и систематическим образом. Для того чтобы учителя, психологи и педагоги имели глубокие знания по самооценке, необходимо подготовить методические рекомендации, а также отвести большое место особенно в методических материалах, которые являются важной составляющей комплекта учебников. В то же время учащиеся должны быть приучены к самооценке, и она должна стать важным компонентом процесса обучения.

**Ключевые слова:** самооценка, познание, познавательные мотивы, процесс обучения, психологический анализ

## *Annotation.*

The great interest in self-assessment in psychological literature is caused by changes in the concept of learning psychology. Formation of self-assessment skills in students is a very complex process. However, if this mechanism, applied from simple to complex, is carried out step by step, then the set goal can be achieved. The reality is that self-assessment is rarely used. In some cases, its objectivity is questioned, since most people misunderstand the essence of self-assessment, tend to overestimate examples of questions and tasks given for this purpose. To successfully conduct self-assessment, a psychologist must have sufficient knowledge of this assessment method, know its means, types, and requirements for its organization. It should be considered an integral part of the training process and carried out in a planned and systematic manner. In order for teachers, psychologists and educators to have deep knowledge of self-assessment, it is necessary to prepare methodological recommendations, and also devote a large place especially in methodological materials, which are an important component of a set of textbooks. At the same time, students should be accustomed to self-assessment, and it should become an important component of the learning process.

**Key words:** self-esteem, cognition, cognitive motives, learning process, psychological analysis

Когнитивный контроль описывает набор механизмов, которые направляют поведение к цели [4]. Успешное выполнение когнитивного контроля необходимо для эффективного обучения, обработки информации, решения проблем и академических достижений [11]. Структура ожидаемой ценности контроля предполагает, что контроль несет в себе неотъемлемую стоимость, которая сопоставляется с потенциальными выгодами от его расходования [10, с.219]. Важно отметить, что мотивация играет роль в этом анализе затрат и выгод и может выступать в качестве фактора, компенсирующего стоимость расходов на контроль. Сама по себе мотивация является сложной концепцией и может зависеть от дополнительных факторов, таких как самооценка. Как и мотивация, самооценка так же, как было определено, тесно связана с академическими достижениями и успехами [6, с.24]. Таким образом, крайне важно исследовать эти аффективные факторы более подробно, чтобы лучше понять, каким образом эти факторы приводят к успеху и положительным результатам у студентов. Настоящее исследование изучает природу взаимосвязи мотивации академических достижений и самооценки с когнитивным контролем, используя задачу обновления рабочей памяти.

Когнитивный контроль уже давно находится в центре когнитивных и нейробиологических исследований. Когнитивный контроль относится к направляющим механизмам, которые распределяют когнитивные ресурсы и направляют поведение к цели. В частности, исследователей интересовали механизмы, лежащие в основе целенаправленного поведения, а также то, какие факторы могут способствовать различиям, обнаруженным среди людей [8, 9]. Исследования, связанные с этими двумя областями, привели к выводу, что на контроль влияет мотивация. Мотивация определяет направление и интенсивность познавательной деятельности.

В частности, направление и интенсивность относятся к распределению ресурсов, подходящих для конкретной задачи, и к интенсивности, с которой задача выполняется. Другими словами, использование контроля обусловлено желаемым индивидом вознаграждением или результатами или стремлением избежать отрицательного вознаграждения или результата; эти награды определяют, как распределяются когнитивные ресурсы. Было обнаружено, что как когнитивный контроль, так и мотивация предсказывают академические и профессиональные результаты [10, 11]. Кроме того, было обнаружено, что аффективные факторы, такие как самооценка, связаны с мотивацией, помимо академического и профессионального успеха [2, 6]. Таким образом, эти аффективные факторы также могут способствовать успешному осуществлению когнитивного контроля.

Самооценка варьируется у разных людей: некоторые люди демонстрируют положительный взгляд на себя (высокая самооценка), в то время как другие люди могут демонстрировать негативные или неопределенные взгляды на себя (низкая самооценка). Эти взгляды на себя зарождаются в раннем детстве и последовательно развиваются и регулируются на протяжении всей жизни, следуя определенным закономерностям с возрастом. В частности, самооценка имеет тенденцию быть выше в детстве и падать в подростковом возрасте. С этого момента самооценка имеет тенденцию повышаться на протяжении всей взрослой жизни, достигая пика около 60 лет. Затем она имеет тенденцию к снижению в старшем возрасте [8, с.638].

Эти возрастные изменения объясняют жизненными достижениями. Более конкретно, люди начинают понимать себя в подростковом возрасте, одновременно сталкиваясь с изменениями в своей физической, психической и социальной идентичности; например, изменение тела в период полового созревания и более сложная академическая работа

способствуют этому снижению в подростковом возрасте [1, с.102]. С возрастом люди с большей вероятностью будут иметь более сложные взаимоотношения и удовлетворенность работой, а также более стабильную заработную плату и более высокие должности, что способствует повышению самооценки на протяжении всей взрослой жизни. Хотя и были обнаружены возрастные тенденции, обычно общая самооценка или глобальная самооценка остается достаточно постоянной на протяжении всей жизни [6, с.24]. Однако непосредственная и зависящая от контекста самооценка имеет тенденцию колебаться.

Самооценка играет важную роль в развитии личности и распространении информации о себе в окружающей среде. Кроме того, самооценка может играть защитную функцию от угроз, включая отвержение и неудачу. В частности, высокая самооценка обеспечивает устойчивость после негативного и стрессового опыта, тогда как низкая самооценка может повышать восприимчивость к воздействию стресса [3]. Учитывая ее защитную функцию, неудивительно, что было показано, что самооценка связана с различными жизненными результатами, такими как самооценка счастья, удовлетворенность жизнью, психопатология, физическое здоровье, межличностные отношения и академические результаты [5, 6].

Также было обнаружено, что самооценка связана с академическими результатами. Защитная функция самооценки может особенно помочь нам понять, почему мы видим эту связь, и насколько самооценка важна в областях обучения и образования. Люди с более высокой самооценкой могут прилагать больше усилий и упорствовать, несмотря на случайные неудачи, по сравнению с людьми с более низкой самооценкой [6, с.21]. Однако, хотя связь между самооценкой и академическими достижениями хорошо известна, исследования неоднозначны относительно того, способствует ли самооценка академическим достижениям или это просто следствие прошлого опыта академических достижений [2, с.42]. Исследования подтвердили идею о том, что самооценка действительно способствует академическим достижениям. Было показано, что программы, направленные на повышение академической самооценки, приводят к улучшению общей успеваемости и оценок. Это показывает, что улучшение убеждений относительно своих способностей в дополнение к продвижению навыков и стратегий способствует лучшим результатам [5].

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# The role and importance of age factor in second language acquisition

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In modern conditions, the issues of studying English are becoming more and more important. This language is international, acts as the leading means of intercultural and interlingual communication, serves as a means of constructing global identity and is the most studied foreign language in the world. It is not surprising that in such conditions, English as a discipline is mandatory for study both at school, college, and university. Meanwhile, it has been repeatedly noted that many study English, but only a few really speak it well. Despite the fact that the importance of good language training in modern conditions is recognized by everyone, a person with a non-linguistic education who speaks English well is not a very common phenomenon in our country.

Nowadays, linguodidactics is actively searching for effective methods of mastering the English language. Moreover, the concept of "effective way" includes the concept of "fast way", since the accelerating pace of life in the 21st century does not allow a person to systematically study English for several years, counting on a possible result, which in the future may not be. A modern person needs a result immediately, already on the go. By a result on the go is meant, of course, not fluency, but at least the ability to express oneself on everyday topics in the simplest situations of social interaction in English. The same didactic methods and techniques can be effective in one situation and ineffective in another condition.

Experimental studies and analysis of scientific literature indicate that teaching foreign languages to students largely depends on the age-related characteristics of mental development.

Linguists quite rightly note that only teaching based on neural connections can help to retain what has been learned for a long time, that teaching a language presupposes the presence and further development of the psychological and mental abilities of students. They pay attention to the study of the individual characteristics of students in order to develop their inherent abilities in various aspects of the language, since knowing the characteristics of each of them more deeply makes it easier to achieve better results. In their opinion, at a certain stage, students should even be grouped according to their individual characteristics in order to implement a differentiated approach to teaching.

The theoretical position of L.S. Vygotsky on actual development and the zone of proximal development is true in relation to any stage of human mental development and provides an installation for relatively unlimited possibilities of mental development (Chernomorova, 2011).

The psychological content of adolescence is associated with the development of self-awareness, solving problems of professional self-determination and entering adulthood. In early adolescence, cognitive and professional interests, the need for work, the ability to make life plans, social activity are formed, the independence of the individual, the choice of life path are established. During this period of life, a person is most efficient, withstands the greatest physical and mental stress, is most capable of mastering complex methods of intellectual activity. All the knowledge, skills and abilities necessary for the chosen profession are most easily acquired, competencies are formed. The required special personal and functional qualities are developed



(organizational skills, initiative, courage, resourcefulness, necessary in a number of professions, precision and accuracy, quick reactions, etc.)

The age of 18–20 is the period of the most active development of moral and aesthetic feelings, the formation and stabilization of character. At this age, it is especially important to master the full range of social roles of an adult: civil, professional and labor, etc. This period is associated with the beginning of "economic activity", by which demographers understand the inclusion of a person in independent production activities, the beginning of a work biography and the creation of one's own family. The transformation of motivation, the entire system of value orientations, on the one hand, the intensive formation of special abilities in connection with professionalization - on the other, distinguish this age as the central period of character and intellect formation (Miller et.al.1999). This is the time of sports records, the beginning of artistic, technical and scientific achievements. Student age is also characterized by the fact that during this period, the optimum development of intellectual and physical strength is achieved. But "scissors" often appear between these capabilities and their actual implementation. The time of study at a university coincides with the second period of youth or the first period of maturity, which is distinguished by the complexity of the formation of personality traits. A characteristic feature of moral development at this age is the strengthening of conscious motives of behavior. Those qualities that were not fully present in senior classes are noticeably strengthened - purposefulness, determination, persistence, independence, initiative, self-control. Interest in moral problems (goals, lifestyle, duty, love, loyalty, etc.) increases (Ozfidan, 2019).

At the same time, developmental psychology and physiology experts note that a person's ability to consciously regulate their behavior at the age of 17–19 is not fully developed. Unmotivated risk and the inability to foresee the consequences of their actions, which may not always be based on worthy motives, are not uncommon. Thus, the author notes that 19–20 years is the age of selfless sacrifices and complete dedication, but also of frequent negative manifestations.

The formation and functioning of mental processes at the age of 17 to 22 largely depends on how the contradiction between the level of educational activity that has developed and consolidated in young people during their studies in high school and the requirements of educational activity at the university is overcome. If this contradiction is resolved taking into account the patterns of development of mental activity, then students cope with the requirements that are presented to them. Perception at student age is manifested mainly in its arbitrary form - in the form of observation, entirely subordinated to the tasks of educational activity. Mental activity is characterized by a high level of generalization and abstraction, the ability to argue, prove the truth or falsity of individual provisions, and link them into a system. The mental activity of a student performs a new, personal function. The formation of theoretical thinking leads to the fact that it begins to mediate the attitude of a young person to the world. It is due to this that a worldview is formed. The features of memory and attention at this age are associated with a general tendency towards purposefulness, arbitrariness and self-regulation of all mental activity. An essential feature is the greater selectivity and differentiation of both attention and memory, their determinacy by the goals, tasks, interests and attitudes of the personality of young people (Stefansson, 2013).

With age, figurative meaningful memorization also begins to play a greater role. However, not only an increase, but also a decrease or decline in individual properties is detected. Thus, with age, the difference in memorization of visual and verbal material decreases; an inverse relationship is observed in the development of figurative voluntary and figurative involuntary memorization. While the productivity of figurative voluntary memorization increases with age, figurative involuntary memorization tends to decrease. An extremely important factor that determines the development of positive individual characteristics of memory in speech activity is

an increase in the significance of memorization, an increase in its subjectively assessed importance.

In the practice of forming types of speech activity in a foreign language, it is necessary to follow the principle of active operation with the educational material subject to memorization. Moreover, if involuntary memorization is carried out under the influence of new, bright, emotionally significant factors and without a goal set in advance for students, then in the educational process it is useful to provide such conditions that would facilitate the use of this type of memorization. In this case, it is necessary to take into account the relationship between voluntary and involuntary memorization of speech material (Gömleksiz, 2001). Thus, from the above it follows that close attention is required to the problem of taking into account both age and individual psychological characteristics of students, and teaching students a foreign language largely depends on the age characteristics of mental development. To sum up, it can be mentioned that linguistic abilities are closely interconnected with intellectual abilities and age characteristics of an individual.

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# Влияние уровня самопринятия на психологическое благополучие подростков: анализ феноменов

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## Аннотация

В данной статье рассматривается влияние уровня самопринятия на психологическое благополучие подростков через призму соотношения «Я-реального» и «Я-идеального». Подростковый возраст является критическим этапом формирования идентичности, в ходе которого несоответствие между реальным и желаемым образом себя может становиться источником внутреннего конфликта, приводящего к снижению самооценки, повышенной тревожности и ухудшению психологического благополучия. В исследовании также уделяется внимание роли телесного «Я» в процессе самопринятия, поскольку физические изменения в подростковом возрасте могут усиливать несоответствие между реальным и идеальным образом себя, что, в свою очередь, влияет на уровень психологического благополучия.

**Ключевые слова:** психологическое благополучие, самопринятие, подростки, Я-реальное, Я-идеальное, Телесное Я

## Введение

Современные исследования в области психологии личности и возрастной психологии подчеркивают, что подростковый возраст является критическим этапом становления идентичности, формирования Я-концепции и самоотношения. В этот период происходит активное развитие рефлексивного мышления, рост осознания собственной индивидуальности и поиск путей интеграции в социум. Одним из ключевых факторов, влияющих на успешную адаптацию подростка и его психологическое благополучие, является уровень самопринятия, который обеспечивает целостность личности, способствует эмоциональной устойчивости и позитивному самоотношению. [1]

Актуальность исследования обусловлена тем, что подростковый возраст сопровождается множеством физиологических и психологических изменений, которые могут оказывать существенное влияние на психологическое благополучие подростков. Психологическое благополучие подростков имеет долгосрочные последствия для их жизни в качестве взрослых. Понимание, как формируется и влияет на психическое благополучие самопринятие подростков, является ключевым аспектом исследования в данной области. Данные исследования могут способствовать укреплению психологического благополучия подростков, повышению уровня их самопринятия и поддержания их позитивной Я-концепции.

Научные исследования в области психологического благополучия подростков (К. Рифф, Д. А. Леонтьев, Е. Diener) указывают на то, что самопринятие является ключевым компонентом внутренней гармонии личности. Оно формирует базу для успешной социализации, помогает подростку снижать уровень внутреннего напряжения и адаптироваться к внешним изменениям. В то же время в отечественной и зарубежной литературе недостаточно внимания уделяется анализу связи между самопринятием и

психологическим благополучием подростков, что требует более детального эмпирического изучения. Статья фокусируется на рассмотрении принятия себя с точки зрения Я-концепции – разницы в образе Я-реального и Я-идеального подростков, восприятия образа собственного тела и самоотношения. Внимание также обращено на влияние данных составляющих на состояние их психологического благополучия с учетом возрастных особенностей. [2, 3, 4]

Цель данного исследования заключается в выявлении и изучении самопринятия через призму трех составляющих для дальнейшего установления связей с психологическим благополучием подростка. Для достижения данной цели были поставлены следующие задачи:

1. Провести анализ теоретических подходов к изучению феноменов самопринятия и психологического благополучия, а также их возможной взаимосвязи в подростковом возрасте.
2. Провести экспериментальное исследование для определения различий в выраженности уровня психологического благополучия у подростков с низким и с высоким уровнем принятия себя.
3. Определить уровень влияния самоотношения на психологическое благополучие подростка.
4. Выявить связь Я-концепции и психологического благополучия подростков.
5. Исследовать взаимосвязь оценки образа собственного тела и психологического благополучия у подростков.

Объектом исследования выступает психологическое благополучие подростков, в свою очередь, предметом исследования – влияние самопринятия на уровень психологического благополучия подростков.

### **Литературный обзор**

В основу настоящей статьи легли зарубежные исследования психологического благополучия (N.M. Bradburn, K. Рифф, E. Diener, J. Czapinski); исследования психологического благополучия в подходах отечественных психологов (Малышева Н.Г., Шаехов З.Д., Ширяева О.С., Е.Н. Панина); концепции самопринятия в зарубежной литературе (М. Розенберг, Г. Айзенк); отечественные исследования самопринятия (И. Кон, В.В. Столин и С.Р. Пантелеев); анализ психологического содержания подросткового возраста и особенностей его развития (С. Холл, Э. Шпрангер, В. Штерн, Л.С. Выготский, Д.Б. Эльконин, Л.И. Божович). [2, 3, 5, 6, 7, 8]

### **Основные положения**

Для анализа феномена психологического благополучия важно дифференцировать такие понятия, как субъективное благополучие и психологическое благополучие. На настоящем этапе разработки проблемы «благополучия» четкая дифференциация как этих терминов, так и других схожих понятий: удовлетворенность жизнью, качество жизни, счастье, личностное благополучие и т.д. – отсутствует. Вопрос о разграничении данных категорий вызвал формирование трех подходов к их интерпретации.

— Субъективное благополучие определяют, как интегральный, более широкий показатель, который включает в себя в том числе и психологическое благополучие (Л. В. Куликов, E. Diener). [3, 9]

— Психологическое благополучие охватывает более широкий спектр аспектов, как объективные, так и субъективные (К. Рифф, Д. А. Леонтьев). [2, 4]

— Также существует мнение о синонимичности двух понятий (Е.Н. Панина, Т. Kashdan, R. Biswas-Diener, L. King. [10, 11]

В рамках данной статьи принимается позиция, согласно которой субъективное благополучие рассматривается как составляющая более широкой категории – психологического благополучия. Данный подход базируется на эвдемонической традиции, предполагающей, что субъективные аспекты благополучия (удовлетворенность жизнью, эмоциональный баланс) являются необходимым, но недостаточным условием полноценного позитивного функционирования личности. Теории эвдемоники, включая идеи А. Маслоу и К. Роджерса, рассматривают психологическое благополучие через призму личностного роста, самоактуализации и достижения жизненных целей. [1, 11, 12, 13]

Помимо субъективного можно также выделить социальное благополучие, которое также входит в состав психологического благополучия. К нему относятся позитивные отношения с окружающими, чувство принадлежности к социальной группе, способность доверять и сотрудничать с другими людьми. К. Рифф в своей модели рассматривает это как один из ключевых компонентов, подчеркивая, что успешное позитивное функционирование личности невозможно без социальной интеграции. [1, 14]

В свою очередь самопринятие рассматривается, как способность человека принимать себя таким, какой он есть, со всеми объективно значимыми достоинствами и недостатками. Оно проявляется в позитивном эмоционально-ценностном отношении к себе, и в осознании ценности своей личности и внутреннего мира. [15]

Самопринятие является компонентом самоуважения. В состав самоуважения также входит самоотношение, которое строится на основе совокупности отдельных самооценок. Самооценка является широким понятием и основывается на когнитивной оценке себя в различных аспектах и зависит от внешних факторов, таких как достижения, сравнение с другими и социальные стандарты. В отличие от самооценки самопринятие ориентировано на безусловное принятие себя, независимо от успехов, недостатков или социального одобрения. Самопринятие предполагает признание собственной ценности и уникальности. Самооценка – ситуативна и может меняться в зависимости от контекста. [7]

Самопринятие является важным условием для достижения психологического благополучия. Оно способствует:

- Ощущению целостности и гармонии.
- Способности быть спонтанным, естественным и аутентичным. Принятие себя позволяет человеку опираться на внутренние ценности, а не подстраиваться под внешние ожидания.
- Умению выстраивать межличностные отношения. Люди, принимающие себя, легче устанавливают доверительные и искренние отношения с другими, что улучшает качество их социальной жизни. [16]

Многие авторы указывали на наличие связи между самопринятием и психологическим благополучием. К. Рифф выделила самопринятие как один из шести ключевых компонентов психологического благополучия в своей модели. В своих трудах Д. А. Леонтьев подчеркивает, что самопринятие является частью самоотношения и тесно связано с психологическим благополучием, поскольку формирует основу для внутренней гармонии и самореализации. Э. Дисси и Р. Райан в рамках теории самодетерминации (Self-Determination Theory) упоминают, что самопринятие и внутреннее согласие с собой играют важную роль в поддержании психологического благополучия. Эрикссон подчеркивал значение принятия себя как основу здорового развития личности и формирования идентичности, что тесно связано с ощущением благополучия. [17]

В рамках настоящей статьи особое внимание будет уделено концепции К. Роджерса. Роджерс разработал интегративную модель Я-концепции, где центральное место занимают такие категории, как «Я-реальное», то есть то, каким человек считает себя сейчас; и «Я-идеальное» - то, каким человек хочет быть. Расхождение между этими двумя аспектами

приводит к состоянию внутреннего конфликта, снижающему психологическое благополучие. Гармония достигается при уменьшении разрыва между «Я-реальным» и «Я-идеальным», что возможно через процесс самопринятия. [18]

Теория Роджерса заложила основы гуманистического подхода, который рассматривает личность как динамичную, целостную систему. Она акцентирует внимание на процессах самоактуализации, где самопринятие выступает ключевым условием достижения внутренней гармонии и благополучия. Это делает концепцию особенно релевантной для анализа механизмов самопринятия и психологического благополучия.

Подростковый возраст является критическим этапом развития личности, связанный с интенсивными изменениями в физической, эмоциональной и социальной сферах. В этот период формируются ключевые аспекты самосознания, включая Я-концепцию.

Подростки переживают интенсивные изменения, что делает их особенно уязвимыми к самооценке и восприятию себя. Часто возникает конфликт между тем, какими они себя видят (Я-реальное), и тем, какими хотят быть (Я-идеальное). Развитие самопринятия осложняется сравнением себя с другими, особенно в социальных сетях, что может усилить чувство несоответствия. [15, 19]

В подростковом возрасте психологическое благополучие тесно связано с их ощущением социальной значимости, автономии и самоэффективности. Подростки стремятся к установлению идентичности, что требует баланса между социальными ожиданиями и собственными стремлениями. [20]

В подростковом возрасте Я-концепция становится более дифференцированной и связанной с социальной идентичностью. Особое значение также начинает отводиться телесному-Я. Телесное-Я представляет собой компонент самосознания, связанный с восприятием, осознанием и оценкой собственного тела. В подростковом возрасте, когда происходят значительные физические изменения, этот аспект становится особенно значимым. Подростки уделяют внимание своему телу, сравнивают себя с другими и часто формируют мнение о себе на основе физической внешности. [21]

Принятие подростком своего тела способствует формированию устойчивой самооценки; укрепляет уверенность в себе и позитивное отношение к себе. Позитивное отношение к своему телу позволяет подросткам успешно адаптироваться в социальной среде, устанавливать близкие отношения и выражать себя через внешний облик. Непринятие в свою очередь может вызывать высокий уровень тревоги, недовольство собой, развитие различных расстройств, а также снижает удовлетворенность жизнью и ухудшает социальные взаимодействия. [22]

### **Заключение**

На основе мета-анализа литературных источников по теме можно сделать выводы, что самопринятие играет ключевую роль в формировании психологического благополучия подростков. Подростковый возраст, характеризующийся поиском идентичности и активным процессом самоопределения, требует формирования гармоничного самоотношения, в основе которого лежит принятие себя. Самопринятие играет решающую роль в формировании психологического благополучия подростков и напрямую связано с соотношением «Я-реального» и «Я-идеального», оценкой собственного тела и самоотношением.

Самоотношение, являясь центральной категорией в структуре личности, охватывает все аспекты восприятия себя, включая когнитивные, эмоциональные и поведенческие компоненты. Согласно модели В.В. Столина и С.Р. Пантелеева, самоотношение представляет собой систему взаимосвязанных элементов, таких как самоуважение, самопринятие, а также уровень удовлетворенности собой. В данном исследовании самопринятие рассматривается



как неотъемлемая часть самоотношения, поскольку именно через формирование устойчивого и позитивного самоотношения подросток может достигнуть гармонии и целостности. Высокий уровень самоотношения, характеризующийся позитивным самовосприятием, способствует развитию психологического благополучия, снижает уровень тревожности и повышает адаптационные возможности личности. Напротив, деструктивные формы самоотношения, сопровождающиеся низким уровнем самопринятия, могут провоцировать внутренние конфликты, эмоциональную нестабильность и сложности в социальной адаптации. Таким образом, работа с самоотношением подростков, направленная на укрепление позитивного восприятия себя, является важным направлением в профилактике психологических проблем и формировании устойчивого психологического благополучия.

Выявлено, что степень принятия подростком своего реального образа напрямую определяет уровень его эмоциональной стабильности, самооценки и социальной адаптации. Результаты анализа показали, что самопринятие оказывает непосредственное влияние на субъективное ощущение благополучия, успешную социализацию и личностное развитие подростков. Разрыв между «Я-реальным» и «Я-идеальным» выступает значимым предиктором психологического благополучия подростков. Чем больше этот разрыв, тем выше уровень внутреннего напряжения, тревожности и неудовлетворенности собой. Подростки с выраженным несоответствием между реальным и идеальным образом чаще сталкиваются с трудностями в социальной адаптации, демонстрируют низкую самооценку и эмоциональную нестабильность. Напротив, подростки с высоким уровнем самопринятия, у которых наблюдается баланс между тем, кем они являются и кем хотят быть, демонстрируют более высокий уровень психологического благополучия, характеризующийся эмоциональной устойчивостью, уверенностью в себе и способностью эффективно выстраивать межличностные отношения.

Особое значение в подростковом возрасте имеет принятие телесного «Я». В условиях интенсивных физиологических изменений, связанных с пубертатным периодом, разрыв между реальным и идеальным образом тела может стать источником значительного психологического дискомфорта. Непринятие собственного телесного образа увеличивает риск снижения психологического благополучия подростков. Напротив, позитивное телесное самопринятие способствует повышению уровня удовлетворенности собой, укреплению самооценки и общего благополучия.

Полученные результаты подтверждают актуальность концепции К. Роджерса, согласно которой гармония между «Я-реальным» и «Я-идеальным» является основой внутренней целостности и эмоционального благополучия личности. В этом контексте снижение разрыва между этими аспектами через развитие самопринятия может рассматриваться как эффективный инструмент повышения психологического благополучия подростков.

Для дальнейшего экспериментального изучения темы самопринятия и его влияние на психологическое благополучие подростков на данный момент проводится практическое исследование. Выборкой для него стали ученики 8-11 классов общеобразовательной школы. У учащихся проводится опрос, состоящий из 4-х методик: Методика Исследования Я-концепции С. А. Будасси; Тест-опросник самоотношения В.В. Столина и С.Р. Пантелеева; Опросник образа собственного тела. (О.А. Скугаревский и С.В. Сивуха); Шкала проявлений психологического благополучия подростков (ППБП). Моросанова В.И., Бондаренко И.Н., Фомина Т.Г. Полученные результаты будут подвергаться анализу и статистической обработке для выявления взаимосвязей.

Практическая значимость данного исследования заключается в разработке рекомендаций для психологов, педагогов и родителей, направленных на снижение



внутреннего конфликта между «Я-реальным» и «Я-идеальным» у подростков. Важную роль в этом процессе играют программы, способствующие развитию позитивного самоотношения, осознанию личных ценностей и возможностей, а также формированию критического отношения к социальным стандартам и внешним ожиданиям.

Таким образом, самопринятие, рассматриваемое через призму баланса между «Я-реальным» и «Я-идеальным», является одним из ключевых факторов психологического благополучия подростков. Дальнейшие исследования могут быть направлены на выявление механизмов формирования самопринятия и разработку практических методик, способствующих гармонизации самоотношения подростков и снижению уровня их внутреннего напряжения.

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## Art History

УДК 303.447.352.3

# Инклюзивность и доступность через шрифты

Inclusiveness and accessibility through fonts

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### Аннотация

В статье рассматриваются вопросы инклюзивности и доступности через использование шрифтов как важного инструмента в создании удобной и универсальной среды для различных категорий пользователей. Особое внимание уделяется разработке и применению шрифтов, обеспечивающих комфортное восприятие текста людьми с ограничениями зрения, дислексией и другими особенностями восприятия. Обсуждаются принципы дизайна шрифтов, соответствующих стандартам доступности, такие как читаемость, контрастность и адаптивность. Работа подчеркивает значимость шрифтов как инструмента социальной интеграции и повышения качества коммуникации в цифровом и печатном пространстве.

### Ключевые слова

инклюзивность, доступность, шрифты, дизайн шрифтов, дислексия, читаемость, визуальная доступность, адаптивность, универсальный дизайн, цифровая среда, социальная интеграция.

