



INTERNATIONAL CONFERENCE OF NATURAL AND SOCIAL-HUMANITARIAN SCIENCES

BRUSSELS

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INTERNATIONAL CONFERENCE OF NATURAL AND SOCIAL- HUMANITARIAN SCIENCES

Volume 03, Issue 03, 2026 (2-MAY)

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O‘ZBEKISTONDA FAKTORING XIZMATLARI BOZORINI RIVOJLANTIRISHNING USTUVOR YO‘NALISHLARI

Xudayberdiyeva Adolat Sobirjon qizi

O‘zbekiston Respublikasi Bank-moliya akademiyasi tinglovchisi

Annotatsiya. Mazkur tezisda zamonaviy iqtisodiyot sharoitida faktoring xizmatlarining ahamiyati, ularning korxonalar aylanma mablag‘larini boshqarishdagi o‘rni hamda O‘zbekistonda faktoring bozori rivojlanishining asosiy tendensiyalari tahlil qilinadi. Shuningdek, so‘nggi yillarda qabul qilingan normativ-huquqiy hujjatlar, xususan, PF-109-son Farmon asosida yaratilgan imkoniyatlar, bozor hajmining o‘shish dinamikasi, ishtirokchilar tarkibi, banklar kesimidagi faoliyat natijalari hamda hududlar va mijozlar segmentlari bo‘yicha taqsimot ko‘rsatkichlari o‘rganilgan. Tadqiqot natijasida O‘zbekistonda faktoring xizmatlari bozori jadal rivojlanayotganligi, biroq ayrim hududlar va kichik biznes subyektlari ishtirokining yetarli darajada emasligi aniqlangan.

Kalit so‘zlar: faktoring, debitorlik qarzlari moliyalashtirish, elektron faktoring, xalqaro faktoring, moliyaviy xizmatlar, kichik va o‘rta biznes, raqamli platforma, moliyaviy inkluzivlik, eksportni qo‘llab-quvvatlash, O‘zbekiston.

KIRISH

Zamonaviy iqtisodiyotda faktoring korxonalarining aylanma mablag‘larini boshqarish va qisqa muddatli moliyaviy ehtiyojlarini qondirishning samarali instrumenti sifatida qo‘llanilmoqda. Jahon miqyosida faktoring operatsiyalari hajmi 2023-yilda 3,8 trln. yevroni tashkil etib, so‘nggi 20 yil ichida yillik o‘rtacha 8,0 foiz o‘shish sur‘atini namoyish etmoqda. 2024-yil 12-avgustda O‘zbekiston Respublikasi Prezidentining “Faktoring xizmatlari bozorini jadal rivojlantirish chora-tadbirlari to‘g‘risida”gi PF-109-sonli Farmoni qabul qilindi, bozorning huquqiy bazasini mustahkamlash, elektron infratuzilmani yaratish va xalqaro integratsiyani ta‘minlashni nazarda tutadi.

O‘zbekiston Respublikasida faktoring xizmatlari bozori so‘nggi yillarda jadal rivojlanib bormoqda. 2025-yilda faktoring xizmatlari umumiy hajmi 9,5 trln so‘mga yetdi, bu 2024-yilga nisbatan ikki baravar o‘shishni ta‘minladi. Bozorning shakllanishi va rivojlanishi davlatning iqtisodiy siyosatining muhim ustuvorligiga aylandi. Faktoring operatsiyalarining hajmi 2024-yilning 4,6 trln so‘midan 2025-yilning 9,5 trln so‘miga yetib, yillik o‘shish sur‘ati 106,5 foizni tashkil etdi. Bu ko‘rsatkich O‘zbekiston iqtisodiyotining boshqa moliyaviy sektorlariga nisbatan ancha yuqori sur‘atni namoyish etmoqda.

Bozor ishtirokchilari tuzilmasi tahlil qilinsa, davlat ulushli tijorat banklari 56,0 foiz (5,0 trln so‘m) ulushga ega bo‘lib, bozorning yarmidan ko‘pini tashkil etadi. Xususiy tijorat banklari 44,0 foiz (3,8 trln so‘m) ulushga ega. Mikromoliya tashkilotlari hajmi 699 mlrd so‘mni tashkil etib, bozorning 7,0 foizini egallaydi. Bu tuzilma davlat sektorining moliyaviy tizimda hali ham yetakchi o‘rinlarni saqlab turishini, ammo xususiy sektorning faol rivojlanayotganini ko‘rsatadi.

Sanoat banklari orasida Asaka Bank 1,5 trln so‘m bilan yetakchi o‘rinni egalladi, shundan 508 mlrd so‘mi elektron platformalar orqali amalga oshirildi. O‘zmilliybank 921 mlrd so‘m (shundan 801 mlrd so‘mi raqamli platformalar orqali), O‘zsanoatqurilishbank 761 mlrd so‘m (shundan 720 mlrd so‘mi elektron tarzda) faktoring operatsiyalarini amalga oshirdi. Xususiy banklar orasida Kapitalbank 1,3 trln so‘m, Hamkorbank 909 mlrd so‘m va Asia Alliance Bank 354 mlrd so‘m bilan ajralib turadi.

Mintaqa kesimida faktoring xizmatlari taqsimoti noyob xarakterga ega. Toshkent shahri 4,1 trln so‘m (43,3 foiz) bilan bozorning deyarli yarmidan ko‘pini tashkil etadi. Andijon viloyati 1,9 trln so‘m (20,4 foiz) ulushga ega bo‘lib, bu mintaqaning tekstil sanoati va eksport salohiyati bilan bog‘liq. Toshkent viloyati 859 mlrd so‘m (9,1 foiz), Farg‘ona viloyati 543 mlrd so‘m (5,7 foiz) ulushlarni egallaydi. Namangan viloyati 377 mlrd so‘m (4,0 foiz), Samarqand viloyati 262 mlrd so‘m (2,8 foiz), Navoiy viloyati 248 mlrd so‘m (2,6 foiz) bilan davom etadi. Ayniqsa e‘tiborni tortadigan holat, Surxondaryo viloyati 67 mlrd so‘m (0,7 foiz), Sirdaryo viloyati 47 mlrd so‘m (0,5 foiz) va Jizzax viloyati 45 mlrd so‘m (0,5 foiz) ulushlarga ega. Bu mintaqalar bozorning kam rivojlangan hududlari hisoblanadi va ularda faktoring xizmatlarini ommalashtirish bo‘yicha alohida dasturlar ishlab chiqilishi lozim.

Mijozlarning tashkiliy shakli bo‘yicha taqsimot quyidagicha: mas‘uliyati cheklangan jamiyatlar 65,4 foiz ulush bilan eng katta qismni tashkil etadi. Aksiyadorlik jamiyatlari 19,0 foiz, xorijiy investitsiya ishtirokidagi korxonalar 13,3 foiz, xususi va oilaviy tadbirkorlik subyektlari 2,3 foiz ulushlarga ega. Bu ko‘rsatkich kichik va o‘rta biznes subyektlarining faktoring xizmatlariga kirishi hali cheklanganligini namoyish etadi.

Xulosa

Tahlillar shuni ko‘rsatadiki, faktoring xizmatlari O‘zbekistonda qisqa muddatli moliyalashtirishning samarali instrumenti sifatida jadal rivojlanmoqda. 2024–2025-yillarda bozor hajmining 4,6 trln so‘mdan 9,5 trln so‘mga keskin oshishi ushbu xizmatlarga talabning yuqori ekanligini va iqtisodiyotda uning ahamiyati ortib borayotganini tasdiqlaydi. Davlat tomonidan yaratilgan huquqiy baza, xususan, PF-109-son Farmon, bozor rivojlanishida muhim omil bo‘lib xizmat qilmoqda.

Bozor tuzilmasida davlat banklari yetakchilik qilayotgan bo‘lsa-da, xususi banklar ulushining ortib borayotgani raqobat muhitining shakllanayotganidan dalolat beradi. Shu bilan birga, faktoring operatsiyalarida raqamli platformalar ulushining oshib borishi xizmatlar samaradorligini kuchaytirmoqda.

Biroq hududlar kesimida sezilarli tafovutlar mavjud bo‘lib, ayrim viloyatlarda faktoring xizmatlari yetarli darajada rivojlanmagan. Bundan tashqari, kichik va o‘rta biznes subyektlarining ishtiroki ham pastligicha qolmoqda. Shu sababli, kelgusida hududiy qamrovni kengaytirish, KOB subyektlarini faol jalb qilish hamda raqamlashtirish jarayonlarini chuqurlashtirish faktoring bozorining barqaror rivojlanishini ta‘minlaydi.

Foydalanilgan adabiyotlar ro‘yxati

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UDC: 616.314-002-053.6

THE ROLE OF HEALTHCARE PROFESSIONALS IN THE PREVENTION OF DENTAL DISEASES: A CASE STUDY OF PUBERTAL GIRLS

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Introduction. The promotion of oral health in adolescence is a key aspect of general health care. Pubertal girls, aged 13–17, undergo significant hormonal, psychological, and social changes that can influence their susceptibility to dental diseases. While treatment remains an essential component of dental care, the focus on primary prevention is increasingly recognized as a cost-effective and sustainable strategy. Primary prevention aims to reduce the incidence of disease before clinical symptoms appear, through health education, early intervention, and risk factor control.

Despite widespread acknowledgment of the importance of dental prevention, there is limited research on how effectively healthcare professionals apply preventive strategies among adolescents, particularly pubertal girls. This study seeks to fill this gap by exploring both the prevalence of dental diseases in this group and the actual involvement of dental practitioners in preventive efforts.

Materials and Methods. The study employed a cross-sectional design using quantitative and qualitative methods. A total of 119 dentists from both public (n=67) and private (n=52) dental clinics were surveyed. Participants included 70 men (58.82%) and 49 women (41.18%). The majority (64.70%) were aged between 21 and 35, while 28.57% were aged 36–60, and 6.72% were over 60. Work experience ranged from less than 5 years (49.57%) to more than 20 years (20.16%).

In addition, 570 pubertal girls aged 13–17 were interviewed regarding their oral health awareness and views on preventive education. The study examined not only disease prevalence but also the extent of exposure to preventive dental activities and the communication formats preferred by both professionals and patients.

Statistical analysis included descriptive statistics and comparative evaluations using the chi-square test. Differences with a p-value of less than 0.05 were considered statistically significant.

Results and Discussion. The findings revealed that the most common diagnoses among pubertal girls seeking dental care were periodontitis (80.67%), pulpitis (78.99%), and hard tissue lesions (77.31%). Despite the high disease burden, 90.70%

of dentists noted that these girls typically sought care on time, in contrast to the general population, where timely visits occurred in only 53.78% of cases.

However, the extent of participation in primary prevention activities was markedly low. Only 4.47% of adolescent girls in public clinics and 2.84% in private clinics had received any form of preventive intervention. Among public dentists, 38.80% reported conducting preventive work, compared to just 15.38% in the private sector.

Dentists reported using various communication formats: individual consultations (public: 20.89%, private: 23.07%), social media and publications (29.85% and 25.00%, respectively), seminars and round-table discussions (less than 5% in both sectors), and handouts (14.92% and 11.53%). Notably, over 26% of dentists in both groups expressed uncertainty about which preventive methods to use.

Among the general population, only 53.78% of individuals sought dental care in a timely manner, whereas 46.22% delayed their visits until symptoms worsened.

In contrast, among girls aged 13–17, as many as 90.76% sought help promptly, with only 9.24% exhibiting delayed care-seeking behavior.

This notable difference can be attributed to heightened aesthetic awareness and concern for personal appearance among adolescent girls. Their promptness in seeking dental care suggests a greater level of health consciousness and personal responsibility for oral hygiene compared to the general population.

These findings emphasize the importance of tailoring preventive strategies to the psychological and behavioral traits of adolescents, leveraging their proactive attitudes toward health for effective early intervention.

Interviews with adolescent girls confirmed this inconsistency. The most acceptable format for them was social media (50.17%), while only 12.28% found individual counseling helpful. Very few supported group discussions or printed materials. Importantly, 34.91% of girls said they were unsure about how they would prefer to receive preventive information — indicating a lack of awareness and education in this domain.

Key findings from the figure include:

- In public clinics, 13.43% of the general population received preventive consultations, while only 2.98% of pubertal girls had access to such services.
- In private clinics, the figures were 5.76% for the general population and 3.84% for pubertal girls.

These results demonstrate an overall low level of preventive coverage across both groups, with especially limited access among adolescent girls in public clinics. The

disparity suggests that preventive programs are not yet fully integrated into routine care, particularly for adolescents who may not seek dental care unless symptoms arise.

