THE AKMOLA REGION ATLAS OF NEW PROFESSIONS AND COMPETENCIES

MINISTRY OF SCIENCE AND HIGHER
EDUCATION OF THE REPUBLIC OF KAZAKHSTAN

AQMOLA

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ATLAS OF NEW
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ABBREVIATIONS

JSC	means a joint stock company
BNS ASPR RK	means the Bureau of the National Statistics Agency for Strategic Planning and Reforms of the Republic of Kazakhstan
GDP	means gross domestic product
DRP	means domestic regional product
HEI	means a higher education institution
SNNP	means the State National Nature Park
EEU	means Eurasian Economic Union
EU	means European Union
SMB	means small and medium business
NGO	means Non-Government Organizations
NCE	means National Chamber of Entrepreneurs
FAS	means faculty and academic staff
VET	means vocational education and training
LLP	means a limited liability partnership
LFDC	means Labor Force Development Center

Akhmetzhanov Marat Muratovich

Akim of Akmola region

Dear Colleagues,

The modern world has entered the time of dynamic changes when high technology and innovations transform both the labor market and our life in general. This shift pushes the boundaries of the opportunities and presents new challenges to the Akmola Region, having a significant agricultural potential. Training the personnel fitting the times is a key prerequisite of the region sustainable development. In this context, I am glad to present you the Akmola Region Atlas of New Professions, being a strategic guide for shaping the region future.

This Atlas is the result of an in-depth analysis of social and economic achievements, polls and interviews conducted among the representatives of business, education and local communities. It contains both a list of professions and a strategic vision of transformation of the main regional industries. The Atlas reflects both current and forecasted labor market demands during next 5-10 years which enables taking due account of prospective turns and preparation for new challenges.

The Akmola Region demonstrates impressive economic and social developments. As at the last year end, the region was among the leaders in terms of processing industry growth rate with its production volume increase by 12%. We continue introducing innovations in agriculture, our crucial sector, i.e., precision agriculture, process flows automation, and satellite land monitoring. This drives grain crops yields increase securing the region's status of a major agricultural region in Kazakhstan.

Services sector, tourism inclusive, also demonstrates a positive development dynamics. The Shchuchye-Borovoye Recreational Zone attracted a record number of tourists, and hotel and restaurant business expansion creates new jobs and improves infrastructure. This success evidences the Akmola Region growing appeal for investors, tourists and professionals.

Given all our achievements, however, we face certain challenges calling for adjustment to new conditions. The Atlas of New Professions is focused on the following three key sectors: processing industry, agriculture and forestry as well as services. These industries constitute the foundation of the regional economy and are the source of demand for highly qualified personnel. We are confident, that

digitalization, automation and use of other innovations will bring about new opportunities for young professionals and retain regional competitive edge.

It is important to note that the President of Kazakhstan declared 2025 as the "Year of Working Professions" drawing attention to the significance of personnel training for the national economy. The Akmola Region actively backs this initiative. During recent two years we modernized a number of colleges, expanded dual education programs, and established partnership relations with major companies operating in the region. These actions already deliver the results: the graduates from our educational institutions find professional jobs and make their contributions to local economy advancement.

Cooperation with business plays a key role in the attainment of the goals set out in the Atlas. I strongly appeal to business community to be actively involved in pooling regional expertise. Internship and targeted educational programs as well as employment conditions improvement – all these measures will boost regional economy and livability.

The Atlas of New Professions is both our vocational training tool and a roadmap. It makes it possible to vision the future and plan it together with business, local communities, educational institutions and youth. This document will enable us to adapt to changes and to initiate them.

I am certain, that together we will ensure favorable environment for professional and personal growth of each resident of the Akmola Region. Let the Atlas of New Professions become a foundation for new achievements in the Akmola Region, inspiring our development and prosperity!

I wish all Atlas users every success in converting new opportunities and professional growth! Thank you for your strive for regional development and your contribution to its best future.

Nurbek Sayasat

Minister of Science and Higher Education of the Republic of Kazakhstan

Dear Friends,

I am delighted to welcome you on the pages of this magazine and to take this opportunity to discuss the roadmap of regional staffing requirements, being the most important challenge in our region. This instrument will play a crucial role in training the specialists driving the Akmola Region sustainable development and economy growth.