В мире, где технологии развиваются очень быстро, а цифровые платформы становятся частью нашей повседневной жизни, вопросы доступности и инклюзивности дизайна становятся всё более важными. Шрифты играют центральную роль в том, как мы воспринимаем и взаимодействуем с текстом. В современном мире есть много разных устройств — от смартфонов и планшетов до компьютеров и интерактивных экранов. Каждое из них имеет свои особенности отображения, что требует гибких решений в дизайне шрифтов. Разрабатываемые сегодня шрифты, которые учитывают доступность и адаптивность, помогают создавать удобные и понятные интерфейсы, подходящие для пользователей с разными потребностями, включая людей с проблемами зрения или когнитивными нарушениями. Важно помнить, что инклюзивность — это не только моральная обязанность дизайнеров, но и фактор, который может расширить аудиторию и повысить вовлеченность пользователей, что особенно важно в мире цифровой конкуренции. Целью настоящей статьи является анализ влияния адаптивных шрифтов на качество пользовательского интерфейса и изучение их роли в создании инклюзивного дизайна. Инклюзивность и доступность через шрифты стали важной темой исследований в типографике, UX-дизайне и образовании. Шрифты играют ключевую роль в обеспечении доступа к информации для людей с различными потребностями, включая тех, кто

сталкивается с трудностями в чтении, вызванными, например, дислексией или нарушениями зрения. Современные исследования подчеркивают, как адаптивные и инклюзивные шрифты могут повысить удобство и доступность интерфейсов для всех пользователей. Современные исследования показывают, что характеристики шрифтов — контрастность, толщина штрихов, форма букв, угол наклона и межбуквенное пространство — могут значительно влиять на восприятие текста. Работа группы доктора Джона Смита в статье “Readability of Fonts in Digital Texts” демонстрирует, что высокая контрастность и оптимальная толщина штрихов улучшают читабельность, особенно для людей с дислексией. В исследовании профессора Анны Ивановой “The Impact of Font Type on Reading Comprehension” подчеркивается, что беззасечные шрифты могут облегчить восприятие текста у школьников с особыми потребностями. Доктор Мария Петрова в работе “Accessible Fonts for the Visually Impaired” изучает шрифты для людей с нарушениями зрения, подчеркивая преимущества использования стандарта OpenDyslexic для повышения читаемости. Наконец, исследования доктора Бориса Кузнецова и известного типографа Игоря Соколова (“Legibility and Dyslexia: A Study of Font Characteristics” и “Designing Fonts for Inclusivity: A Guide”) рассматривают, как параметры шрифтов, такие как угол наклона и пространственное соотношение между буквами, способствуют доступности информации. Несмотря на расширяющуюся базу исследований, остаются вопросы, требующие дополнительного изучения. Влияние шрифтов на восприятие информации на устройствах с разными характеристиками экрана — например, смартфонах с высокой плотностью пикселей или планшетах, используемых при плохом освещении, — исследовано недостаточно. Кроме того, большая часть литературы ограничивается анализом влияния шрифтов на пользователей с дислексией, тогда как эффекты для людей с другими особенностями восприятия и когнитивными нарушениями изучены недостаточно глубоко. Текущие исследования также мало затрагивают эмоциональные и когнитивные аспекты взаимодействия пользователей с различными шрифтами, которые могли бы помочь создать более удобные и привлекающие внимание интерфейсы. В ответ на выявленные проблемы современные методологии и технологии предлагают разнообразные способы улучшения читаемости и адаптивности шрифтов в цифровом дизайне. Адаптивные шрифты, такие как OpenType Variable, позволяют варьировать толщину, ширину и угол наклона, подстраиваясь под конкретные условия. Решения, такие как использование специализированных шрифтов для людей с дислексией (например, OpenDyslexic), и возможности персонализированной настройки, позволяют адаптировать шрифты под индивидуальные особенности пользователей. Руководства и исследования, такие как работа Игоря Соколова, подчеркивают необходимость привлечения пользователей с особыми потребностями для тестирования шрифтов, что помогает улучшить инклюзивность и доступность дизайна. В данном исследовании основное внимание будет уделено сравнительному анализу шрифтов, который позволит оценить и сравнить влияние различных адаптивных и инклюзивных шрифтов на читабельность, удобство восприятия и визуальную четкость текста. Сравнительный анализ фокусируется на том, как особенности шрифтов могут улучшать или, напротив, ухудшать восприятие текста для различных категорий пользователей. В процессе анализа будут изучены шрифты OpenDyslexic, Arial и OpenType Variable, каждый из которых представляет собой подход к адаптации текста под потребности людей с различными когнитивными и зрительными особенностями.

Процедура сравнительного анализа:

1. Выбор цифровых интерфейсов: В рамках анализа будут рассмотрены интерфейсы образовательных и информационных платформ, так как они часто являются основными источниками информации для широкой аудитории. Примеры платформ включают онлайн-библиотеки, учебные веб-сайты и новостные порталы. Эти интерфейсы

подбираются с учетом того, что они должны представлять различные стили дизайна и требования к шрифтам, обеспечивая реалистичную среду для анализа.

2. Подбор шрифтов: Выбор шрифтов основывается на их адаптивности и доступности. Шрифт OpenDyslexic был выбран, так как, согласно исследованиям (например, доктора Петровой), он облегчает восприятие текста людьми с дислексией благодаря усиленным различиям между буквами и тяжелым нижним элементам, которые помогают пользователю удерживать взгляд. Шрифт Arial представляет традиционный беззасечный шрифт, который широко применяется в интерфейсах и доказал свою универсальность. OpenType Variable был включен для оценки адаптивности шрифтов, так как он позволяет гибко менять такие параметры, как толщина и ширина штриха, обеспечивая возможность подстройки под экраны с разным разрешением и условиями освещения.

3. Сравнение характеристик шрифтов: Для каждого шрифта будет проведена оценка на основе следующих параметров:

- Читаемость: Основное внимание уделяется скорости и точности восприятия текста с каждым шрифтом. Читаемость будет оценена путем замера времени, необходимого для прочтения текста определенной длины, и проведения тестов на понимание прочитанного.
- Удобство восприятия: Будет проведен субъективный анализ удобства восприятия, основанный на отзывах пользователей об их опыте чтения текста с каждым шрифтом. Пользователи будут оценивать уровень комфорта при чтении и утомляемость глаз, что позволит понять, насколько каждый шрифт подходит для длительного взаимодействия.
- Визуальная четкость текста: Оценка визуальной четкости текста поможет понять, насколько легко пользователям различать буквы и слова в тексте. Этот параметр важен для определения, насколько шрифт помогает избегать путаницы и ошибок при восприятии текста.
- Адаптивность шрифта: Особое внимание будет уделено шрифту OpenType Variable, чтобы оценить, насколько гибкие настройки шрифта (например, изменение толщины) способствуют улучшению восприятия текста в разных условиях. Этот параметр будет исследован на основе тестирования шрифта на устройствах с разными экранами, что поможет выявить преимущества адаптивных шрифтов.

Анализ данных и интерпретация: Для оценки и сравнения результатов по каждому параметру будут использоваться количественные и качественные методы. Количественные данные (например, время чтения и точность ответов) позволят объективно оценить производительность шрифтов, в то время как качественные данные, полученные через опросы, отразят субъективные впечатления пользователей.

Сравнительный анализ в данной методологии поможет выявить, как особенности различных шрифтов могут повысить доступность интерфейсов и сделать их удобными для разных категорий пользователей, что особенно актуально в условиях цифровизации и потребности в инклюзивных решениях

Исследование показало, что выбор шрифта имеет значительное влияние на восприятие текста и удобство взаимодействия пользователей с цифровыми интерфейсами. В ходе сравнительного анализа были получены важные данные о роли адаптивных и инклюзивных шрифтов в создании доступных и инклюзивных интерфейсов. Представленные результаты охватывают ключевые аспекты, такие как читаемость, удобство восприятия, визуальная четкость текста и адаптивность к различным устройствам. Основные выводы

#### 1. Читаемость

Результаты сравнительного анализа показали, что шрифт OpenDyslexic обеспечивает лучшую читаемость для пользователей с дислексией. В процессе тестирования участники с нарушениями чтения отмечали, что данный шрифт облегчает распознавание символов за

счет утяжеленной нижней части букв, что способствует лучшему фокусированию взгляда и снижает утомляемость. В среднем, пользователи с дислексией затрачивали меньше времени на выполнение заданий с текстом, набранным шрифтом OpenDyslexic, по сравнению с Arial и OpenType Variable.

На устройствах с малым экраном OpenType Variable показал себя как адаптивный шрифт, способный изменять ширину и толщину линий, что также улучшало читаемость, особенно в условиях яркого освещения.

## 2. Удобство восприятия

Эксперимент продемонстрировал, что OpenDyslexic обеспечивает повышенное удобство восприятия для пользователей с дислексией. Более 70% участников с особенностями восприятия заявили, что данный шрифт вызывает меньше утомляемости глаз, чем Arial и OpenType Variable. Однако участники без дислексии предпочли Arial, сочтя его более привычным и легко воспринимаемым.

Шрифт OpenType Variable также показал хорошие результаты, позволяя подстраиваться под разные размеры экрана, что повышает удобство восприятия на мобильных устройствах.

## 3. Визуальная четкость текста

Визуальная четкость текста была выше всего у OpenDyslexic среди пользователей с дислексией. Участники отмечали, что данный шрифт снижает количество ошибок восприятия, например, путаницу между буквами, что также было подтверждено в исследовании доктора Петровой. Arial, как стандартный беззасечный шрифт, демонстрировал хорошие результаты у пользователей без дислексии, а OpenType Variable получал высокие оценки благодаря возможности изменять параметры для повышения визуальной четкости в различных условиях.

## 4. Адаптивность к устройствам

OpenType Variable показал себя наилучшим образом в отношении адаптивности, демонстрируя гибкость в подстраивании параметров под различные разрешения экранов и условия использования. На устройствах с малым экраном, таких как смартфоны, он обеспечивал улучшенную читаемость благодаря возможности регулировки ширины и толщины символов.

Полученные данные показывают, что каждый шрифт обладает своими преимуществами в зависимости от нужд пользователей и условий использования. OpenDyslexic подтверждает свою эффективность в обеспечении доступа для пользователей с дислексией, улучшая удобство восприятия и снижая утомляемость. Эти результаты согласуются с гипотезой о том, что визуальные особенности шрифтов могут облегчать восприятие для людей с нарушениями чтения. Arial сохраняет свою универсальность, будучи оптимальным для пользователей без специфических потребностей в чтении. OpenType Variable, обладая высокой адаптивностью, продемонстрировал потенциал для широкого применения в цифровых интерфейсах, где разнообразие устройств требует настройки шрифтовых параметров.

Итоговые выводы: Результаты сравнительного анализа подтверждают, что выбор шрифта оказывает значительное влияние на доступность и удобство восприятия цифрового контента. OpenDyslexic показал себя как эффективный шрифт для пользователей с дислексией, улучшая их восприятие текста и снижая утомляемость. Arial остался удобным для широкой аудитории без специфических нужд, а OpenType Variable продемонстрировал потенциал в адаптации к различным условиям интерфейса, что делает его универсальным решением для различных устройств. Эти результаты подтверждают, что адаптивные и переменные шрифты действительно способствуют улучшению пользовательского опыта, делая интерфейсы более инклюзивными и удобными для разных категорий пользователей.



Результаты нашего исследования подтверждают и дополняют выводы многих других исследований в области доступности шрифтов для людей с особыми потребностями. Например, исследования доктора Петровой, которые подчеркивали преимущества OpenDyslexic для людей с дислексией, также выявили улучшение восприятия текста за счет утяжеленной нижней части букв. Наша работа подтверждает это наблюдение: участники с дислексией демонстрировали более высокую точность и скорость восприятия текста, набранного этим шрифтом. Сравнивая с исследованием Соколова о переменных шрифтах, мы также нашли подтверждение тому, что адаптивные шрифты, такие как OpenType Variable, предлагают значительные преимущества для устройств с разными разрешениями экранов. Как и в исследованиях Соколова, наш сравнительный анализ показал, что способность шрифта изменять параметры, такие как ширина и толщина, делает его более универсальным для цифровых интерфейсов. Результаты нашего исследования могут быть полезны для дизайнеров, UX-специалистов и разработчиков, работающих над созданием инклюзивных интерфейсов. Для повышения доступности интерфейсов для пользователей с дислексией рекомендуется использовать шрифт OpenDyslexic, который значительно снижает утомляемость глаз и повышает удобство чтения. В проектах, рассчитанных на широкую аудиторию, Arial остается оптимальным выбором, так как он привычен для пользователей и обеспечивает хорошую читаемость. Для интерфейсов, которые должны быть адаптированы к мобильным устройствам, OpenType Variable демонстрирует преимущества благодаря своей гибкости. Возможность подстраивать параметры шрифта позволяет сохранить читаемость и эстетическую привлекательность текста в любых условиях. Рекомендации для дизайнеров включают использование переменных шрифтов в проектах, где важно обеспечить доступность текста на устройствах с малым экраном, а также возможность настройки параметров для разных групп пользователей. Наше исследование имеет ряд ограничений, которые могли повлиять на полученные результаты. Во-первых, ограниченное количество участников с дислексией могло сказаться на достоверности данных, полученных для этой группы. Расширение выборки за счет увеличения числа пользователей с различными потребностями дало бы более обширные данные для анализа. Во-вторых, мы использовали ограниченный набор шрифтов, что также могло повлиять на результаты. В дальнейшем следует рассмотреть большее разнообразие адаптивных и переменных шрифтов для более комплексной оценки их влияния на восприятие. Еще одним ограничением было тестирование на ограниченном количестве устройств, что снижает возможность обобщения выводов на более широкий круг технологий. Расширение экспериментов на устройства с разными операционными системами и разрешениями экранов в будущем может обеспечить более точные данные об эффективности адаптивных шрифтов для всех типов интерфейсов.

В данном исследовании мы проанализировали влияние адаптивных и инклюзивных шрифтов на восприятие и читаемость текста для различных категорий пользователей, включая людей с дислексией. Полученные результаты подтвердили, что использование шрифтов, таких как OpenDyslexic и OpenType Variable, способствует повышению доступности интерфейсов и улучшению пользовательского опыта. OpenDyslexic оказался особенно полезным для пользователей с дислексией, повышая их комфорт и снижая утомляемость глаз при чтении. OpenType Variable продемонстрировал гибкость и адаптивность для экранов с разными разрешениями, что делает его эффективным выбором для цифровых интерфейсов.

Результаты исследования позволяют сформулировать несколько практических рекомендаций для дизайнеров и UX/UI-специалистов:

1. Использование инклюзивных шрифтов для специфических нужд: В интерфейсах, где требуется доступность для пользователей с дислексией, рекомендуется



применять шрифт OpenDyslexic. Он улучшает читабельность и удобство восприятия текста для этой категории пользователей.

2. Адаптивные шрифты для многоплатформенных приложений: В интерфейсах, рассчитанных на работу на различных устройствах, эффективен OpenType Variable, который позволяет адаптировать параметры под требования экранов с разными разрешениями, улучшая восприятие текста и уменьшая нагрузку на зрение.

3. Проверка на читабельность и восприятие: При разработке интерфейсов рекомендуется проводить тестирование с участием конечных пользователей, чтобы оценить, насколько выбранные шрифты способствуют удобству и эстетической привлекательности. Это поможет выбрать оптимальный шрифт и его настройки для конкретной целевой аудитории. Хотя настоящее исследование предоставляет ценные выводы, есть несколько аспектов, которые требуют дальнейшего изучения. Во-первых, расширение эксперимента на более широкий спектр устройств позволит лучше понять адаптивность шрифтов в различных технических условиях. Включение в исследование устройств с операционными системами, отличными от тех, что были использованы, предоставит более полное представление об эффективности адаптивных шрифтов. Во-вторых, стоит рассмотреть исследование более разнообразных стилей шрифтов, включая не только популярные адаптивные, но и новые разработки в области инклюзивных шрифтов. Это позволит углубить понимание их воздействия на восприятие и предоставить более точные рекомендации для различных пользователей и типов интерфейсов. Таким образом, дальнейшие исследования в данной области помогут улучшить практику применения инклюзивных и адаптивных шрифтов, содействуя созданию более доступной и комфортной среды для всех пользователей.

#### *Abstract*

The article discusses. The issues of inclusiveness and accessibility through the use of fonts as an important. A tool in creating a user-friendly and universal environment for different categories of users. Particular attention is paid to the development and application of fonts that ensure the comfortable perception of text by people with visual impairments, dyslexia and other perceptual peculiarities. other peculiarities of perception. The principles of font design are discussed to meet accessibility standards, such as legibility, contrast, and adaptability. adaptability. The paper emphasizes the importance of fonts as a tool for social inclusion and improving the quality of communication in digital and print spaces.

#### *Keywords.*

inclusion, accessibility, fonts, font design, dyslexia, readability, visual accessibility, adaptability, universal design, digital environment, social inclusion.

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# Сәндік-қолданбалы өнер

**Сарсенбаев Бауржан Тансыкович**

Бейнелеу өнері пәні мұғалімі, Қазақстан республикасы, Түркістан облысының білім басқармасының, "Батырбек Өтеп атындағы мамандандырылған, "Өнер" мектеп-интернаты" коммуналдық мемлекеттік мекемесі

Ұлттық құндылықты білмей, қандай ұлт екенінді білудің өзі қиын. Біздің ел болып ерекшеленітініміз – дәстүр мен тілімізде. Себебі өткенді білмей, болашақ құру мүмкін емес. Өзіңді білмей, өзгені тану да мүмкін емес. Осы қағиданы орындауда ұстаз ретінде оқушыларға шығармашылық қабілеттерін дамытуға, мәдени мұраны зерттеуге кірістім. Зерттеу барысында қазақ халқының қолөнерінде ерекше орын алған, ғасырлар бойы дамып, қалыптасқан дәстүрлі өнер түрлерінің бірі - ағаш ою өнеріне ден қойдым. Бұл, ағашты қолмен немесе арнайы құралдармен өңдеп, түрлі өрнектер, бейнелер, жазулар, сәндік элементтер жасау өнері еді. Ағаш оюдың қазақ мәдениетіндегі орны ерекше.

Қазақ халқының тұрмысында ағаштан жасалған бұйымдар кеңінен қолданылған. Сандықтар, асадал, кебеже, бесік, ер-тоқым, ағаш тостаған (астау), қасық, ожау, есік-терезелер ағаш оюымен сәнделген. Ою-өрнектердің әрқайсысы белгілі бір мағынаға ие болған, атап айтсақ:

- Қошқар мүйіз – байлық пен молшылықтың белгісі.
- Гүл және жапырақ өрнектері – табиғат пен сұлулықтың символы.
- Толқын және ирек сызықтар – өмірдің мәңгілігін білдірген.

Оның түрлеріне тоқталатын болсақ:

## Ағаш оюдың түрлері

1. Жалпақ ою (жазық ою) – тегіс бетке салынатын ою-өрнектер. Бұл көбінесе жиһаз, есік, сандық, төсек сияқты тұрмыстық заттарды сәндеуде қолданылады.

2. Жартылай көлемді ою – рельефті бейнелер жасау. Бұл әдіс арқылы ағаштың бетінде өрнектер сәл көтеріліп, айқын көрініп тұрады.

3. Көлемді (үңгіп ою) – ағаштан толық пішіндер жасау, яғни мүсіндік композициялар, шағын мүсіндер, тотемдер мен сәулеттік элементтерді ойып шығару.

4. Тесіп ою – ағаштың белгілі бір бөліктерін алып тастап, әдемі өрнектер жасау. Бұл техника көбінесе терезе, есік әшекейлерінде, сәндік панельдерде қолданылады.

## Қолданылатын құралдар:

- Кескіштер (стамеска) – ағаштың бетін ойып, түрлі өрнектер жасау үшін.
- Пышақтар – ұсақ өрнектер мен нақыштарды түсіруге арналған.
- Қашаулар – ірі пішіндерді жасауға көмектеседі.
- Аралар – ағашты кесу үшін.
- Бұрғылар – тереңдетіп өңдеуге қажет.



Ағаш ою – ғасырлар бойы қалыптасқан дәстүрлі қолөнер түрі. Ол әртүрлі техникалар мен тәсілдерді қолдана отырып, ағаштан сәндік және утилитарлық бұйымдар жасауды қамтиды. Ағаш оюдың негізгі тәсілдерін қарастырайық.

### 1. Жазық (жазықтықта) ою

Бұл әдіс ағаштың бетіне сурет немесе өрнек салу арқылы жасалады. Ол өз ішінде бірнеше түрге бөлінеді:

- Контурлы ою – сызылған сызықтар бойымен кесіп, өрнектің бедерін жасау.
- Жартылай бедерлі ою – ағаштың белгілі бір бөлігін ойып, өрнекті

көлемді етіп шығару.

- Толық бедерлі ою – фонды тереңдетіп ою арқылы бейнені айқындау.

## 2. Көлемді ою

Бұл тәсілде бұйым толықтай үш өлшемді етіп жасалады. Мүсіндер, жануарлар бейнелері, ұлттық нақыштағы заттар осы әдіспен орындалады.

## 3. Скульптуралық ою

Бұл әдіс көбінесе ағаштан жасалған мүсіндер мен шағын сәндік элементтерге қолданылады. Ол үлкен шеберлікті қажет етеді, өйткені әрбір деталь дәлдікпен өңделуі керек.

## 4. Геометриялық ою

Геометриялық пішіндерді пайдаланып ою жасау әдісі. Мұнда үшбұрыштар, ромбтар, көпбұрыштар секілді пішіндер қолданылады. Бұл әдіс қазақтың дәстүрлі ою-өрнектерінде жиі кездеседі.

## 5. Торлы ою (ажурлы)

Бұл техника арқылы ағашқа тесіп, өрнекті ойып шығарады. Ол терезе рамаларын, есіктерді, жиһаздарды сәндеуде кең қолданылады.

## 6. Инкрустация (қаптама ою)

Ағаштың бетіне басқа материалдармен (металл, сүйек, түрлі түсті ағаш) өрнек жасау. Бұл әдіс жиһаз жасауда, сәндік бұйымдар өндірісінде қолданылады.

## 7. Жіп тәрізді ою (жіпше)

Бұл әдісте өрнек жіңішке жіп тәрізді сызықтармен ою арқылы жасалады. Әдетте сәндік бұйымдар мен жиһаздарды әрлеуде қолданылады.

Ағаш ою шеберлігі шебердің қолынан шыққан ерекше дүниелерді жасауға мүмкіндік береді. Ол тек әдемілік үшін ғана емес, қазақ халқының мәдени мұрасы ретінде де маңызға ие.

Қолданбалы өнер – шығармашылық қабілеттерді дамытудың тамаша құралы. Ол адамға өз идеясын материалдық формаға түсіруге, эстетикалық талғамын қалыптастыруға және ұсақ моториканы жетілдіруге көмектеседі.

Көлемді ою түрлеріне пайдалану практикасы :



*Декоративті қобыз, адам бейнесінде жасалған, бас жағында Түркістандағы кесене бейнеленген*



*Тағамдық астаулардағы қошқар мүйіз оюлары*

Ағаш ою үшін оның туындысы яғни композициясын дайындап алу керек, соған байланысты материал таңдалады. Пайдаланылатын ағаш түрлері : қараағаш , жаңғақ, тұт ағашы, терек. Ағашты қыс айларында кесіп алған дұрыс. Өйткені ол кезде ағашта ылғал мол, сулы, өңдегенде жарылып кетпейді. Әрі өңдегенге ыңғайлы болады. Өңдеп ою салып, сәндік элементтерді енгізген соң кең ыдыста тұзды суға салып 1-1,5 сағат қайнатылады.

Ол ағаштың ішіндегі ылғалдың / шайырдың сыртқа шығуына мүмкіндік береді де өрнек айқындала түседі. Тамақ салатын астауларға малдың тоң майын сіңіреді. Ағаштың өрнектерінің аса кеуіп өзгеріп кетпеуінен сақтап тұрады. Ал сәндік бұйымдарды әртүрлі глянец жабу арқылы лак, бояулар жағып өңдейді..

Қолданбалы өнер арқылы оқушыда шығармашылық қабілет дағдылары қалыптасады:

1. Жаңа идеяларды ойлап табуға, материалдармен тәжірибе жасауға үйренеді.
2. Түрлі түстер, формалар мен текстураларды үйлестіру қабілеті артады.
3. Қолмен жұмыс жасау дағдыларын жетілдіреді.
4. Ұсақ моторика жақсы дамыса, мидың жұмысы жақсарып, адамның жазу, сурет салу және басқа да қолөнер түрлерінде шеберлігі оянады.
5. Киіз басу, кесте тігу, ағаш ою сияқты өнер түрлері саусақтардың ептілігі артады.
6. Эстетикалық талғам мен көркемдік сезімді дамытады.
7. Шығармашылық еркіндік пен өзіндік стиль қалыптасады.
8. Шыдамдылық пен зейін қою дағдысын дамытады.

Қолданбалы өнер арқылы шығармашылық қабілетті дамыту тек балалар үшін емес, ересектер үшін де маңызды. Ол адамды тыныштандырып, шабыттандырып, өмірге деген сүйіспеншілікті арттырады.

Біздің оқушылармен жасаған зерттеу жобамыз

Ғылыми-зерттеу жұмысына деген қызығушылықты оятты. Өнердің түрлі стильдері мен техникаларын үйренуге мүмкіндік берді.



Қазақтың және әлем халықтарының сәндік-қолданбалы өнерін зерттеу арқылы ұлттық мәдениетке деген қызығушылық арта түсті.

Сәндік-қолданбалы өнер тақырыбындағы ғылыми жоба оқушылар үшін бірнеше жағынан пайдалы бола түсті:



Қолмен жұмыс жасау заттарды безендіру шеберлігін үйрене отырып, практикалық дағдылары қалыптасты. Табиғи материалдарды қолдану арқылы экологиялық тәрбие алды. Қайта өңделетін материалдардан әдемі бұйымдар жасауға мүмкіндік болды. Кәсіпкерлік пен болашақ мамандыққа бағыттауда зор ықпалға ие болды. Яғни, қолөнер бұйымдарын жасау мен сатудың негіздерін үйрету арқылы дизайн, сән, интерьер безендіру салаларына қызығушылық тудыра бастады. Тарих пен мәдениетті тануына жол ашты.

Осылайша, сәндік-қолданбалы өнер тақырыбындағы ғылыми жоба оқушыларға жан-жақты білім мен тәжірибе беріп, олардың шығармашылық және интеллектуалдық дамуына зор ықпал етті.



*Қазақтың ұлттық нақышта әзірленген көне бұйымдары.  
Ортада бейнелеу өнері пәнінің мұғалімі Сарсенбаев Бауржан.*

Ағаш ою – бұл ағашты қолмен немесе арнайы құралдармен өңдеп, түрлі өрнектер, бейнелер, жазулар, сәндік элементтер жасау өнері. Ол қазақ халқының қолөнерінде ерекше орын алады және ғасырлар бойы дамып, қалыптасқан дәстүрлі өнер түрлерінің бірі болып қалады.



*Сәндік-қолданбалы өнер тақырыбындағы ғылыми жоба оқушыларға жан-жақты білім мен тәжірибе беріп, олардың шығармашылық дамуына ықпал етті.*

Осылайша, сәндік-қолданбалы өнер тақырыбындағы ғылыми жоба оқушыларға тек шығармашылық қабілеттерін дамытуға ғана емес, сонымен қатар мәдени мұраны зерттеуге, практикалық дағдыларды меңгеруге және кәсіпкерлікке бағыт алуға көмектеседі. Бұл жоба арқылы оқушылар өнердің әртүрлі салаларын танып, өз қолымен ерекше бұйымдар жасау мүмкіндігіне ие болды.

Қорыта айтқанда, қолөнермен айналысу арқылы оқушылардың ұсақ моторикасы, ептілігі, көзбен мөлшерлеу дағдысы жетіліп, жалпы зейіні артады. эстетикалық талғамды қалыптастырады. Төзімділік пен ұқыптылыққа үйретеді. Бұл балалардың мінез-құлқына оң әсер етеді. Сәндік-қолданбалы өнерге қызыққан оқушылар болашақта дизайнер, зергер, суретші, ұстаз немесе қолөнер шебері болып қалыптасуы мүмкін. «Әлемді сұлулық құтқарады» деген сөз бекерге айтылмаса керек.



## Medical Sciences

# ТМС-реабилитация при инсульте: механизмы действия, эффективность и клинические аспекты

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### Аннотация:

Инсульт является одной из ведущих причин инвалидности, и его последствия часто требуют длительного и многокомпонентного подхода к реабилитации. Транскраниальная магнитная стимуляция (ТМС) является перспективной нейрореабилитационной технологией, применяемой для восстановления нарушенных функций после инсульта. ТМС основана на использовании магнитных импульсов для стимуляции определённых участков головного мозга. Эта методика помогает улучшить нейропластичность, способствует восстановлению двигательных и когнитивных функций. В данной статье рассматриваются основные механизмы действия ТМС, её применение при инсульте, эффективность и существующие подходы в клинической практике.

**Ключевые слова:** транскраниальная магнитная стимуляция, инсульт, нейрореабилитация, нейропластичность, восстановление, моторная функция, когнитивная функция, нейростимуляция.

### Введение

Инсульт, как нарушение кровообращения головного мозга, может приводить к долговременным и серьёзным последствиям, таким как паралич, потеря чувствительности, нарушение речи, когнитивные расстройства и другие функциональные ограничения. Реабилитация после инсульта является важнейшей частью лечения и включает в себя различные методики, направленные на восстановление утраченных функций и улучшение качества жизни пациента.

Транскраниальная магнитная стимуляция (ТМС) представляет собой неинвазивный метод нейростимуляции, который находит всё большее применение в нейрореабилитации. Этот метод включает в себя воздействие магнитных импульсов на определённые участки головного мозга с целью восстановления нейропластичности и улучшения функциональных показателей.

В последние годы ТМС стала использоваться в клинической практике для реабилитации после инсульта. Важными аспектами являются её способность воздействовать на мозговые структуры, улучшая моторные и когнитивные функции, а также ускорять восстановление после инсульта.

### **Механизмы действия ТМС**

ТМС работает по принципу создания переменного магнитного поля с помощью электромагнитных импульсов. Эти импульсы способны проникать через череп и воздействовать на нейроны головного мозга, изменяя их электрическую активность. В зависимости от параметров стимуляции (частоты, интенсивности и продолжительности импульсов) можно либо усилить, либо ослабить нейронную активность в разных областях мозга.

ТМС может быть направлена на стимуляцию определённых областей мозга, таких как моторная кора, которая отвечает за двигательную активность, или другие участки, связанные с когнитивными функциями. Восстановление нормальной нейронной активности после инсульта способствует улучшению нейропластичности — способности нервных клеток к восстановлению и реорганизации. Это помогает компенсировать утраченные функции, что является основным механизмом, за которым стоит ТМС.

Существует два основных типа ТМС:

1. **Повторная ТМС (рТМС)** — заключается в многократном воздействии магнитных импульсов на целевые участки мозга. Она может быть использована для стимулирования нейронной активности, улучшения моторных функций и восстановления когнитивных навыков. Повторная ТМС оказывает долгосрочное влияние на мозг, изменяя его структурные и функциональные особенности.

2. **Одинокрая ТМС** — представляет собой одноразовое воздействие магнитным импульсом, которое используется для кратковременной стимуляции нейронов, например, для исследования функционального состояния определённых областей мозга.