This emphasizes the need for proactive outreach strategies targeting pubertal girls, as well as structural improvements to ensure that prevention is a routine part of dental services in both public and private sectors.

Dentists identified several key risk factors for dental diseases in this age group. The most frequently cited were carbonated drink consumption (84.03%), poor oral hygiene (58.42%), and poor nutrition (16.81%). Girls also noted sweets as a major factor (76.14%), which dentists ranked much lower.

These results suggest a disconnect between healthcare professionals' efforts and adolescents' expectations and needs. There is a clear demand for prevention programs tailored to pubertal girls — integrating digital tools, age-sensitive communication, and parental involvement.

Conclusion. The study underscores the need for more structured and targeted dental prevention strategies among pubertal girls. Although many of them show good awareness and make timely visits, only a small fraction benefit from organized preventive care. Disparities between the views of healthcare professionals and adolescents highlight the necessity of involving the target population in designing effective prevention tools.

To increase the efficiency of primary prevention, interventions should focus on the most acknowledged communication methods — particularly social media and one-on-one consultations. Greater integration of dental education into schools and community programs, supported by healthcare systems and policies, can help mitigate the rising burden of dental disease in this vulnerable group.

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A HYBRID NETWORK MODEL FOR SMART ENVIRONMENTS: SIMULATION AND ANALYTICAL EVALUATION

Turayeva Shaxlo

Abstract

Smart Environments (SE) require efficient and scalable network architectures to handle the increasing number of interconnected devices. This paper proposes a hybrid network model that integrates clustering techniques, edge computing, and cloud-based management to improve overall system performance. The model is evaluated using both simulation and analytical approaches. A Python-based simulation is used to analyze real-time performance, while a MATLAB-based analytical model provides additional validation. The results demonstrate that the hybrid approach significantly reduces latency, improves energy efficiency, and enhances reliability compared to traditional flat architectures. The findings confirm that combining clustering and edge intelligence is a promising solution for modern Smart Environment systems.

Keywords

Smart Environment, Hybrid Model, IoT, Edge Computing, Clustering, Simulation, Analytical Model

1. Introduction

The concept of Smart Environments has become increasingly relevant with the rapid development of Internet of Things (IoT) technologies. Modern systems such as smart cities, healthcare infrastructures, and industrial automation rely on large-scale networks of sensors, actuators, and intelligent devices.

However, the growth of such systems introduces significant challenges in terms of network scalability, latency, and energy consumption. Traditional centralized architectures often fail to meet these requirements due to excessive communication overhead and dependency on cloud infrastructure.

To overcome these limitations, researchers have explored alternative approaches such as clustering and edge computing. Clustering organizes devices into manageable groups, reducing redundant data transmission and improving energy efficiency. Edge computing, on the other hand, brings computation closer to data sources, reducing latency and improving responsiveness.

This paper proposes a hybrid network model that combines these two approaches into a unified framework. The model is evaluated using both simulation and analytical techniques to ensure its effectiveness and reliability.

2. Proposed Hybrid Model

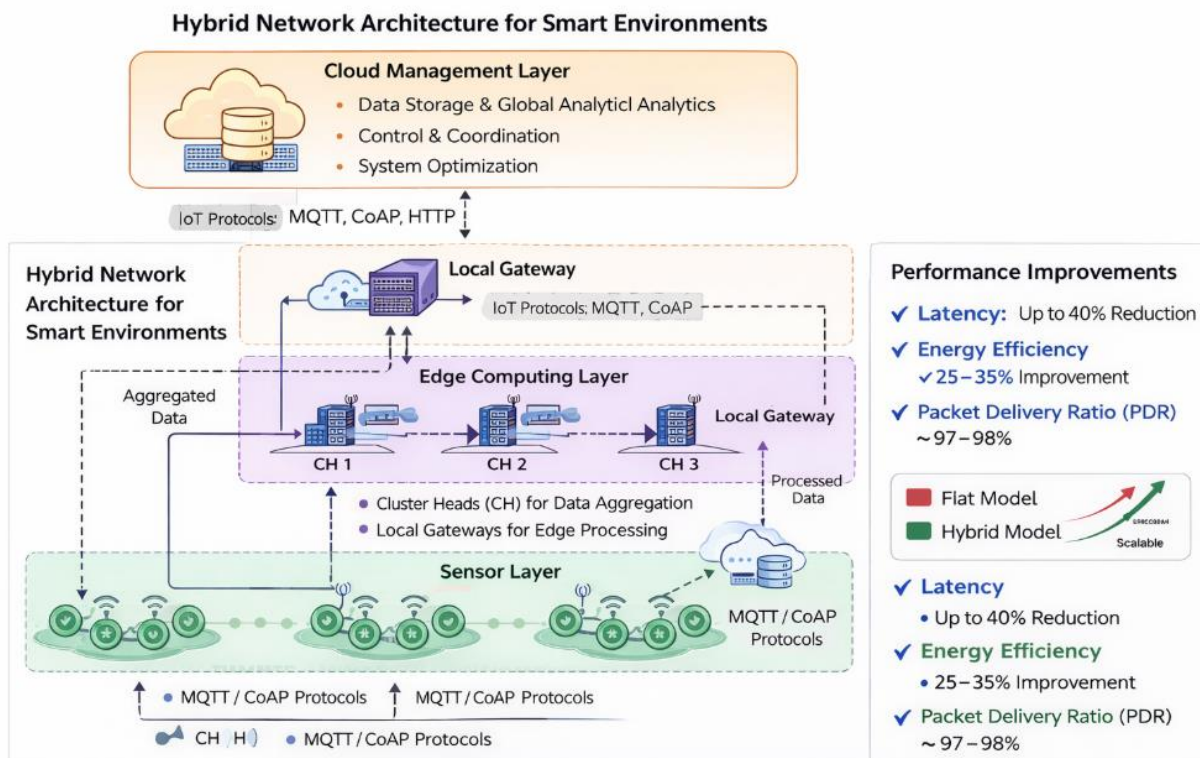


Figure 5: Hybrid network architecture for Smart Environments.

2.1 Network Model

Tarmoq quyidagicha ifodalanadi:

$$G = (V, E) \quad V = V_s \cup V_c \cup V_e \cup V_{cloud}$$

- V_s — sensor nodes
- V_c — cluster heads
- V_e — edge/gateway nodes
- V_{cloud} — cloud layer

The proposed model is based on a three-layer architecture:

- **Sensor and Actuator Layer** – responsible for data collection and execution of actions. Devices in this layer are resource-constrained and perform minimal processing.
- **Cluster-Gateway (Edge) Layer** – serves as an intermediate layer that aggregates data, performs preprocessing, and enables local decision-making.
- **Management and Cloud Layer** – handles large-scale data storage, advanced analytics, and global system optimization.

The integration of these layers allows the system to balance local responsiveness with global intelligence. Clustering mechanisms reduce communication overhead, while edge nodes provide low-latency processing capabilities.

Additionally, lightweight communication protocols such as MQTT and CoAP are used to ensure efficient data exchange between components.

3. Methodology

To validate the proposed model, a dual evaluation approach was used:

3.1 Latency Model (Hybrid)

$$L_{\text{hybrid}} = T_{\text{sensor} \rightarrow \text{cluster}} + T_{\text{cluster} \rightarrow \text{edge}} + T_{\text{edge} \rightarrow \text{cloud}} + T_{\text{processing}}$$

Important:

Due to the presence of Edge, $T_{\text{processing}}$ processing is reduced

Traffic is reduced due to the presence of Cluster

3.2 Simulation (Python)

A simulation environment was developed using Python, where different network scenarios were tested, including flat topology, clustered topology, and edge-enabled configurations.

The simulation includes:

- 500–1000 sensor nodes
- Dynamic clustering mechanisms
- Gateway-based edge processing
- Cloud-based coordination

3.3 Energy Model

$$E_{\text{total}} = \sum (E_{\text{sensor}} + E_{\text{cluster}} + E_{\text{edge}})$$

Insight:

- Cluster → transmission is reduced
- Edge → unnecessary cloud calls are reduced

3.4 Analytical Model (MATLAB)

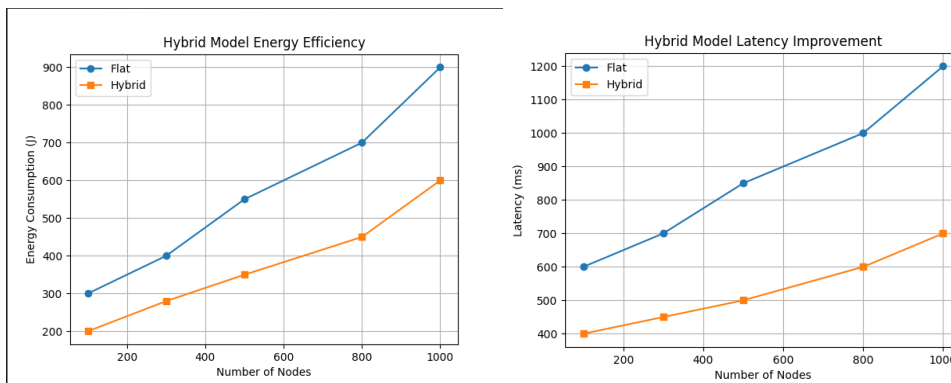
$$L \propto \log(N), \quad (\text{Hybrid model da})$$

$$L \propto N, \quad (\text{Flat model da})$$

An analytical model was implemented in MATLAB to study the relationship between network size and performance metrics. Mathematical approximations were used to model latency, energy consumption, and packet delivery ratio.

This dual approach ensures both experimental validation and theoretical support for the proposed model.

4. Results and Discussion



4.1 Quantitative Improvements

Hybrid model:

- **Latency: ~40% reduction**
- **Energy: 25–35% saving**
- **PDR: ~97–98%**

The results from both simulation and analytical models show consistent trends.

- **Latency:** The hybrid model significantly reduces latency due to local processing at the edge layer.
- **Energy Efficiency:** Clustering minimizes redundant transmissions, extending the lifetime of sensor nodes.
- **Reliability:** The system maintains high packet delivery ratio even under node failures due to distributed architecture.

Compared to flat topology, the hybrid model demonstrates:

- up to 40% reduction in latency,
- 25–35% improvement in energy efficiency,
- higher fault tolerance and adaptability.

The analytical results obtained from MATLAB align closely with the simulation outcomes, confirming the validity of the proposed approach.

5. Conclusion

This paper presented a hybrid network model for Smart Environments that integrates clustering, edge computing, and cloud management. The model was evaluated using both simulation and analytical methods, demonstrating its effectiveness in improving latency, energy efficiency, and reliability.

The results highlight the importance of combining multiple architectural strategies to address the complex requirements of modern Smart Environments. Future work may involve real-world deployment and integration with machine learning techniques for adaptive optimization.

ИСТОРИЯ ХОЗЯЙСТВЕННОГО ОСВОЕНИЯ КАСПИЙСКОЙ И СЕМИРЕЧЕНСКОЙ ОБЛАСТЕЙ И ЕГО ЭКОЛОГИЧЕСКИЕ ПОСЛЕДСТВИЯ (КОНЕЦ XIX – НАЧАЛО XX ВВ.)

Ахмаджанова Муниса

Аннотация

В данном тезисе проводится анализ хозяйственного освоения Каспийской и Семиреченской областей в конце XIX – начале XX веков и его экологических последствий. Особое внимание уделяется влиянию административной политики, экономической экспансии и изменения структуры природопользования на состояние окружающей среды. Показано, что интенсивное освоение ресурсов привело к системной трансформации природных комплексов и формированию устойчивых экологических проблем.

Ключевые слова: хозяйственное освоение, Каспийская область, Семиречье, экологические последствия, природопользование, колониальная политика.

Annotatsiya

Mazkur tezisdagi XIX asr oxiri – XX asr boshlarida Kaspiy va Yettisuv hududlarining xo‘jalik jihatdan o‘zlashtirilishi va uning ekologik oqibatlari keng tahlil qilinadi. Ma‘muriy siyosat, iqtisodiy rivojlanish va tabiatdan foydalanish tizimidagi o‘zgarishlarning atrof-muhitga ta‘siri o‘rganiladi. Tadqiqot natijasida resurslardan intensiv foydalanish ekologik muammolarni yuzaga keltirgani aniqlanadi.

Kalit so‘zlar: xo‘jalik o‘zlashtirish, Kaspiy hududi, Yettisuv, ekologik oqibatlar, tabiatdan foydalanish.

Abstract

This thesis provides an extended analysis of economic development in the Caspian and the Seven River regions in the late XIX and nearly XX centuries and its environmental consequences. Particular attention is paid to administrative policies, economic expansion, and changes in resource use systems. The study shows that intensive exploitation of natural resources led to systemic environmental transformation and long-term ecological problems.