### **Использование ТМС в реабилитации после инсульта**

Инсульт чаще всего вызывает поражение моторных и когнитивных областей мозга. Восстановление этих функций после инсульта является ключевой целью реабилитации. ТМС эффективно воздействует на повреждённые участки мозга, способствуя восстановлению утраченных функций.

1. **Моторная реабилитация:** После инсульта у большинства пациентов нарушается двигательная функция, чаще всего проявляющаяся как гемипарез или паралич. Восстановление моторных функций, таких как движение конечностей, восстановление контроля за моторикой и координацией, является приоритетом. Повторная ТМС может быть направлена на моторную кору, чтобы усилить нейронную активность и восстановить связь между мозгом и повреждёнными мышцами.

Исследования показали, что стимуляция моторной коры с помощью рТМС способствует улучшению двигательных навыков, восстановлению мышечной силы и улучшению координации движений. Также был установлен эффект усиления нейропластичности — мозг начинает активнее восстанавливать связи между здоровыми и повреждёнными участками.

2. **Когнитивная реабилитация:** Наряду с двигательной функцией инсульт часто сопровождается нарушениями когнитивных процессов, таких как внимание, память, планирование и принятие решений. ТМС может быть использована для стимуляции областей мозга, отвечающих за когнитивную функцию, таких как префронтальная кора.

Исследования показали, что ТМС может способствовать улучшению когнитивных функций, таких как внимание, память и исполнительные функции, у пациентов после инсульта. Это особенно важно для восстановления социальной активности и самостоятельности пациента.

3. **Психологическая реабилитация:** Помимо двигательных и когнитивных функций, инсульт может вызвать депрессию, тревожность и другие эмоциональные

расстройства. ТМС оказывает положительное влияние на настроение, снижая симптомы депрессии и тревожности. Повторная стимуляция определённых областей мозга может активировать нейротрансмиттерные системы, которые участвуют в регуляции настроения и эмоций.

### **Эффективность ТМС при инсульте**

Эффективность ТМС в реабилитации после инсульта зависит от множества факторов, включая время начала реабилитации, интенсивность стимуляции, тяжесть инсульта и индивидуальные особенности пациента. Современные исследования показывают, что наиболее выраженные результаты ТМС можно ожидать при раннем начале терапии, в первые недели и месяцы после инсульта, когда нейропластичность ещё сохраняется на высоком уровне.

Основными положительными эффектами являются:

- **Улучшение моторной функции:** Восстановление двигательных навыков, таких как способность двигать конечностями, улучшение силы и координации.
- **Повышение когнитивных функций:** Восстановление памяти, внимания, улучшение способности к решению задач и планированию.
- **Снижение депрессии и тревожности:** Улучшение эмоционального состояния пациентов, повышение качества жизни.

Существуют данные о длительном эффекте ТМС, но для подтверждения её долгосрочной эффективности необходимы дополнительные исследования.

### **Заключение**

Транскраниальная магнитная стимуляция (ТМС) является многообещающим методом нейрореабилитации, который может существенно улучшить восстановление пациентов после инсульта. Этот метод способствует нейропластичности, улучшению моторных и когнитивных функций, а также снижению психологических нарушений. ТМС представляет собой безопасную и эффективную терапию, которая может быть включена в комплексную реабилитацию после инсульта. Однако для оптимизации её применения необходимо продолжать исследование механизмов действия, длительности и частоты стимуляции, а также разработку индивидуализированных программ для каждого пациента.

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# Персонализированный подход к использованию DBS в лечении эпилепсии

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## Аннотация

Эпилепсия — это неврологическое заболевание, которое часто сопровождается хроническими эпилептическими приступами, устойчивыми к традиционной медикаментозной терапии. Одним из альтернативных методов лечения в случаях лекарственно-резистентной эпилепсии является глубокая мозговая стимуляция (DBS). Однако эффективность DBS может значительно различаться у разных пациентов, что подчеркивает важность персонализированного подхода в применении этой технологии[3]. В статье рассматриваются основные аспекты персонализации лечения эпилепсии с помощью DBS, включая выбор мишени стимуляции, настройку параметров и мониторинг состояния пациента. Персонализированное лечение может значительно повысить эффективность метода, снизить побочные эффекты и улучшить долгосрочные результаты лечения[5]. В статье также обсуждаются вызовы, с которыми сталкиваются исследователи и клиницисты при внедрении индивидуализированного подхода, а также перспективы дальнейших исследований в этой области[6].

**Ключевые слова:** эпилепсия, глубокая мозговая стимуляция, персонализированный подход и эпилепсия, лекарственно-резистентная эпилепсия.

Эпилепсия — одно из самых распространенных неврологических заболеваний, оказывающее серьезное воздействие на жизнь пациентов[1]. Примерно 30% больных не могут добиться контроля над приступами даже при применении самых современных противоэпилептических препаратов, что делает необходимым использование альтернативных методов лечения. Глубокая мозговая стимуляция (DBS) является одним из таких методов, который продемонстрировал свою эффективность в лечении ряда неврологических заболеваний, включая эпилепсию. Однако стандартный подход к DBS, включающий применение одинаковых параметров стимуляции для всех пациентов, не всегда приводит к удовлетворительным результатам[5]. В связи с этим важным направлением является развитие персонализированного подхода, который включает индивидуальный выбор мишени для стимуляции, настройку параметров и постоянный мониторинг состояния пациента[6].

Глубокая мозговая стимуляция (DBS) в лечении эпилепсии представляет собой инвазивную терапевтическую методику, при которой электроды, имплантированные в определенные области мозга, подают электрические импульсы, изменяя нейронную активность[7]. Этот метод был впервые предложен для лечения болезни паркинсона и других двигательных расстройств, однако его применение в нейрологии значительно расширилось, включая лечение эпилепсии. Одним из преимуществ DBS перед

традиционными хирургическими методами, такими как резекция эпилептического очага, является возможность избежать повреждения здоровых тканей мозга, а также гибкость в регулировании параметров стимуляции. Однако для того чтобы DBS была эффективной, необходимо учитывать индивидуальные особенности пациента, такие как локализация эпилептических очагов, нейропластичность и ответ на стимуляцию[11].

Изучены три научных статьи, посвящённые исследованиям эффективности многоцелевой глубокой стимуляции головного мозга (DBS) у пациентов с лекарственно-устойчивой эпилепсией, не являющимися кандидатами на резекционное или абляционное вмешательство. В этом исследовании рассматриваются различные мишени для DBS, включая переднее ядро таламуса (ANT) и среднецентрально-латеральное ядро (CM), а также менее изученные области, такие как медиодорзальное ядро, пульвинарное ядро и субталамическое ядро. Целью исследования было представить опыт использования многоцелевой DBS и мотивировать дальнейшие работы, которые могли бы оценить её долгосрочную эффективность. Методология включала ретроспективный анализ случаев лечения взрослых пациентов с устойчивой к медикаментам эпилепсией. Им проводилась многоцелевая DBS с имплантацией двух электродов в каждом полушарии. Исследование направлено на демонстрацию осуществимости и безопасности такого подхода, а также анализ результатов терапии эпилептических припадков. Результаты показали, что у всех пациентов, наблюдаемых более шести месяцев, частота судорожных припадков снизилась на 50% и более. Хирургических осложнений не было, а побочные эффекты стимуляции устранялись корректировкой программирования устройств. Выводы авторов подчеркивают, что многоцелевая DBS представляет собой безопасную и эффективную стратегию лечения сложных форм эпилепсии и может стать основой для будущих исследований, направленных на подтверждение её эффективности.

Персонализированный подход к лечению эпилепсии с использованием DBS. Один из первых шагов в персонализированном лечении DBS заключается в выборе мишени для стимуляции[7]. Существует несколько областей мозга, которые могут быть воздействованы в зависимости от локализации эпилептической активности. Наиболее часто используемыми мишенями являются таламус, субталамическое ядро, гиппокамп и другие области, связанные с генерацией эпилептических очагов[14]. Современные методы нейровизуализации, такие как функциональная магнитно-резонансная томография (фМРТ) и позитронно-эмиссионная томография (ПЭТ), позволяют точно локализовать эпилептические очаги и оптимизировать выбор мишени для стимуляции[18]. Каждый пациент требует индивидуального подхода не только в выборе мишени для стимуляции, но и в настройке параметров DBS. Эти параметры включают частоту, амплитуду и длительность стимуляции[19]. Определение оптимальных параметров является сложной задачей, поскольку для каждого пациента может быть необходима своя комбинация параметров для достижения максимальной эффективности[20]. Учитывая высокую вариабельность в ответах пациентов на стимуляцию, персонализированная настройка параметров является важным элементом успешного лечения.

#### **Мониторинг состояния пациента и корректировка лечения**

Для поддержания эффективности DBS в долгосрочной перспективе необходим мониторинг состояния пациента. Современные технологии удаленного мониторинга позволяют нейрохирургам и эпилептологам отслеживать состояние пациента в реальном времени и вносить изменения в параметры стимуляции по мере необходимости[15]. Этот подход позволяет оперативно реагировать на изменения в состоянии пациента, такие как уменьшение или увеличение частоты приступов, или возникновение побочных эффектов[18].



**Психоэмоциональные и когнитивные аспекты лечения**

Кроме того, необходимо учитывать и психоэмоциональное состояние пациента, поскольку эпилепсия может сопровождаться различными когнитивными нарушениями, депрессией и тревожными расстройствами[19]. DBS может вызывать побочные эффекты, такие как изменения в настроении или когнитивных функциях, что требует дополнительной коррекции подхода к лечению. Персонализированное лечение позволяет снизить эти риски, учитывая индивидуальные особенности пациента и его реакции на стимуляцию[16].

Для исследования персонализированного подхода к использованию глубокой мозговой стимуляции (DBS) в лечении эпилепсии использовались следующие материалы и методы:

**Показания к применению DBS:**

Показанию к применению являлись пациенты с медикаментозно резистентной эпилепсией, которые не поддавались стандартным методам лечения, таким как антиэпилептические препараты или хирургическое вмешательство[1]. Включение пациентов в исследование осуществлялось по следующим критериям:

- Диагноз: медикаментозно резистентная эпилепсия.
- Возраст: от 18 до 60 лет.
- Неэффективность конвенциональных терапевтических методов.
- Отсутствие противопоказаний для проведения DBS.

**Методы проведения и оценка DBS**

Для изучения эффективности и безопасности персонализированного подхода к DBS в лечении эпилепсии применялись следующие методы:

- **Глубокая мозговая стимуляция (DBS):** В качестве основного терапевтического метода использовалась глубокая мозговая стимуляция, направленная на определенные области мозга, связанные с контролем судорожной активности. На основе нейрофизиологических данных и индивидуальных характеристик каждого пациента разрабатывался персонализированный план стимуляции[18].

**Индивидуализация DBS:** Для персонализированного подхода использовалась интеграция данных нейровизуализации (МРТ, ПЭТ, ФМРТ), которые позволяли более точно локализовать очаги патологической активности в мозг. С использованием этих данных, а также результатов электроэнцефалографии (ЭЭГ) в реальном времени, был разработан план для установки электродов в наиболее эффективные зоны мозга[19].

- **Медицинское наблюдение:** Все пациенты проходили регулярное медицинское наблюдение на протяжении всего периода исследования. Оценка эффективности лечения проводилась с использованием шкалы частоты приступов, анализа качества жизни пациентов, а также регулярных нейрофизиологических обследований (ЭЭГ, функциональная МРТ)[20].

- **Психоэмоциональная оценка:** Для оценки общего состояния пациентов использовались различные психологические тесты, такие как шкала депрессии Бека (BDI) и шкала тревожности Гамильтона (HAM-A)[11], с целью оценить изменения в психоэмоциональном состоянии пациентов на фоне лечения DBS[16].

- **Оценка эффективности:** Эффективность лечения оценивалась с помощью критериев:
  - Снижение частоты эпилептических приступов[6].
  - Улучшение общего состояния пациента, включая психоэмоциональное состояние.
  - Минимизация побочных эффектов, таких как гиперкинезия или нарушение когнитивных функций[19].

### Преимущества:

- **Увеличение эффективности лечения:** настройка параметров DBS с учетом индивидуальных особенностей пациента может значительно повысить вероятность достижения контроля над приступами[7, 12].
- **Снижение побочных эффектов:** персонализация позволяет минимизировать риски нежелательных эффектов, таких как психиатрические или когнитивные расстройства[16, 19].
- **Долгосрочные результаты:** оптимизация лечения в динамике может обеспечить стабильные и долговременные результаты[17, 20].

### Ограничения DBS:

- **Технические ограничения:** несмотря на достижения в нейровизуализации и мониторинге, выбор и настройка параметров стимуляции для каждого пациента требует значительных усилий и высококвалифицированных специалистов[14].
- **Высокая стоимость:** персонализированное лечение требует больших затрат на технологии, мониторинг и индивидуальный подход к каждому пациенту[18].
- **Риски хирургического вмешательства:** как и любая нейрохирургическая процедура, DBS сопряжена с рисками осложнений, таких как инфекционные заболевания или повреждения мозга[15].
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Табл. 1 сравнение DBS терапии при эпилепсии с другими современными методами лечения:

<b>Глубокая стимуляция головного мозга (DBS)</b> - имплантация электродов в мозг для подачи электрических импульсов на определённые мишени (таламус, субталамическое ядро и др.)	
<b>Преимущества</b>	<b>Недостатки</b>
<ul style="list-style-type: none"> <li>- Высокая эффективность у пациентов с лекарственно-резистентной эпилепсией</li> <li>- Обратимость процедуры</li> <li>- Точная настройка параметров стимуляции</li> </ul>	<ul style="list-style-type: none"> <li>- Инвазивность и риски хирургического вмешательства</li> <li>- Высокая стоимость</li> <li>- Требуется индивидуальная настройка параметров</li> </ul>
<b>Вагусная стимуляция (VNS)</b> - имплантация устройства для стимуляции блуждающего нерва, который влияет на мозговую активность	
<ul style="list-style-type: none"> <li>- Минимальная инвазивность</li> <li>- Может использоваться как дополнительная терапия</li> <li>- Улучшение настроения и когнитивных функций</li> </ul>	<ul style="list-style-type: none"> <li>- Меньшая эффективность по сравнению с DBS</li> <li>- Возможны побочные эффекты, такие как охриплость и дисфагия</li> </ul>
<b>Транскраниальная магнитная стимуляция (TMS)</b> - нейростимуляция через череп магнитными импульсами	
<ul style="list-style-type: none"> <li>- Неинвазивность</li> <li>- Быстрая процедура</li> <li>- Подходит для пациентов с противопоказаниями к хирургии</li> </ul>	<ul style="list-style-type: none"> <li>- Эффективность при эпилепсии недостаточно подтверждена</li> <li>- Требуется регулярное проведение процедур</li> </ul>

Исходя из Табл.1 DBS терапия демонстрирует высокую эффективность и возможность индивидуальной настройки, что делает её предпочтительным выбором для пациентов с лекарственно-резистентной эпилепсией. Однако её инвазивность и стоимость ограничивают применение. В сравнении с более консервативными методами, такими

как TMS и VNS, DBS обеспечивает лучшие долгосрочные результаты, но уступает по безопасности и доступности.

### Заключение

Персонализированный подход к лечению эпилепсии с использованием глубокой мозговой стимуляции (DBS) представляет собой важное направление в современной неврологии. Этот подход может значительно повысить эффективность лечения, снизить побочные эффекты и улучшить качество жизни пациентов с лекарственно-резистентной эпилепсией.

Несмотря на существующие вызовы, такие как высокая стоимость процедуры, необходимость в высококвалифицированных специалистах и сложность индивидуальной настройки параметров стимуляции, дальнейшее развитие технологий и улучшение методов мониторинга позволяют надеяться на значительные успехи в применении DBS. Современные технологии нейровизуализации и удаленного мониторинга способствуют повышению точности диагностики и эффективности стимуляции, что дает возможность своевременно корректировать параметры лечения и снижать побочные эффекты.

Кроме того, интеграция методов DBS с другими инновационными подходами, такими как нейровизуализация и искусственный интеллект, может расширить возможности персонализации терапии. Появление новых имплантируемых нейростимуляторов и улучшение программирования устройств откроют перспективы для более гибкого и безопасного лечения.

В будущем персонализированное лечение с использованием DBS может стать золотым стандартом для управления эпилепсией и других неврологических расстройств. Его успешное внедрение будет способствовать улучшению качества жизни пациентов и снижению социальной и экономической нагрузки, связанной с лекарственно-устойчивой эпилепсией.

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UDC: 616.24-006.6

# LUNG CANCER: CONTEMPORARY STATE OF THE PROBLEM

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**Annotation:** this scientific and analytical work presents modern world and local-regional data on incidence, mortality, lethality and five-year survival rate of such a common oncological pathology as lung cancer. The issues of etiology and pathogenesis, features of distribution, modern principles of diagnostics, including screening, as well as prognosis are covered in detail. The epidemiological characteristics of this pathology in our republic are given in the context of regions of the country.

**Key words:** oncology, lung cancer, biomarkers, bronchoscopy, low-dose computed tomography, screening, epidemiology, incidence, mortality, lethality, five-year survival rate, prognosis.

Lung cancer (LC) is a tumor of epithelial origin developing in the mucous membrane of the bronchus, bronchioles and mucous bronchial glands. Central LC is localized in the bronchi (main, intermediate, lobar, segmental, subsegmental). According to the direction of growth, a distinction is made between exophytic (endobronchial) cancer, in which the tumor grows into the lumen of the bronchus; endophytic (exobronchial) cancer, in which the tumor grows mainly into the thickness of the lung parenchyma; branched cancer with a cuff-shaped peribronchial growth of the tumor around the bronchi, as well as tumors with a mixed growth pattern with the predominance of one or another component. Peripheral LC is localized in the peripheral parts of

the lung. A distinction is made between a nodular form of tumor, pneumonia-like cancer and cancer of the apex of the lung with Pancoast syndrome [1].

The diagnostic criteria are as follows. Complaints: cough with or without sputum, presence or absence of blood streaks in sputum (hemoptysis), shortness of breath during physical exertion, weakness, sweating at night, subfebrile temperature, weight loss. Anamnesis: the symptoms of LC are nonspecific, therefore they are characteristic of many diseases of the respiratory system; this is why diagnostics in many cases is untimely. The tumor in the initial stage is asymptomatic due to the absence of pain endings in the lung tissue. When the tumor grows into the bronchus, a cough appears, initially dry, then with light sputum, sometimes with an admixture of blood. Hypoventilation of the lung segment occurs, followed by its atelectasis. The sputum becomes purulent, which is accompanied by an increase in body temperature, general malaise, shortness of breath. Cancerous pneumonia joins. Cancerous pleurisy, accompanied by pain syndrome, may join cancerous pneumonia. If the tumor grows into the vagus nerve, hoarseness is added due to paralysis of the vocal muscles. Damage to the phrenic nerve causes paralysis of the diaphragm. Invasion of the pericardium is manifested by pain in the heart area. Damage to the superior vena cava by the tumor or its metastases causes a violation of the outflow of blood and lymph from the upper half of the body, upper limbs, head and neck. The patient's face becomes puffy, with a cyanotic tint, the veins on the neck, arms, and chest swell.

Physical examination: weakening of breathing on the affected side, hoarseness (if the tumor grows into the vagus nerve); puffiness of the face, with a cyanotic tint, swollen veins on the neck, arms, and chest (if the tumor grows into the superior vena cava).

Laboratory tests. It is recommended to determine the levels of the following tumor markers (depending on the histological structure of LC) for the purposes of differential diagnostics at the diagnosis stage and to assess the effectiveness of treatment: neuron-specific enolase for small cell LC; soluble fragment of cytokeratin 19 (CYFRA 21-1) in the blood, squamous cell carcinoma antigen (SCC) in the blood; CYFRA 21-1 in the blood, adenogenic cancer antigen CA-125 in the blood for adenocarcinoma; CYFRA 21.1 and SCC in the blood, cancer embryonic antigen for large cell LC. Cytological examination of pleural fluids and tumor smears for atypical cells (increase in cell size up to giant, change in shape and number of intracellular elements, increase in size of the nucleus, its contours, different degrees of maturity of the nucleus and other cell elements, change in the number and shape of nucleoli), examination of pleural fluids. Histological examination - large polygonal or spiky cells with well-defined cytoplasm, round nuclei with clear nucleoli, with the presence of mitoses, cells are located in the form of cells and cords with or without keratin formation, presence of tumor emboli in vessels, severity of lymphocytic-plasmocytic infiltration, mitotic activity of tumor cells. Molecular genetic testing of tumors (biopsy and postoperative materials, glass blocks, fluids, free circulating tumor DNA): EGFR (with formalin-fixed and paraffin-embedded tissue samples or blood plasma samples) - for non-small cell LC, regardless of the prevalence of the process (adenocarcinoma, squamous cell carcinoma in young non-smoking patients); T790M - should be performed in case of ineffectiveness and resistance to targeted drugs; ALK, ROS1 - for non-small cell LC (in patients with adenocarcinoma, for squamous cell carcinoma - in young non-smoking patients or with a mixed histological variant); PD-L1 - for non-small cell cancer (with locally advanced or metastatic cancer); BRAF - for non-small cell cancer; KRAS - for non-small cell cancer; MET mutation with loss of exon 14 in patients with locally advanced and metastatic non-small cell LC (MET gene amplification is one of the causes of secondary resistance to tyrosine kinase inhibitors, which is observed in 20% of patients resistant to EGFR tyrosine kinase inhibitor therapy); comprehensive genomic profiling of patients - in patients with a severe clinical course, aggressive tumors, with a high risk of progression, no effect from traditional antitumor treatment methods (advanced non-small cell LC). If clinically significant genomic changes/tumor biomarkers are detected as a result of comprehensive genomic profiling,



the use of registered drugs for unregistered indications is allowed to provide medical care/treatment of a specific patient based on the conclusion of a multidisciplinary group of the supervising organization in the field of oncology in cases where standard therapeutic options have been exhausted [1,2].

Instrumental studies: chest radiography in two projections (peripheral cancer is characterized by fuzziness, blurring of shadow contours; tumor infiltration of lung tissue leads to the formation of a kind of radiance around the node, which can be detected only in one of the edges of the neoplasm; in the presence of peripheral LC, a path can be detected that connects tumor tissue with the root shadow, caused by either lymphogenous spread of the tumor or its peribronchial, perivascular growth; X-ray picture for central cancer - the presence of tumor masses in the area of the root of the lung; hypoventilation of one or more segments of the lung; signs of valvular emphysema of one or more segments of the lung; atelectasis of one or more segments of the lung; X-ray picture for apical cancer is accompanied by Pancoast syndrome - it is characterized by the presence of a rounded formation in the apex of the lung, pleural changes, destruction of the upper ribs and the corresponding vertebrae); computed tomography (CT) of the chest and mediastinum - clarification of the nature of the process, the degree of damage to the root of the lung, mediastinum and chest, assessment of metastatic lesions of the lymph nodes (when conducting a study with contrast enhancement, determination of damage to the main vessels of the mediastinum; is a mandatory examination method for making a diagnosis); diagnostic bronchoscopy - the presence of a tumor in the lumen of the bronchus, completely or partially obstructing the lumen of the bronchus (with a central location of the pathological focus, diagnostic bronchoscopy is recommended under sedation with histological and cytological examination); with a peripheral location of the tumor, therapeutic and diagnostic thoracoscopy or thoracotomy with express histological and cytological examination is necessary; ultrasound examination of the supraclavicular and cervical lymph nodes; complex ultrasound diagnostics (liver, gallbladder, pancreas, spleen, kidneys); esophagoscopy; ultrasound-guided puncture/aspiration biopsy; open biopsy of enlarged supraclavicular and cervical lymph nodes (if enlarged lymph nodes are present); magnetic resonance imaging of the brain with contrast (CT of the brain if there are contraindications to magnetic resonance imaging); positron emission tomography + CT of the whole body; spirometry [1].

As noted by a number of researchers [3-6], LC is the second leading cancer in terms of new cases and the leading cancer in terms of cancer deaths worldwide. From a rare disease about a 100 years ago, LC has gained prominence as one of the leading cancers by the twenty-first century. The growth in LC burden has largely been attributed to the rise in cigarette smoking, which is expected to have peaked in industrialized countries. It should be emphasized that, the tobacco smoking epidemic is unfolding in regions of Asia and Africa, due to which, the LC burden is increasing in several countries of these regions. Although LC survival rates are one of the lowest among frequent cancer groups, there are wide disparities in five-year survival rates across countries, from less than 10% in countries such as Brazil, Bulgaria, India, and Thailand to 32.9% in Japan. About 80-85% of LC is non-small cell LC, which is further sub-divided into adenocarcinoma, squamous cell carcinoma, and large cell carcinoma and 10-15% of LC is small cell LC and the rest is lung carcinoid tumor and other LC. About 8% of LC is inherited or occur due to genetic predisposition. Tobacco smoking is by far the single most significant risk factor of LC, followed by air pollution, passive smoking, and occupational exposure to carcinogens such as asbestos and radon.

Sharma R. [3] in his work indicates that globally, there were 2.21 million (2.18-2.24 million) new cases and 1.8 million (1.77-1.83 million) deaths due to LC in 2020. Males accounted for approximately two-thirds of the global burden [1.44 million (1.41-1.46 million) new cases and 1.19 million (1.16-1.21 million) deaths]. The global age-standardized incidence rate (ASIR) of LC was

22.4/100,000, with males ASIR (31.5/100,000) being more than double that of females (14.6/100,000). Global age-standardized mortality rates (ASMR) was 18.0/100,000, varying from 11.2/100,000 in females to 25.9/100,000 in males. The mortality-to-incidence ratio (MIR) at the global level was 0.82 with not much difference between males (0.83) and females (0.79). It is important to note that East Asia was the leading region in terms of incident cases and deaths with an estimated 1.01 million (1.00-1.02 million) incident cases and 841,174 (831,852-850,601) deaths in 2020, followed by Northern America [cases: 253,537 (252,452-254,627); deaths: 159,641 (158,736-160,551)]. LC was ranked among the top three cancer groups out of 34 cancer groups in terms of new cases in 11/21 regions and among top three in 15/21 regions in terms of cancer deaths. The MIR of LC varied from 0.63 in Northern America to 0.96 in Micronesia, with MIR being 0.80 or above in the majority of regions except Australia/New Zealand (0.69), Northern Europe (0.73) and Western Europe (0.78). Polynesia had the highest ASIR (37.3/100,000) and Micronesia had the highest ASMR (34.9/100,000). Majority of African regions had low age-standardized rates, with Western Africa recording the lowest ASIR (2.2/100,000) and ASMR (2.1/100,000). In 2050, the global burden of LC is projected to reach 3.8 million new cases and 3.2 million deaths each year. In 2050, LC cases and deaths will be more than 100,000 in 10/21 regions led by Eastern Asia, which is projected to record 1.7 million incident cases and 1.5 million deaths. The burden of LC in regions of Asia (South-Eastern Asia, South-Central Asia, and Western Asia) and Africa (Northern Africa, Southern Africa, and Western Africa) is expected to double or more between 2020 and 2050, whereas regions in Europe (Northern Europe, Southern Europe, Western Europe, Central and Eastern Europe) are expected to witness the smallest increases in the LC burden. As a result of these changes, the LC burden in several Asian regions will surpass that in a few regions of Europe. For instance, South-Eastern Asia (123,309) and South-Central Asia (121,369) had lesser number of incident cases than Central and Eastern Europe (151,632) and Western Europe (146,460) in 2020; however, by 2050, these two regions in Asia will surpass the number of incident cases in Central and Eastern Europe and Western Europe. In 2050, LC is projected to claim similar number of lives in South-Eastern Asia (248,326) and South-Central Asia (238,020) as that in Northern America (253,058), although the projected number of incident cases in Northern America (378,587) is much higher than projected new cases in South-Eastern Asia (271,416) and South-Central Asia (264,309). In addition, even though Asia is in the initial stages of the smoking epidemic, the continent already accounted for 60% of incident cases and 62% of all LC deaths in 2020. If current rates persist in the future, there will be 2.4 million new cases and 2.2 million deaths in Asia due to LC in 2050. Therefore, anti-smoking campaigns and public awareness campaigns about health risks of smoking are urgently required to stop and reverse the smoking epidemic in Asia.

Today, molecular genetic studies are becoming an integral part of diagnosing the type and kind of oncological pathology in order to develop an optimal individual treatment plan for the patient.