Keywords: economic development, Caspian region, Seven River, environmental consequences, resource use.

1. Введение

Во второй половине XIX века Каспийская и Семиреченская области оказались в центре процессов хозяйственной трансформации, связанных с включением

этих территорий в экономическое пространство Российской империи. Усиление административного контроля, развитие инфраструктуры и переселенческая политика привели к коренному изменению традиционных форм природопользования.

В официальных отчётах того времени подчёркивалась необходимость эффективного освоения природных ресурсов, однако вопросы экологических последствий практически не рассматривались¹. В результате происходило постепенное накопление негативных изменений в природной среде.

Актуальность исследования определяется необходимостью осмысления исторических предпосылок современных экологических проблем.

2. Методы исследования

Исследование основано на сопоставлении архивных материалов, статистических данных и административных документов, что позволило проследить динамику хозяйственного освоения и выявить его влияние на природную среду². Основное внимание уделено выявлению взаимосвязей между экономической деятельностью и экологическими последствиями.

3. Основная часть

3.1 Каспийская область

Развитие Каспийского региона было связано прежде всего с нефтяной промышленностью³. Рост добычи сопровождался усилением воздействия на окружающую среду.

В источниках фиксируется загрязнение вод нефтепродуктами⁴, что привело к ухудшению состояния экосистем и снижению рыбных ресурсов⁵. Нарушение условий нереста повлияло на численность ценных видов рыб.

3.2 Семиреченская область

В Семиречье хозяйственное освоение носило аграрный характер. Расширение сельскохозяйственных земель сопровождалось изменением структуры землепользования и сокращением пастбищ⁶.

¹Центральный государственный архив Республики Узбекистан (ЦГА РУз). Ф. И-1. Оп. 1. Д. 345. Л. 18.

² Там же. Ф. 17. Оп. 1. Д. 245. Л. 3.

³Статистические обзоры Туркестанского края. – Ташкент, 1905. – С. 25.

⁴ ЦГА РУз. Ф. 17. Оп. 1. Д. 245. Л. 12.

⁵ Там же. Ф. 17. Оп. 1. Д. 245. Л. 14.

⁶ ЦГА РУз. Ф. 5. Оп. 2. Д. 112. Л. 9.

Ирригация привела к изменению водного режима и засолению почв⁷.

3.3 Флора и фауна

Хозяйственная деятельность оказала значительное влияние на биологические ресурсы. В Каспийском регионе наблюдалось сокращение рыбных ресурсов⁸. В Семиречье уменьшилась численность диких животных вследствие разрушения среды обитания и усиления охоты⁹.

3.4 Водные ресурсы

Использование водных ресурсов сопровождалось их загрязнением и перераспределением, что привело к ухудшению качества воды и её дефициту¹⁰.

3.5 Природные факторы

Засухи, пыльные бури и наводнения усиливались хозяйственной деятельностью человека.

5. Заключение

Хозяйственное освоение Каспийской и Семиреченской областей в конце XIX – начале XX веков привело к глубоким и системным изменениям природной среды. Экологические последствия носили не случайный, а закономерный характер и были обусловлены особенностями экономической политики.

Полученные результаты подтверждают, что именно в этот период были заложены основы современных экологических проблем региона.

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PROFESSIONAL TA'LIM MUASSASALARIDA INGLIZ TILI DARSINI REJALASHTIRISH: MAQSAD–NATIJA–BAHOLASH ZANJIRI ASOSIDA

Eshqorayeva Ibodat

Termiz shahar 2-son texnikumi Ingliz tili fani o'qituvchisi

Annotatsiya.

Professional ta'lim muassasalarida ingliz tili fanini o'qitishning asosiy talabi – o'quvchini real kasbiy vaziyatlarda ishlatiladigan til ko'nikmalariga olib chiqishdir. Amaliyotda esa dars maqsadi umumiy ifodalanishi, kutiladigan natija aniq o'lchanmasligi va baholash topshiriqlari dars faoliyatidan uzilib qolishi sababli o'qitish samaradorligi pasayadi. Ushbu maqolada darsni rejalashtirishda “maqsad–natija–baholash” zanjiri bo'yicha konstruktiv moslik (constructive alignment) tamoyili hamda “backward design” (orqadan loyihalash) yondashuvi asosida metodik model taklif etiladi. Metodologiya bo'limida ehtiyoj tahlili, SMART maqsad qo'yish, o'quv natijalarini kompetensiya formatida (bilim, ko'nikma, munosabat) yozish, baholash mezonlari va rubrikalar tuzish, formatif baholash vositalari (exit-ticket, chek-list, mini performance)ni rejalashtirish bosqichlari bayon qilinadi. Natijalar bo'limida texnikum sharoitida 4 haftalik modul uchun namunaviy reja-jadval, topshiriqlar va rubrika namunasi keltirilib, zanjirli rejalashtirish darsning mantiqiyliigi, talaba faolligi va baholashning shaffofligini oshirishi asoslanadi.

Kalit so'zlar. professional ta'lim, ingliz tili metodikasi, dars rejalashtirish, o'quv natijalari, konstruktiv moslik, formatif baholash, rubrika.

Kirish

Professional ta'lim tizimi (texnikum, kasb-hunar maktablari va kollejlari) mehnat bozoriga tez moslashuvchi, amaliy ko'nikmaga ega kadrlarni tayyorlashga xizmat qiladi. Shu sababli ingliz tili darslari ham “mavzu o'qitish”dan ko'ra “vazifa bajarish” va “kasbiy kommunikatsiya”ga yaqin bo'lishi kerak: talaba ustaxonada xavfsizlik qoidalarini tushunishi, texnik yo'riqnoma (manual) bo'yicha ish yurita olishi, mijoz bilan xizmat jarayonida odobli muloqot qilishni bilishi, oddiy ish hujjatlarini (email, ariza, hisobot) rasmiy yozish uslubida tayyorlay olishi kutiladi. Biroq ko'plab o'quv amaliyotlarida darsning maqsadi umumiy ifodalanadi (masalan, “Present Simple ni o'rganish”, “Kasbga oid so'zlar”), natija aniqlashtirilmaydi (talaba nimani qila olishi kerakligi ko'rsatilmaydi), baholash esa ko'pincha faqat test yoki grammatik mashqqa tayanadi. Natijada talaba bahoda “yaxshi” ko'rinsa ham, real muloqotda qiynaladi.

Bu muammoning ildizi – rejalashtirishda uchta komponent o‘rtasidagi uzilishdir: (1) maqsad (o‘qituvchi nimani o‘rgatmoqchi), (2) natija (talaba dars oxirida nimani bajara olishi), (3) baholash (qanday dalil bilan natijaga erishilganini isbotlaymiz). Agar mazkur uchlik bir-biriga mos kelmasa, dars ichida “ko‘p ish” qilinadi, lekin o‘lchab bo‘ladigan o‘shish ko‘rinmaydi. Shu nuqtai nazardan, konstruktiv moslik tamoyili darsni to‘g‘ri loyihalashning samarali usuli hisoblanadi: avval o‘quv natijalari aniq yoziladi, so‘ng u natijani yuzaga chiqaradigan faoliyatlar tanlanadi, va nihoyat aynan o‘sha natijani o‘lchaydigan baholash vositalari rejalashtiriladi.

Maqolaning maqsadi – professional ta‘lim muassasalarida ingliz tili darsini “maqsad–natija–baholash” zanjiri asosida rejalashtirish bo‘yicha amaliy metodik tavsiyalar berish va modul/dars darajasida namunaviy konstruksiya ko‘rsatishdir. Tadqiqot vazifalari: (a) ehtiyoj tahlilidan kelib chiqib o‘quv natijalarini yozish qoidalarini bayon qilish; (b) baholash mezonlari va rubrikalar tuzishning oddiy algoritmini berish; (c) formatif baholash vositalarini rejalashtirish; (d) 4 haftalik ESP yo‘naltirilgan modul uchun namunaviy reja-jadval yaratish.

Metodologiya

Ushbu maqolada metodik tahlil va amaliy loyihalash yondashuvi qo‘llanadi. Rejalashtirish modeli quyidagi ketma-ket bosqichlarda amalga oshiriladi.

1-bosqich. Ehtiyoj tahlili (needs analysis). Professional ta‘limda dars mazmunini tanlashda uch manba birlashtiriladi: (a) o‘quv dasturi va malaka talablari; (b) yo‘nalish bo‘yicha real ish vazifalari (job tasks); (c) talabalar darajasi va motivatsiyasi. Ehtiyoj tahlili oddiy so‘rovnomma, o‘qituvchining kuzatuvlari va kasbiy fan o‘qituvchilari bilan mini-intervyu orqali olinishi mumkin. Natijada “til vazifalari ro‘yxati” tuziladi: masalan, “mijozga xizmatni tushuntirish”, “asbob-uskunani ta‘riflash”, “xavfsizlik bo‘yicha ogohlantirish berish”, “oddiy hisobot yozish”.

2-bosqich. Maqsadni SMART formatida aniq qilish. Umumiy maqsad (masalan, “talabalar servis sohasida muloqot qila oladi”) o‘lchanadigan kichik maqsadlarga ajratiladi. SMARTda maqsad aniq (Specific), o‘lchanadigan (Measurable), erishiladigan (Achievable), dolzarb (Relevant) va vaqt bilan chegaralangan (Time-bound) bo‘lishi kerak. Masalan: “Dars oxirida talaba mijozga xizmat narxi va vaqtini 4–5 gapda tushuntira oladi.”

3-bosqich. O‘quv natijalarini (learning outcomes) yozish. Natija – talabaning bajaradigan harakati bilan ifodalanadi. “Biladi/tushunadi” kabi fe‘llar o‘rniga “aytib beradi, taqqoslaydi, tanlaydi, yozadi, so‘raydi, tushuntiradi, to‘ldiradi, xulosa qiladi” kabi kuzatiladigan fe‘llar ishlatiladi. Professional ta‘lim uchun natijalarni 3 yo‘nalishda muvozanatlash tavsiya etiladi: (a) til vositalari (leksika, grammatik

konstruktsiyalar); (b) ko‘nikma (speaking, listening, reading, writing); (c) kasbiy vazifa (workplace task).

Natijalarni yozishda qo‘shimcha mezon sifatida CEFR daraja tavsiflari va soddalashtirilgan kognitiv darajalar (masalan, eslab qolish – qo‘llash – moslashtirish)dan foydalanish foydali. Masalan, A2–B1 oralig‘ida “talaba mijoz savoliga 3–5 gap bilan javob beradi” natijasi realistik hisoblanadi; B1–B2 oralig‘ida esa “mijoz e‘tirozini eshitib, muqobil yechim taklif qiladi” kabi natija kiritilishi mumkin. Shu tariqa natija nafaqat “nima qilish”ni, balki “qaysi murakkablik darajasida” bajarilishini ham anglatadi.

4-bosqich. Baholashni oldindan loyihalash (backward design). Avval “qaysi dalil natijani isbotlaydi?” savoliga javob topiladi. Agar natija “mijozga xizmatni tushuntirish” bo‘lsa, baholash ham muloqot vazifasi bo‘lishi kerak (role-play, mini-dialog, audio javob). Faqat test bilan cheklanilsa, natija to‘liq o‘lchanmaydi. Baholash ikki turga ajratiladi: formatif (o‘qitish jarayonida rivojlantiruvchi) va summativ (yakuniy). Professional ta‘limda formatif baholash ulushi yuqori bo‘lishi samarali: tez-tez, kichik, aniq mezonli baholash.

5-bosqich. Baholash mezonlari va rubrika. Rubrika – topshiriq sifatini mezonlar bo‘yicha darajalarga ajratib baholash jadvalidir. Speaking topshirig‘ida minimal mezonlar: mazmunning to‘liqligi, mantiqiylik, leksik moslik, grammatik aniqlik, talaffuz/tushunarlik, muloqot odobi. Rubrika baholashni shaffof qiladi, talaba nimani yaxshilashini aniq ko‘radi.

6-bosqich. O‘qitish faoliyatlarini natijaga mos tanlash. Har bir faoliyat (warm-up, input, practice, production) natijaga xizmat qilishi kerak. Masalan, yakuniy baholash role-play bo‘lsa, dars ichida ham dialog qurish, tayyor iboralar bilan mashq qilish, real vaziyatlarda gapirishga tayyorlovchi “scaffold”lar bo‘lishi zarur.

7-bosqich. Resurs va vaqtni optimallashtirish. Professional ta‘lim muassasalarida dars soati cheklangan bo‘lishi mumkin. Shuning uchun 1 darsda 1–2 ta aniq natijaga erishish, qolganini keyingi darsga ulashgan modul sifatida rejalashtirish maqsadga muvofiq.