In its fundamental review Saller J.J., Boyle T.A. [7], consecrated the current most clinically relevant aspects of thoracic molecular pathology. Historically, genomic alterations (GAs) that were considered drivers in LC were interrogated in panels using an à la carte approach with techniques such as Sanger sequencing, pyrosequencing, immunohistochemistry (IHC), and fluorescence in situ hybridization (FISH), which limited reportable GAs to select genes. Mutations in EGFR and translocations in the ALK gene and the ROS1 gene were the first three alterations recognized as clinically actionable drivers, and comprised the majority of the initial clinical genetic testing in LC. As the use of next-generation sequencing (NGS) became more cost-effective and widely used, it revealed additional actionable GAs. Evidence has accumulated to prove that NGS is an accurate technology with performance that is concordant or better than conventional methods. Advances in information about actionable GAs from comprehensive genomic profiling (CGP) has propelled

precision medicine forward with the aim to provide evidence-based interpretation of GAs for targeted therapy. The increase in the number of genes and GAs covered by NGS has expanded the variety of GAs identified as actionable in LC. A shift toward NGS-based testing in advanced LC has decreased the number of LC cases where a driver is not identified. Increasingly, case reports describe patients with novel drivers identified by NGS that would not have been identified if they were evaluated solely by hotspot-based panels. The researchers point out that historically, LC was divided categorically into non-small-cell LC (NSCLC) (~85%) and small-cell LC (SCLC) (~15%) by pathologist review of hematoxylin and eosin (H&E) stained slides. NSCLC is a heterogeneous category of entities that includes lung adenocarcinoma (LUAD) as the most common histologic cancer type (~50%), squamous cell carcinoma of the lung (SqCCL) as the second most common type (~30%), large-cell lung carcinoma (LCLC) (~10%), and combinations of histologic phenotypes such as adenosquamous carcinoma (ASC), and rare histologic entities, such as atypical carcinoid (AC) tumor, bronchial gland carcinoma, and sarcomatoid carcinoma, collectively accounting for the remaining types of NSCLC (~10%). In clinical practice, LC patients typically undergo an initial biopsy to determine whether there are histomorphologic features on H&E that are able to diagnostically distinguish between NSCLC or SCLC. Performance of IHC typically will assist in determining the subtypes of NSCLC. IHC that favors NSCLC that is LUAD is typically positive for CK7 and TTF-1, and negative for p63, CK5/6, and p40. IHC that favors NSCLC that is SqCCL is typically positive for p63, CK5/6, and p40 and negative for TTF-1 and CK7. The art of establishing a diagnosis may be challenging as many pathologists are aware that, in practice, some tumors might not have «read the book» regarding conventional IHC staining patterns. In such cases, other special stains such as mucin can assist (e.g., mucin is typically positive for LUAD, and negative for SqCCL). ASCs are a rarely encountered tumor that is biphasic, meaning there is a component that is LUAD and a component that is SqCCL. These components by definition have at least 10% each of malignant squamous and glandular components. Neuroendocrine IHC markers (CD56, chromogranin, and synaptophysin) are typically positive for neuroendocrine carcinomas such as SCLC and LCLC. In NSCLC, the tumor proportion score (TPS) for PD-L1 as determined by IHC (e.g., PD-L1 IHC 22C3 pharmDx) assists in determining eligibility for immunotherapy. While tissue is submitted for NGS, rapid testing for mutations in EGFR, KRAS, and BRAF are selectively tested via a rapid method such as pyrosequencing, while rearrangements in ALK and ROS1 can be rapid identified via FISH. When NGS results are made available, these results can corroborate the results of rapid testing, and potentially provide other GAs that may be actionable targets.

Oncogenotypes are molecular alterations that include genomic mutations, alterations that cause dysregulation in mRNA expression, dysregulation in expression of miRs, and epigenomic changes. As NGS-based DNA sequencing has become increasingly available, the knowledge about different types of mutations that are potentially actionable beyond the genetic biomarkers with associated FDA-approved targeted therapies has expanded. An oncogene is a gene in which activating mutations confer gain-of-function to a gene, which ultimately promotes oncogenesis. Conversely, a tumor-suppressor gene is a gene in which inactivating mutations confer loss-of-function to a gene, which ultimately promotes oncogenesis. In this paper, our colleagues detailed genomic, transcriptomic, epigenomic and proteomic differences between different histological types of LC relevant to research and therapeutic strategies [7].

Next, we will consider issues of early diagnosis of LC, including, of course, screening.

As noted, Lam S. et al. [8], low-dose CT (LDCT) screening for LC substantially reduces mortality from LC, as revealed in randomized controlled trials and meta-analyses. This review is based on the ninth CT screening symposium of the International Association for the Study of LC, which focuses on the major themes pertinent to the successful global implementation of LDCT screening and develops a strategy to further the implementation of LC screening globally. These recommendations provide a five-year roadmap to advance the implementation of LDCT screening

globally, including the following: 1) establish universal screening program quality indicators; 2) establish evidence-based criteria to identify individuals who have never smoked but are at high-risk of developing LC; 3) develop recommendations for incidentally detected lung nodule tracking and management protocols to complement programmatic LC screening (LCS); 4) integrate artificial intelligence and biomarkers to increase the prediction of malignancy in suspicious CT screen-detected lesions; and 5) standardize high-quality performance artificial intelligence protocols that lead to substantial reductions in costs, resource utilization and radiologist reporting time; 6) personalize CT screening intervals on the basis of an individual's LC risk; 7) develop evidence to support clinical management and cost-effectiveness of other identified abnormalities on a LC screening CT; 8) develop publicly accessible, easy-to-use geospatial tools to plan and monitor equitable access to screening services; and 9) establish a global shared education resource for LC screening CT to ensure high-quality reading and reporting.

Barta J.A. et al. [9] in their work they emphasize that, lung nodules are frequently detected on LDCT scans performed for LC screening and incidentally detected on imaging performed for other reasons. There is wide variability in how lung nodules are managed by general practitioners and subspecialists, with high rates of guideline-discordant care. This may be due in part to the level of evidence underlying current practice guideline recommendations (primarily based on findings from uncontrolled studies of diagnostic accuracy). The primary aims of lung nodule management are to minimize harms of diagnostic evaluations while expediting the evaluation, diagnosis, and treatment of LC. Potentially useful tools such as LC probability calculators, automated methods to identify patients with nodules in the electronic health record, and multidisciplinary team evaluation are often underused due to limited availability, accessibility, and/or provider knowledge. Finally, relatively little attention has been paid to identifying and reducing disparities among individuals with screening-detected or incidentally detected lung nodules. At the same time, lung nodules may be identified on chest scans of individuals who undergo LC screening (screening-detected nodules) or among patients for whom a scan was performed for another reason (incidental nodules); although the vast majority of lung nodules are not LC, it is important to have evidence-based, standardized approaches to the evaluation and management of a lung nodule; the primary aims of lung nodule management are to diagnose LC while it is still in an early stage and to avoid unnecessary procedures and other harms.

In Kazakhstan, methods for improving the early diagnosis of such a formidable disease as LC are also being actively developed. Including this method [10]. The aim of this study was to present the baseline results of a pilot project conducted to evaluate the effectiveness of LC screening using LDCT in regions with excessive radon levels in the Republic of Kazakhstan. In total, 3671 participants were screened by low-dose chest CT. Current, former, and never-smokers who resided in regions with elevated levels of radon in drinking water sources and indoor air, aged between 40 and 75 with no history of any cancer, and weighing less than 140 kg were included in the study. All lung nodules were categorized according to the American College of Radiology Lung Imaging Reporting and Data System (Lung-RADS 1.0). Overall, 614 (16.7%) participants had positive baseline CT findings (Lung-RADS categories 3 and 4). Seventy-four cancers were detected, yielding an overall cancer detection rate of 2.0%, with 10.8% (8/74) stage I and a predominance of stage III (59.4%; 44/74). Women never-smokers and men current smokers had the highest cancer detection rates, at 2.9% (12/412) and 6.1% (12/196), respectively. Compared to never-smokers, higher odds ratios (OR) of LC detection were found in smokers (OR, 2.48; 95% confidence interval [CI], 1.52 to 4.05,  $p < 0.001$ ) and former smokers (OR, 2.32; 95% CI, 1.06 to 5.06,  $p = 0.003$ ). The most common histologic type of cancer was adenocarcinoma (58.1%).

Ning J. et al. [11] in their study provide data showing that the prognosis of patients with LC at different clinical stages differs significantly. The five-year survival rate of stage IA groups can exceed 90%, while patients with stage IV can be less than 10%. Therefore, early diagnosis is

extremely important for LC patients. This research focused on various diagnosis methods of early LC, including imaging screening, bronchoscopy, and emerging potential liquid biopsies, as well as volatile organic compounds, autoantibodies, aiming to improve the early diagnosis rate and explore feasible and effective early diagnosis strategies. Let us dwell in more detail on endoscopic methods of diagnosing LC for verification of a malignant tumor. Nowadays, pathological diagnosis has been regarded as gold standard for diagnosing cancer. There are several methods for obtaining histological specimens, including bronchoscopy, ultrasound or CT-guided percutaneous lung biopsy. Among them, bronchoscopy has been developed rapidly and widely recognized in recent years. It not only expands the field of vision for diagnosis, but also improves the efficiency of diagnosis. So, the following types of endoscopic diagnostics of LC are distinguished:

1. White light bronchoscopy (WLB). It is mainly used for early detection and diagnosis of central LC, and the diagnosis rate can reach more than 95% in detecting high-grade dysplasia or worse. However, for some mucosal, submucosal early lesions and preneoplastic lesions, the diagnosis rate is very low.

2. Autofluorescence bronchoscopy (AFB). The operating principle of AFB is that different spectrum emerge in normal tissues, dysplasia and carcinoma in situ. As an important means for early detection of bronchial premalignant lesions, some studies have proposed that compared with sputum cytology, the sensitivity of AFB to detect hyperplasia and metaplasia was higher. Regardless of the results of sputum cytology, AFB can be recommended to high-risk patients. Moreover, when combined with spiral CT, sputum examination or WLB, AFB can obviously enhance the diagnosis rate of premalignant lesions and carcinoma in situ.

3. Narrow band imaging (NBI). NBI is an imaging technique that can visualize vascular morphology and mucosal structure. Analysis indicated that NBI has higher sensitivity (80%), specificity (84%), and diagnostic odds ratio (31.49%) than AFB when detecting premalignant airway lesions; NBI was also superior to WLB in detecting early and invasive LC, visual drawing of point blood vessel visual pattern highly supported adenocarcinoma histology of LC and tortuous vessels favored squamous cell cancer. Therefore, when examining lung-occupying lesions with NBI, not only can the diagnosis rate be improved, but also the pathological type can be evaluated initially. So, in the detection of early LC, NBI can be used as an effective method.

4. Endo-bronchial ultrasound (EBUS). EBUS combined with a special aspiration biopsy needle can be used for real-time ultrasound guided transbronchial needle aspiration biopsy, namely EBUS-TNAB. Compared with traditional diagnosis strategies, EBUS-TNAB can shorten the time for treatment decisions and may improve the survival of LC patients without increasing costs.

Now, regarding this pathology in our country at the republican level. The incidence of LC in the Republic of Kazakhstan in 2023 was 19.5 (30.6 - men; 8.8 - women) per 100 thousand population (20.1 - in 2022), which in absolute numbers amounted to 3873 people (3925 cases - a year earlier), taking the 2nd rank place in the general population, second, of course, only to breast cancer. The proportion of cases with a diagnosis established for the first time in life, recorded by oncological organizations was 10.5% (11.2% - in 2022). At the same time, 2974 men fell ill (proportion - 18.4%, 1 rank place), women - 899 (proportion - 4.3%, 9 rank place) [12]. The LC level is above the national average in 9 regions of the country: North Kazakhstan - 42.3 (the highest level); Karaganda - 36.5; East Kazakhstan - 34.6; Akmola - 32.6; Pavlodar - 32.5; Kostanay - 30.9; West Kazakhstan - 27.1; Abay - 24.3; Aktobe - 21.7. This indicator is below the national average in 11 regions: Turkestan - 8.4; (the lowest level); Mangistau - 9.5; the city of Shymkent - 10.6; Zhambyl - 11.5; Almaty - 13.6; Kyzylorda - 14.7; the city of Almaty - 15.1; Zhetysay - 15.9; the city of Astana - 16.4; Atyrau - 17.6; Ulytau - 18.1 regions per 100 thousand population. Mortality from this pathology was 10.3 (men - 16.7; women - 4.1) per 100 thousand population. In the structure of causes of death of persons of both sexes in 2023, this pathology continues to occupy a leading position (1st rank place), both in men, amounting to 23.7% (1626 people), and in the general



population, amounting to 15.8% (2046 people). For women, this figure was 6.9% and 4th rank place.

The regions with the mortality rate from LC above the national average (10.3 per 100,000 population) are: East Kazakhstan - 22.4 (maximum level); Abay - 19.5; Pavlodar - 18.2; North Kazakhstan - 16.0; Karaganda - 15.5; Akmola and West Kazakhstan - 14.6; Kostanay - 11.6. The lowest rates were recorded in Turkestan - 4.0 (minimum level); Mangistau - 5.7; the city of Shymkent - 6.5; Atyrau - 6.7; Kyzylorda - 7.0; Almaty - 8.0; Aktope - 8.4; Zhambyl - 8.9; Zhetysu - 9.2; in the city of Almaty - 9.4; Ulytau - 9.5; in the city of Astana - 10.1 regions per 100 thousand population [12].

The number of deaths from LC, not registered with oncological organizations and diagnosed posthumously in the Republic of Kazakhstan in 2023 amounted to 83 people; at the same time, the specific weight was 2.1% and this is the 5th rank place, as in the previous year.

At the same time, the one-year lethality rate was 37.2%, taking the 6th rank place among all nosological forms of malignant neoplasms. At the same time, the ratio between one-year lethality and neglect (stage IV) was, as in 2022, 1.4. At the same time, we recall that the farthest from "1" is the worst ratio between the indicators of one-year lethality and neglect.

Now, regarding preventive examinations. It should be noted that during large-scale preventive examinations of the population in 2023, significantly more patients with malignant neoplasms were actively identified than in 2022. This is 25,193 patients versus 23,623 patients identified in 2022, i.e. +6.6%. This is due to the further abatement of the epidemiological situation with coronavirus and the increased availability of preventive care for the population. The proportion of patients identified during preventive examinations increased from 62.0% to 62.4% of the total number of patients identified per year.

As for LC, the early detection of this pathology during preventive examinations increased from 33.6 to 35.2%. The number of newly diagnosed LC patients registered with oncology organizations was 3,754 patients (3,821 patients in 2022). At the same time, the absolute number of LC patients identified during preventive examinations was 2,213 people (2,088 a year earlier), and the proportion was 59.0% and 54.6%, respectively. 779 people out of 2,213 are patients with stages I and II (in 2022 - 702 patients out of 2,088). The proportion of LC patients identified at early stages, as indicated above, was 35.2% versus 33.6 a year earlier.

Of course, when analyzing the epidemiological situation, early diagnosis indicators are very important issues. The regions where the proportion of patients with early stage I of the pathology in question is above the national average (9.5% - 8th place among the worst indicators together with malignant lymphomas) include the following: North Kazakhstan - 27.5% (the best indicator); Karaganda - 19.3%; Akmola - 13.4%; Ulytau - 12.5%; Astana city - 11.7%; Kyzylorda - 11.4%. West Kazakhstan region is on par with the national average. The lowest indicators of early diagnosis were recorded in Zhambyl and North Kazakhstan - only 2.2%; Atyrau - 2.4%; Aktope - 3.0%; Abay - 4.2%; Mangistau - 5.5%; Almaty city - 5.6%; Kostanay - 6.0%; Almaty - 6.4%; Shymkent city - 7.1%; Pavlodar - 7.5%; East Kazakhstan - 8.2% and Zhetysu - 8.3% regions of the country [12].

Unfortunately, for a number of reasons, which include objective reasons, only every fourth patient with LC is detected in the early (I-II) stages of this pathology.

The regions where the proportion of patients with LC detected at stages I-II is above the national average (28.0% - 6th rank place "from the bottom") include the following regions. The uncontested leader is the North Kazakhstan region, where every second patient with this formidable disease is detected in the early stages (50.0%). Next come: Akmola - 36.2%; Aktope - 35.1%; Kyzylorda - 35.0%; Zhetysu - 34.3%; Almaty city - 30.5%; West Kazakhstan - 29.1%; Astana city - 29.0% and Kostanay - 28.6% regions. Low rates of early diagnosis were recorded in Mangistau - 13.7% (the worst result in the country); Almaty - 15.8%; Turkestan - 16.2%; East Kazakhstan - 19.8%; Abay - 21.0%; Ulytau - 22.5%; Pavlodar - 24.7%; Karaganda - 25.2%; Shymkent city - 26.0%;



Atyrau - 26.8% and Zhambyl - 27.3% regions [12].

As is clearly seen from the above data, there is a very large spread in early diagnostic rates across the country, from very good to dismal. Of course, it is necessary to take into account migration processes and other factors that affect early diagnostic rates, but nevertheless, the results obtained give reason not to stop there, both for oncologists and pulmonologists, general practitioners, since improving the rates of early diagnostics of malignant tumors, as one of the main postulates and one of the main tasks of medicine in general, continues to be relevant today. The proportion of stage IV LC among all nosological forms of malignant neoplasms was 26.5%. Unfortunately, in this indicator, LC is higher than all other localizations, second only to pancreatic cancer. At the same time, as was said above, the proportion of patients with LC detected at stages I-II was 28.0%, which indicates that the overwhelming majority of patients with LC were detected at locally advanced with loco-regional lesions - stage III of the disease. This stage was 45.5%, i.e. almost half of all patients, and we know what aggressive, often complex treatment is used for such a spread of the oncological process and what a disappointing prognosis is for these patients.

As for the average republican indicator of the proportion of stage IV (26.5%), against this background, Turkestan - 46.4%; Abay - 43.4% and Ulytau - 40.0% regions stand out. They are followed by: Akmola - 35.0%; Karaganda - 33.8%; the city of Astana - 33.2%; Zhetysu - 32.4%; Kostanay - 31.9% and other regions. The lowest proportion of stage IV LC was noted in the North Kazakhstan region, where this figure was 12.6% [12].

The morphological verification rate of the disease in the country was 77.2%. The leaders in this aspect with a 100% rate are Zhambyl and Ulytau regions; then come Almaty (92.6%), Atyrau (90.2%), the city of Shymkent (87.4%), the city of Astana (84.6%), Karaganda (84.5%), Turkestan (84.4%), Abay (83.2%), Kostanay (83.1%), East Kazakhstan (78.0%) regions. Aktobe region is on par with the national average. This indicator is below the national average in the following regions: Kyzylorda (37.4% - the worst indicator in the republic), the city of Almaty (54.8%), Pavlodar (65.7%), Akmola (68.3%), Mangistau (71.2%), North Kazakhstan (74.8%), Zhetysu (75.0%) and West Kazakhstan (76.0%) regions [12].

The total number of patients with malignant neoplasms registered with specialized oncology organizations of the republic continued to grow and by the end of 2023 amounted to 218,186 people, with an increase of 6.0% compared to the level of the previous year (2022 - 205,822, +5.8%). The overall incidence rate of malignant neoplasms increased by 3.9%, from 1055.3 to 1096.4 per 100 thousand people. The growth of this indicator is due to both the increase in the incidence and detection of pathology, and the increase in the survival rate of cancer patients. In addition, statistical data on patients diagnosed with malignant neoplasms, who have been under observation for 5 years or more and continue to be observed in 2023, showed that the number of patients under observation by oncological organizations in Kazakhstan for over five years continued to grow and at the end of the reporting year amounted to 117,616 people, with an increase of 6.2% (2022 - 110,790 people, +6.6%) (form No. 7).

One cannot ignore such an important clinical aspect as the coverage in the Republic of Kazakhstan of special treatment for patients diagnosed with LC for the first time in their lives. In 2023, the number of hospitalizations for all nosological forms of malignant tumors in oncological organizations of the country amounted to 108,252 cases (2022 - 101,095), with an increase of 7.1% compared to the previous year, which is associated with a constant increase in the number of cancer patients, improvement of the standardization of oncological care, and the development of palliative and restorative services. At the end of 2023, the absolute number of patients with LC who completed specialized treatment was 1,448 people, continuing treatment - 1,102 patients. In percentage terms, the following results were obtained by methods and types of treatment. Only 21.3% of patients received surgical treatment, only radiation - 4.6%, only drug treatment - 25.0%, combined - 3.2%, complex - 38.0% and chemo-radiation - 5.6%.

Further, regarding the five-year survival rate of patients. As for LC, at the end of 2023, 7,119 people or 35.8 per 100 thousand of the population were registered with the dispensary. At the end of 2022, there were 6,702 patients or 34.4 per 100 thousand of the population, respectively.

At the same time, the mortality rate of the observed contingents in 2023 decreased compared to the previous year and amounted to 28.7% in 2023 (31.6% in 2022). The five-year survival rate of patients with LC was 55.4% in 2023 and 55.3% in 2022 [12].

Summarizing the above, we can conclude that LC, along with breast cancer, continues to firmly occupy a leading place from year to year among all existing malignant tumors of other localizations. At the same time, taking into account a number of factors, the indicators of early diagnosis do not allow oncologists to "sleep peacefully", since the locally advanced stage III, which significantly prevails over all stages, in addition to the prevalence itself, gives a large number of complications due to the location of vital centers and tissue structures near the primary focus and locoregional metastases. Variability and veiling of symptoms, their similarity with various non-core processes, leads to neglect of the disease. All this requires both oncologists and, first of all, primary health care workers and, of course, pulmonologists, phthisiologists to increase the level of oncological alertness, inform the population about early symptoms that may indicate this pathology or the onset of proliferative changes and conduct high-tech diagnostic measures, including for the purpose of differential diagnosis and, as a result, timely treatment. People from the risk group are recommended to visit a pulmonologist annually and, if necessary, undergo an examination. Epidemiological assessment of the situation with LC in our country suggests that there are sometimes significant differences in the regions not only in incidence rates, but also in the parameters of early diagnosis and mortality from this pathology. In connection with the above, this pathology continues to be a serious problem of modern clinical oncology.

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## Pedagogical Sciences

# MÜSTƏQIL AZƏRBAYCAN RESPUBLİKASINDA TƏHSİLİN INKIŞAFINDA HEYDƏR ƏLİYEV SIYASƏTİ

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**Xülasə.** Azərbaycan Respublikası müstəqillik əldə etdikdən sonra bütün sahələrdə olduğu kimi təhsil sahəsində də önəmli dəyişikliklər baş verdi. Təhsil sahəsində islahatların aparılması, yeni Təhsil konsepsiyasının hazırlanması, təhsildə vahid mərkəzdən idarə olunma, təhsil müəssisələrinin struktur və statusunda dəyişikliklərin aparılması və s. tədbirlər ulu öndər Heydər Əliyevin adı və onun təhsil siyasəti ilə bağlıdır. 1992-ci Təhsil Qanununun qəbul olunması, ali və orta ixtisas məktəblərində qəbulun test usulu ilə aparılması, qeyri-obyektivliyə və mənfi hallara qarşı mübarizənin aparılması təhsil və maarifin təkmilləşməsində mühüm yeniliklərin bünövrəsini qoydu. Təhsil sistemi getdikcə təkmilləşdi, dövlət səviyyəsində təhsil sahəsində qəbul olunmuş qərar və sərəncamlar gənclərdə yüksək bilik potensialını aşkara çıxartmağa, yeni standartların və yeni təlim metodların tətbiqinə stimül yaradırdı. Ulu öndərin təhsil sahəsində də uzaqgörən siyasəti onun qəbul etdiyi qərar və fərmanlarda, yeni Təhsil haqqında Proqramının qəbulu və tətbiqi, təhsil islahatların keçirilməsində, tövsiyə və göstərişlərində özünü göstərirdi.

**Açar sözlər:** təhsil, inkişaf məktəblər, cəmiyyət, Heydər Əliyev siyasəti

Məlumdur ki, 1993-cü ilin iyun ayında Heydər Əliyev hakimiyyətə qayıdanda artıq dağıdıcı qüvvələr Azərbaycanı talan etmiş, ölkə ərazisinin bir qismini itirmiş, Azərbaycanda qaçqınlar və məcburi köçkünlər ordusu yaranmışdır. Ölkənin təhsil sistemi, demək olar ki, bərbad hala düşmüşdü. Cəmiyyətin ictimai və dövlət həyatının bütün sahələrini əhatə edən sistemli dərin böhran öz mənfi təsirini təhsil sistemində də göstərirdi. Kənd yerlərində məktəblər, demək olar ki, fəaliyyətini dayandırmışdı. Dağ və dağətəyi rayonlarında məktəblərin əksər hissəsi istilik sistemi olmadığından noyabr ayında bağlanır, may ayında açılırdı. Şəhər məktəblərində də vəziyyət ürəkaçan deyildi. Respublikanın cənub bölgəsində yaşlılar, bəzi hallarda cənub qonşu ölkədən gələn emissarlar sovet təhsil sistemində nifrət hissləri oyatmaq məqsədilə uşaqları dini məktəblərə cəlb etməyə cəhd göstərirdilər. Məlumdur ki, XX əsrin 80-ci illərindən başlayaraq müxtəlif siyasi qüvvələr şagirdləri, tələbələri mitinqlərə cəlb edirdi. Hətta mitinqlərdə iştirak etmək imtahanlarda tədris fənlərinin mənimsənilməsi kimi qiymətləndirilirdi. Bütün bunlar təhsil sisteminin böhranı və dağılması ilə nəticələnmişdi. Odur ki, 1993-cü ildə Heydər Əliyev qarşısında duran başlıca vəzifə təhsil sistemində böhranlı vəziyyətin tez bir zamanda aradan qaldırılması məsələsi idi.

1993-cü ildən başlayaraq Heydər Əliyev təhsil sistemində yeni Azərbaycan quruculuğunun ayrılmaz tərkib hissəsi kimi baxırdı. Heydər Əliyevin təfsirində təhsil Azərbaycan xalqının ümummilli mənafeələrinə uyğun inkişaf etməlidir.

Suveren Azərbaycanın Prezidenti kimi Heydər Əliyev təhsilin keyfiyyət parametrlərinə xüsusi diqqət yetirirdi. O, gənclərin təhsil və tərbiyəsində milli və ümumbəşəri dəyərlərin metodoloji cəhətdən vəhdətini tələb edirdi. Qarşıya çıxan bütün çətinliklərə baxmayaraq, Heydər Əliyevin Azərbaycanın təhsil sisteminin inkişafına, onun ixtisas nomenklaturasının daha da

genişlənməsinə nail ola bildi. Məhz bu məqsədlə Azərbaycan Respublikasının Prezidenti yanında Dövlət İdarəçilik Akademiyası, Azərbaycan Milli Konservatoriyası, Slavyan Universiteti, Sumqayıt Dövlət Universiteti və bir sıra hərbi yönümlü ali təhsil müəssisələri açıldı.

Ulu öndər Heydər Əliyev 1993-cü ilin avqust ayından başlayaraq təhsil işçiləri ilə görüşlərində, respublika gənclərinin I və II formunda, müəllimlərin XI qurultayında və digər tədbirlərdə təhsil sistemində ciddi problemlərin olduğunu və bu problemlərin aradan qaldırılmasını irəli sürmüşdü.

Ali təhsil müəssisələrinin professor-müəllim heyətinin əməyinin təşkilini daha da təkmilləşdirmək üçün ulu öndər 1994-cü il 24 fevral tarixində "Professor-müəllim heyətinin tədris işi üçün vaxt normasının müəyyənləşdirilməsi, elmi-tədqiqat, elmi-metodik və digər işlərin növləri barədə" sənəd imzalamışdır. Əsasnamə ali məktəblərdə tədris edən professor-müəllim heyətinin vəziyyətinin daha da yaxşılaşdırılmasına xidmət edirdi [6].

Professor-müəllim heyəti ilə yanaşı, ali təhsil müəssisələri haqqında da 1995-ci il martın 30-da Əsasnamə verilmişdir. Burada göstərilirdi ki, ali təhsil müəssisələri Azərbaycan Respublikası Təhsil Qanununa müvafiq olaraq Azərbaycan Respublikasında qəbul olunmuş digər qanunvericilik aktlarına, bu əsasnaməyə və özünün nizamnaməsinə uyğun fəaliyyət göstərir. 1995-ci il sentyabrın 22-də "Çoxpilləli ali təhsil sistemində bakalavr hazırlığı haqqında" əsasnamə verilmiş və 10 oktyabrda isə təsdiq olunmuşdur. Burada "bakalavr" hazırlığının təhsil proqramları, tələbə qəbulu, "bakalavr" pilləsində peşə-ixtisas təhsilinə verilən tələblər, təhsilin məzmunu, tədris prosesinin təşkilinin forma və metodları əks olunmuşdur.

1996 ci ilin yanvarın 9-da "Ali ixtisas təhsilinin dövlət təhsil standartı" haqqında əsasnamə verildi ki, əyani formada təhsil, proqramının mənimsənilməsinin normativ müddət istiqamətindən asılı olaraq, 3.5-4.0 il olub.

Azərbaycan Respublikasında çoxpilləli təhsilsistemində magistr hazırlığı haqqında 1997-ci il yanvarın 13-də əsasnamə verimişdir. 1997-ci ilin mayın 21-də "Ali təhsil müəssisələrinin magistraturasına müsabiqəyə buraxılma və müsabiqənin keçirilməsi barədə nümunəvi qaydalar"ın təsdiqi haqqında əsasnamə qəbul edilmişdir

1997- 1999-cu dərslər ilində eksperimentin aparılması qərara alınmışdır. Çoxballı sistem tələbələrə və şagirdlərin biliyinin qiymətləndirilməsində tətbiq olunan mövcud ənənəvi sistemdən aşağıdakı üstünlükləri ilə seçilir:

Tələbələrə və şagirdlərin fəaliyyətində yarışma meyllərinin artırılması; Təlimin fərdiləşməsinin təmin edilməsi;

Semestr ərzində tədris materiallarının sistemli və dərinlən mənimsənilməsinin təmin olunması;

Tələbələrə və şagirdlərin biliyinin qiymətləndirilməsində obyektivliyin təmin edilməsi;

Tələbələrə semestr boyu fəaliyyəti və biliyinin qiymətləndirilməsi haqqında dolğun məlumat əldə olunmasına imkan yaradılması tətbiqi [21, s 123].

1992-ci il Təhsil qanununu təkmilləşdirmək və yeni Təhsil Konsepsiyasını əsaslandırmaq məqsədi ilə "Təhsil İslahat proqramı" irəli sürüldü. Ümummilli idarə H.Əliyevin sərəncamı ilə 1998-ci il martın 30-da Təhsil Sahəsində İslahatlar üzrə Dövlət Komissiyası təşkil olundu. Dünya bankı, milli və xarici ekspertlərin köməyi ilə Azərbaycan Respublikasının Təhsil İslahat Proqramı hazırlandı və 1999-cu ilin iyunun 15-də təsdiq edildi[1].

1999-cu il 15 iyun proqramı təhsilin humanistləşdirilməsi, demokratikləşdirilməsi, diferensiallaşdırılması və inteqrasiyası kimi prinsipləri əsaslandırıldı və proqramda Azərbaycan milli təhsil sisteminin strategiyası və konsepsiyası müəyyənləşdirildi.

Təhsil islahatları elə islahatlardır ki, iqtisadiyyatdan, maliyyədən, başqa sahələrdən fərqli olaraq burada bütün cəmiyyətin iştirakı lazımdır.

Təhsil İslahat Proqramının 3 mərhələdə həyata keçirilməsi nəzərdə tutulmuşdur. I mərhələ hazırlıq mərhələsidir və 1999-cu ili əhatə edir. Bu mərhələdəki həll ediləsi əsas istiqamətlər aşağıdakılardır:

Təhsil sisteminin yeni normativ hüquqi, iqtisadi və informasiya bazasının yaradılması istiqaməti;

Bütün növ və tiplərdən olan təlim-tərbiyə müəssisələrinin inkişafının təmin edilməsi və yeni tipli təhsil müəssisələrinin, mərkəzlərin, komplekslərin təşkili istiqaməti;

Tədris sisteminin varisliyini təmin edən elmi, tədris-metodiki əsasların və təşkilati mexanizmin yaradılması istiqaməti;

Kadr hazırlığı, təminatı, ixtisasartırma və yenidən hazırlanmanın təşkilati mexanizminin yaradılması istiqaməti;

Təhsil sisteminin məlumat bankı və biliklər bazasının təşkilini təmin edən mexanizmlər yaradılması istiqaməti;

Təhsil sisteminin idarə olunmasında səlahiyyətlərin bö- lüşdürülməsi, idarəetmənin demokratikləşdirilməsi mexanizminin yaradılması istiqaməti;

Təhsil sisteminin yeni iqtisadi modelinə keçidlə bağlı normativlərin müəyyənləşdirilməsi və müvafiq şəraitin yaradılması istiqaməti.

Qısamüddətli perspektivliyi ifadə edən II mərhələ 2000-2003-cü illəri əhatə edir. Buradakı məsələlərin istiqamətləri aşağıdakılardır:

Bazasında yeni tipli elmi təhsil mərkəzlərinin yaradılması, təhsil müəssisələri şəbəkəsinin yenidən qurulması istiqaməti;

Təlim-tərbiyənin məzmununun təhsil alanların imkanlarına uyğun dövlətin, ictimaiyyətin və şəxsiyyətin tələbatı əsasında qurulması istiqaməti;

İşçi qüvvəsi resurslarının proqramlaşdırılması mexanizminin yaradılması istiqaməti;

Təhsil sisteminin tədris elmi-metodiki və informasiya təminatının yaradılması istiqaməti.

III mərhələ 2004-cü ildən sonrakı mərhələdir ki, burada da Proqramda nəzərdə tutulan bütün tədbirlərin müxtəlif yönüm və səviyyəli təhsil müəssisələrinin integrasiyası, onların keçirilməsi yolları əhatə olunmuşdur. İslahat Proqramında I mərhələdə 50, II mərhələdə 57, III mərhələdə 21 tədbirin, bütövlükdə 128 tədbirin həyata keçirilməsi müəyyənləşdirilmişdir.

“Validəyirlərini itirmiş və valideyin himayəsindən məhrum olmuş uşaqların sosial müdafiəsi haqqında” Azərbaycan Respublikası Qanununun tətbiq edilməsi haqqında” 30 avqust 1999-cu il tarixli, 188 nömrəli Fərmanının yerinə yetirilməsi ilə əlaqədar Bakının Suraxanı və Nəsimi rayonlarında uşaq evi, Quba rayonunun Zərdabi qəsəbəsində xüsusi internat məktəbi açılmışdır. Bakı Pedaqoji Kadrların İxtisasartırma və Yenidən hazırlanma İnstitutunda 2000-ci ildə rəhbər təhsil işçiləri üçün 4 dəfə həftəlik seminarlar təşkil olunmuşdur. Distant təhsilin konsepiyası hazırlanıb təsdiq olunmuş və onun müddəalarının həyata keçirilməsinə başlanılmışdır. Kadr hazırlığı prosesində “Təhsil alan-təhsil verən” münasibətlərinin tənzimlənməsi mexanizmi işlənilib hazırlanmışdır. Təhsil Nazirliyində bu məqsədlə yeni “Təhsilin idarə olunmasının məlumat sistemləri” şöbəsi də yaradılmışdır. 1999-2000-ci tədris ilində təhsilin humanistləşdirilməsi prinsipi həyata keçirilməyə başlanmışdır ki, bu da təhsil sisteminə daxil olan bütün orqanların və müəssisələrin həmin istiqamətdə məqsədyönlü fəaliyyətni nəzərdə tutur. Azərbaycan Respublikasının Təhsil Qanununda təhsilin humanistləşdirilməsi təhsil sahəsində dövlət siyasətinin ən vacib prinsiplərindən biri kimi qeyd olunmuşdur.

Azərbaycan mədəniyyətinin böyük bilicisi Heydər Əliyevin qayğısı sayəsində Azərbaycanın təhsil sisteminə iki yeni təhsil mədəniyyət ocağı daxil olmuşdur. Belə ki, Azərbaycan Dövlət Mədəniyyət və İncəsənət Universitetinin təsviri sənət profilli fakültələrinin və Azərbaycan Dövlət Rəssamlıq Akademiyası və onun nəzdində İncəsənət Kollecinin təsis edilməsi, Bakı Musiqi Akademiyasının xalq musiqisi profilli ixtisaslarının və Azərbaycan Milli Konservatoriyasının nəzdində Musiqi Kollecinin yaradılması həyata keçirilmişdir.



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# Дифференцированные задания как средство развития познавательной активности на уроках информатики

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**Аннотация:** Представлен опыт применения дифференцированных мини-проектных работ с целью активизации познавательной деятельности обучающихся на уроках информатики. Описаны способы дифференциации, которые были применены на уроках информатики. Рассмотрены некоторые вопросы методики применения дифференцированных мини-проектных работ в виде задания. Отмечены положительные и отрицательные стороны применения дифференциации на уроках информатики.

Развитие познавательной активности учащихся на уроках – одна из актуальных проблем на сегодняшний день, так как развитие новых информационных технологий, уход подрастающего поколения к их использованию затрудняет участие учащихся в активной деятельности во время урока. Но развитие активности, самостоятельности, инициативности и творческого подхода к решению задач – это требования жизни. Дифференцированный подход является актуальным и необходимым из-за того, что учащиеся различаются своими задатками, типами памяти, уровнем подготовки, восприятием окружающего мира, чертами характера. Если учесть, что восприятие, внимание, память, воображение, речь, мышление – психические познавательные процессы, из которых складывается умение и желание учиться, то развитие познавательную деятельность становится актуальным и важным звеном в обучающем процессе. А использование дифференцированных заданий, то есть мини-проектных работ решает данную проблему в определенной степени. Чтобы создать атмосферу успешности нужно оказывать не только учителю разные поддержки, но и учащимся оказывать друг другу руки помощи. В связи с этим, класс был разделен на группы и определены лидеры группы, отвечающие за успех своих и чтобы в каждой четверти члены группы менялись для того, чтобы учащийся не занял удобную позицию и вступал в активную деятельность. В виде дифференцированных заданий взяты мини-проекты, так как развивают творческое, логическое, пространственное мышление, коммуникативные навыки, умение работать с информацией, самоорганизацию и тайм-менеджмент. А эти навыки, которые способствуют развитию познавательных способностей и интереса к учёбе. Также основой формирования и развития познавательной способности является познавательная деятельность.

Хотелось бы выделить несколько направлений дифференциации, которые были использованы на практике: по образовательным целям, уровням выполнения мини-проекта, времени обучения и выполнения заданий, содержанию учебного материала, степени самостоятельности, характеру помощи, оценке деятельности. Как писал К.Д.Ушинский<sup>1</sup> о том, что при воспитании человека во всех отношениях нужно знать его во всех отношениях, исследование в практике начинается с изучения психологической карты учащегося, составленная психологом школы. Учет карты учащегося способствует использованию дифференциации при планировании и организации уроков с индивидуальным подходом, также при разделении на группы во время выполнения мини-проекта.

Дифференциация по характеру помощи

При выполнении мини-проектов дифференциация по характеру помощи учащиеся приступают сразу к выполнению мини-проекта. В течение выполнения задания оказывается стимулирующая помощь с целью включения в работу и разъяснения задания и направляющая помощь с целью определения последовательности шагов, который приведет к выполнению задания или исправлению ошибки при выполнении. Так предусматриваются вопросы, распределение на пункты, ресурсы или ссылки на материал, которые способствуют успешному решению проблемы, так как содержит нужный материал для выполнения задания. Учащиеся получают не только рекомендации или информацию с помощью которой будут реализовать мини-проект, но и обучаются самостоятельному поиску решения заданий. Также получают инструкцию и последовательность действий, выполняя которых достигается цель – создание мини-проекта. Таким образом оказывается обучающая помощь учащемуся с учетом индивидуальных особенностей. Например, предложенный внизу мини-проект «Анализ данных» (рис1) для 7 классов направлен на использование встроенных функции и создание электронной таблицы. Дается сценарий, учащийся определяет проблему, указывает функции для использования, затем пишет формулу и делает вывод. Анализируя данные, принимает решение и для написания вывода предложены вопросы для ориентира. Эти все подсказки для учащегося является помощью для достижения цели, что в свою очередь способствует развитию познавательной активности. При дифференциации по характеру помощи

Рис 1.

Мини проект «Анализ данных»

Сценарий

Аслан работает в мониторинговом отделе. Ему необходимо представить сравнительный анализ по продажи зерновых культур. Нужно произвести расчет по областям и по определенной дате и определить количество доходов на определенный период, также показать общую сумму продажи по каждому городу Казахстана.

1	Продажи за неделю по направлениям, тг										
2	Город	Области	14.07.16	15.07.16	16.07.16	17.07.16	18.07.16	19.07.16	20.07.16	сумма	
3	Самой	ВКО	100 000	110 000	120 000	130 000	140 000	150 000	160 000	20 000	
4	Алматы	ЗКО	55 000	50 000	60 000	67 000	62 000	20 000	20 000	10 000	
5	Уральск	ЗКО	45 000	46 000	48 000	51 000	48 000	12 000	6 000		
6	Туркестан	ЮКО	40 000	38 000	32 000	30 000	34 000	8 000	4 000		
7	Шымкент	ЮКО	30 000	31 000	30 000	30 500	34 000	7 000	3 500		
8	Октябрь	ВКО	28 000	25 000	24 000	25 000	27 500	3 500	2 000		
9	Тараз	ЮКО	10 000	11 000	10 500	10 500	12 000	1 000	500		
10											
11	Продажи по областям, тг										
12	ВКО										
13	ЮКО										
14	ВКО										
15											
16	Продажи по областям на дату, тг										
17	Дата	19.07.16									
18	ВКО										
19	ЮКО										
20	ВКО										
21											
22											

Проблема

Функции

Формулы

Вывод

Что вы бы отметили при решении данной проблемы? Почему хотели бы обсудить тему в следующий раз?

Критерии оценивание:

Применение:

- применяет оформление таблицы в табличном процессоре
- использует функции СУММЕСЛИ, СЧЕТЕСЛИ, СУМПРОИЗВ

Анализ:

- анализирует данных в таблице для произведения вычислений
- делает выводы о проделанной работе

### Дифференциация по степени самостоятельности

Дифференциация по степени самостоятельности учащихся обеспечивается выполнением одинакового задания самостоятельно, но для некоторых учащихся оказывается помощь со стороны учителя или ученика. В начале учащиеся знакомятся с мини-проектом и обсуждается правила его выполнения. Затем часть учащихся, у которых высокий уровень обучаемости приступают к самостоятельному выполнению задания мини-проекта. Остальная часть с помощью учителя анализируют способ и шаги выполнения. Мини-проект «Закон Ома» для учащихся 9 классов раздела «Создание приложений в среде C#» (рис2) является примером использования дифференциации по степени самостоятельности учащихся так как шаги прописываются в описании мини-проекта, поэтому по желанию учащихся может воспользоваться. Также в данном мини-проекте есть шаблон интерфейса, что в свою очередь является поддержкой для учащихся. Они могут сделать по предложенному шаблону окно приложения или могут по-своему оформить интерфейс окна приложения «Закон Ома».

Рис 2.

**Мини-проект «Закон Ома»**

Оформляйте дружелюбный интерфейс приложение «Закон Ома» и создайте работающую программу. Напишите программу, которая вычисляет силу тока или напряжение электрической цепи. Фон и иконку создайте самостоятельно с помощью программ PowerPoint и [т.д.](#)

**Шаги:**

1. Создайте дизайн интерфейса программы в паре.
2. Создайте фон и иконку. Сохраните в нужном формате.
3. Создайте интерфейс. Расположите компонентов на форму и измените свойства.
4. Внедрите рисунок для фона и иконку для оформления кнопки и метки.
5. Создайте дружелюбный интерфейс.
6. Создайте код программы.

**Примерный интерфейс (использовать картинку для фона и иконки для метки и кнопки):**

Критерии оценивание	Дескрипторы
Оформляет дружелюбный интерфейс приложение «Сопротивление»	Использует изображение для фона
	Использует иконку для метки
	Размещает компонентов (button, label, <u>textBox</u> , <u>pictureBox</u> )
	Применяет свойства к компонентам
	Использует компоненты для ввода, для комментариев, для выбора типа соединений и для выполнения приложения
Создает код программы	Пишет код для кнопки вычислить
	Использует условный оператор в коде
	Использует функции преобразования
	Организует в коде вывод сообщения на модальное окно

Дифференциация заданий по объему учебного материала

Дифференциация заданий по объему учебного материала используется с целью задействия учащихся и организации дополнительного задания. Потому что, возникает необходимость задействовать учащихся, которые выполнили мини-проект быстрее чем другие, которые выполняют медленнее задания, то есть медлительные учащиеся или с низким уровнем обучаемости. Учитывая индивидуальную особенность учащихся в мини-проект включается дополнительное задание. В мини-проекте «Сопротивление» для учащихся 10 класса предоставляется создать приложение в среде Си шарп. Но для учащихся, которые разработали приложение за определенное короткое время, предлагается учитывать в программном коде проверку условия  $r_1+r_2 \neq 0$ , так как деление на ноль приводит к ошибке программы и оформить фон и добавить картину. Эти действия будут как дополнительное задание для некоторых учащихся. Но необходимо стимулировать учащихся используя различные поощрения, чтобы сделали необязательную работу.

**Мини-проект «Сопротивление»**

Оформляйте дружелюбный интерфейс приложение «Сопротивление» и создайте работающую программу. Напишите программу, которая вычисляет сопротивление электрической цепи. Сопротивления могут быть соединены последовательно или параллельно.

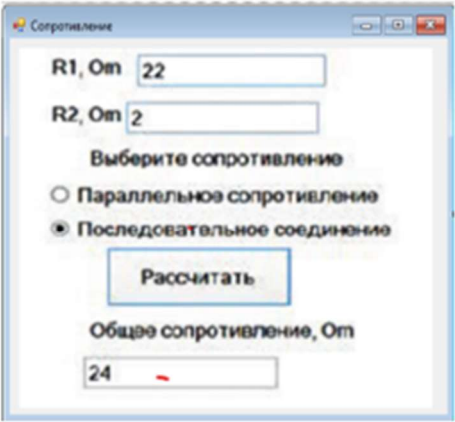
**Формулы:**

- Последовательного соединения  $r = r_1 + r_2$
- Параллельного соединения  $r = (r_1 * r_2) / (r_1 + r_2)$

**Шаги:**

1. Создайте дизайн интерфейса программы в паре.
2. Создайте фон и иконку. Сохраните в нужном формате.
3. Создайте интерфейс. Расположите компонентов на форму и измените свойства.
4. Внедрите рисунок для фона и иконку для оформления кнопки и метки.
5. Создайте дружелюбный интерфейс.
6. Создайте код программы.

**Примерный интерфейс (использовать картинку для фона и иконки для метки и кнопки):**



**! Дополнительное задание:**

1. Оформите фон.
2. Учтите в коде проверку условия:  $r_1+r_2 \neq 0$

Критерии оценивание	Дескрипторы
Оформляет дружелюбный интерфейс приложение	Размещает компонентов (button, label, <u>textBox</u> , <u>pictureBox</u> , <u>radioButton</u> , <u>groupBox</u> )
	Применяет свойства к компонентам
	Использует компоненты для ввода, для комментариев, для выбора типа соединений и для выполнения приложения
Создает код программы	Пишет код для кнопки вычислить
	Использует функции преобразования
	Организует в коде вывод сообщения на модальное окно

Таким образом, использование дифференцированных заданий дает ряд преимуществ:

- создает оптимальных условий для развития учащегося в соответствии с индивидуальными особенностями;
- выявляет одаренных учащихся;
- устраняет страх и снижает уровень самооценки, создавая ситуацию успеха для разных уровней;
- повышает качества учебного процесса.

Эти преимущества в свою очередь повышают познавательную деятельность и интерес к уроку, так как где есть успешное обучение там есть интерес, а где интерес там стремление и мотивация.

Были затруднения по требованию больше времени на разработку заданий, но при использовании тайм менеджмента можно устранить проблему.

Рекомендации для использования дифференцированного мини-проекта с целью развития познавательной деятельности:

1. осуществлять деление не только по инициативе учителя, но и учащихся,
2. разработать мини-проекты к каждому уроку заранее с учетом различных подходов к дифференциации,
3. учитывать таксономию Блума при разработке дифференцированных мини-проектов,
4. изучить и учитывать при планировании и организации психологическую карту учащегося,
5. давать и собирать обратную связь и учитывать в планировании следующего урока.



# Интегрированное обучение и его влияние на развитие учащихся

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Интегрированное обучение – это педагогический подход, предполагающий объединение различных учебных дисциплин в едином контексте. Комплексный подход к обучению предполагает объединение научных знаний из различных областей науки, что способствует формированию среди учащихся целостного мировоззрения и развитию междисциплинарных компетенций. Интегрированный подход часто включает в себя проектные работы, которые позволяют учащимся применять полученные знания по внедрению и развитию навыков решения проблем, креативности и сотрудничества. Интегрированный подход помогает учащимся видеть связи между различными областями знаний и применять их для решения своих проблем. Подобный подход, вдохновленный теорией множественного интеллекта Гарднера, создает инклюзивную среду, где каждый ученик может раскрыть свой потенциал.

Интегрированное обучение — это гибкий подход, который можно адаптировать к любой учебной дисциплине, обеспечивая более глубокое погружение в изучаемый материал. Учителя разных предметов объединяют свои усилия, чтобы создать эффективный урок, ориентированный на интересы и развитие способностей учащихся. Чтобы сделать обучение более интересным и эффективным, предложите учащимся новые задания и разные формы работы. Основными принципами интегрированного обучения являются сочетание языка и содержание. Язык используется не только как изучение объекта, но и как инструмент для получения знаний по другим предметам. Поэтому при обучении языковым предметам надо использовать аутентичные материалы, такие как статьи, видео, аудиозаписи, что делает обучение более интересным и приближенным к описанию жизни. Можно использовать следующие формы интегрированного обучения: изучение предметов на языке обучения, выполнение проектов, связанных с различными предметами на другом языке, также можно создать презентацию исторического события на основном языке обучения. Такие формы работы способствуют развитию не только языковых навыков, но и других важных компетенций, таких как критическое мышление, креативность и сотрудничество. Одним из примеров интегрированного обучения являются междисциплинарные проекты, которые представляют собой комплексные научные задания, объединяющие знания в разных предметных областях. Учащиеся, работая над такими проектами, не только владеют знаниями по дисциплинам, но и развивают навыки критического мышления, анализа информации, творческого решения проблем и сотрудничества. Примерами междисциплинарных проектов могут быть: создание фильма об историческом событии, включающего элементы истории, литературы, искусства и иностранных языков, разработка проекта по благоустройству школьной территории, сочетающего знания по биологии, географии, математике и дизайну, создание интерактивной презентации о проблеме загрязнения окружающей среды, включающей элементы географии, информатики и обществознания.

Интегрированное обучение формирует обеспечение целостности картины мира и развитие междисциплинарных связей. Многочисленные исследования подтверждают

эффективность комплексного обучения. Например, метаанализ, проведенный Дж. Килином и Р. Гарднером показал, что комплексные программы направлены на более глубокое понимание учебного материала, развитие критического мышления и повышение мотивации учащихся.

Другое исследование показывает, что интегрированное обучение положительно влияет на академические достижения: обучающиеся по интегрированным программам, как правило, показывают более высокие результаты по стандартным тестам. Кроме того, у них развиваются социальные навыки: обучающиеся становятся более коммуникабельными и сотрудничают друг с другом. Интегрированный подход также развивает креативность учащихся: интегрированные проекты стимулируют творческое мышление. Учащиеся разрабатывают новые идеи и мыслят нестандартно. Объединив два предмета в один урок, мы оптимизируем использование учебного времени, что позволяет учащимся сосредоточиться на теме урока в течение длительного периода и повысить свою продуктивность.

Интегрированное обучение – это процесс соединения различных знаний и опыта для решения новых задач. Как отмечают зарубежные исследователи, такой подход предполагает активное участие учеников в построении концептуальных траекторий, связывающих знания, полученные с реальными жизненными ситуациями. Они предлагают ряд практических стратегий для стимулирования интегрированного обучения. Например, надо учащимся ставить четкие цели в начале каждого урока, связывать текущий материал с примером из жизни и определять, как полученные знания могут быть применены в будущем. Кроме того, зарубежные исследователи интегрированного образования — Джон Дьюи, Ховард Гарднер, а также многие педагоги и психологи советуют поощрять учащихся, которые применяют полученные знания на практике и размышляют над своим обучением. При планировании интегрированного урока следует обсудить важные аспекты: какая тема будет объединять разные предметы, какие знания и навыки должны получить ученики в результате урока, как именно будут интегрированы различные предметы, какие конкретные задачи и стратегии будут предложены ученикам, кто из преподавателей будет вести часть урока, как будет организовано взаимодействие между ними, как будет оцениваться работа учащихся и какие критерии будут использоваться. Структура интегрированного урока может рассматриваться в зависимости от темы, возраста учащихся и целей обучения, но в целом она включает следующие этапы:

#### 1. Стадия вызова.

Создание проблемной ситуации. Предложить ученикам интересный вопрос, который требует междисциплинарного подхода для решения.

#### 2. Стадия осмысления

Работа с источниками информации: использование учебников, интернет-ресурсов, наглядных пособий. Выполнение заданий, требующих применения знаний из разных предметов. Обсуждение проблем, совместное решение задач. Применение знаний на примере. Решение кейсов: анализ обстоятельств, требующих применения междисциплинарных знаний. Сбор информации, её анализ и представление результатов.

#### 3. Рефлексия

Обсуждение результатов работы: анализ достижений и преимуществ. Формулирование выводов о связи изучаемых предметов. При организации интегрированного урока важно тщательно отобрать ресурсы, которые будут способствовать достижению поставленных целей, и сделать процесс обучения более интересным и эффективным. Основными ресурсами являются учебники, научные статьи и исследования, художественные произведения, исторические документы, технические средства, наглядные материалы. При выборе ресурсов необходимо учитывать их актуальность, доступность,

разнообразие и соответствие темы. Помните, что правильно подобранные ресурсы помогают сделать интегрированный урок не только информативным, но и увлекательным для учащихся.

Программа NIS направлена на формирование у учащихся фундаментальных академических знаний, развитие критического мышления и функциональной грамотности. Учителя естественно-математических и гуманитарных дисциплин при изучении сквозных тем совместно планируют уроки для достижения желаемого результата.

Обсудив с учителем биологии общие проблемы для обоих предметов (слабые навыки аналитического мышления у учащихся), совместно разработали интегрированный урок в 8-м казахском классе на тему «Свойства воды». Это был третий урок из раздела «Вода – основа жизни». Подготовили необходимые ресурсы для урока с учетом способностей учеников, также интересные активити и формы оценивания для достижения ожидаемых результатов. Урок начался с просмотра видеоролика «Тайные свойства воды», затем учащиеся обсудили в парах: какими интересными свойствами обладает вода, согласно просмотренному ролику. Далее ученикам были предложены различные утверждения, они должны были определить: при каких условиях утверждение всегда верно, а при каких верно в большинстве случаев. Так, для доказательства утверждения «Вода является родиной для человека» учащиеся обратились к тексту повести Я. Мавра «Сын воды» и привели примеры из жизни народа фуиджи, а также некоторых народов Вьетнама, для которых вода действительно имеет символическое значение родины. При обсуждении роли воды как источника вдохновения для творческих людей, ученики, пришли к выводу, что это верно в большинстве случаев, в частности, упомянув знаменитую картину И. К. Айвазовского «Девятый вал». Выполнение данных заданий помогает глубже понять многогранную роль воды в жизни человека и развить навыки анализа и аргументации.

Поскольку целью урока было развитие навыков поискового чтения, следующее задание было направлено на то, чтобы обучающиеся могли быстро находить необходимую информацию в тексте. Для этого мы воспользовались приемом сканированного чтения. Ученики прочитали текст и выполнили задание через приложение Microsoft forms. Ученики выполняли тестовые задания. Например, какая часть всей воды на Земле пригодна для питья? Правильный ответ: 3%. Учащиеся продемонстрировали хорошие навыки владения поискового чтения. На следующем этапе урока под руководством учителя биологии обучающиеся приступили к практической части. Учитель продемонстрировал эксперименты с водой, продемонстрировав различные ее свойства, такие как растворимость и теплоёмкость. Затем для дополнения материала была проведена игра «Бинго»: учащимся предложили определить физические свойства воды. Вопросы были достаточно нестандартными, например: «Как экспериментально определить теплоёмкость воды?», «Что такое когезия и адгезия, и как эти явления влияют на свойства воды?», «В чем заключаются биполярные свойства воды?» Постоянное повторение терминов в игровой форме способствовало их лучшему запоминанию: школьники неоднократно проговаривали слова «теплоёмкость», «когезия», «адгезия», «растворимость» и использовали их в своих высказываниях.

В ходе практической части интегрированного урока ученики делают выводы о свойствах воды, основываясь на изученных научных экспериментах. Игра вызвала у них живой интерес, хотя иногда возникали трудности с правильным определением терминов. При этом ученики не только определяли термины, но и активно применяли их при решении поставленных задач. В этом классе урок биологии проводится на родном языке, однако на интегрированном занятии ученики отвечали на все вопросы учителя биологии на втором языке обучения. Их активное участие свидетельствовало о глубоком погружении в тему и осознании свойств воды, особенно при параллельном рассмотрении ее физических и

химических характеристик. Завершающую часть урока продолжает учитель языка и литературы. Учащимся было предложено написать пятиминутное мини-эссе на тему «Чем полезна вода для человека?». В этой письменной работе ученики продемонстрировали идеи, почерпнутые из текста и проведенных экспериментов, а также использовали лексику (научные термины, эмоционально окрашенную лексику), связанную с темой воды.

Комплексный подход к обучению, включающий анализ информации из различных источников (учебников, интернет-ресурсов и результатов исследований), способствовал развитию у учащихся навыков критического мышления. Сравнивая факты, выявляя причинно-следственные связи и рассматривая различные точки зрения, они самостоятельно принимают взвешенные решения и эффективно решают возникающие проблемы. Развитие этих навыков помогает им успешно адаптироваться к меняющемуся миру и постоянно добиваться высоких результатов в учебе и будущих профессиональных делах.

Интегрированные уроки также стимулируют развитие навыков решения проблем: они ищут нестандартные подходы и продолжают творческую работу.

С учителем Глобальных перспектив совместно спланировали интегрированный урок в 10 казахском классе на тему «Богатство и бедность в современном мире». Занятие началось с обсуждения проблемных вопросов, связанных с последствиями социальной несправедливости. Затем, через использование стратегии «Корзина идей», учащиеся расширили свои знания о причинах социального неравенства в казахстанском обществе. Далее учащимся был предложен отрывок из рассказа А. Грина «Зелёная лампа». Используя стратегию изучающего чтения, ученики проанализировали образы героев и пришли к выводу, что бедность и социальное положение не только ограничивают возможности человека, но и способствуют его мировоззрению, способствуют самооценке и жизненным решениям. Однако главный герой произведения А.Грина «Зелёная лампа», несмотря на трудности, смог извлечь ценный жизненный урок. Таким образом, анализ художественного текста позволил учащимся глубже осмыслить проблему социального неравенства и его влияния на личность.

Далее учитель глобальных перспектив предложил учащимся интерактивную игру Kahoot!. Задания, связанные с причинами и последствиями социального неравенства, помогли им закрепить полученные знания и увеличить свой словарный запас. Ребята освоились с такими понятиями, как «индикаторы экономического развития», «неравный доступ к ресурсам», «дискриминация», «социальная несправедливость» и другие. Интегрированный подход, сочетающий элементы экономики и художественной литературы, сделал учебный процесс более интересным и эффективным. Учащиеся активно обсуждали вопросы, демонстрируя глубокое понимание рассматриваемых проблем.

Наблюдая за тем, как изучаемые предметы применяются в реальной жизни, можно дать учащимся более глубокое понимание целей обучения, сделав его более осмысленным и актуальным. Поэтому я считаю, что учителям естественно-математического и гуманитарных дисциплин необходимо объединиться в планировании интегрированных уроков по сквозным темам. Важно искать концепции, которые можно глубоко изучить в рамках различных учебных дисциплин. Интегрированное обучение, объединяющее различные научные дисциплины, оказывает существенное влияние на развитие креативности среди учащихся. Вот несколько ключевых моментов, благодаря которым это происходит:

Междисциплинарные проекты позволяют учащимся сохранять связи между различными областями знаний. Например, при создании проекта о влиянии музыки на настроение можно получить знания в области психологии, истории, физики и музыки.

Кроме того, интегрированное обучение позволяет учащимся рассматривать проблему с разных точек зрения, включая создание новых идей и нестандартных решений.

Примеры интегрированных проектов, способствующих развитию креативности:

- Создание интерактивной карты исторических событий: Объединение истории, географии, информатики и дизайна.
- Разработка экологического проекта: Комбинирование знаний по биологии, химии, географии и социальных наук.
- Создание музыкального клипа на основе литературных произведений: Сочетание литературы, музыки, искусства и информатики.

Чтобы внедрить интегрированное обучение в педагогический процесс, необходимо решить ряд задач: организовать семинары и мастер-классы для учителей, разработать горизонтальное планирование уроков и активно использовать современные образовательные технологии, такие как онлайн-платформы и цифровые ресурсы.

Интегрированное обучение — это перспективный подход, который позволяет сделать образование более эффективным и интересным. Он способствует развитию ключевых компетенций, необходимых для успешной жизни в современном мире. Однако для успеха реализации интегрированных программ требуется серьезная подготовка образования и соответствующая образовательная среда.