Natijalar

Modelning amaliy ko‘rinishini ko‘rsatish uchun “Servis va mijoz bilan muloqot” yo‘nalishidagi 4 haftalik mini-modul uchun namunaviy rejalashtirish taqdim etiladi. Modulning umumiy maqsadi: talabalar xizmat ko‘rsatish jarayonida oddiy inglizcha muloqot qilish va mijoz savollariga qisqa, tushunarli javob berish ko‘nikmasini shakllantirish.

Modul yakuniy (summativ) baholash vazifasi: 2 daqiqalik role-play (Talaba – xodim, o‘qituvchi/yoki juftlik – mijoz). Vaziyat: mijoz xizmat turi, narx, vaqt va kafolat haqida so‘raydi; xodim tushuntiradi va yakunda xushmuomalalik bilan yakunlaydi.

Quyidagi jadval “maqsad–natija–faoliyat–baholash” mosligini ko‘rsatadi.

O‘quv natijasi (dars/hafta)	Asosiy faoliyat (dars ichida)	Formatif baholash dalili	Mezon (qisqa)
Mijozga salomlashish va xizmat turini aniqlashtiruvchi 3–4 savol bera oladi.	Dialog shabloni + juftlikda savol-javob; “question cards”.	Exit-ticket: 4 savolni yozib/topshirish.	Savol grammatikasi, mos leksika
Xizmat narxi va vaqtini 4–5 gapda tushuntira oladi.	Model gaplar (chunks) bilan gap tuzish; mini-presentation.	1 daqiqalik audio javob (telefon).	Aniqlik, mantiqiy ketma-ketlik
Kafolat va shartlarni oddiy iboralar bilan izohlab bera oladi.	Reading: qisqa kafolat matni; keyin paraphrase.	Chek-list bilan juft baholash.	Mazmunni to‘g‘ri yetkazish
Mijoz e‘tiroziga muloyim javob bera oladi (apology + solution).	Role-play: “complaint handling” kartochokalari.	Teacher quick rating (2 mezon).	Odob, muammo yechimi
Role-playni yakunda xushmuomalalik bilan yopadi (closing).	Dialogni to‘liq yig‘ish; rehearsal.	Mini-performance (sinfdoshlar oldida).	To‘liqlik, fluency

Jadvaldan ko‘rinadiki, har bir haftalik natija uchun mos o‘qitish faoliyati tanlangan va u bilan bevosita bog‘langan formatif baholash dalili rejalashtirilgan. Bu yondashuv darsni “mavzu o‘tish”dan “ko‘nikma yaratish”ga yo‘naltiradi: talaba har hafta kichik natijaga erishadi, o‘qituvchi esa aniq dalil asosida feedback beradi.

Masalan, 80 daqiqalik bitta darsni ham shu zanjirda loyihalash mumkin: natija – “talaba mijozga narx va vaqtni 4–5 gapda tushuntiradi”. Darsning kirish qismida 5 daqiqalik warm-up (narx va vaqt so‘raladigan savollar), so‘ng 10 daqiqalik input

(tayyor iboralar: It costs..., It takes..., We can do it in...), 20 daqiqalik controlled practice (gaplarni to‘ldirish va juftlikda mini-dialog), 25 daqiqalik production (2 ta vaziyat kartochkasi bo‘yicha role-play), yakunda 5 daqiqalik exit-ticket (talaba o‘zi tanlagan xizmat bo‘yicha 4 gap yozadi) rejalashtiriladi. Bu tuzilma baholash dalilini dars ichiga “yashirib” qo‘yadi va o‘qituvchiga darhol teskari aloqa berish imkonini yaratadi.

Yakuniy baholash uchun rubrika namunasi quyidagicha tuziladi.

Mezon	4 (a‘lo)	3 (yaxshi)	2 (qoniqarli)	1 (past)
Mazmun (to‘liqlik)	Narx, vaqt, shart, yakun – hammasi bor.	1 element yetishmaydi.	2 element yetishmaydi.	Mazmun ancha to‘liq emas.
Leksika va iboralar	Kasbiy iboralar mos va xilma-xil.	Asosan mos, kam xilma-xil.	Oddiy so‘zlar, ba‘zi mos emas.	Ko‘p mos kelmaydi.
Grammatika va aniqlik	Xatolar juda kam, ma‘no buzilmaydi.	Ba‘zi xatolar bor, lekin tushunarli.	Xatolar ko‘p, ba‘zan ma‘no buziladi.	Xatolar sabab tushunish qiyin.
Tushunarlilik (talaffuz/tezlik)	Tushunarli, tezlik mos.	Asosan tushunarli.	Qiyinchiliklar bor.	Ko‘p joyi tushunarsiz.
Muloqot odobi	Salomlashish, muloyimlik, yakun to‘liq.	Kichik kamchilik bor.	Odobiy iboralar kam.	Noqulay/uslub noto‘g‘ri.

Rubrika talaba uchun “nima uchun bu baho qo‘yildi?” savolini bartaraf etadi, o‘qituvchi uchun esa subyektivlikni kamaytiradi. Eng muhimi, rubrika o‘quv natijalari bilan bir xil “til”da yoziladi: ya‘ni natijada talab qilinadigan komponentlar baholash mezonlariga aylanadi.

Muhokama

“Maqsad–natija–baholash” zanjiri professional ta‘lim sharoitida bir nechta metodik afzallik beradi.

Birinchi, darsning fokusini aniqlashtiradi. O‘qituvchi “bugun nima o‘tamiz?” degan savoldan ko‘ra “bugun talaba nimani qila olishi kerak?” degan savolga tayanadi. Bu o‘zgarish darsning har bir bosqichini (warm-up, input, practice, production) bir yo‘nalishga yig‘adi.

Ikkinchi, baholashning mazmuniy adolatliligini (validity) oshiradi. Agar natija kasbiy muloqot bo‘lsa, baholash ham kommunikativ bo‘lishi kerak. Testlar foydali,

lekin ular ko‘proq til vositalarini tekshiradi; kasbiy vazifani bajarish esa performance orqali baholanadi. Zanjirli rejalashtirish o‘qituvchini “baholash dalili” haqida oldindan o‘ylashga majbur qiladi.

Uchinchidan, formatif baholashni tizimlashtiradi. Professional ta’limda talabalar ko‘pincha tezkor, aniq va qo‘llab-quvvatlovchi feedbackga ehtiyoj sezadi. Exit-ticket, chek-list, juft baholash, 1 daqiqalik audio javob kabi vositalar ko‘p vaqt olmaydi, ammo o‘qituvchi uchun diagnostik ma’lumot beradi. Bu ma’lumot keyingi dars rejasini moslashtirishga xizmat qiladi.

To‘rtinchidan, differensial yondashuvni osonlashtiradi. Aralash darajali guruhda bitta natijaga turli darajadagi “dalil”lar qabul qilish mumkin: masalan, kuchli talaba 6–7 gap, o‘rta talaba 4–5 gap, boshlang‘ich talaba tayyor iboralar asosida 3–4 gap. Rubrikada esa mazmuniy komponentlar saqlanadi, faqat daraja talablari moslanadi.

Shu bilan birga, cheklovlar ham bor. Birinchisi, o‘qituvchidan dastlab ko‘proq vaqt va metodik intizom talab etiladi: natijani to‘g‘ri yozish, rubrika tuzish, dalillarni jamlash. Ikkinchisi, resurslar yetishmasligi (audio qurilma, internet) ba’zi performance topshiriqlarni cheklashi mumkin. Biroq model minimal resurs bilan ham ishlaydi: audio o‘rniga jonli role-play, internet o‘rniga oldindan tayyorlangan kartochkalar, rubrika o‘rniga chek-list qo‘llash mumkin.

Umuman olganda, “maqsad–natija–baholash” zanjiri professional ta’lim muassasalarida ingliz tili darslarini amaliy natijaga yo‘naltirish, shaffof baholash va barqaror rivojlanishni ta’minlash uchun metodik tayanch bo‘la oladi.

Xulosa

Maqolada professional ta’lim muassasalarida ingliz tili darsini rejalashtirishda “maqsad–natija–baholash” zanjiri asosida konstruktiv moslik va backward design yondashuvlarini qo‘llashning metodik asoslari yoritildi. Amaliy tavsiya sifatida: (1) ehtiyoj tahlili asosida til vazifalari ro‘yxatini tuzish; (2) maqsadni SMART formatida aniqlashtirish; (3) natijani kuzatiladigan fe‘llar bilan yozish; (4) natijaga mos performance baholashni oldindan belgilash; (5) rubrika/chek-list orqali shaffof mezon yaratish; (6) formatif baholash vositalari bilan jarayonni boshqarish taklif etildi. Keltirilgan 4 haftalik modul namunasi zanjirli rejalashtirish darsning mantiqiyligini kuchaytirishi, talabada aniq progress hissini yaratishi va baholashning adolatli bo‘lishiga xizmat qilishini ko‘rsatadi. Kelgusida mazkur yondashuvni turli yo‘nalishlar (IT, turizm, mexanika, tibbiyot) kesimida moslashtirilgan modul paketlari bilan boyitish va natijadorlikni empirik ko‘rsatkichlar (masalan, rubrika ballari dinamikasi, nutqiy chiqishlar soni, yozma ish xatolari kamayishi) asosida chuqurroq o‘rganish maqsadga muvofiq.

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ENVIRONMENTAL IMPACT OF THE TEXTILE INDUSTRY AND THEIR MITIGATION SOLUTIONS

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Abstract. This article analyzes the negative impact of the textile industry on the environment, including water and air pollution, soil degradation, and the problem of solid waste. It also presents proposals and solutions for establishing environmentally sustainable production.

The textile industry constitutes a pivotal segment of the global economic landscape. Driven by the burgeoning consumer demand for clothing, manufacturing outputs exhibit a consistent year-on-year growth. Notably, the 'fast fashion' paradigm has expedited the product lifecycle, significantly escalating environmental strain. As a result, this sector has emerged as a primary contributor to global environmental concerns [1].

Globally, significant importance is being attached to the comprehensive utilization and rational management of natural raw materials, particularly fibers and various types of waste. In developed nations, the collection and recycling of textile waste are dictated by the steadily expanding demand for textile fibers and the raw materials required for their production. According to analytical forecasts, the production volumes of cotton, wool, artificial, and synthetic fibers are expected to grow further in the future. In the cotton fabric manufacturing industry, more than 20 types of production waste have been identified [2].

In recent years, textile enterprises have introduced a diverse array of sustainably manufactured and recycled fabrics, fibers, yarns, and dyes. Ensuring sustainability in textile fabrics and prioritizing fibers derived from organic agriculture has gained paramount importance. Fabrics produced from organic cotton, wool, hemp, flax, or silk constitute the foundation of eco-friendly textile products. These ecological textiles are manufactured in accordance with strict standards and are certified from both environmental and social responsibility perspectives. Such standards guarantee that the

raw materials used for fabrics or yarns are genuinely organic and ensure compliance with rigorous eco-friendly production protocols throughout the entire manufacturing chain. Certification is only granted if standards are upheld at every stage of the value chain. Within the textile industry, the most significant environmental challenges remain excessive water consumption and water pollution. The cotton cultivation process requires intensive irrigation; on average, the production of a single cotton T-shirt consumes between 2,500 and 3,000 liters of water [3].

Various chemical substances are utilized in the processes of fabric dyeing and bleaching. If bleaching agents, synthetic dyes, and heavy metal residues are discharged into water bodies without adequate treatment, they degrade the quality of drinking water and severely damage aquatic ecosystems. Furthermore, energy consumption in textile manufacturing remains excessively high. Many factories still employ coal or petroleum products as primary fuel sources, leading to the emission of carbon dioxide (CO₂) and other hazardous gases. The production process of synthetic fibers, particularly polyester, is directly linked to the petrochemical industry, further contributing to the increase in greenhouse gas emissions [4].

The cultivation of cotton involves the extensive application of pesticides and mineral fertilizers. This practice diminishes soil fertility, reduces beneficial microorganisms, and severely compromises biological diversity. Furthermore, prolonged chemical exposure leads to progressive soil degradation. Solid waste and the microplastic crisis: due to the 'fast fashion' phenomenon, apparel is utilized for a short duration before being discarded as waste. Synthetic fabrics do not decompose in natural environments for hundreds of years. Furthermore, microplastic fibers shed during the laundering process enter water bodies, exerting a detrimental impact on marine life.

Solutions to the problem:

Organic raw cotton production reduces the use of pesticides and chemical fertilizers. Furthermore, the use of natural fibers such as bamboo and flax reduces environmental risks.

Water-saving technologies: The implementation of closed water circulation systems in modern production significantly reduces water consumption. Water treatment technologies must be applied during the bleaching and dyeing processes.

Recycling system - The recycling of clothing and its use as secondary raw materials reduces the amount of waste. Using recycled fibers reduces the pressure on natural resources.

Energy efficiency - The use of renewable energy sources such as solar and wind in enterprises reduces greenhouse gas emissions.

Conscious consumer culture: It is important to develop a culture of choosing high-quality and durable clothing among the population. Buying less and using existing clothing for longer reduces environmental pressure.

Conclusion: The textile industry is economically important, but its environmental impact poses serious problems. Water pollution, atmospheric gases, soil degradation, and waste management are pressing issues. These problems can be reduced through the introduction of modern technologies, the use of environmentally friendly raw materials, and the formation of a culture of conscious consumption. Production based on sustainable development principles serves to create a healthy environment for future generations.

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QISHLOQ XO‘JALIGIDA SUVDAN FOYDALANISH USULLARINI TAKOMILLASHTIRISHNING ILMIY-METODOLOGIK ASOSLARI

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Annotatsiya: Maqola qishloq xo‘jaligi tarmoqlarida suv resurslaridan foydalanish samaradorligini oshirish masalasi va ilmiy-metodologik yondashuv asosida tadqiq etilgan. Suv tanqisligi kuchayib borayotgan sharoitda sug‘orish tizimlarining amaldagi holati tanqidiy tahlil qilinib, suvdan foydalanish samaradorligini cheklovchi omillar aniqlangan. Tadqiqot doirasida suv tejoychi sug‘orish texnologiyalarining iqtisodiy, ekologik va texnologik afzalliklari asoslab berilgan. Muallif tomonidan qishloq xo‘jaligida suvdan foydalanishni takomillashtirishga yo‘naltirilgan ustuvor ilmiy-amaliy yo‘nalishlar taklif etilgan.

Аннотация: В статье исследуется вопрос повышения эффективности использования водных ресурсов в сельскохозяйственных отраслях на основе научно-методологического подхода. В условиях усиливающегося дефицита воды критически проанализировано текущее состояние оросительных систем и выявлены факторы, ограничивающие эффективность водопользования. В рамках исследования обоснованы экономические, экологические и технологические преимущества водосберегающих технологий орошения. Автором предложены приоритетные научно-практические направления, направленные на совершенствование водопользования в сельском хозяйстве.

Abstract: The article examines the issue of increasing the efficiency of water resource use in agricultural sectors based on a scientific and methodological approach. In the context of increasing water scarcity, a critical analysis of the current state of irrigation systems was carried out, and factors limiting the efficiency of water use were identified. Within the framework of the study, the economic, ecological, and technological advantages of water-saving irrigation technologies are substantiated. The author proposes priority scientific and practical directions aimed at improving water use in agriculture.

Kalit so‘zlar: suv resurslari, sug‘orish samaradorligi, suv tanqisligi, tomchilatib sug‘orish, innovatsion texnologiyalar, meliorativ holat.

Ключевые слова: водные ресурсы, эффективность орошения, дефицит воды, капельное орошение, инновационные технологии, мелиоративное состояние.

Keywords: water resources, irrigation efficiency, water scarcity, drip irrigation, innovative technologies, melioration status.

Kirish: Bugungi kunda dunyo miqyosida suv resurslarining cheklanganligi qishloq xo‘jaligi rivojiga jiddiy ta‘sir ko‘rsatmoqda. Aholi sonining ortishi, iqlim o‘zgarishi va suvga bo‘lgan talabning oshishi suvdan oqilona foydalanishni taqozo etmoqda. Ayniqsa, qishloq xo‘jaligi suv resurslarining asosiy iste‘molchisi bo‘lib, umumiy suv sarfining katta qismi aynan ushbu sohaga to‘g‘ri keladi. Shu sababli qishloq xo‘jaligida suvdan foydalanish usullarini takomillashtirish dolzarb ilmiy-amaliy masala hisoblanadi.

So‘nggi yillarda global miqyosda suv resurslarining kamayib borishi qishloq xo‘jaligi tarmoqlarida jiddiy muammolar yuzaga kelishiga sabab bo‘lmoqda. Iqlim o‘zgarishi, aholining tez sur‘atlarda ko‘payishi hamda suvga bo‘lgan talabning ortishi suvdan foydalanish masalasini strategik ahamiyatga ega bo‘lgan muammo sifatida maydonga chiqarmoqda. Qishloq xo‘jaligi suv resurslarining asosiy iste‘molchisi bo‘lib, ayrim hududlarda umumiy suv sarfining 80–90 foizi ushbu sohaga to‘g‘ri keladi.

O‘zbekiston sharoitida sug‘orma dehqonchilik ustuvor ahamiyatga ega bo‘lib, suv resurslaridan oqilona foydalanish mamlakat oziq-ovqat xavfsizligini ta‘minlashda muhim omil hisoblanadi. Shu boisdan qishloq xo‘jaligida suvdan samarali foydalanish usullarini takomillashtirish, suv tejovchi texnologiyalarni keng joriy etish va sug‘orish tizimlarini ilmiy asosda boshqarish dolzarb ilmiy-amaliy vazifa biri hisoblanadi.

Global miqyosda suv resurslarining cheklanganligi va ularning hududlar bo‘yicha notekis taqsimlanishi qishloq xo‘jaligi ishlab chiqarishining barqaror rivojlanishiga jiddiy tahdid solmoqda. Iqlim o‘zgarishi jarayonlarining jadallashuvi, sug‘oriladigan yerlar maydonining kengayishi hamda suv iste‘molining ortishi mavjud suv resurslaridan foydalanishga bo‘lgan yondashuvlarni tubdan qayta ko‘rib chiqishni talab etmoqda.

Qishloq xo‘jaligi suv resurslarining eng yirik iste‘molchisi bo‘lib, suvdan foydalanish samaradorligining pastligi ishlab chiqarish tannarxining oshishi, meliorativ holatning yomonlashuvi va hosildorlikning pasayishiga olib kelmoqda. Shu nuqtai nazardan, qishloq xo‘jaligida suvdan foydalanish usullarini takomillashtirish masalasi nafaqat amaliy, balki chuqur ilmiy tadqiqotlarni talab etuvchi dolzarb muammo sifatida namoyon bo‘lmoqda.

Asosiy qism: Qishloq xo‘jaligida suvdan foydalanishning hozirgi holati,

Amaldagi sug‘orish tizimlarining katta qismi an‘anaviy usullarga asoslangan bo‘lib, suv resurslaridan foydalanish samaradorligi pastligicha qolmoqda. Bostirib sug‘orish

usulida suvning sezilarli qismi bug‘lanish, yerga sizib ketish va noto‘g‘ri taqsimlanish natijasida yo‘qotiladi. Natijada sug‘oriladigan yerlarning meliorativ holati yomonlashadi, tuproq sho‘r lanishi kuchayadi va hosildorlik pasayadi.

Bundan tashqari, sug‘orish infratuzilmasining eskirganligi, suv hisobining yetarli darajada yuritilmasligi va suvdan foydalanish madaniyatining pastligi mavjud muammolarni yanada chuqurlashtirmoqda.

Suv tejoychi sug‘orish texnologiyalarining ahamiyati: So‘nggi yillarda suv tejoychi texnologiyalarni joriy etish qishloq xo‘jaligida muhim ahamiyat kasb etmoqda. Jumladan, tomchilatib sug‘orish usuli suvni bevosita o‘simlik ildiziga yetkazib berish imkonini yaratadi. Bu usul orqali suv sarfi 30–50 foizgacha qisqaradi, hosildorlik esa sezilarli darajada oshadi. Yomg‘irlatib sug‘orish usuli ham suvdan samarali foydalanishga xizmat qilib, tuproq strukturasi saqlab qolishga yordam beradi.

Bundan tashqari, sug‘orish infratuzilmasining eskirganligi, suv hisobining yetarli darajada yuritilmasligi va suvdan foydalanish madaniyatining pastligi mavjud muammolarni yanada chuqurlashtirmoqda.

Suv tejoychi sug‘orish texnologiyalarining ilmiy asoslari: Suv tejoychi texnologiyalar qishloq xo‘jaligida suv resurslaridan foydalanish samaradorligini oshirishning eng muhim yo‘nalishlaridan biridir. Tomchilatib sug‘orish texnologiyasi suvni to‘g‘ridan-to‘g‘ri o‘simlik ildiz zonasiga yetkazib berish imkonini yaratadi. Ilmiy tadqiqotlar natijalariga ko‘ra, ushbu usul suv sarfini 40–50 foizgacha kamaytirish bilan birga hosildorlikni 20–30 foizga oshirish imkonini beradi.

Yomg‘irlatib sug‘orish texnologiyasi ham suvdan foydalanish samaradorligini oshiradi, tuproqning fizik xususiyatlarini saqlaydi va suvning bir tekis taqsimlanishini ta‘minlaydi. Ushbu usullarni qo‘llash ekologik barqarorlikni ta‘minlashda ham muhim ahamiyatga ega.

Qishloq xo‘jaligida suvdan foydalanish samaradorligini cheklovchi omillar: Tahlillar shuni ko‘rsatadiki, sug‘orish tizimlarida suvdan foydalanish samaradorligining pastligi bir qator tizimli muammolar bilan bog‘liq. Jumladan, an‘anaviy sug‘orish usullarining ustunligi suv yo‘qotilishining yuqori darajada bo‘lishiga sabab bo‘lmoqda. Sug‘orish jarayonida suvning sezilarli qismi bug‘lanish va filtratsiya orqali yo‘qotilmoqda, bu esa ekinlarning biologik ehtiyojlariga mos kelmaydigan suv sarfiga olib keladi.

Bundan tashqari, sug‘orish infratuzilmasining texnik jihatdan eskirgani, suv hisobining yetarli darajada yo‘lga qo‘yilmagani hamda suvdan foydalanish jarayonida ilmiy asoslangan me‘yorlarning to‘liq joriy etilmagani muammoni yanada chuqurlashtirmoqda.

Suv tejavchi sug‘orish texnologiyalarining ilmiy tahlili: Zamonaviy ilmiy tadqiqotlar suv tejavchi sug‘orish texnologiyalarini joriy etish qishloq xo‘jaligida suvdan foydalanish samaradorligini oshirishning eng maqbul yo‘li ekanligini ko‘rsatmoqda. Xususan, tomchilatib sug‘orish texnologiyasi suvni o‘simlik ildiz zonasiga aniq dozada yetkazib berish imkonini yaratib, suv sarfini sezilarli darajada kamaytiradi.

Mazkur texnologiyaning afzalligi shundaki, u nafaqat suv resurslarini tejaydi, balki o‘simliklarning oziqlanish jarayonini optimallashtiradi, tuproq sho‘rlanishining oldini oladi hamda hosildorlikning barqaror o‘shishini ta‘minlaydi. Yomg‘irilatib sug‘orish texnologiyasi esa suvning maydon bo‘ylab bir tekis taqsimlanishini ta‘minlab, agrotexnik tadbirlarning samaradorligini oshiradi.

Suvdan foydalanishni takomillashtirish yo‘llari: Qishloq xo‘jaligida suvdan foydalanish samaradorligini oshirish uchun quyidagi choralar muhim hisoblanadi:

- sug‘orish tizimlarini modernizatsiya qilish;
- suv hisobini yuritish va monitoring tizimlarini joriy etish;
- suv tejavchi texnologiyalarni keng tatbiq etish;
- fermer va dehqonlarning suvdan foydalanish bo‘yicha bilim va ko‘nikmalarini oshirish;
- ilmiy asoslangan sug‘orish me‘yorlarini ishlab chiqish.

Tadqiqot metodologiyasi: Tadqiqot jarayonida tizimli tahlil, mantiqiy umumlashtirish, qiyosiy tahlil hamda ilmiy abstraksiyalash usullaridan foydalanildi. Shuningdek, milliy va xorijiy ilmiy manbalar, normativ-huquqiy hujjatlar hamda soha mutaxassislarining ilmiy qarashlari asosida muammo kompleks tarzda yoritildi.

Mazkur mavzuning ilmiy yangiligi quyidagilardan iborat:

1. Qishloq xo‘jaligida suvdan foydalanish samaradorligini baholashga **tizimli ilmiy yondashuv** ishlab chiqildi, bunda sug‘orish texnologiyalari, suv yo‘qotilish omillari va meliorativ holat o‘zaro bog‘liq holda tahlil qilindi.

2. Suv tanqisligi sharoitida sug‘orish jarayonini tashkil etishga ta‘sir etuvchi **asosiy cheklovchi omillar** (texnik, agrotexnik va tashkiliy) ilmiy jihatdan guruhlanib, ularning suv sarfiga ta‘sir mexanizmi asoslab berildi.