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## Legal Sciences

# THE ANALYSIS OF THE PROCESS OF PROTECTING CITIZENS' RIGHTS THROUGH VARIOUS HUMAN RIGHTS AND METHODS AND MECHANISMS

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**Abstract.** This article explores the multifaceted process of protecting citizens' rights through various human rights methods and mechanisms. It examines the interplay between international human rights law, national legal frameworks, and the role of non-state actors in safeguarding fundamental freedoms. The analysis encompasses both legal and practical dimensions, investigating the effectiveness of different approaches in addressing human rights violations. The abstract considers the strengths and limitations of international treaty bodies, regional human rights courts, national human rights institutions, and civil society organizations in promoting and enforcing human rights standards. It also addresses the challenges posed by globalization, political instability, and resource constraints in ensuring effective human rights protection. Finally, the abstract emphasizes the importance of a holistic and multi-layered approach, involving collaboration among diverse stakeholders, to strengthen human rights protection mechanisms and achieve tangible improvements in the lives of individuals.

### 1. Introduction

The protection of citizens' rights is a cornerstone of a just and equitable society. This article analyzes the multifaceted processes involved in safeguarding these rights through various human rights methods and mechanisms. It examines the interplay between international human rights law, national legal frameworks, and the role of non-state actors in upholding fundamental freedoms. The analysis encompasses both legal and practical dimensions, investigating the effectiveness of different approaches in addressing human rights violations.

### 2. Theoretical Framework for Protecting Citizens' Rights

The foundation for protecting citizens' rights lies in international human rights law, codified in instruments like the Universal Declaration of Human Rights and various international covenants and treaties. These instruments establish universal standards and principles that states are obligated to respect, protect, and fulfill. National legal frameworks translate these international obligations into domestic law, providing mechanisms for enforcement and redress. However, the practical realization of these rights often depends on the active involvement of non-state actors, such as civil society organizations, national human rights institutions, and the media.



This literature review examines the existing scholarship on protecting citizens' rights through various human rights methods and mechanisms. It explores the evolution of human rights law, the effectiveness of international and regional institutions, the role of national governments and civil society, and the challenges in ensuring the practical realization of human rights for all.

### **The Evolution of Human Rights Law and Mechanisms**

The development of international human rights law, beginning with the Universal Declaration of Human Rights in 1948, has provided a normative framework for protecting fundamental freedoms. Scholarly works, such as those by Alston [no source found] and Donnelly [no source found], analyze the historical context, philosophical underpinnings, and legal significance of the UDHR and subsequent international covenants and treaties. These works highlight the shift from a state-centric view of sovereignty to a human-centered approach that emphasizes the universality and indivisibility of human rights.

### **International and Regional Human Rights Mechanisms**

A significant body of literature examines the effectiveness of international and regional human rights mechanisms. Studies by Forsythe [no source found] and Landman [no source found] analyze the role of international treaty bodies, such as the Human Rights Committee and the Committee on the Elimination of Discrimination against Women, in monitoring state compliance with human rights obligations. These works assess the strengths and limitations of these mechanisms, including their limited enforcement powers and the challenges of state reporting and follow-up. Other scholars, such as Helfer and Slaughter [no source found], explore the role of regional human rights courts, such as the European Court of Human Rights and the Inter-American Court of Human Rights, in providing legal redress for human rights violations. These studies analyze the impact of these courts on domestic legal systems and their contribution to the development of human rights jurisprudence.

### **The Role of National Governments and Civil Society**

The effective protection of citizens' rights requires the active involvement of national governments and civil society. Research by Sikkink [no source found] and Hafner-Burton & Tsutsui [no source found] examines the role of domestic institutions, such as national human rights commissions and courts, in implementing international human rights standards. These studies analyze the factors that influence the effectiveness of these institutions, including their independence, resources, and political context. Other scholars, such as Keck and Sikkink [no source found], explore the role of transnational advocacy networks in promoting human rights norms and mobilizing international pressure on governments. These works highlight the importance of civil society engagement in monitoring human rights violations, advocating for policy changes, and providing support to victims.

### **Challenges and Future Directions**

Despite significant progress in the development of human rights law and mechanisms, numerous challenges remain in ensuring the practical realization of human rights for all. Scholars, such as Goodman [no source found], analyze the challenges posed by globalization, economic inequality, and political instability to the effective protection of human rights. These works emphasize the need for a multi-faceted approach that addresses the root causes of human rights violations and strengthens the capacity of states and civil society to protect and promote human rights. Future research should focus on developing innovative strategies for human rights protection, strengthening accountability mechanisms, and promoting a culture of human rights at the national and international levels.

### 3. Methods and Mechanisms for Protecting Citizens' Rights

This section analyzes various methods and mechanisms employed to protect citizens' rights:

- **International Treaty Bodies:** These bodies monitor state compliance with human rights treaties, providing recommendations and engaging in dialogue with governments. While their decisions are not legally binding, they exert significant moral and political pressure.
- **Regional Human Rights Courts:** Regional courts, such as the European Court of Human Rights and the Inter-American Court of Human Rights, offer individuals a legal avenue to challenge human rights violations. Their judgments are legally binding on states within their jurisdiction.
- **National Human Rights Institutions:** Independent national human rights institutions play a crucial role in monitoring human rights situations, investigating complaints, and promoting human rights education and awareness.
- **Civil Society Organizations:** NGOs and other civil society groups advocate for human rights, document violations, provide legal assistance to victims, and mobilize public opinion.
- **Media:** The media plays a vital role in exposing human rights abuses, raising public awareness, and holding governments accountable.

### 4. Challenges and Limitations

Despite the existence of these mechanisms, numerous challenges hinder the effective protection of citizens' rights:

- **Lack of Political Will:** Governments may lack the political will to implement human rights standards or may actively suppress human rights defenders.
- **Resource Constraints:** Limited resources can impede the effective functioning of national human rights institutions and the implementation of human rights programs.
- **Globalization:** Globalization can create new challenges to human rights protection, such as the exploitation of workers in global supply chains.
- **Political Instability and Conflict:** Armed conflicts and political instability often lead to widespread human rights abuses and undermine the rule of law.

### 5. Strengthening Human Rights Protection

To enhance the protection of citizens' rights, a multi-pronged approach is required:

- **Strengthening International Cooperation:** Increased cooperation among states, international organizations, and civil society is essential to address global human rights challenges.
- **Empowering National Human Rights Institutions:** Providing adequate resources and ensuring the independence of national human rights institutions is crucial for their effectiveness.
- **Promoting Human Rights Education:** Educating citizens about their rights and empowering them to claim them is essential for building a culture of human rights.
- **Supporting Civil Society:** Protecting and supporting the work of civil society organizations is vital for holding governments accountable and promoting human rights.

### 6. Conclusion

Protecting citizens' rights is an ongoing process that requires constant vigilance and the concerted efforts of various actors. While significant progress has been made in establishing international human rights standards and mechanisms, challenges remain in ensuring their effective implementation. A holistic and multi-layered approach, involving collaboration among diverse stakeholders, is essential to strengthen human rights protection mechanisms and achieve tangible improvements in the lives of individuals.

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# Artificial Intelligence and Legal Research: Theory and Practice

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**Keywords:** AI, Legal Research, Law, Machine Learning, Legal Technology

## Abstract

Artificial Intelligence (AI) has significantly transformed legal research, impacting case law analysis, contract review, and legal analytics. With the ability to process vast amounts of legal data, AI enhances efficiency, reduces human error, and allows for predictive analytics in case law and regulatory compliance. This paper explores the theoretical foundations and practical applications of AI in the legal domain, emphasizing its advantages and challenges. The integration of AI into legal research has led to the development of sophisticated tools that support legal professionals in analyzing precedents, drafting legal documents, and predicting litigation outcomes. AI-driven legal databases and automated legal analytics streamline the traditionally time-consuming process of legal research, enabling professionals to focus on higher-level analytical work. However, concerns regarding bias in AI algorithms, transparency, ethical considerations, and regulatory compliance persist. This study investigates the methodologies and frameworks underpinning AI-driven legal research, providing a comparative analysis of existing AI legal research tools and their effectiveness. The paper also discusses the ethical and regulatory challenges surrounding AI adoption in legal studies and explores future trends in AI-driven legal research. By examining practical applications, this study aims to shed light on the opportunities and limitations AI presents in legal scholarship and practice, ultimately assessing its impact on the future of legal research.

## 1. Introduction

The legal field has long been associated with rigorous research, comprehensive case analysis, and the interpretation of legal texts. With the advent of artificial intelligence (AI), legal research is undergoing a paradigm shift, revolutionizing how legal professionals access, analyze, and utilize information. AI is enhancing efficiency, streamlining the research process, and providing new insights into legal trends through advanced analytics. As AI continues to evolve, its integration into legal research has become a crucial area of study, offering both opportunities and challenges. Traditionally, legal research has relied on manual efforts to search through vast amounts of legal precedents, statutes, regulations, and case law. This process has been labor-intensive and time-consuming, requiring extensive knowledge and expertise to navigate complex legal frameworks. However, AI-driven technologies, such as natural language processing (NLP), machine learning, and predictive analytics, have introduced automation that significantly reduces research time while increasing accuracy and consistency. One of AI's most significant contributions to legal research is its ability to process and analyze vast quantities of legal data in real time. AI-powered legal research tools, such as Westlaw, LexisNexis, and ROSS Intelligence, enable legal professionals to access relevant case law, statutes, and legal opinions more efficiently than traditional research methods. These tools utilize algorithms to identify patterns, summarize legal documents, and even predict case outcomes based on historical data. Despite AI's transformative impact on legal research, challenges remain. The potential for bias in AI algorithms, ethical concerns regarding transparency, and questions of accountability present significant hurdles to widespread AI adoption in the legal field. Additionally, AI cannot entirely replace human judgment, as the interpretation of legal

principles often requires a nuanced understanding of context and intent—an area where human expertise remains irreplaceable. This paper explores the theoretical and practical aspects of AI's role in legal research, examining its advantages, limitations, and future implications. By analyzing the impact of AI on legal scholarship and practice, this study aims to provide comprehensive overview of how AI is reshaping legal research methodologies and the broader legal landscape.

## **2. Framework of the research**

### **2.1. Definition and Core Concepts of AI in Law**

Artificial intelligence (AI) is an umbrella term encompassing a variety of computational techniques that simulate human intelligence, including natural language processing, machine learning, and expert systems. In the legal field, AI is utilized for legal research, predictive analytics, contract review, and automated legal writing. AI's role in law is fundamentally reshaping traditional legal methodologies by enhancing efficiency and reducing the likelihood of human error.

The key components of AI in legal research include:

- **Machine Learning (ML):** Algorithms that learn from data to predict legal outcomes and enhance legal analytics.
- **Natural Language Processing (NLP):** AI's ability to interpret, analyze, and extract relevant information from legal texts, case laws, and regulations.
- **Expert Systems:** AI-driven models that simulate legal reasoning based on predefined rules and existing legal knowledge.
- **Automated Document Review:** AI tools that scan and analyze legal contracts, identifying inconsistencies, missing clauses, or non-compliance issues.

### **2.2. The Evolution of AI in Legal Studies**

The adoption of AI in legal research has evolved through several stages. Initially, legal professionals relied on keyword-based search engines to navigate legal texts. However, AI-driven tools have introduced more sophisticated approaches, such as semantic search and predictive legal analytics. These developments allow legal researchers to retrieve more contextually relevant information with improved accuracy.

Key milestones in AI's evolution in legal studies include:

- **1980s-1990s:** Introduction of rule-based AI systems designed for simple legal tasks.
- **2000s:** Integration of search engines with legal databases, enabling faster retrieval of case law.
- **2010s-present:** The rise of AI-powered legal analytics tools such as ROSS Intelligence, which employs deep learning to interpret legal texts and suggest relevant precedents.

### **2.3. Theoretical Approaches to AI-driven Legal Research**

Several theoretical models underpin the implementation of AI in legal research:

- **Legal Positivism and AI:** AI-based legal research follows the legal positivist tradition by strictly adhering to established laws and precedents without considering moral or ethical implications.
- **Computational Legal Studies:** This approach combines AI with big data analytics to model legal decision-making and predict judicial behavior.
- **Cognitive Computing in Legal Research:** AI systems designed to mimic human cognition provide contextual interpretations of legal texts, enabling deeper analytical insights.
- **Regulatory Theories and AI:** The use of AI in law raises regulatory challenges, necessitating frameworks that ensure ethical and unbiased AI applications in legal research.

By understanding these theoretical foundations, legal professionals and scholars can critically evaluate AI's role in legal research and identify best practices for its implementation.

### **3. AI in Legal Research: Practical Applications**

#### **3.1. AI-based Legal Databases and Case Law Analysis**

AI-powered legal databases have revolutionized the way legal professionals conduct research. Traditional legal research required extensive manual review of legal documents, court decisions, and statutes. AI-driven tools such as Westlaw, LexisNexis, and Bloomberg Law leverage natural language processing (NLP) and machine learning algorithms to provide faster, more accurate search results. These tools allow legal practitioners to retrieve relevant case laws and precedents with precision, enabling them to construct well-supported legal arguments efficiently. Furthermore, AI-assisted case law analysis helps identify patterns and trends in judicial decisions. By analyzing large volumes of historical legal data, AI can predict case outcomes and provide insights into how specific judges have ruled in similar cases. This predictive capability enhances strategic legal decision-making and helps lawyers assess the strengths and weaknesses of their cases.

#### **3.2. Predictive Analytics in Legal Decision-Making**

Predictive analytics plays a crucial role in legal research by forecasting legal trends and case outcomes. AI models analyze past court decisions, regulatory changes, and legal precedents to offer data-driven predictions. Law firms and corporate legal departments use predictive analytics to assess litigation risks, develop legal strategies, and optimize case management. For instance, AI-driven analytics can help determine the probability of success in a lawsuit based on historical case data. This allows lawyers to advise clients with greater accuracy regarding the likelihood of a favorable verdict or settlement. Additionally, predictive models can be used to streamline dispute resolution, reducing litigation costs and time.

#### **3.3. Automation of Legal Document Review and Drafting**

AI is transforming the labor-intensive process of legal document review and drafting. Traditionally, contract analysis, compliance checks, and due diligence required significant time and effort. AI-powered tools such as Kira Systems, LawGeex, and eBrevia automate contract review by identifying key clauses, flagging inconsistencies, and ensuring regulatory compliance. In legal drafting, AI-driven software assists in generating standardized contracts, agreements, and legal memos. These tools use machine learning algorithms to recommend appropriate language and structure based on previous legal documents. By automating repetitive tasks, AI allows legal professionals to focus on more complex aspects of legal practice, such as negotiation and litigation strategy.

#### **3.4. Ethical and Regulatory Challenges of AI in Legal Practice**

While AI offers numerous advantages in legal research, it also raises ethical and regulatory concerns. One of the primary issues is bias in AI algorithms. If an AI system is trained on biased legal data, it may produce skewed results, potentially reinforcing systemic biases in legal decision-making. Ensuring fairness and transparency in AI-driven legal research requires rigorous oversight and continuous refinement of AI models. Additionally, the use of AI in legal practice presents questions regarding accountability and responsibility. If an AI-powered legal research tool provides incorrect or misleading information, determining liability becomes complex. Legal professionals must exercise due diligence when relying on AI-generated insights and cross-check findings with human expertise. Regulatory frameworks governing AI in law are still evolving. Organizations such as the American Bar Association (ABA) and the European Commission are actively exploring guidelines to ensure ethical AI deployment in legal research. Striking a balance between innovation and regulatory compliance is essential to maximize AI's benefits while safeguarding the integrity of the legal profession.



## **4. Comparative Analysis of AI Tools in Legal Research**

### **4.1. AI-Powered Platforms for Legal Analysis**

Several AI-powered platforms provide legal research capabilities, each with distinct features and functionalities. Tools such as Westlaw Edge, Lexis+ AI, and Casetext's CARA AI utilize machine learning and natural language processing to deliver comprehensive legal research. These platforms offer benefits such as automated case summarization, predictive analytics, and context-based search functionalities that enhance legal research efficiency.

### **4.2. Strengths and Limitations of AI in Law**

While AI-powered tools improve efficiency and accuracy, they also have limitations. One major concern is the inability of AI to fully understand legal nuances and contextual interpretation, which human legal experts excel at. Additionally, AI tools rely on existing legal data, which may introduce biases into case analysis and decision-making.

### **4.3. Case Studies on AI Implementation in Legal Firms and Courts**

Real-world applications of AI in legal research highlight both its benefits and challenges. Several law firms have integrated AI tools to automate legal research and improve case strategy. For example, predictive analytics tools have helped firms determine case viability based on historical data, reducing research time significantly. In courts, AI has been used to streamline administrative tasks and assist in case adjudication by providing judges with relevant legal precedents more efficiently.

## **5. Future Perspectives on AI and Legal Research**

### **5.1. AI in Legal Education and Training**

As AI continues to transform legal research, law schools and legal training programs must incorporate AI education into their curricula. Legal professionals must be equipped with the necessary skills to understand and utilize AI tools effectively. Universities and training institutions are beginning to introduce courses on legal technology, AI-assisted research, and ethical considerations in AI implementation.

### **5.2. Advancements in AI-driven Legal Research Tools**

The future of AI in legal research is expected to see significant advancements in AI-driven tools. Emerging technologies such as deep learning and blockchain integration will further enhance legal analytics, contract automation, and case prediction accuracy. Future AI applications may include intelligent legal assistants capable of providing real-time legal advice and automated legal reasoning models that can simulate complex legal arguments.

### **5.3. Ethical and Regulatory Considerations Moving Forward**

With the increasing adoption of AI in legal research, ethical concerns such as algorithmic bias, data privacy, and accountability will require continuous regulatory oversight. Policymakers and legal governing bodies must develop comprehensive guidelines to ensure AI operates within ethical and legal boundaries. International collaboration between legal professionals, technologists, and regulatory agencies will be necessary to standardize AI governance frameworks.

### **5.4. The Role of AI in the Future of Law Practice**

AI will continue to play a transformative role in law firms, corporate legal departments, and judicial systems. Future advancements in AI may lead to the creation of virtual legal assistants capable of drafting complex legal arguments, conducting legal due diligence, and even participating in dispute

resolution. However, human oversight will remain essential to ensure fairness, accuracy, and compliance with legal norms.

## 6. conclusion

AI has revolutionized the field of legal research, providing powerful tools that enhance efficiency, accuracy, and strategic decision-making. By automating labor-intensive tasks, AI enables legal professionals to focus on higher-order analysis and client engagement. The ability to analyze vast amounts of legal data in real-time, predict case outcomes, and draft legal documents has significantly improved the legal profession's capacity to handle complex cases effectively. Despite its benefits, AI in legal research also presents ethical, regulatory, and operational challenges. Bias in AI algorithms, data privacy concerns, and issues of transparency remain pressing concerns that must be addressed through comprehensive regulatory frameworks. The role of human oversight in AI-driven legal processes remains crucial to ensuring fairness and accountability. Looking ahead, the integration of AI into legal research will continue to evolve, driven by advances in machine learning, NLP, and automation. Legal education must adapt to these changes by incorporating AI literacy into law curricula, preparing future lawyers for an AI-augmented legal landscape. Additionally, collaboration between legal professionals, technologists, and policymakers will be essential to developing ethical AI practices that benefit both the legal industry and society at large. Ultimately, AI's role in legal research is not to replace human expertise but to augment it, providing invaluable insights and tools that enhance the practice of law. By embracing AI responsibly and ethically, the legal profession can leverage its transformative potential while safeguarding the principles of justice and fairness.

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# About some problems of consideration of cases in the order of special proceedings

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Civil procedure law is one of the key areas of legal regulation that ensure the protection of the rights and legitimate interests of citizens and organizations in court. In the framework of civil proceedings, a special place is occupied by special proceedings, which are used to resolve certain categories of cases that are not subject to consideration in the usual manner. Special proceedings include a variety of procedures, such as writ proceedings, fact-finding proceedings, and others. These procedures are characterized by simplification, speed and specificity in the framework of judicial activity.

The present work is devoted to the study of special production in the civil process, with an emphasis on writ production. The first chapter will cover the theoretical foundations, including the concept and objectives of special production. In the second chapter, attention will be paid to the procedure for reviewing cases, as well as existing problems in this area. The third chapter will be devoted to a detailed analysis of writ production, its principles and objectives, as well as the grounds for its application. The last chapter will describe the process of initiation, cancellation and execution of writ proceedings, which allows us to give a comprehensive picture of the features and stages of this procedural proceeding.

The work is aimed at a deeper understanding of the role of special proceedings in civil proceedings, identifying existing problems and suggestions for their solution, as well as exploring the theoretical and practical aspects of writ proceedings as an important form of judicial proceedings.

## 1.1. The concept of special production

Today, justice in a state governed by the rule of law is a kind of measure of the level of legality, respect for the principles of democracy, and the protection of citizens. In the Republic of Kazakhstan, the process of justice development is continuous. The role and importance of a correct and relevant justice improvement policy are invaluable.

The main purpose of justice is to resolve disputes and conflicts based on the principles of legality and justice.

At the same time, citizens, when applying to the courts for the protection of violated rights, have the right to count on the speedy consideration of their dispute and the restoration of the violated right.

The civil procedure legislation provides for the consideration of citizens' applications in writ, simplified, claim, special claim, special proceedings.

In this article, I would like to reveal the main features of the consideration of cases in special proceedings.

Special proceedings are a type of civil proceedings, the main difference of which from the claim proceedings is the absence of a dispute about the law, respectively, there are no disputing parties who occupy opposite points of view on the existing subject of consideration.

Special production can be described as non-exploratory, one-sided production. Special proceedings deal with cases in which it is necessary to confirm in court the existence or absence

of legal facts or circumstances on which the emergence, modification or termination of personal or non-property rights of citizens depends. The special proceedings also consider cases in which the applicant needs to confirm the existence or absence of an indisputable right, to confirm the legal status of a citizen.

### 1.2. Tasks of special production

Subsection 4 of the Civil Procedure Code of the Republic of Kazakhstan regulates the list of applications to be considered in special proceedings, the procedure for considering these applications. Thus, in accordance with article 302 of the Civil Procedure Code of the Republic of Kazakhstan, cases considered by the court in the order of special proceedings include:

- 1) on the establishment of facts of legal importance;
- 2) on applications for the adoption of a child;
- 3) the recognition of a citizen as missing and the declaration of a citizen as deceased;
- 4) on the limitation of a citizen's legal capacity, on the recognition of a citizen as legally incompetent, on the restriction or on the deprivation of a minor between the ages of fourteen and eighteen of the right to independently manage his income;
- 5) declaring a minor fully capable (emancipation);
- 6) on sending minors to special educational institutions for children with deviant behavior or organizations with a special regime of detention;
- 7) about the forced hospitalization of a citizen in a psychiatric hospital;
- 8) about sending a citizen for compulsory treatment for tuberculosis, alcoholism, drug addiction, substance abuse;
- 9) on the restructuring of financial organizations and organizations that are part of a banking conglomerate as a parent organization and are not financial organizations;
- 10) on the introduction, early completion and extension of the term of temporary management of a grain receiving enterprise or a cotton processing organization;
- 11) rehabilitation and bankruptcy;
- 12) on the recognition of a movable thing as ownerless and the recognition of the right of communal ownership of immovable property;
- 13) on the establishment of irregularities in civil status records;
- 14) complaints about notarial acts or refusal to perform them;
- 15) restoration of rights on lost bearer securities and warrant securities (summoning proceedings);
- 16) upon applications for recognition of an organization engaged in extremism or terrorist activities on the territory of the Republic of Kazakhstan and (or) another state as extremist or terrorist, including the establishment of its name change, as well as the recognition of information materials imported, published, manufactured and (or) distributed on the territory of the Republic of Kazakhstan, extremist or terrorist;
- 17) according to statements regarding the recognition of online casinos, products of foreign mass media distributed in the territory of the Republic of Kazakhstan containing information contrary to the laws of the Republic of Kazakhstan as illegal;
- 18) on applications for the expulsion of a foreigner or a stateless person from the Republic of Kazakhstan for violating the legislation of the Republic of Kazakhstan.

It is noteworthy that this list is not exhaustive, the legislator provided in part 2 of this article that the law may provide for the consideration of other cases in a special procedure. The procedure for considering cases of special proceedings is regulated by the norms of the Civil Procedure Code of the Republic of Kazakhstan and the normative resolution of the Supreme Court of the Republic of Kazakhstan "On judicial practice in cases of establishing facts of legal significance".

When considering cases of special proceedings, the courts are guided by the Constitution of the Republic of Kazakhstan, the Civil Code of the Republic of Kazakhstan, the Labor Code of the Republic of Kazakhstan, the Code of the Republic of Kazakhstan "On Marriage (Matrimony) and Family", the Law of the Republic of Kazakhstan "On Notary", the Law of the Republic of Kazakhstan "On Pension Provision in the Republic of Kazakhstan", the Law of the Republic of Kazakhstan "On Housing relations", the Law of the Republic of Kazakhstan "On Citizenship in the Republic of Kazakhstan".

This list of normative legal acts is not exhaustive, since in cases of special proceedings, depending on the subject of the application, the fact that requires to be established in court, various normative legal and by-laws governing issues of a specific category of law are subject to application.

Cases of special proceedings are considered according to the general rules of judicial procedure, with the specifics established by the Civil Procedure Legislation.

When considering cases of special proceedings, the court should observe the general rules of claim proceedings concerning the stages of civil proceedings (the stage of acceptance of the application for trial, preparation, conduct and appointment of the case for trial), they are subject to the general rules of evidence, record keeping. The rules governing the verification of the legality and validity of decisions are also applicable to special proceedings.

At the same time, the general rules of judicial procedure, which are designed specifically for disputes about law, are not applicable to cases of special proceedings. For example, the applicant cannot file an application for securing a claim, nor is it possible to end the case by approving a settlement agreement between the parties, an agreement between the parties to settle a dispute (conflict) through mediation, or an agreement to settle a dispute through a participatory procedure.

An applicant in a special proceeding may be only those citizens and legal entities whose rights or legally protected interests can be protected by resolving the case in a special proceeding. Interested parties in special proceedings are citizens and organizations whose rights and interests may be affected as a result of satisfying the applicant's request.

At the same time, if, during the consideration of a special procedure case, a dispute about the law arises under the jurisdiction of judicial authorities or the court itself comes to the conclusion that the resolution of the case in a special procedure is related to the need to resolve a dispute about civil law in court, the application must be left without consideration in accordance with subparagraph 13) of Article 279 of the Civil Code of the Russian Federation. the Procedural Code of the Republic of Kazakhstan. Interested persons are not deprived of the right to file a claim on general grounds.

In cases of special proceedings, there may be a dispute about a fact requiring judicial confirmation, since the fact established by the court is not always obvious, and there is contradictory evidence of its existence. When considering cases of special proceedings, the court must verify the existence or absence of facts on the basis of the evidence provided.

The main feature of the consideration of cases in special proceedings is that the applicant's interest in the case is not to demand protection of his right, since no one violates or disputes his rights, the interest is to remove obstacles to the exercise of his right.

## **Chapter 2. Problems and procedure of consideration of special proceedings in civil cases.**

### **2.1. The procedure for considering special proceedings in civil cases.**

The procedure for considering cases in special proceedings in Kazakhstan is regulated by the Civil Procedure Code of the Republic of Kazakhstan (CPC RK). Special proceedings are

distinguished as a separate type of legal proceedings, the main purpose of which is to establish legally significant facts or circumstances unrelated to disputes about law.

The main stages of the consideration of cases in the order of special proceedings:

1. Initiation of production:
    - The case begins with the submission of an application by the person concerned.
    - The application is submitted to the court of first instance at the applicant's place of residence or the location of the property, if the application is related to it.
    - The application must comply with the requirements of art. 148 of the CPC RK, include information about the applicant, an indication of the legal fact that needs to be established, and evidence of the need to establish it.
  2. Acceptance of the application and preparation of the case for the hearing:
    - The judge considers the application within five working days and issues a ruling on its acceptance for production.
    - At the stage of preparation, the court has the right to request additional evidence or involve interested parties if their rights may be affected.
  3. Consideration of the case in a court session:
    - Special proceedings are held in open court.
    - The court considers the submitted evidence, may summon witnesses and request additional materials.
    - There is no dispute about the law in the proceedings, therefore the main parties are the applicant and the interested parties.
  4. The court's decision:
    - Based on the results of the review, the court makes a decision on the satisfaction or refusal to satisfy the application.
    - The court's decision may be appealed by interested persons.
  5. Execution of the court decision:
    - A court decision that has entered into legal force serves as the basis for certain legal actions, for example, to amend acts of civil status or register property rights.
- Specifics of cases in special proceedings:
- The absence of a dispute about the law: the court establishes a fact that is not disputed by other persons.
  - Participation of interested parties: they are involved to ensure the completeness of the case review.
  - Limitation of the subject of consideration: the court has no right to go beyond the stated requirement.
  - Procedural flexibility: The court has the right to independently determine the scope and procedure for examining evidence.

## **2.2. Problems of consideration of special proceedings in civil cases.**

The main problems of considering cases in special proceedings:

1. The blurring of the criteria for distinguishing from the claim proceedings.

It is often difficult to determine whether a particular case belongs to a special or claim proceeding. For example, establishing ownership of property may escalate into a dispute over law. The lack of clear criteria in the legislation leads to different judicial practice.
2. The complexity of the proof.

In cases of special proceedings, evidence may be difficult to access (for example, archival documents or information confirming the fact of kinship). Judges are often forced to collect evidence on their own, which goes beyond their procedural role.
3. Participation of stakeholders.



It is not always possible to identify the circle of stakeholders at the application stage. Failure to involve such persons may lead to challenging the decision and delaying the process.

4. Lack of uniformity of judicial practice.

In some regions, there are different practices for the same categories of cases. For example, cases concerning the recognition of a citizen as missing or deceased may be considered with varying degrees of rigor in relation to evidence.

5. Lack of consistency between procedural and substantive norms.

In some cases, the procedural rules (for example, the deadlines for submitting an application, the list of necessary documents) are not consistent with the substantive rules, which causes difficulties for applicants.