3. Tomchilatib va yomg‘irilatib sug‘orish texnologiyalarining **suv tejash samaradorligi va hosildorlikka ta‘siri** qiyosiy tahlil qilinib, ularning qo‘llanish sharoitlari ilmiy asosda aniqlashtirildi.

4. Qishloq xo‘jaligida suvdan foydalanishni takomillashtirishga yo‘naltirilgan **ustuvor ilmiy-amaliy yo‘nalishlar majmuasi** shakllantirildi va ularning barqaror rivojlanishga ta‘siri konseptual jihatdan asoslandi.

5. Sug'orish jarayonini takomillashtirishda **innovatsion va raqamli yondashuvlardan foydalanish zarurati** ilmiy jihatdan asoslanib, suv resurslarini boshqarishda ularning samaradorlikka ta'siri ko'rsatib berildi.

Mavzu natijalarining amaliy ahamiyati quyidagilarda namoyon bo'ladi:

1. Ishlab chiqilgan ilmiy xulosalar va tavsiyalar qishloq xo'jaligi korxonalari, fermer va dehqon xo'jaliklarida **sug'orish jarayonlarini takomillashtirishda** amaliy qo'llanilishi mumkin.

2. Tadqiqotda asoslab berilgan suv tejoychi sug'orish texnologiyalaridan foydalanish bo'yicha tavsiyalar **suv sarfini kamaytirish va hosildorlikni oshirishga** xizmat qiladi.

3. Tadqiqot natijalari suv xo'jaligi tashkilotlari tomonidan **suv resurslarini boshqarish va rejalashtirish** jarayonida metodik asos sifatida foydalanilishi mumkin.

4. Olingan ilmiy xulosalar qishloq xo'jaligi yo'nalishidagi oliy ta'lim muassasalarida **o'quv fanlari va maxsus kurslar** mazmunini boyitishda qo'llanilishi mumkin.

5. Tadqiqot natijalari qishloq xo'jaligida suvdan foydalanish bo'yicha **davlat va hududiy dasturlarni ishlab chiqishda** ilmiy asos sifatida xizmat qiladi.

Xulosa: O'tkazilgan tadqiqot natijalari shuni ko'rsatadiki, qishloq xo'jaligida suvdan foydalanish usullarini takomillashtirish suv tanqisligi sharoitida strategik ahamiyatga ega bo'lgan vazifadir. Suv tejoychi texnologiyalarni joriy etish, sug'orish jarayonlarini ilmiy asosda boshqarish va innovatsion yondashuvlardan foydalanish orqali suv resurslaridan oqilona foydalanish imkoniyati yaratiladi. Tadqiqot natijalari PhD darajasidagi ilmiy izlanishlar uchun nazariy va amaliy asos bo'lib xizmat qiladi.

Xulosa qilib aytganda, qishloq xo'jaligida suvdan foydalanish usullarini takomillashtirish suv resurslarini tejash, ekinlar hosildorligini oshirish va ekologik barqarorlikni ta'minlashda muhim ahamiyatga ega. Zamonaviy sug'orish texnologiyalarini joriy etish va suvdan oqilona foydalanish orqali qishloq xo'jaligi ishlab chiqarishining samaradorligini oshirish mumkin. Ushbu yo'nalishda olib boriladigan ilmiy tadqiqotlar va amaliy chora-tadbirlar kelajakda suv tanqisligi muammosini yumshatishga xizmat qiladi.

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Ekspertiza xulosasining isbotlash vositasi sifatidagi o‘rni va ahamiyati

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Annotatsiya. Mazkur tezisdagi jinoyat protsessual qonunchiligi doirasida ekspertiza xulosasining isbotlash vositasi sifatidagi o‘rni va ahamiyati har tomonlama tahlil etiladi. Unda ekspert xulosasining huquqiy tabiati, uni tayinlash va o‘tkazish tartibi, dalillar tizimidagi o‘rni hamda boshqa isbotlash vositalari bilan o‘zaro bog‘liqligi yoritilgan. Shuningdek, ekspert xulosasining ishonchliligi, obyektivligi, ilmiy asoslanganligi va protsessual talablarga muvofiqligi uni baholashning asosiy mezonlari sifatida ko‘rib chiqiladi.

Tezisdagi ekspertiza xulosasining jinoyat ishlarini hal etishda, ayniqsa maxsus bilimlarni talab qiluvchi holatlarni aniqlashda hal qiluvchi ahamiyat kasb etishi asoslab beriladi. Uning ayblov va oqlov dalili sifatidagi xususiyatlari, sudning ichki ishonchini shakllantirishdagi roli hamda adolatli qaror qabul qilishdagi o‘rni ochib berilgan. Shuningdek, amaldagi jinoyat-protsessual qonunchilik normalari, sud amaliyoti va ilmiy qarashlar asosida ekspertiza institutining rivojlanish tendensiyalari va dolzarb muammolari tahlil qilinadi.

Natijada, ekspertiza xulosasi jinoyat protsessida haqiqatni aniqlash, dalillarni mustahkamlash va sud qarorlarining qonuniyligi hamda asoslanganligini ta’minlashda muhim isbotlash vositasi ekanligi xulosa qilinadi.

Kalit so‘zlar. Ekspertiza xulosasi, isbotlash vositalari, jinoyat protsessi, jinoyat-protsessual qonunchilik, dalillar tizimi, ekspert, sud ekspertizasi, maxsus bilimlar, dalillarning maqbulligi, ishonchlilik, obyektivlik, ilmiy asoslanganlik, protsessual tartib, ekspertiza tayinlash, qo‘shimcha ekspertiza, qayta ekspertiza, ayblov dalillari, oqlov dalillari, sudning ichki ishonchi, dalillarni baholash, sud amaliyoti, tergov jarayoni, sud-tibbiy ekspertiza, kriminalistika, DNK tahlili, sud psixologiyasi, iqtisodiy ekspertiza, raqamli kriminalistika, sabab-oqibat bog‘lanishi, jinoyat tarkibi, dalillar yetarliligi, sud qarorining asoslanganligi, ekspertning vakolati, protsess ishtirokchilari huquqlari.

Роль и значение заключения эксперта как средства доказывания

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Аннотация. В настоящих тезисах всесторонне анализируются роль и значение заключения эксперта как средства доказывания в рамках уголовно-процессуального законодательства. Освещаются правовая природа экспертного заключения, порядок его назначения и проведения, его место в системе доказательств, а также взаимосвязь с другими средствами доказывания. Рассматриваются критерии оценки экспертного заключения, такие как достоверность, объективность, научная обоснованность и соответствие процессуальным требованиям.

В тезисах обосновывается, что заключение эксперта имеет решающее значение при разрешении уголовных дел, особенно при установлении обстоятельств, требующих специальных знаний. Раскрываются его особенности как обвинительного и оправдательного доказательства, роль в формировании внутреннего убеждения суда и значение при вынесении справедливого решения. Также анализируются тенденции развития института судебной экспертизы и актуальные проблемы на основе действующего уголовно-процессуального законодательства, судебной практики и научных подходов.

В результате делается вывод о том, что заключение эксперта является важным средством доказывания, способствующим установлению истины, укреплению доказательной базы и обеспечению законности и обоснованности судебных решений в уголовном процессе.

Ключевые слова: заключение эксперта, средства доказывания, уголовный процесс, уголовно-процессуальное законодательство, система доказательств, эксперт, судебная экспертиза, специальные знания, допустимость доказательств, достоверность, объективность, научная обоснованность, процессуальный порядок, назначение экспертизы, дополнительная экспертиза, повторная экспертиза, обвинительные доказательства, оправдательные доказательства, внутреннее убеждение суда, оценка доказательств, судебная практика, следственный процесс, судебно-медицинская экспертиза, криминалистика, ДНК-анализ, судебная психология, экономическая экспертиза, цифровая криминалистика, причинно-следственная связь, состав преступления,

достаточность доказательств, обоснованность судебного решения, полномочия эксперта, права участников процесса.

The Role and Significance of Expert Opinion as a Means of Proof

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Abstract. This thesis provides a comprehensive analysis of the role and significance of expert opinion as a means of proof within the framework of criminal procedural legislation. It examines the legal nature of expert opinion, the procedure for its appointment and conduct, its place in the system of evidence, and its interrelation with other means of proof. Particular attention is given to the criteria for evaluating expert opinion, including reliability, objectivity, scientific validity, and compliance with procedural requirements.

The thesis substantiates that expert opinion plays a decisive role in resolving criminal cases, especially in establishing circumstances that require specialized knowledge. Its features as both incriminating and exculpatory evidence, its role in shaping the internal conviction of the court, and its importance in ensuring fair judgments are highlighted. In addition, the study analyzes the development trends and current issues of the forensic examination institution based on existing criminal procedural legislation, judicial practice, and scholarly approaches.

As a result, it is concluded that expert opinion is an essential means of proof in criminal proceedings, contributing to the establishment of truth, strengthening the evidentiary basis, and ensuring the legality and validity of judicial decisions.

Keywords: expert opinion, means of proof, criminal procedure, criminal procedural law, system of evidence, expert, forensic examination, specialized knowledge, admissibility of evidence, reliability, objectivity, scientific validity, procedural procedure, appointment of expertise, additional expertise, repeated expertise, incriminating evidence, exculpatory evidence, internal conviction of the court, evaluation of evidence, judicial practice, investigation process, forensic medical examination, criminalistics, DNA analysis, forensic psychology, economic expertise, digital forensics, causal relationship, corpus delicti, sufficiency of evidence, validity of judicial decisions, powers of the expert, rights of participants in proceedings.

Introduction.

Hozirgi kunda jinoyat protsessual qonunchiligini takomillashtirish, isbotlash jarayonining samaradorligini oshirish hamda sud qarorlarining qonuniyligi va asoslanganligini ta'minlash dolzarb masalalardan biri hisoblanadi. Mazkur jarayonda dalillar tizimi markaziy o'rin egallab, ular orasida ekspertiza xulosasi alohida ahamiyat kasb etadi. Chunki jinoyat ishlarini ko'rib chiqishda ko'plab holatlar maxsus bilimlarni talab qiladi va bunday vaziyatlarda sud, tergovchi hamda prokurorlar ekspert xulosasiga tayanishga majbur bo'ladi.

Ekspertiza xulosasi jinoyat protsessida nafaqat oddiy dalil, balki ilmiy asoslangan, obyektiv va maxsus bilimlarga tayanilgan isbotlash vositasi sifatida namoyon bo'ladi. U orqali murakkab faktlar, sabab-oqibat bog'lanishlari, shuningdek jinoyat tarkibining muhim elementlari aniqlanadi. Ayniqsa, sud-tibbiy, kriminalistik, iqtisodiy va raqamli ekspertizalar orqali jinoyat ishlarining mohiyatini chuqur anglash va to'g'ri baholash imkoniyati yaratiladi.

Amaldagi jinoyat-protsessual qonunchilikda ekspert xulosasi mustaqil isbotlash vositasi sifatida e'tirof etilgan bo'lib, u dalillar tizimining ajralmas qismi hisoblanadi. Shu bilan birga, ekspert xulosasining ishonchliligi, obyektivligi, ilmiy asoslanganligi va protsessual talablarga muvofiqligi uni baholashda muhim mezonlar sifatida namoyon bo'ladi. Sud amaliyotida ko'plab ishlar aynan ekspert xulosasi asosida hal etilishi esa uning amaliy ahamiyati naqadar yuqori ekanligini ko'rsatadi.

Shu nuqtai nazardan, ekspertiza xulosasining isbotlash vositasi sifatidagi o'rni va ahamiyatini ilmiy jihatdan tahlil qilish, uning nazariy asoslari va amaliy qo'llanishini o'rganish muhim ilmiy-amaliy ahamiyat kasb etadi. Mazkur tezisning maqsadi ham ekspert xulosasining jinoyat protsessidagi o'rni, uning dalillar tizimidagi ahamiyati, baholash mezonlari hamda amaliy muammolarini kompleks tahlil qilishdan iboratdir.

Main body.

To explain the role and significance of an expert opinion as a means of proof, it is appropriate to briefly focus on two aspects. First, what is an "expert opinion" and what does it contain? Second, what is meant by a "means of proof"?

Firstly, an expert opinion is the conclusion of a specialist who possesses in-depth knowledge in a particular field. It is based on evidence, analysis of the situation, and scientific methods. The main characteristics of an expert opinion are:

- Competence – the specialist must possess professional knowledge and relevant experience.
- Objectivity – the opinion should be based not on personal views, but on established facts.

- Reasonableness – each hypothesis must be supported by evidence.
- Reliability – the expert must consider all available information and analyze it within the context of the issue.

When discussing the expert opinion, it is also appropriate to consider the views and opinions of a number of scholars. In particular, as Yu. K. Orlov emphasizes, “although an expert opinion does not possess any superior evidentiary force compared to other types of evidence, it has a very important distinctive feature. This is because it represents a conclusion drawn by an expert as a result of research conducted through the application of specialized knowledge.”¹

E. A. Zaytseva, in turn, states that: “the appointment and conduct of a forensic examination constitute an investigative action that also encompasses the activities of the expert and represents a complex and multifaceted practice. This process includes the procedural methods of the investigator and other persons involved in obtaining new evidence — the expert opinion.”²

According to S. A. Sheyfer, it is precisely the investigator who determines the subject, scope, and objects of the forthcoming expert examination, oversees its scientific validity, completeness, and objectivity, and ensures the lawful interests of the suspect, the accused, and other participants in pre-trial proceedings, among other responsibilities.³

According to S. B. Rossinskiy, the key difference between an expert and an investigator lies in the fact that an expert is a local (i.e., limited and episodic) participant in pre-trial proceedings. The expert is engaged solely to perform a one-time task—establishing specific circumstances through the use of specialized knowledge and forming a single piece of evidence. After completing the research and submitting the prepared conclusion, that is, after fulfilling their public-law obligations before the pre-trial investigative authorities, the expert is generally removed from further participation in the criminal case.⁴

An expert opinion is a written document предусмотрен by law, in which the expert reflects the research conducted and the conclusions reached in response to the questions posed by the authority or person who appointed the examination.

¹ Orlov, Y.K. *Expert's Conclusion and Its Evaluation in Criminal Cases: Textbook*. Moscow, 1995, 40 pp.

² Zaytseva, E.A. *The Concept of the Development of the Forensic Examination Institution in the Context of Adversarial Criminal Proceedings*. Moscow, 2010, 102 pp.

Shafer, S.A. “The System of Investigative Actions: What Are the Ways of Its Development?” *Laws of Russia: Experience, Analysis, Practice*, no. 2 (2015).

⁴ Rossinsky, S.B. “Forensic Expertise as a Special Method of Proving in Predictive Proceedings in Criminal Cases.” *Siberian Law Herald*, no. 4 (91), 2020. <https://doi.org/10.26516/2071-8136.2020.4.100>.

Secondly, according to widely accepted views in legal literature, means of proof include persons who possess evidentiary information, objects bearing traces of a crime, and documents containing information relevant to the case.⁵ This approach appears to be incorrect. Individuals do not create information; rather, they serve as its carriers. Depending on the specific circumstances, persons possessing information may participate as witnesses, victims, specialists, experts, suspects, or defendants. Various procedural rules also establish different procedures for conducting investigative actions aimed at obtaining evidence (such as interrogations), which include the relevant testimonies provided by the person being questioned.⁶

Thus, it can be concluded that evidentiary materials related to a criminal act, which assist in solving the crime, constitute means of proof. In this regard, an expert opinion, despite its advisory nature, is also considered a means of proof, as it may serve either to establish the innocence of a suspect or to substantiate their guilt.

The role and significance of an expert opinion as a means of proof constitute one of the most complex, theoretically rich, and practically significant institutions of the modern legal system. This is because the process of expert examination itself enables courts, investigators, prosecutors, and all parties involved in criminal and civil proceedings to understand and evaluate facts that can only be clarified through scientific, technical, medical, economic, or other specialized knowledge beyond their ordinary competence. Moreover, an expert opinion is considered one of the most stable and reliable elements of the evidentiary process grounded in scientific methodology. Compared to other means of proof—such as witness testimony, documents, material evidence, photo and video materials, explanations of the parties, and other sources of information—it stands out due to its objectivity, independence, and scientific substantiation. Precisely for these reasons, expert opinions play a decisive role in many complex cases, particularly in fields such as criminalistics, forensic medicine, forensic psychology, economic crimes, financial audits, technical examinations, DNA analysis, forensic ballistics, traffic accident reconstruction, labor disputes, construction expertise, and many other areas.

It is widely acknowledged that in many situations, courts cannot arrive at the truth without an expert opinion. Therefore, the institution of expertise occupies a firm place both in legislation and judicial practice as an integral part of the system of means of proof. An expert opinion serves not only as a document confirming or refuting a fact, but also as an analytical source that guides the court on a scientific basis, logically

⁵ Fiskevich, S.V. "Assessment of the Relevance of Evidence in Court Proceedings with Jury Participation." *Theory and Practice of Social Development*, no. 1 (2011): 11–18.

⁶ Stepenko, V.E., & Kosmynin, E.S. "Scholarly Notes of TOGU." *TOGU Scholarly Notes*, vol. 6, no. 4 (2015).

connects disputed circumstances, reconstructs cause-and-effect relationships, and deeply examines evidence to reach conclusions grounded in scientific criteria.

Unlike other types of evidence, an expert opinion requires specialized knowledge that the court itself does not possess. Judges are generally not capable of independently evaluating technical processes, biological reactions, the reliability of DNA results, the extent of construction violations, the accuracy of financial calculations, or the outcomes of psychological diagnostics. For this reason, the role of expert examination is exceptionally important. In forming conclusions, experts rely on scientific methods, experimental analyses, laboratory testing, computer modeling, diagnostic techniques, statistical analysis, analytical algorithms, ballistic testing, forensic chemical examinations, medical criteria, engineering calculations, and other scientifically grounded tools. This significantly enhances the overall quality of the evidentiary process.

In the modern era of rapid technological development, expert opinions are becoming increasingly accurate, reliable, and comprehensive. The use of advanced laboratories, digital forensics, high-precision image analysis, 3D reconstruction, genetic testing, psychometrics, computer simulations, and artificial intelligence has greatly expanded the scientific potential of expert examinations.

All these factors demonstrate that the expert opinion has evolved from merely an auxiliary tool into a highly significant scientific and legal form of evidence. Its importance in judicial practice is so substantial that many criminal cases involve issues that cannot be resolved without it—for example, determining the cause of death, identifying the nature of injuries, detecting forged signatures, reconstructing the mechanism of traffic accidents, calculating the amount of financial theft, assessing construction defects, determining economic damage, establishing whether a child has been subjected to psychological abuse, or evaluating the severity of health damage in labor disputes.

According to Article 81 of the Criminal Procedure Code, any factual data that serve as a basis for establishing whether a socially dangerous act has occurred, whether a person is guilty or not, and other circumstances relevant to the proper resolution of the case are considered evidence. Such data are established through witness statements, victim statements, statements of suspects, accused and defendants, expert opinions, material evidence, audio and video recordings, film and photographic materials, records of investigative and judicial actions, and other documents.

Furthermore, paragraph 3 of the Resolution of the Plenum of the Supreme Court of the Republic of Uzbekistan dated August 24, 2018, “On Certain Issues of Applying the Norms of Criminal Procedure Law on the Admissibility of Evidence,” clarifies that

evidence obtained from testimonies that are not confirmed by the totality of evidence in court is considered inadmissible. At the same time, the Constitution of the Republic of Uzbekistan establishes that all doubts concerning guilt, if they cannot be eliminated, must be resolved in favor of the suspect, accused, defendant, or convicted person. This principle is also закрепед in Article 23(3) of the Criminal Procedure Code, while Article 464(1)(1) provides that an acquittal must be issued if the criminal event has not occurred.

This shows that a fair decision (judgment) in a case can be ensured only when there is sufficient and well-founded evidence. In criminal proceedings, the process of proof serves as the basis for establishing whether a person is not connected to the consequences that have occurred or, conversely, is guilty of them.

If we look at the history of the legal regulation of formalizing expert opinions as a means of proof in the Criminal Procedure Code, it can be noted that in the first Criminal Procedure Code of Uzbekistan, adopted in 1926 as part of the former Soviet Union, the chapters entitled “On Evidence” and “On Protocols” already included the use of expert opinions and other types of evidence in court proceedings.

Furthermore, compared to the 1929 Code, the Criminal Procedure Code of 1959 paid greater attention to issues related to the collection and formalization of evidence. It specifically addressed expert opinions, the circumstances to be proven, types of evidence, procedures for their collection and evaluation, as well as material evidence, including the порядок их хранения, time limits, and other related aspects.⁷

In cases involving human death, as well as cases where a person has suffered physical harm without resulting in death, an expert opinion serves as the basis for:

- Establishing that a person’s actions or inactions did not cause the death or health impairment of another, or that the person is not responsible for such consequences, thereby ensuring that an innocent individual is not held liable;
- Identifying the crimes committed and revealing the perpetrator, leading to the involvement of the person who committed the crime as the accused in the case;
- Charging the person who committed the crime under the relevant article of the specific part of the Criminal Code (hereinafter referred to as the CC) and preparing an indictment;
- Ensuring that a lawful, substantiated, and fair judgment is issued under the relevant article of the CC that establishes criminal liability for offenses involving physical harm to a person.

⁷ Muminov, M. “Huquq va Burch.” *Law and Duty*, no. 8 (2022): 28–29.

Thus, in cases involving physical harm to a person, an expert opinion serves both as **evidence supporting an accusation** and as **evidence supporting an acquittal**.

By “evidence supporting an accusation” or “evidence supporting an acquittal” is meant **evidence supporting an accusation** refers to factual information that indicates that a specific person has committed a crime or that aggravates their guilt; **evidence supporting an acquittal** refers to factual information that denies that a specific person committed a crime or mitigates their guilt.⁸ In this case, as a result of conducting the expert examination, the outcome (such as the cause of a person’s death or the extent of health impairment) is determined, and consequently, it is established whether the person’s actions or inactions caused that outcome or not.

One of the key legal justifications for appointing and conducting an expert examination in cases involving physical harm to a person is that, according to Article 82 of the Criminal Procedure Code (CPC), in order to accuse a person and issue a conviction, three out of five essential elements that must be proven rely specifically on an expert opinion:

1. The nature and extent of the harm caused by the crime;
2. The causal connection between the committed crime’s time, place, method, act, and the socially dangerous consequences that occurred;
3. Establishing that the crime was committed by the specific person.

It is also important to emphasize that if the degree and cause of the inflicted bodily injury are not determined, it is impossible to issue a decision (judgment) in cases involving physical harm. This is because an expert opinion is a crucial piece of evidence for determining the severity of the injury, whether it directly caused death or other consequences, identifying the perpetrator, and confirming their presence at the scene of the incident.

According to Article 16, Part 2 of the Criminal Code of the Republic of Uzbekistan, the sole basis for criminal liability is the existence of all elements of a criminal act. If even one element of the act is absent, the act is not considered a crime. Therefore, in cases involving physical harm to a person, it would not be incorrect to state that, in accordance with this provision, the presence or absence of a criminal act cannot be established without an expert opinion.

The need to conduct a forensic medical examination arises in criminal cases involving offenses against a person’s life and health, and it serves the purposes and functions of

⁸ Mirazov, D.M., Rashidov, B.N., Qulmatov, Sh.A., et al. *Criminal Procedure Law: Textbook*. Tashkent: Academy of the Ministry of Internal Affairs of the Republic of Uzbekistan, 2019, 333 pp. (See Rajabov, B.A., Chapter III, Topic 6, p. 106, available at <https://drive.google.com/file/d/1th6t1Y5>)

fair justice.⁹ Under the current Criminal Procedure Code, Article 173 stipulates that an expert examination is mandatory to determine the cause of death, the nature, and the severity of inflicted bodily injuries. In economic crimes, however, thousands of transactions, financial documents, accounting records, cash flows, tax reports, audit trails, corporate assets, the amount of damages, and forms of unlawful enrichment are analyzed by experts, and the expert conclusion becomes the primary tool for establishing economic truth.

Forensic psychological examinations play a decisive role in determining a person's mental state, emotional stability, the reliability of statements made under stress, the psychological readiness of minors for interrogation, and the trauma level of victims of violence. Therefore, without an expert conclusion, many cases cannot be correctly resolved.

The strength of an expert conclusion lies in its scientific foundation, methodological accuracy, objectivity, impartiality, and direct connection with the evidence under examination. An expert follows strict procedures in forming their conclusion, conducting investigations based on methodological manuals, international standards, scientific traditions, laboratory criteria, and evaluation techniques. In particular, in fields such as forensic ballistics, forensic chemistry, forensic biology, DNA analysis, digital forensics, and traceology, the accuracy of expert conclusions typically ranges from 95% to 99%, a reliability level rarely found in other types of evidence.

The significance of expert conclusions is so high that parties often adjust their legal strategy based on the results: the prosecution may strengthen its case using the expert conclusion, while the defense may point out deficiencies or request additional expertise to revise its strategy. When evaluating an expert conclusion, the court examines its formal correctness, logical consistency of the research, the justification for the chosen methodology, the completeness of the analysis process, the sufficiency of materials used, the expert's reasoning, and the connection of the final conclusion with the evidence.