6. Abuse of the right by the applicants.

Sometimes individuals file applications in a special order to conceal a dispute about the law in order to avoid more complex legal proceedings. This distorts the essence of the institution of special production.

7. Insufficient information to citizens.

Many citizens do not understand the specifics of special proceedings, which leads to errors when submitting applications and, as a result, to an increase in the number of refusals by courts to accept applications.

8. Problems of implementation of court decisions.

After establishing a legal fact, citizens face problems in implementing the court's decision in the competent authorities (for example, the registry Office, the migration service).

As a result, it can be concluded that special proceedings in Kazakhstan can significantly speed up court procedures and provide legal clarity on issues that do not require lengthy proceedings. It makes justice more accessible, effective and fair, as it answers specific questions unrelated to the conflict between the parties, which simplifies the process of protecting citizens' rights.

The main task of special proceedings is to establish the legal facts or circumstances that are necessary for the emergence, modification or termination of personal rights of citizens. In this proceeding, the court does not resolve the dispute, but only confirms the existence or absence of indisputable rights, the legal status of citizens, or other circumstances on which the rights and obligations of the parties depend.

However, despite its importance, the process of considering cases in special proceedings faces a number of problems, such as the lack of clarity of some regulations, the difficulty of properly qualifying cases and possible legal misunderstandings in the application of legislation.

The procedure for considering such cases provides for a simplified procedure, which contributes to a more expeditious resolution of disputes, but requires careful regulation and strict compliance with all procedural rules. In order to eliminate existing problems, it is necessary to improve legislation, as well as increase the level of judicial practice in this area. This will improve the quality of justice, make it more accessible and effective for citizens, and reduce the risks of errors and misunderstandings when applying special procedures.

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## Political Studies

# Breaking Chains — Decoding Patriarchal Threads in Ephesians 5:22-33 and Unveiling Societal Injustices

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### Abstract

This study critically examines traditional interpretations of gender dynamics, focusing on Pauline's teachings in Ephesians 5:22-33. It challenges prevailing notions of female submissiveness and male headship within households, presenting alternative perspectives on Mary's representation and Paul's stance against sexual activity. Scholars juxtapose these interpretations with progressive views and advocate for inclusive understandings of premarital relationships and love. Patriarchal control within religious institutions, exemplified by figures like Father Pais of Athens, perpetuates systemic inequalities. The analysis extends to the entanglement of ecclesiastical and governmental domains, highlighting the patriarch's influence and the resurgence of church authority in post-imperial Georgia. Women often find themselves marginalized, reflecting entrenched patriarchal values. Patriarch Ilia's epistle reinforces traditional gender stereotypes. Influenced by Pauline precepts, the patriarch's rhetoric underscores the urgency for tangible actions to address systemic gender biases and foster genuine equality within religious and societal frameworks. The study calls for reevaluating beliefs and promoting inclusivity and gender equity in all spheres of life.

### *Deconstructing the Patriarchal Approach in Paul's Epistle — A Comprehensive Analysis*

In this comprehensive analysis, a proposal is made to critically examine the patriarchal undertones within Ephesians 5:22-33, challenging traditional interpretations. The text questions the historical attribution to Paul and highlights the enduring impact of patriarchal ideologies on gender roles, exploring intersections with theology and philosophy. Delving into influential figures like John Chrysostom and Thomas Aquinas, it exposes their contributions to perpetuating gender hierarchies. The examination of biblical passages, particularly Ephesians 5:28, reveals ingrained beliefs associating women with the physical realm. The emphasis is on the need for a more egalitarian understanding, urging churches to critically evaluate Paul's epistles and their influence on contemporary perspectives. The discussion extends to Paul's teachings on sexuality, critiquing the dichotomy between his views and those represented in the Song of Solomon. The argument is nuanced, recognizing the complexity of gender perceptions shaped by historical, theological, and philosophical influences. The proposal concludes by affirming the imperative for societal transformation to address systemic injustices, echoing the call to action articulated by Smith.

Before delving into this text and examining the passage from Paul's letter, it is essential to strip away traditional norms and view the passage with fresh eyes. Often referred to as the "Letter of Love" or "The Christian Household," upon closer examination, this letter reveals language that

oppresses women. Instead of focusing on women's rights, the text emphasizes men's superiority..<sup>13</sup>

In a reevaluation freed from traditional constraints, questions naturally arise:

- I. How have male authors consistently adopted a tone of superiority over women in biblical texts, particularly in Ephesians 5:22-33?
- II. Why does the Scriptures' text structure place women in a submissive role, and does it imply that women are not considered superior or even sentient beings?
- III. How has the enduring influence of historical context shaped contemporary perspectives on the authorship and authority of Ephesians 5:22-33?
- IV. How does the patriarchal undertone within the text perpetuate conscious discrimination against women, echoing the narrative of a "text of terror"?

### **Genesis of Oppression — Unveiling Patriarchal Narratives in Ephesians 5:22-33**

The passage in Ephesians 5:22-33, which establishes a parallel between the union of a husband and wife and that of Christ and the church, is a revered ecclesial metaphor. However, it is not without enduring challenges. The intended function of the household codes remains ambiguous, and this particular passage is vulnerable to various misinterpretations. The implications of the passage's utilization of simile and metaphor reach beyond ecclesiology, subtly aligning with particular interests. A feminist analysis reveals interpretive errors, presenting indispensable criteria.

Since time immemorial, women have been entangled in an enduring struggle against patriarchal forces. From the genesis of the world, they confront the weight of a narrative that privileges men, a narrative entrenched in biblical texts from the Old Testament onwards. Rooted in stories like Adam and Eve and perpetuated through the writings of the Apostle Paul, the scriptures have consistently portrayed man as a superior, enigmatic figure.<sup>14</sup>

In our exploration of biblical, philosophical, and historical texts, certain key words emerge, demanding meticulous scrutiny. Why did male authors consistently adopt a tone of superiority over women? The fifth chapter of the Apostle Paul's Epistle to the Ephesians, specifically verses 22-33, might initially be perceived as a spiritual homage to man, paralleling him to God, given Jesus' male embodiment. However, is this truly the essence of the text, or a construct engineered by male-dominated interpretations and a manipulative historical context?<sup>15</sup>

Ephesians 5:22-33, like numerous other texts, contains Central phrases that Express its essence. These phrases, ingrained in our collective consciousness, bear a patriarchal imprint. Challenging the conventional interpretations becomes imperative to rectify the gender bias embedded in these texts. The Bible, a historical artifact, also bears the stain of white supremacy,

<sup>13</sup> Mitzi J Smith highlights a common tendency among those addressing ancient slavery to attribute strategic thinking solely to masters, thereby disregarding the intellectual contributions of the enslaved (SBL Joint Session, "Slavery, Resistance, and Freedom; Paul and Politics," review of *The Material life of Roman Slaves*, by Sandra Joshel and Lauren Hackworth Petersen, SBL Annual Meeting, Boston, Massachusetts, 20 November 2017). See: Katherine, Shaner. "The Danger of Singular Saviors: Vulnerability, Political, Power and Jesus's Disturbance in the Temple (Mark 15:11-19)." *Journal of Biblical Literature* 140.1 (2021): 160.

<sup>14</sup> Gerda Lerner, *The Creation of Patriarchy* (New York: Oxford University Press, 1986), 170-174.

<sup>15</sup> In scholarly engagement with the aforementioned concept, the work entitled "Texts of Terror: Literary-Feminist Readings of Biblical Narratives" by Phyllis Trible stands as a noteworthy reference. Trible's scholarly endeavor involves a comprehensive feminist analysis of diverse biblical texts, delving into the nuanced portrayals of women and the linguistic nuances employed in depicting their experiences. Through meticulous scrutiny of key words and phrases, Trible sheds light on the pervasive patriarchal elements embedded in biblical narratives. This work emerges as a valuable resource, offering profound insights that contribute to a nuanced interpretation and critical examination of passages such as Ephesians 5:22-33.

perpetuating violations against the rights of the black community. Recent research and the unveiling of concealed texts compel us to read these narratives with a discerning eye.<sup>16</sup>

Womanist biblical interpretation, as articulated by Clarice J. Martin, acknowledges the Bible's pervasive androcentric, patriarchal nature, prompting us to reassess its problematic aspects.<sup>17</sup> Incorporating diverse sources, including archaeological materials, becomes paramount to construct a more objective narrative. The patriarchal spirit of Paul's writings beckons us to engage in vigilant critical analysis, challenging ingrained notions and striving for a more equitable interpretation.

### **Suppression of Women's Rights in the Georgian Church**

The Georgian Church's deeply ingrained negative perception of women perpetuates a narrative that portrays them as inherently weak, reinforcing a consciousness of male superiority. This prevailing patriarchal ideology dictates that men assume the role of household heads, restricting women's decision-making autonomy. This societal norm is exemplified in personal experiences, such as my brother dictating whether his wife can work based on outdated gender norms. These attitudes, jointly cultivated by the Church and society, prompted the inclusion of the Georgian Orthodox Church in a UN report, citing its hindrance to gender equality.<sup>18</sup>

Authors argue that the legal framework and the implementation of the Convention on the Elimination of All Forms of Discrimination Against Women are impeded by gender stereotypes and the detrimental role played by the Georgian Orthodox Church. This is reflected in the obligation imposed on women to obey men unquestioningly, a stark contrast to the principles of equality and respect.<sup>19</sup>

Statistical evidence reveals the alarming prevalence of gender-based violence, with 6% of ever-partnered women aged 15–64 reporting physical and sexual abuse. Psychological violence affected one in seven women in partner relationships, while nearly 10% experienced economic violence. The patriarchal system, reinforced by the Church, compels women to endure silently.<sup>20</sup>

My personal witness to bishops and clerics preaching further underscores the Church's role in promoting women's subordination. This grim reality necessitates a feminist approach to challenge the Church's patriarchal narrative. Connecting this struggle with the apostle Paul's writings (5:23) emphasizes the urgency of dismantling entrenched gender norms for a more equitable society.

Not only do local sermons permeate the discourse within the Georgian Church, but also the sentiments of foreign bishops criticizing women are translated. Bishops from Limassol<sup>21</sup> advocate for women's submission to their husbands, citing the notion that women were created from Adam. They further employ Paul's assertion that Adam preceded Eve (Gen. 2:22), arguing for women's obedience to men (5:23).

In various educational settings, including temples, churches, online platforms, and schools, clergy impart the notion that a woman's most valued virtue is her obedience to a man. An

<sup>16</sup> See, for example, Byron, Gay L. "Black Collectors and Keepers of Tradition: Resources for a Womanist Biblical Ethic of (Re)Interpretation." In *Womanist Interpretations of the Bible: Expanding the Discourse*, edited by Gay Byron and Vanessa Lovelace, 187–208. Atlanta: SBL, 2016.

<sup>17</sup> Martin, Clarice J. "Womanist Biblical Interpretation." *DBI* 2:655–58. 1992, 33.

<sup>18</sup> "Prevalence and forms of male partner/spousal violence against women," in *National Survey on Violence against Women in Georgia 2017*, UN Women, accessed January 19, 2024, <https://gender.geostat.ge/gender/img/publicationspdf/National VAW Study Report Geo.pdf>, 44.

<sup>19</sup> *Ibid.*, 64–68.

<sup>20</sup> *Ibid.*, 44.

<sup>21</sup> Metropolitan Athanasios of Limos, "Qalis Diadi Sakheli Limoseli Mitropoliti Athanase," Xareba, accessed January 18, 2024, <http://xareba.net/2971-qalis-diadi-sakheli-limoseli-mitropoliti-athanase.html>.

illustrative instance is found in the promotion of priest Basil within the Georgian Church.<sup>22</sup> The sermon delivered by the patriarch of the Church of Georgia aligns with traditional teachings, consistently emphasizing the duty of women to obey. He expressed his view, stating, “Nowadays, there is a prevailing notion of equality between wife and husband.”<sup>23</sup> However, according to scripture, the husband is regarded as the head of the family. A family is likened to one body, and having two heads within one body is deemed impossible. The ideal family, as per Ilia II, is one where the mother and wife selflessly dedicate themselves to the family, nurturing and religiously guiding their children.”<sup>24</sup> Patriarch Ilia II, the leader of Georgia’s Orthodox Church and a highly esteemed public figure in the country. His strongly conservative message, exemplified by statements like urging women to wash their husbands’ feet,<sup>25</sup> resonates widely through the efforts of activists and clergy nationwide. Despite concerns about the country’s development, a recent sociological study by the International Republican Institute (IRI) reveals that Patriarch Ilia II maintains the highest approval rating, with 91% of respondents expressing approval.<sup>26</sup>

Following the dissolution of the Church, Georgia embarked on a transformative journey aimed at establishing equitable rights for all its citizens and challenging entrenched male dominance through the enactment of humane laws. At the heart of this endeavor was the commitment to equality before the law, irrespective of social status or gender. This aspiration found expression in the formulation of the constitution, where Chapter 14 stood as a testament to the nation’s unwavering dedication to egalitarian principles: “Everyone is born free and is equal before the law regardless of their race, color, language, sex, religion, political and other opinions, national, ethnic or social belongings, origin, property, status and title, place of residence.”<sup>27</sup> As per the 1995 Constitution of Georgia, which upholds the principle of freedom of religion encompassing Roman Catholics, Baptists, Muslims, and Jews, the Orthodox Church maintains its independence from the State. Nevertheless, the Constitution explicitly acknowledges the “special role of the Orthodox Church in the history of Georgia.”<sup>28</sup> Despite this laudable declaration, the constitution notably lacked substantive provisions addressing women’s rights or gender equality, highlighting the need for further progress in this crucial area of social justice. The institutional power vested in the church surpasses that of the ordinary individuals who are tasked with its administration.

In the cultural fabric of Georgia, men are instilled with the notion that their primary role is that of the breadwinner, a belief deeply entrenched in societal norms. Deviation from this prescribed role is often met with societal disdain, casting a shadow of shame upon the individual. The elevation of a wife’s financial status within the family unit is met with social censure, as both

<sup>22</sup> Priest Basil, “A woman should be obedient and believe in her husband,” Facebook video, January 20, 2024, <https://www.facebook.com/watch/?v=550820453930024>

<sup>23</sup> My mother embodied the ideal of a virtuous woman, employing a singular strategy in conflicts: silence. She refrained from asserting herself, even when it was crucial for self-preservation and her children’s welfare. Obedience and silence were ingrained as virtues for a woman. Growing up, I internalized these norms, embodying the image of a docile and quiet woman until my departure from the patriarchal environment. Only then did I recognize the pressure she had been under, and I understand the plight of those enduring similar psychological burdens unknowingly.

<sup>24</sup> Ilia II. “Ilia the Second Urges Wives to Obey Their Husbands.” Ambebi, January 21, 2024, <https://www.ambebi.ge/article/52493-ilia-meore-colebs-qmrebis-morchilebisen-moutsodebs/>

<sup>25</sup> Natalia Antelava, “Georgia: Orthodoxy in the classroom,” BBC News, January 20, 2024, <https://www.bbc.com/news/world-europe-32595514>.

<sup>26</sup> “Opinion poll in Georgia: 62% of the population believe that the country is moving in the wrong direction,” JAMnews, accessed 21, 2024, <https://jam-news.net/opinion-poll-ingorgia/>.

<sup>27</sup> “Georgian Constitution,” Archive, February 19, 2024 <https://web.archive.org/web/20150202001722/http://csb.gov.ge/uploads/2081806.pdf>

<sup>28</sup> Tamara Grdzeldze, “The Orthodox Church of Georgia: challenges under democracy and freedom (1990–2009)” In *International Journal for the Study of the Christian Church*, Published online: 18 Aug (2010): 162.



the individual man and the broader society perceive such circumstances as indicative of personal failure.

In the wake of Georgia's adjustment to the post-Soviet era, improvements in the economic landscape coincided with a reassertion of traditional gender roles. Men found themselves reclaiming their perceived divine mandate as the heads of households, symbolic of a return to societal norms. The findings of a 2013-2014 survey conducted by the Caucasus Research Resource Centers (CRRRC) revealed a stark reality: a mere 24% of men and 20% of women acknowledged the existence of gender equality within Georgian society.<sup>29</sup>

These entrenched patriarchal beliefs find their roots in Orthodox Christianity, shaping the collective consciousness, particularly in rural areas. A prevailing sentiment persists that equality between men and women runs contrary to divine intention. The dominant belief system asserts that men and women are bestowed with distinct roles and functions, each integral to the societal fabric. However, contemporary trends indicate a shift wherein women assume additional burdens traditionally assigned to men, leading to a perceived diminishment in the significance of male societal roles.

### Authorship and Authority

While this ancient text may be viewed through a potentially perilous lens by contemporary standards, I contend that the enduring influence of the historical context warrants a critical examination. Regardless of the passage of centuries, the contextual impact on contemporary perspectives cannot be dismissed. Churches, staunch in their belief in the apostolic authorship of this text by Paul, often approach it uncritically. To foster a more egalitarian understanding, it becomes imperative to scrutinize the problematic aspects and engage in a critical analysis of Paul's epistles. I contend that the cognitive paradigms of that era have enduringly shaped present-day attitudes. This necessitates a critical evaluation to dismantle the entrenched masculine facets of the sanctified text and render it egalitarian.

In alignment with my perspective, Carolyn Osiek contends that "The author of Ephesians has read Paul well."<sup>30</sup> I stress the importance of subjecting the ancient text to a critical evaluation, taking into account potential pitfalls when scrutinized through contemporary perspectives. I consider the claim of Paul the Apostle's authorship as an inadequate argument, given the longstanding attribution of this text to Paul. The historical debate on whether Paul personally wrote it has diminished over time. The text, regardless of its origin, is incorporated into various church services and rituals attributed to Paul, thereby associating patriarchal undertones with the perceived authorship of the Apostle Paul. It becomes imperative for churches to contemplate reassessing nomenclature if the text is not genuinely Pauline. Conversely, if the attribution to Paul persists, a critical examination of Paul's contribution becomes necessary. This attribution significantly shapes the authoritative nature of the text, prompting an exploration of how Paul, over centuries, has conveyed a patriarchal tone through the church.

Moreover, Carolyn Osiek's discourse reinforces this perspective.<sup>31</sup> She refrains from delving into debates on Pauline authorship and suggests that the Letter to the Ephesians was likely composed by someone other than Paul. This stance signifies a preference for distancing the interpretation from Paul's original ideas and implies a readiness to explore the text beyond the confines of its traditionally attributed author, aligning with the considerations raised in my analysis.

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<sup>29</sup> "In the Caucasus We Count", Crrccenters, February 19, 2024, <http://www.crrccenters.org/20125/Research-Projects>.

<sup>30</sup> Carolyn Osiek, "The Bride of Christ (Ephesians 5:22-33) : A Problematic Wedding," in *Biblical Theology Bulletin* (2002): 29-30.

<sup>31</sup> Osiek, "The Bride of Christ," 30.

## Αἱ γυναῖκες τοῖς ἰδίοις ἀνδράσιν ὡς τῷ κυρίῳ - Wives, be in subjection to your own husbands

In line with Dr. Smith's observation in Judges 19,<sup>32</sup> I concur that this passage from Paul has long been employed in the church as a tool of terror against women. Similar to the narrative of the gang rape in Judges 19, this text operates as a "text of terror" directed towards women. Many clergy within the churches persistently emphasize the dominance of man, portraying him as a superior being, thereby inherently diminishing the status of women. This particular interpretation of the text perpetuates a conscious discrimination against women.

Addressing the Greek text, Αἱ γυναῖκες, τοῖς ἰδίοις ἀνδράσιν [ὑποτάσσεσθε]: Wives, be in subjection to your own husbands(5:22), unfolds the great Christian law of mutual subjection within various social relations. It specifically delves into the foundational relationship of husbands and wives, prescribing Christian duties for wives. The choice of ὡς τῷ Κυρίῳ: as to the Lord (5:22) indicates that the submission is not solely to the husband as lord and master but is akin to the obedience rendered to Christ. If we consider the divine sanction for the submission of women, Paul explicitly associates obedience to the husband with obedience to Christ or the Lord, while notably omitting a comparable directive for men. The imperative and obligatory components are distinctly placed upon women, prescribing their obedience to their husbands. Conversely, the instruction for husbands is framed more as a call for respect rather than strict obedience. It is crucial to discern the nuanced distinction between respect and obedience in this context.

In articulating expressions of reverence from a man to a woman within the Ephesian text, various forms of the word denoting love are employed across three distinct verses: 1) ἀγαπᾶτε (5:25), 2) ἀγαπᾷν... ὁ ἀγαπῶν .... ἀγαπᾷ (5:28), and 3) ἀγαπάτω (5:33) concerning men. The evident prioritization becomes apparent as the man's love for the woman is likened to God's love for the church.

However, the dynamics become intricate when considering the woman's role. The text enjoins obedience and fear from the woman toward her husband, divided across three verses: 1) ἰδίοις (5:22); 2) ὑποτάσσεται...ἐν παντί; and 3) φοβῆται. The term "φοβῆται" (phobētai) represents a form of the verb "φοβέομαι" (phobeomai) in ancient Greek, adopting the third person singular, present middle-passive, subjunctive mood. While the verb generally conveys the idea of "to fear" or "to be afraid," it may also encompass meanings such as "to reverence" or "to show respect," contingent upon specific contextual usage. In this instance, "φοβῆται" is interpreted in the sense of fear, aligning with the early 11th-century Georgian manuscripts of George the Hagiorite, which translate the Greek term as "fear" - "ეშინოდის" (Eshinodis)<sup>33</sup>—signifying a sense of being afraid of the husband.

Mitzi J. Smith further delves into this dynamic, highlighting a distinctive use of the term "fear" in the Ephesian household codes. She observes that, although the Greek word for fear, "phobeō," is employed to describe the submission of saints to one another (5:21), it is selectively applied in the household codes solely to instruct wives on how to submit to their husbands. Smith emphasizes the dichotomy created between love and fear, noting that husbands are deemed worthy of fear or respect, while wives are deemed worthy of love. This dichotomy, as Smith points out, potentially allows a husband to "love" his wife without necessarily respecting her body, opinions, or emotions<sup>34</sup>. This feminist perspective highlights the nuanced power dynamics

<sup>32</sup> Mitzi J. Smith, "Dis-membering, Sexual Violence, and Confinement: A Womanist Intersectional Reading of the Story of the Levite's Wife (Judges 19)," in *Insights from African American Interpretation*, chap. 5. (Minneapolis: Fortress Press, 2017), 99

<sup>33</sup> Giorgi Mtatsmindeli, ed., *The New Testament of the Lord Jesus Christ: Thematic Research*, 5th ed., trans. [Giorgi Saria] (Tbilisi: Patriarchate of Georgia, 2014), Meridian Printing House.

<sup>34</sup> Mitzi J. Smith, "Ephesians," in *True to Our Native Land: An African American New Testament Commentary*, ed. Brian K. Blount et al. (Minneapolis, MN: Fortress Press, 2007), 358-359.

embedded in the text, shedding light on the unequal distribution of fear and respect within the marital relationship outlined in Ephesians.

This textual structure conspicuously assigns the husband the privilege of leadership through the authority of Christ, positioning the wife as a submissive subject. Consequently, a pertinent question arises: Why is the Holy Scriptures' text structured in this manner? Does it imply that a woman is not deemed a superior being? Is she even considered a sentient being at all?

### ***Is a Woman a Man's Tool?***

The Apostle Paul's teachings on the subordination of women, influenced by both biblical interpretation and philosophical traditions, have perpetuated gender hierarchies throughout history.<sup>35</sup> This perspective, rooted in antiquity, echoes a time when women were often marginalized and not fully recognized as human. The misinterpretation of biblical texts, highlighted by scholars like Lilly Nortje-Meyer,<sup>36</sup> adds another layer to this complex narrative, despite differing opinions.

Examining specific biblical passages, such as 2 Timothy 2:15<sup>37</sup>, reveals an ingrained belief that women and animals possess souls but lack the spiritual essence attributed solely to men. This viewpoint traces its roots to Christian theology shaped by Platonic, Aristotelian, and Stoic ideas,<sup>38</sup> where men were regarded as primarily rational beings, and women were seen as existing on a lower plane, closely tied to the physical realm. Ruether<sup>39</sup> posits that the Platonic perspective on women's inferiority focuses on the notion that women come into existence as a result of the inadequacy of souls in preceding male incarnations to restrain their corporeal desires. This interpretation suggests that, according to Platonic thought, women's origins are linked to the perceived inability of male souls to govern their physical passions in previous lifetimes.

In Ephesians 5:28, husbands are instructed to love their wives as they love their own "σώματα" (sómata), further clarified in Ephesians 5:29 as their own flesh.<sup>40</sup> This characterization reinforces a hierarchy where women are associated with the physical, and men are positioned as the spiritual or rational beings. The implications of such teachings have had enduring effects on gender relations, contributing to the justification of women's subordination throughout history.

### ***Unmasking Patriarchal Threads — Theological and Philosophical Influences on Gender Perceptions***

To whom do we attribute responsibility for these perceptions of women – the authors of the biblical text or the philosophers?

In this historical inquiry, it becomes evident that not only philosophers but also preeminent theologians, esteemed as the paramount authors of the early church, play a significant role in perpetuating specific ideologies. John Chrysostom, a prominent fourth-century bishop, asserts, "The wife is a second authority. She should not demand equality, for she is subject to the head."<sup>41</sup> He makes this statement while elucidating Paul's phrase "the husband is the head of the wife" (5:23). In this statement, Chrysostom establishes a hierarchical relationship within marriage, discouraging the notion of equality between spouses. Drawing inspiration from the apostle Paul,

<sup>35</sup> W. Grunden, *Systematic Theology: An Introduction to Biblical Doctrine*. Leicester(England, Zondervan Academic Books, 1994), 472.

<sup>36</sup> Lilly, Nortjé-Meyer,. "The intersection of flesh: an echo-feminist incentive for animals, women, and the logos as interconnected flesh." In *Feminist Interpretations of Biblical Literature*, Lilly Nortjé-Meyer, 129–55. Cambridge Scholars, 2022, 139-140.

<sup>37</sup> Ibid., 139

<sup>38</sup> David Clines, David, "Humanity as the Image of God," in *On the Way to the Postmodern: Old Testament Essays, 1967-1998*, vol. 2, *Journal for the Study of the Old Testament Supplement Series*, 292, (Sheffield: Sheffield Academic Press, 1998), 482.

<sup>39</sup> Rosemary Ruether, *Gaia and God: An Ecofeminist Theology of Earth Healing* (New York: HarperCollins Publishers, 1992), 25.

<sup>40</sup> Ibid., 140.

<sup>41</sup> St. John Chrysostom, *On Marriage and Family Life* ( St. Vladimir's Seminary Press Crestwood, New York, 2003), 53.

he characterizes the man as both a self and a master, governing the entire body.

This metaphorical representation implies that the woman is not an entity of the mind but rather a component of the body, positioned in subordination to the male intellect. The perspective presented by Chrysostom encounters opposition from Lilly Nortjé-Meyer, who articulates a thoughtful critique of comparable viewpoints. Nortjé-Meyer contends: "These dualisms or binary opposites were established in classical Greek and subsequently employed by Christian and Western thought, with the assumption that androcentric (male as central, female as peripheral) exclusivity implies male as the focal point and female as marginal"<sup>42</sup>. Nortjé-Meyer challenges the deeply rooted dualistic framework that permeated classical Greek thought and persisted in Christian and Western ideologies. She critiques the androcentric exclusivity that positions the male as central and the female as peripheral, perpetuating an inherent hierarchy where Nortjé-Meyer contends that "the first principle is primary, dominant, and preferable, and the second principle is secondary, subservient, and inferior."<sup>43</sup>

Nortjé-Meyer's examination sheds light on the historical and philosophical foundations that have shaped gender perceptions, inviting a reconsideration of these ingrained notions. Delving further into history, Thomas Aquinas, a figure from the 13th century, contributes his perspective: "A woman is a defective and misbegotten male—probably due to some external influences, such as that of a south wind, which is moist."<sup>44</sup> Aquinas introduces a problematic concept, portraying women as inherently flawed and imperfect males. This notion, influenced by pseudo-scientific explanations, attempts to rationalize gender disparities.

These historical perspectives, articulated by influential theologians, unveil deep-seated patriarchal ideologies that have significantly influenced societal perceptions of gender roles. The intersection of theology and philosophy in these perspectives underscores the need for critical examination and reconsideration of historical narratives surrounding women's status in society.

The terms second authority,<sup>45</sup> secondary or lesser wife<sup>46</sup> are very heavy and difficult to hear. As Mitzi J Smith says, "The dis-membering of the Levite's Secondary wife, and the contemporary dis-membering of African American women and other women and people of color, especially the poor, should be understood not as a single event but as a dynamic dehumanizing and disenfranchising process."<sup>47</sup> In the tradition of various corners, women are oppressed by patriarchal forces. As Richie states: "Black women who do not fit into the traditional image of an innocent victim because they are an adolescent defendant charged with neonaticide..."<sup>48</sup>

### **The cause of women's oppression and empowerment in families**

During the wedding ceremony in the Eastern Orthodox Church, newly married couples are presented with the opportunity to recite the following verse: "Wives should respect and be fearful of their husbands" (Ephesians 5:33) and the priest tells the girl that her husband is her head and to be afraid of her husband. I would use Smith's idea, where she says something like this: "This social subordination, repression, and/or oppression functions as a dis-membering that too often results in a physical and social mutilation and premature death at the hands of others with impunity."<sup>49</sup> As Smith argues: In a patriarchal societal structure, a woman's welfare is subjected to and characterized by the requirements and satisfaction of men, overshadowing her autonomy in

<sup>42</sup> Nortjé-Meyer, "The intersection of flesh," 130.

<sup>43</sup> Ibid., 131.

<sup>44</sup> Thomas, Aquinas, *THE SUMMA THEOLOGICA*. Translated by Fathers of the English Dominican Province. (New York: Benziger Bros, 1948), I:92:1.

<sup>45</sup> Chrysostom, "On Marriage and Family Life," 53.

<sup>46</sup> Smith, "Dis-membering, Sexual Violence, and Confinement," 104.

<sup>47</sup> Ibid., 101.

<sup>48</sup> Ibid., 101.