If deficiencies are found in the expert conclusion, the court may reject it or order a supplementary examination, although this rarely occurs because expert analyses are usually scientifically robust. The value of expert conclusions lies in enhancing the reasoned nature of court decisions, reinforcing judicial confidence, ensuring impartial and fair judgments, and strengthening public trust in the judiciary.

The importance of expert conclusions as a means of proof is significant not only in practice but also theoretically, recognized as an essential element of a lawful state and

⁹ Indiaminov, S.I. *Forensic Medicine: Textbook*. Tashkent, 2012, p. 13.

judicial independence. In legal proceedings, facts are usually divided into two types: those requiring legal assessment and those requiring specialized knowledge. Expert examinations are established precisely to determine the latter, where the court relies on the expert's scientific opinion.

With the development of the expert institution, the process of proof has become increasingly scientific, significantly improving the quality and fairness of court decisions. In particular, genetic examinations have revolutionized forensic medicine: DNA matching enables precise proof of homicide, violence, biological relationships, lineage, and even materially aged evidence. Similarly, digital forensics has become one of the most critical fields today, scientifically examining data stored on smartphones, computers, cameras, servers, networks, social media, and cloud services to establish traces of crimes, communications, geolocation information, and the authenticity of audio-video files. This expands the process of proof, further enhancing the significance of expert conclusions year by year.

The power of an expert conclusion is that it reinforces other evidence or resolves ambiguities; in some cases, the court prioritizes the expert's opinion over other evidence because other forms of proof are often subjective, prone to human error, memory lapses, or influenced by party interests. Another crucial factor enhancing the role of expert conclusions as a means of proof is the scientific validity and practical effectiveness of the methodology chosen by the expert. In practice, if a method is not scientifically validated, untested in practice, or controversial, the reliability of the expert conclusion decreases significantly.

For this reason, expert activities are regulated through special licensing, professional development, and certification systems, ensuring not only professional competence but also adherence to principles of impartiality, accuracy, responsibility, and legality. According to current legislation, an expert conclusion is an independent legal document; however, its value depends on the expert's level of knowledge, the completeness of the objects studied, and the rigor of the analysis.

Therefore, Article 78 of the Criminal Procedure Code of the Republic of Uzbekistan contains a provision stating that "a person who conducted the investigation or any other internal inquiry forming the basis for the initiation of the case is not entitled to participate in this case as an expert or specialist." However, it is advisable to further refine this article to explicitly include a rule that a person who has conducted an expert examination is also not entitled to participate in the same case as an expert or specialist. As the above analysis shows, in many criminal cases, it is impossible to issue a conviction without an expert conclusion. It is not without reason that, in the Justinian Code, the significance of experts' participation in court proceedings was described with

the phrase: “Judges are not witnesses; they stand above witnesses and even above the magistrates,” highlighting their superior role and authority in establishing the truth.¹⁰ According to statistical data, in 2022, acquittal verdicts were issued for 1,010 individuals; in 2023, for 1,244 individuals; and in the first half of 2024, for 465 individuals.¹¹ It can be agreed that one of the reasons for these acquittals was “the inadmissibility of the evidence on which these individuals were charged or the preparation of an indictment despite insufficient evidence to accuse the person.”

Taking into account the statement by the President of our country, Shavkat M. Mirziyoyev, emphasizing the need to “ensure in practice that evidence is reliable, obtained lawfully, and relevant to the case — in other words, to uphold the principle of admissibility of evidence in the language of judges — for which it is necessary to establish appropriate legal mechanisms and improve the current legislation,” the following proposals are put forward:

If a separate investigative department is established, it would allow for proper distribution of criminal cases based on workload, provide investigators with the opportunity to focus exclusively on conducting investigative actions, enhance their independence in case management, and enable highly qualified investigators to provide legal guidance to less experienced colleagues. This, in turn, would increase the efficiency and quality of preliminary investigations.

When an expert conclusion reaches the authorized person conducting the pre-trial investigation, before deciding to involve a person as a defendant or victim based on that conclusion, it is necessary to introduce these individuals to the expert conclusion and, simultaneously, inform them of their right to submit a request or complaint regarding the appointment and conduct of the expertise. Implementing this practice would further ensure that well-founded decisions are made during the pre-trial stage.

An expert conclusion may be assigned not only at the request of the prosecution or defense but also on the initiative of the court. This demonstrates the adherence of investigative and judicial bodies to the principle of impartiality, as expertise is conducted to provide additional clarity and precision. When a court itself initiates an expert examination, it usually occurs in complex cases where contradictory evidence exists or where the sufficiency of available evidence is low. Therefore, the expert conclusion often becomes a decisive factor in ensuring a fair decision.

¹⁰ G'iyosov, Z.A., Botaev, J.I., & Saidov, Ch.Sh. *Forensic Medicine and Psychiatry: Textbook*. Tashkent: Academy of the Ministry of Internal Affairs of the Republic of Uzbekistan, 2006, p. 76.

¹¹ stat.sud.uz – Court Statistics Statistical data on cases reviewed by the courts of the Republic across various judicial sectors.

The importance of expert conclusions is also highlighted by the adoption of the Resolution of the Cabinet of Ministers “On the approval of regulations on the activities of non-state forensic organizations.” According to these regulations, a non-state forensic organization is a specialized entity authorized to conduct forensic examinations in civil, economic, criminal, and administrative cases, staffed with specialists holding certified judicial expert qualifications. Non-state forensic organizations are established as legal entities. Only a certified judicial expert may serve as the head of such an organization, and a judicial expert may be a founder (participant) of only one non-state forensic organization.

Non-state forensic organizations have the right to carry out judicial examinations based on orders received from all regions of the Republic as well as from foreign countries. The adoption of these regulations provides the basis for including Article 182¹, “Conducting judicial examinations by non-state forensic organizations,” in the Criminal Procedure Code. Judicial examinations in non-state forensic organizations are conducted in accordance with Article 182 of the Criminal Procedure Code, i.e., according to the rules applied in state forensic institutions.

Non-state forensic organizations conduct their activities in compliance with current legislation and enjoy equal rights with state forensic institutions, fulfilling the obligations imposed on them to the same extent. Expert conclusions issued by non-state forensic organizations carry the same legal force as those prepared by state forensic institutions. The types of judicial examinations that may be conducted by non-state forensic organizations are determined by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan.

Furthermore, a number of procedural characteristics can be identified in the field of judicial expertise, which are distinguished by unique stages and requirements. The first stage involves the assignment of a judicial examination by an investigator, prosecutor, or court. This decision is made based on the need to obtain additional information to resolve specific issues arising during the investigation or court proceedings. A crucial aspect of this stage is defining the subject of the examination, which includes formulating precise questions that require thorough and comprehensive study by the expert.

The second stage involves the selection of the expert. An expert is a person entrusted with conducting a judicial examination due to their specialized knowledge in fields such as science, technology, art, craftsmanship, and other relevant areas.¹² In turn, the powers of the expert, including their rights and obligations, and the specific provisions

¹² Shishkin, A.P. “The Role of Forensic Examinations in Criminal Proceedings.” *Moscow Innovative University*.

of the duties to be performed, are defined not by the Criminal Procedure Code but by the Law “On Judicial Expertise,” the Resolution of the Cabinet of Ministers “On the Procedure for Conducting Judicial Expertise Studies,” and other relevant legal norms. The third stage involves the practical conduct of the examination, including the collection of materials, the research process, and the preparation of the conclusion. The duties of the expert include receiving and analyzing forensic materials, thoroughly examining evidence and the questions submitted, preparing well-reasoned conclusions, and, in certain cases—such as when questions fall outside the scope of the expert’s expertise or when the objects and materials available for analysis are insufficient for the examination—preparing a document declaring the conclusion invalid. If it is impossible to resolve an issue due to limitations in scientific and technological development or refusal to provide elements necessary for the examination, the expert is obliged to notify the submitting body or individual. Another important rule is to ensure the safety of the objects and materials presented for examination.

The final stage involves the use and evaluation of the results of the expertise. The expert conclusion, serving as an element of the evidentiary base, is submitted for consideration by the court or investigative authorities. During court proceedings, as well as during the investigative process, the conclusion must be thoroughly analyzed, and if potential deficiencies or uncertainties are identified, the parties may initiate procedures to raise objections. Thus, if a previously conducted examination is found to be unreliable, the participants in the proceedings have the right to request a repeat forensic examination.¹³

The criteria for evaluating the reliability of an expert conclusion include the following:

- The reliability of the methodology applied by the expert;
- The sufficiency and quality of the materials provided to the expert;
- The completeness of the expert’s examination;
- The accuracy of the initial data;
- The extent to which the expert’s conclusions are substantiated within the report itself;

The consistency of the conclusion with the evidence available in the case (including other expert conclusions), ensuring the absence of contradictions.¹⁴

The reliability of a scientific analysis conducted by an expert relies on the use of methods supported by various factors. These include the recognition and reputation of the institute responsible for developing the method, the period and authority of those

¹³ Shishkin, A.P. “The Role of Forensic Examinations in Criminal Proceedings.” *Moscow Innovative University*.

¹⁴ Orlov, Y.K. *Forensic Examination as a Means of Proof in Criminal Proceedings*. Moscow, 2005, 268 pp.

who initially tested it, as well as the approval of bodies recommending its use in professional practice. As part of their conclusion, the expert is required to provide an updated list of normative and methodological documents forming the basis of their analytical work. Sources must also be indicated with references or annotations.

The sufficiency and quality of materials provided for the expert examination are critical for producing an objective conclusion. Sufficiency reflects the adequate volume and scope of data, allowing comprehensive analysis without the need for additional information. The dataset must cover all relevant aspects, ensuring full consideration of the questions posed.

High reliability and accuracy of the provided information are determined by the quality of source materials, their verifiability, and the absence of bias, which together ensure the essential precision and consistency of the data. Comprehensive content, including technical reports, statistical data, and documentary verification, forms the basis for well-founded and qualified conclusions.

Expert analysis plays a crucial role in criminal cases, reflecting both the interest of the scientific community and practical necessity. At the same time, scholars have highlighted a number of challenges arising in this field. According to T.V. Demidova, one of the significant issues is the selection between state and private expert institutions when assigning judicial expertise. The appointment of a private expert often meets resistance from investigators or courts that prefer state organizations.

Moreover, the law does not differentiate between the legal force of private and state expert conclusions, recognizing them as equivalent. However, this creates a new challenge: determining the source of funding for private expert services and verifying their qualifications. Private experts face difficulties because their activity does not require mandatory certification, and participation in voluntary certification programs is optional.¹⁵

Undoubtedly, judicial expertise plays a crucial role in the criminal process, assisting in the establishment of the truth and the formation of a reliable system of evidence. Ongoing research in this field provides the basis for developing new methods and improving existing ones, thereby enhancing the efficiency and effectiveness of the criminal process.

Conclusion

¹⁵ Demidova, T.V. "Problematic Issues in Ordering Forensic Examinations." Herald of Economic Security, no. 4 (2016): 29–32.

Judicial expertise represents a cornerstone of the criminal process, playing a decisive role in establishing the truth, ensuring the reliability of evidence, and supporting the fair administration of justice. Expert conclusions serve as a critical tool for courts and investigative bodies, providing scientifically grounded, methodologically rigorous, and objective assessments that underpin legally sound decisions. The reliability of an expert conclusion depends on multiple factors, including the validity of the methodology used, the sufficiency and quality of the materials provided, the completeness of the investigation, the accuracy of initial data, the internal consistency of the expert report, and the alignment of conclusions with other evidence in the case.

The organization of investigative and expert activities, including the establishment of separate investigative departments and the regulation of state and non-state forensic organizations, enhances the efficiency, independence, and professionalism of the investigative process. Clear procedural stages—from the assignment of an expert examination to the collection of materials, detailed analysis, and the preparation of conclusions—ensure comprehensive and impartial evaluations. Moreover, the ongoing development of scientific methods and improvements in forensic technology strengthen the role of judicial expertise, enabling courts to resolve complex cases with conflicting or insufficient evidence.

While private expert services provide additional resources, challenges remain regarding the verification of their qualifications and sources of funding. Legal frameworks recognize the equivalence of state and private expert conclusions, emphasizing the need for adherence to established methodological and procedural standards to maintain reliability and objectivity.

Ultimately, judicial expertise not only supports the immediate determination of facts in individual cases but also contributes to the continuous improvement of investigative practices and the overall effectiveness of the criminal justice system. Its proper implementation fosters public confidence, strengthens the rule of law, and ensures that justice is both fair and scientifically substantiated.

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