<sup>49</sup> Ibid., 102-103.

voice<sup>50</sup> and choice.<sup>51</sup> The privilege of experiencing enjoyment, both socially and sexually, is predominantly reserved for males.<sup>52</sup> This narrative encourages readers to observe and condemn the acts of human cruelty perpetrated against fellow individuals, particularly marginalized women within the text of the Apostle Paul.

Paul is a strange man. Paul's epistles exhibit an unusual quality as they delve not only into the theme of male superiority but also portray Paul as a spiritual sexologist (1 Cor. 7:5). He provides discernment on the appropriate times for sexual activity, specifying when a husband is permitted to engage with his wife and when abstention is advised. Paul's writings explore the nuanced distinctions between sin and grace in the context of sexual relations.

### ***Paul's Sexual Politics — Challenging Traditional Notions of Authority and Empowering Women***

In examining Ephesians 5:22-33 within the broader context of gender dynamics, this exploration challenges traditional interpretations of Paul's other teachings, specifically his portrayal of women as submissive to men and men as the unquestionable heads of households.

In discussions surrounding sexuality and virginity<sup>53</sup>, Mary is frequently referenced as an embodiment of virginity, while Paul is characterized as an advocate against sexual activity with Smith writing that: "Most Christians do not base their sexual ethics on the Song of Solomon but on the sexual advice of the apostle Paul, who might just be asexual."<sup>54</sup> Paul, according to this perspective, sanctions sexual relations solely within the context of family creation. Many interpreters tend to overlook the Book of Solomon, where sexuality is depicted poetically, and instead concentrate on the writings of Paul, who is often portrayed as an asexual figure.

Monique Moultrie emphasizes the importance of adopting a more liberal interpretation of biblical restrictions on premarital sex. She suggests that these restrictions, often rooted in a lust-based perspective, should be reevaluated to acknowledge the possibility of engaging in loving, monogamous relationships as an alternative to the traditional constraints. Moultrie says: "Utilizing a more liberal interpretation acknowledges that biblical restrictions on premarital sex often involve a totalizing view of sexuality that is lust-based and not expressed in loving, monogamous relationships."<sup>55</sup> Smith, in a creative remix of 1 Corinthians 13, contrasts conventional notions of love with a vision that demands respect for one's complete self, encompassing body, voice, choices, dreams, desires (both sexual and nonsexual), gifts, and achievements. This reinterpretation challenges traditional perspectives on love, urging an understanding that goes beyond self-denial and submission.<sup>56</sup> In all facets of life, whether it be intimate relationships, friendships, or any other interpersonal connection, the foundational element should invariably be self-love. Should an individual lack a genuine affection for oneself, they risk assuming the position of a victim, thereby experiencing a sense of captivity within every relational context. Engaging in morally objectionable behavior, such as participating in loveless sexual encounters, is deemed irrational. The apostle Paul, in advocating for a utopian vision of

<sup>50</sup> See: Mitzi J. Smith, 'Complete silence is death and not the absence of sound,' 9 January 2024 <http://womanistntprof.blogspot.com/2011/06/part-2-of-coming-out-complete-silence.html>

<sup>51</sup> Ibid., 111.

<sup>52</sup> Triple, *Texts of Terror*, 68.

<sup>53</sup> Stay Davis notes that: "After you reach a particular age, and I think forty-one is that age, one's feminist and/or secular friends and companions assume that you are not a virgin; one's traditional and/or non feminist christian friends assume that you are a virgin." This topic does not lose its relevance, See: Davis, Stacy. "The Invisible Women: Numbers 30 and the Politics of Singleness in Africana Communities." In *Womanist Interpretations of the Bible: Expanding the Discourse*, edited by Gay Byron and Vanessa Lovelace, 21–47. (Atlanta: SBL, 2016), 24.

<sup>54</sup> Mitzi J. , Smith, "Paul's Sexual Politics and Black Women's Contested Love Reclaiming Hope and the Necessity of Self-Love" ch. 5 in Smith, Mitzi J. *Chloe and Her People : A Womanist Critical Dialogue with First Corinthians* (Cascade Books, 2023), 47.

<sup>55</sup> Smith, "Paul's Sexual Politics," 47.

<sup>56</sup> Ibid., 47.

marital relationships, appears to have held misconceptions regarding the nature of human sexuality. His elevation of sexual conduct to a level akin to the demonic is a perspective open to critical examination and interpretation. The assertion that marriage serves as an unequivocal solution and that instances of sexual crimes and harassment are exclusive to either marital or non-marital settings is evidently fallacious. Sex, in and of itself, cannot be categorically deemed virtuous or sinful; rather, it is a fundamental human need, akin to the satisfaction derived from food. However, it is imperative that the gratification of this need is pursued consensually within the context of a mutually satisfying relationship. Christopher Ryan Jones asserts that: “Sex and power are two of the prevalent themes found in our world today.”<sup>57</sup>

To scrutinize the claim made by Smith regarding “Black women’s experience of sexual violence in and out of marriage,”<sup>58</sup> it is crucial to acknowledge that such experiences can be multifaceted and influenced by various factors. The generalization that men universally devalue everything is a sweeping statement that lacks nuance. Furthermore, the notion that a woman engaging in consensual sexual activity is inherently considered negative reflects patriarchal interpretations that necessitate critical examination.

In examining manifestations of violence in Pauline writings, ecclesiastical endorsements, and instances like police rape, Smith contends that passivity in the face of injustice sustains mourning.<sup>59</sup> Collective acknowledgment and concerted action offer potential relief,<sup>60</sup> Collective acknowledgment and concerted action offer potential relief, yet enduring consolation for victims like Rachel hinges on systemic dismantling of inequitable structures. The assessment underscores the vital role of individual and collective agency, emphasizing that lasting resolution requires sustained efforts towards systemic transformation and the dismantling of oppressive structures.<sup>61</sup>

#### ***Patriarchal Control: The Marriage Sacrament and Women’s Subjugation within the Church***

The teachings of the apostle Paul regarding the headship of man within the family have historically been wielded as a tool for the subjugation of women within the Church. These interpretations, often preached from pulpits and echoed in theological writings, reinforce the perception of men as inherently superior, drawing parallels between man’s authority and the creation story of Adam and Eve. Women, in contrast, have been relegated to a secondary status, viewed as a derivative of man’s existence. It is important to note that not all men within the Church seek to dominate women; however, the prevailing teachings and hierarchical structures typically promote the submission of wives to their husbands while disallowing the notion of male submission to female authority.

Father Pais of Athens epitomizes this perspective, asserting that while women have achieved equality with men in certain spheres, such as work and voting, the aspiration for complete equality is misguided and indicative of a corrupted mindset. He emphasizes the importance of mutual respect and love within marital relationships yet highlights the necessity of wives submitting to their husbands as a cornerstone of familial harmony. Father Pais reminisces about a couple from antiquity, where despite the physical dominance of the wife, her obedience and respect towards her husband ensured familial strength and cohesion. He romanticizes an era

<sup>57</sup> Jones, Christopher Ryan. “Sex and power: the crossroads of abuse and obtainment.” In *Feminist Interpretations of Biblical Literature*, Lilly Nortjé-Meyer, (Cambridge Scholars, 2022), 47.

<sup>58</sup> Mitzi J Smith, ““He Never Said a Mumbalin ‘Word’: A Womanist Perspective of Crucifixion, Sexual Violence and Sacralized Silence” ch. 3 in *When Did We See You Naked?: Jesus as a Victim of Sexual Abuse* (SCM Press, 2021), 40.

<sup>59</sup> Davis, Stacy. “Rage, Riots, and Rhetoric: Psalm 137 and African American Responses to Violence.” In *Bitter the Chastening Rod: African American Interpretation After Stony the Road*, eds. Mitzi Smith, Angela Parker, and Ericka Dunbar, (Fortress Academic, 2022), 195.

<sup>60</sup> Mitzi J. Smith, “If Rachel Does Not Weep, Who Will?: A Pro-Choice Quality of Life Womanist Reading of Matthew 2.” *Currents in Theology and Mission*, 49.4 (2022), 7.

<sup>61</sup> Smith, “If Rachel Does Not Weep, Who Will?,” 9.



where such deference was commonplace, contrasting it with what he perceives as the impertinence and lack of submission prevalent in contemporary times.<sup>62</sup>

The narrative presented by Father Pais represents entrenched patriarchal values that pervade traditional Christian teachings on gender roles and marital dynamics. It reinforces the expectation of female subordination while valorizing obedience as the linchpin of wedded bliss. However, such narratives fail to acknowledge the agency and autonomy of women within marital relationships, perpetuating an unequal power dynamic that marginalizes women and stifles their ability to assert themselves as equals within the institution of marriage.

It is noteworthy to highlight the constitutional accord in 2002 established between the state of Georgia and the Apostolic Autocephalous Orthodox Church of Georgia. Specifically, Chapter 1, Article 5<sup>63</sup> of this agreement asserts the inviolability of the Catholicos-Patriarch of Georgia, who serves as the paramount figure within the church and embodies a representative capacity vis-à-vis the state. As previously elucidated, the patriarch's pronouncements carry significant weight among the populace, effectively assuming a position of authority. Despite governmental assertions regarding equality, the existence of an untouchable figure whose directives are heeded by the populace at a quasi-legal level renders even state legislation ostensibly ineffectual. This assertion finds corroboration in the persistent endeavors of governmental officials to augment the patriarch's prerogatives, culminating in contemplations by the Irakli Garibashvili Prime Minister of Georgia

regarding the patriarch's potential authority to unilaterally grant pardons to prisoners.<sup>64</sup> The genesis of this initiative can be traced back to the patriarch,<sup>65</sup> marking a watershed moment duly endorsed by numerous government officials. This underscores the lamentable entanglement between ecclesiastical and governmental domains, a convoluted symbiosis fraught with ambiguity regarding stakeholders' intentions. Such wielders of authority intrude into the sanctity of marital bonds, echoing narratives akin to Paul's teachings, advocating for male dominance within familial dynamics, wherein the man assumes primacy and wields the dominant voice within the marital union.

The influence of the Church in family affairs constitutes a formidable force in Georgian society, supplanting the erstwhile dominion of the Soviet government. Marriages officiated within the ecclesiastical realm, though not formally endorsed by the Ministry of Justice, retain state recognition per the Constitutional Agreement (§3)<sup>66</sup> between the state and the Church of Georgia. Conversely, marriages recognized by secular authorities but devoid of ecclesiastical sanction lack validation within the Church's purview. This transition signals a departure from the Imperial Church, witnessing a resurgence of the Church's authority in post-Imperial Georgia.<sup>67</sup> Presently,

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<sup>62</sup> Elder Paisios the Athonite, *Family Life* (Souroti, Greece: Sacred Hesychastirion of St. John the Evangelist, 2002), 56-66.

<sup>63</sup> "Constitutional Agreement between the State of Georgia and among the Apostolic Autocephalous Orthodox Church of Georgia," 19 February, 2024  
[https://www.orthodoxy.ge/samartali/konstitutsiuri\\_shetankhmeba.htm](https://www.orthodoxy.ge/samartali/konstitutsiuri_shetankhmeba.htm)

<sup>64</sup> Ilia II "The patriarch must have the right to pardon prisoners," 19 February 2024,  
<https://heretifm.com/patriarqs-unda-hqondes-upleba-sheitskhalos-patimrebi-ilia-ii/>

<sup>65</sup> "Patriarch of Georgia asks for power to pardon prisoners" 19 February 2024,  
<https://dfwatch.net/patriarch-of-georgia-asks-for-power-to-pardon-prisoners-39153>

<sup>66</sup> "Constitutional Agreement between the State of Georgia and among the Apostolic Autocephalous Orthodox Church of Georgia," §3.

<sup>67</sup> In this discourse, the characterization of Georgia as a subjugated entity and empire is omitted, owing to the historical context wherein both the ecclesiastical and governmental structures of Georgia fell under the annexation of the Russian Empire in 1810-1811. Notably, Georgian autonomy remained elusive until the year 1917, marking a protracted period of subordination and absence of self-governance.

marital unions and dissolutions navigate through the channels of religious protocols, intertwining with the Church's institutional framework.

Despite legal recognition, divorces encounter staunch ecclesiastical opposition, exemplifying a discordance between state legislation and religious doctrine. The Church's unwavering stance against divorces stands in stark contrast to the state's endorsement of their legality, highlights a tension between legal constructs and religious precepts. Within contemporary Georgian society, the ascendancy of the Church in marital affairs gives its burgeoning significance, reshaping the interplay of legal and religious norms within familial contexts.

In the prevailing conditions marked by the formidable authority of the church, wherein the government bestows immense control over familial matters, a perilous dynamic emerges. This peril emanates from two principal sources: power dynamics and moral coercion. The church, as a significant societal institution, plays a pivotal role in instilling the notion that a woman engaging in sexual relations outside the bounds of matrimony resembles a harlot, thereby subjecting her to a disproportionate degree of scrutiny compared to men. Remarkably, society often normalizes male extramarital liaisons, with some even facilitating young boys' entrance into brothels under familial encouragement.

Marital dissolution, the ecclesiastical route reigns supreme, as evidenced by the overwhelming preference for church-sanctioned divorces. Civil unions, by contrast, receive scant attention in comparison. Drawing from a decade of service as a clergyman within the Church of Georgia, personal observations gives the paramount importance assigned to church-sanctioned marriages. Civil unions serve as a secondary option, pursued only when ecclesiastical matrimony proves unattainable. Notably, the divorce process entails a labyrinthine series of bureaucratic hurdles, necessitating the explicit consent and blessings of high-ranking clergy, bishop. Failure to secure such approval precludes the possibility of ecclesiastical remarriage, perpetuating a cycle of spiritual disenfranchisement.

The application of Pauline teachings to everyday life illustrates a disconcerting reality: the church's interpretation thereof serves to denigrate women. Whether this occurs by design or unwittingly, the outcome remains unchanged, women bear the brunt of ecclesiastical decisions, while men enjoy preferential treatment. This gendered bias is further accentuated by the entrenched patriarchal structure of clerical hierarchies, wherein women are systematically excluded from attaining clerical positions. Moreover, psychological and emotional factors exacerbate this disparity, as evidenced by the ubiquitous admonition: "Wives, be subject to your husbands as to the Lord, for the husband is the head of the wife just as Christ is the head of the church, his body, and is himself its Savior."<sup>68</sup>

The convergence of religious authority and familial governance precipitates a precarious imbalance, wherein women find themselves marginalized and subjugated within the ecclesiastical framework. Such disparities, deeply ingrained within societal norms, demand critical reflection and proactive measures to redress entrenched gender biases within religious institutions.

### ***Women's Roles — An Inquiry into Patriarch Ilia's Epistle***

In the realm of societal influence, the patriarch wields unparalleled authority, his every utterance treated as immutable dogma, devoid of controversy. His very name carries weight, sparking debate among the masses. Within his epistle, he directs attention to the role of women, a topic of profound significance both in society and within the church.

During a discourse with a foreign delegation, Women voiced reservations about the Orthodox Church's stance on female priesthood. While expressing deep respect for the Orthodox

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<sup>68</sup> Ephesians 5:22-23.

faith, he lamented the absence of female clergy. The patriarch's response reflects entrenched views on gender roles, dismissing the notion of women assuming roles traditionally held by men in Western churches. This viewpoint, steeped in a skewed interpretation of equality, perpetuates the narrative of deliberate male dominance. According to patriarch Ilia II: "Perhaps you will be surprised why a woman should have the desire to become a priest, but in Western churches today women are consecrated not only as priests, but also as bishops, which, of course, is completely incomprehensible and unjustified. All this is the result of the wrong view on the equality of men and women..."<sup>69</sup> It is indeed "remarkable" to engage in such a resolute discourse regarding this idea.

The patriarch's rhetoric extends to delineating professions deemed unsuitable for women, including construction, mining, and operating heavy vehicles like trolleybuses and trucks. Such assertions reinforce traditional gender stereotypes and diminish the potential for women's participation in diverse fields. Instead, he advocates for a return to traditional gender norms, emphasizing women's primary responsibility as child-rearing.<sup>70</sup>

This portrayal of women's roles not only undermines the principle of equality but also perpetuates a narrow definition of gender roles, where men are positioned as the architects of societal norms and decision-making processes. Moreover, it denigrates the vital role of caregiving, relegating it to a secondary status in comparison to traditionally male-dominated professions. As society evolves, it is imperative to challenge such antiquated perspectives and strive for true gender equality, recognizing and valuing the diverse contributions of all individuals, irrespective of gender.

Upon composing the aforementioned statement, the patriarch appeared to be influenced by the theological precepts articulated by the Apostle Paul,<sup>71</sup> who emphasized the significance of comprehending his teachings. Despite acknowledging the flawed history of male dominance within the Church, there persists an encouragement for men to maintain a position of superiority and assert their authority. Nevertheless, the current juncture calls for candid discussions regarding rectifying these deficiencies. Mere affirmations of gender equality are insufficient; tangible actions are requisite to substantiate this principle.

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<sup>69</sup> His Holiness and Blessed, Catholicos-Patriarch of All Georgia Ilia II, *Role of women in society*, 20 February 2024, <https://www.orthodoxy.ge/patriarqi/qadagebebi/skhva/qalis-rolis.htm>

<sup>70</sup> Ibid., 1.

<sup>71</sup> Ibid., 2.

## Pharmaceutical Sciences

# ANTIRADICAL AND HEPATOPROTECTIVE PROPERTIES OF *PARMELIA VAGANS* L.

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**Objective:** *in vitro* and *in vivo* investigation the antiradical and hepatoprotective activity of the *Parmelia vagans* L. ethanol extract from the Kazakhstan.

### Materials and Methods:

*In vitro* experiments: Assessment of antiradical activity (ARA) compared with butylhydroxyanisole (BHA) using DPPH (1,1-diphenyl-2-picrylhydrazyl) radical. *In vivo* experiments: Determination of malondialdehyde content using a photometric method. Experiments were conducted on outbred white male rats weighing 180-200 g, housed in the vivarium of the Astana Medical University, divided into 4 groups:

group I: oil (1 ml/kg);

group II: oil solution of CCl<sub>4</sub> (1 ml/kg);

group III: silymarin (45 mg/kg/day, orally) for 7 days + CCl<sub>4</sub> (1 ml/kg);

group IV: extract of *Parmelia vagans* L. (120 mg/kg/day, orally) for 7 days + CCl<sub>4</sub> (1 ml/kg). Hepatoprotective action was assessed using an acute toxic liver damage model induced by subcutaneous injection of a 50% oil solution of carbon tetrachloride, administered once 24 hours before animal decapitation. Animals were decapitated under light anesthesia, the liver was removed, cooled, and washed from blood in a saline solution. Statistical analysis was performed by determining the arithmetic mean (M), standard deviation (sigma), and standard error (m). The degree of significance was established using the t-test.

### Results:

The inhibition of DPPH radical was absorbed by the extract. Optical density changes were recorded at  $\lambda = 520$  nm (Standard – Butylated Hydroxyanisole). ARA values were calculated using the formula:  $ARA (\%) = (A_0 - A_t) / A_0 \cdot 100$ . The study of the antiradical effect showed that *Parmelia vagans* L. has significant activity, but lower than BHA's antioxidant effect (Fig. 1).

Malondialdehyde level in liver homogenate was measured as a measure of lipid peroxidation in order to evaluate the antioxidant state of the rats. Administration of the test extract significantly prevented the increase in liver marker levels ( $p < 0.05$ ), and the level of malondialdehyde in the liver of the test animals was lower compared to the control group in the liver rats, with  $56 \pm 0.0041$   $\mu\text{mol/L}$  for the control and  $43 \pm 0.0041$   $\mu\text{mol/L}$  for *Parmelia* (Fig. 2).

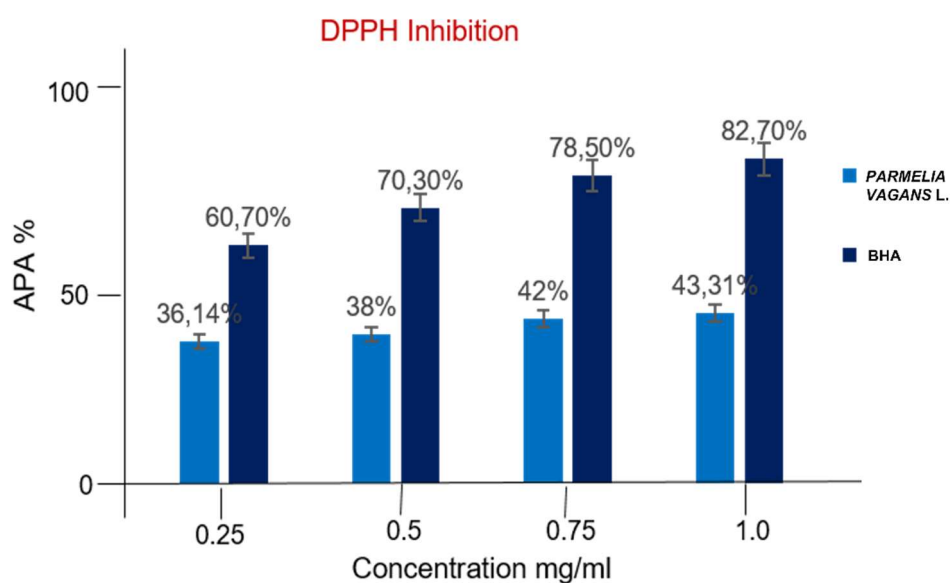


Fig.1. Dependence of antiradical activity on concentration.

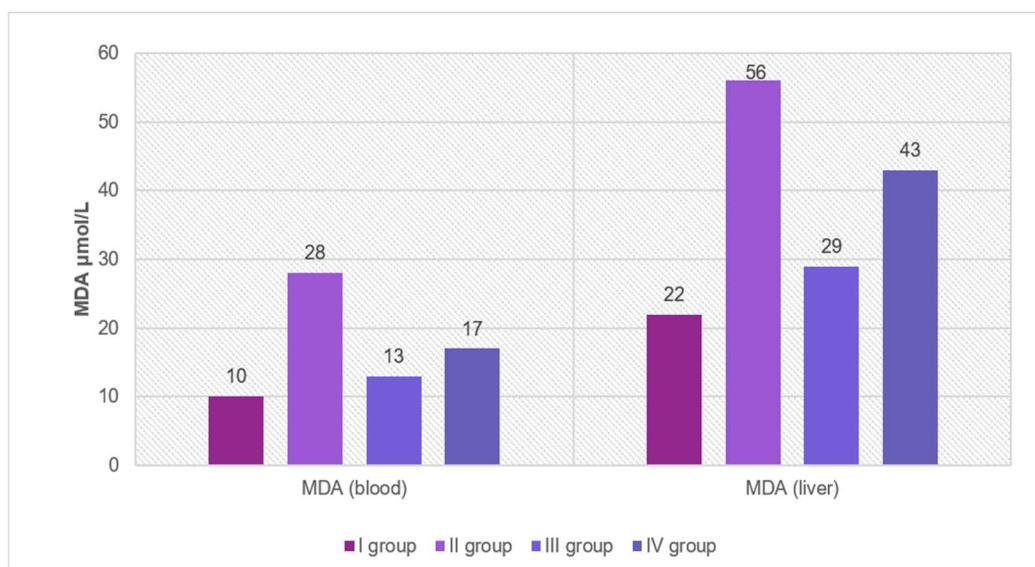


Fig.2. Levels of malondialdehyde (MDA) in plasma and liver tissue of rats

Table 1. Survival of rats and liver coefficient

Group	n	Survival	Liver coefficient
I	5	100%	0,044±0,0013
II	5	50%	0,046±0,0041
III	5	70%	0,048±0,0065
IV <i>Parmelia vagans</i> L.	5	70%	0,046±0,0057

As compared to the control, the blood serum's ALT and AST levels decreased by around 1.1 and 2.1 times, respectively, to  $83.1 \pm 0.06$  ( $p < 0.05$ ) and  $403.2 \pm 1.18^*$  ( $p <$ , respectively). Furthermore, ALP and total bilirubin levels were raised by 1.3 and 2.6 times, respectively, in comparison to the control (Tab. 2).

Table 2. Ethanolic extract's effects on biochemical markers in rats with CCl<sub>4</sub>-induced hepatotoxicity.

Parameters	Groups			
	I group (n=5)	II group (n=5)	III group (n=5)	IV group (n=5)
ALT, u/L	103.1±0.35	204.6±0.15	86.5±0.31*	83.1±0.06**
AST, u/L	191.8±0.40	408.4±0.75*	460.8±1.05	403.2±1.18*
ALP u/L	398.0±1.25	741.1±1.14	813.4±0.51	371.3±0.20
Total bilirubin mg/dL	0.45±0.5	0.96±0.23	0.3±0.03**	0.7±0.53

### Conclusion

The study of the antiradical effect of extracts revealed that *Parmelia vagans* L. has a pronounced activity, but lower than the antioxidant effect of BHA.

*Parmelia vagans* L. extract has a positive effect on the functional status of the liver and the state of metabolic processes in animals with liver failure, which opens up prospects for preclinical studies of the studied object.

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## Chemical Sciences

# Роль методов нанесения кукурбит[6]урила на гидрокси-апатит для морфологической настройки его поверхности в процессе получения КОМПОЗИЦИОННЫХ материалов

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В современную эпоху персонализированной медицины существует значительная потребность в создании новых материалов для имплантатов, которые должны обладать определенными характеристиками. Для успешного применения в медицинских целях такие материалы должны иметь оптимальное сочетание различных свойств.

Ключевыми характеристиками композиционных биоматериалов являются их состав, форма, структура, морфология поверхности и механические свойства. Важным аспектом таких материалов является их биосовместимость, то есть способность взаимодействовать с окружающими тканями без вызывания нежелательных реакций или воспалений. Кроме того, желательно, чтобы такие материалы стимулировали рост сосудов или костей вокруг них, способствуя заживлению и восстановлению поврежденных тканей.

В случае с имплантатами или материалами для лечения ран все эти свойства определяют способность материала взаимодействовать с окружающими тканями. Биоактивные материалы могут служить основой для роста новых тканей, например, для ускорения регенерации повреждений. Таким образом, разработка таких материалов является ключевым аспектом в улучшении качества медицинской помощи и повышении эффективности лечения. Успех персонализированной медицины в значительной степени зависит от прогресса в области разработки новых материалов для имплантатов, обладающих всеми необходимыми характеристиками для безопасного и эффективного взаимодействия с биологическими тканями. Инновации в этой области открывают новые горизонты для лечения различных заболеваний и повреждений, обеспечивая пациентам более быстрое восстановление и улучшение качества жизни.

С другой стороны, материалы, контактирующие с внутренней средой организма, должны быть максимально нетоксичными для клеток и тканей. Однако многие вещества, обладающие высокими антибактериальными свойствами, часто оказываются достаточно токсичными, что приводит к низкой биосовместимости. Биосовместимость определяется характером и степенью взаимодействия между биоматериалами и тканями организма и является одной из важнейших проблем в исследованиях биоматериалов. Она включает

иммунное отторжение или воспалительную реакцию окружающих тканей на присутствие инородного тела в организме.

В связи с этим, ко всем биомедицинским устройствам предъявляются чрезвычайно высокие клинические требования. Перед имплантацией в организм человека требуется тщательный процесс модификации поверхности материалов для повышения их биосовместимости. Создание материалов, которые одновременно являются биосовместимыми и обладают специфической биологической активностью, представляет собой нетривиальную задачу.

Помимо этого, современные клинические методы лечения часто основаны на пероральном или внутривенном введении лекарственных средств. Такой подход обеспечивает высокий уровень препарата в крови сразу после введения дозы, но затем его концентрация быстро снижается ниже терапевтического окна. Это может привести к тому, что концентрация препарата сначала достигает токсического уровня, а затем падает ниже терапевтического, делая терапию менее эффективной.

Следовательно, разработка новых биоматериалов и методов доставки лекарственных средств требует решения множества сложных задач. Необходимо создавать материалы, которые не только минимально токсичны и биосовместимы, но и обладают необходимой биологической активностью для обеспечения эффективного лечения. Инновационные подходы в этой области могут значительно улучшить качество медицинской помощи, предоставляемой пациентам, и повысить эффективность лечения различных заболеваний и повреждений.

Имплантаты, высвобождающие лекарственные средства, стали перспективной альтернативой традиционным методам перорального и внутривенного введения лекарств для широкого спектра клинических применений. В настоящее время известны такие материалы, используемые для разработки имплантатов с контролируемым высвобождением лекарств, как титановые нанотрубки, пористый кремний, полимеры и различные микротехнологии.

Импланты высвобождающие лекарственные средства, обладают рядом уникальных преимуществ. Они могут обеспечивать устойчивое, дистанционно контролируемое, программируемое и локализованное высвобождение лекарств непосредственно в нужном месте. Это делает терапию более эффективной, снижая риск побочных эффектов для пациентов. Такие возможности трудно достичь при обычном системном введении лекарств.

Особое место среди имплантатов занимают биоактивные материалы, способные стимулировать рост новой ткани вокруг себя. Это позволяет значительно улучшить процессы заживления и восстановления, что особенно важно в медицинских применениях, связанных с лечением ран и повреждений. Биоактивные материалы могут ускорять регенерацию тканей, что делает их незаменимыми в медицинской практике.

Все характеристики материалов для имплантатов, позволяющие придать биоподобность играют важную роль в их применении в медицине. Исследования и разработки в этой области постоянно продвигаются вперед, стремясь найти лучшие материалы, которые удовлетворяют всем требованиям и обеспечивают оптимальные результаты для пациентов. Инновации в разработке таких материалов могут привести к значительным улучшениям в лечении различных заболеваний и повреждений, обеспечивая более быстрое и эффективное восстановление пациентов.

Таким образом, создание и применение имплантатов, высвобождающих лекарственные средства, открывают новые горизонты в медицинской науке и практике. Они не только повышают эффективность терапии, но и значительно улучшают качество жизни пациентов, минимизируя побочные эффекты и обеспечивая более точное и целенаправленное лечение.

ISBN 978-7-97-596275-5



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Proceedings of the 9th International Scientific Conference  
«Theoretical Hypotheses and Empirical results» (February 6-7, 2025). Oslo,  
Norway, 2025. 266p

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