Kassym-Jomart K. Tokayev, the President of Kazakhstan, in his Address to the Nation announced 2025 "The Year of Working Professions". This once again evidences the increasing significance of vocational professions for Kazakhstan economy.

Thus, the roadmap of regional staffing requirements is not only an administrative initiative; it is a strategic move building a stable basis for the Akmola Region economic growth and prosperity. This roadmap will be a core instrument determining the most sought-after professions in the years and decades to come.

The roadmap of regional staffing requirements will enhance our awareness of the demand in occupations in the years ahead and focus our efforts on professionals training in the top priority industries. The following sectors are particularly essential for the Akmola Region: processing industry, agriculture, forestry and services.

The roadmap of regional staffing requirements will help us plan educational programs with more precision, adapt our vocational training and higher education systems as well as train highly qualified personnel for the industries of vital importance for the Akmola Region economic growth.

The regional roadmap will assist senior school students and their parents with making a conscious choice of their career paths.

Summing it all up, I would like to emphasize that it is a formidable challenge to train highly professional personnel for the future. It calls for close collaboration of business, educational institutions and the state. We must be proactive to be able to ensure the appropriate staffing of the Akmola Region who will shape our future economy.

I would like to thank you for your attention. I wish you every success in this important endeavor!

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INTRODUCTION

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I.1. Foresight: a View into the Future

The Atlas of New Professions and Competencies of the Akmola Region is a guide for the future labor market of the region. It reflects key changes in the economy and education that will help identify promising professions, new development areas, and in-demand skills. The Atlas was created for students, teachers, educational institutions, and employers so that they can better navigate modern requirements and adapt their plans to the needs of the economy.

Particular attention is paid to three important industries of the region: manufacturing, agriculture, forestry, and services. These areas are considered key to accelerating economic growth and require specialists who know how to work with new technologies and implement innovations.

When creating the Atlas, the foresight methodology was used - this is an approach that allows you to predict the future with the help of experts and business representatives. Based on the analysis of the current situation, trends, and professional opinions, the Atlas offers recommendations on career guidance and the development of in-demand competencies.

Atlas Primary Goals:

• Informing about new and transforming professions in-demand in the next 5-10 years;

• Supporting career guidance for schoolers accommodating their interests and market demands;

• Remodeling educational programs enabling personnel training meet future needs.

This Atlas promotes adaptation of schoolers and students to the labor market

shifts helping them avoid obsolete trends and get modern competencies.

This Atlas, suggesting 40 new professions, determining 27 transforming and forecasting 17 obsolescent occupations, is the result of 30 in-depth interviews, 200 questionnaires on industry future filled out by the relevant experts and foresight sessions involving 38 experts.

I.2. Navigation

The Atlas Introduction sets out its goals and target audience, and a summary of its practical significance. Then the Atlas considers regional advancements, elaborates on the complications and prospects in the sphere of education and personnel training with a breakdown by key industries.

The Atlas gives particular emphasis to the trends changing the future, including the analysis of processing industry, agriculture, forestry and services sectors. A separate section is dedicated to the opinions of representatives of business, teachers and the region residents regarding their future and preparedness to changes.

A catalogue of new and transforming professions and a description of future competencies are core elements of this Atlas. Its final sections deal with Edunavigator.kz, a career guiding platform, recommendations for schoolers.

I.3. Who needs the Akmola Region Atlas of New Professions and Competencies and Why

The Akmola Region Atlas of New Professions and Competencies is a strategic tool intended for various groups of regional population.

It assists **schoolers and students** with making an informed choice of their future profession focusing on the advanced trends of economic development.

The Atlas is a guideline for **educational institutions** for updating their programs to meet future labor market demands.

It is a precious tool for **teachers** enabling them to improve the quality of education and to adapt the teaching and learning processes to modern labor market requirements. It boosts the understanding of professional development trends driving educational programs adjustments, including topical knowledge and skills. Teachers may use this Atlas to guide their students' conscious career path choice.

It is a valuable source of information for **employers** regarding the competences to be in-demand in the future triggering their business success.

The Atlas helps **state authorities** formulate efficient employment and educational policies boosting human resources development and the region competitive growth.

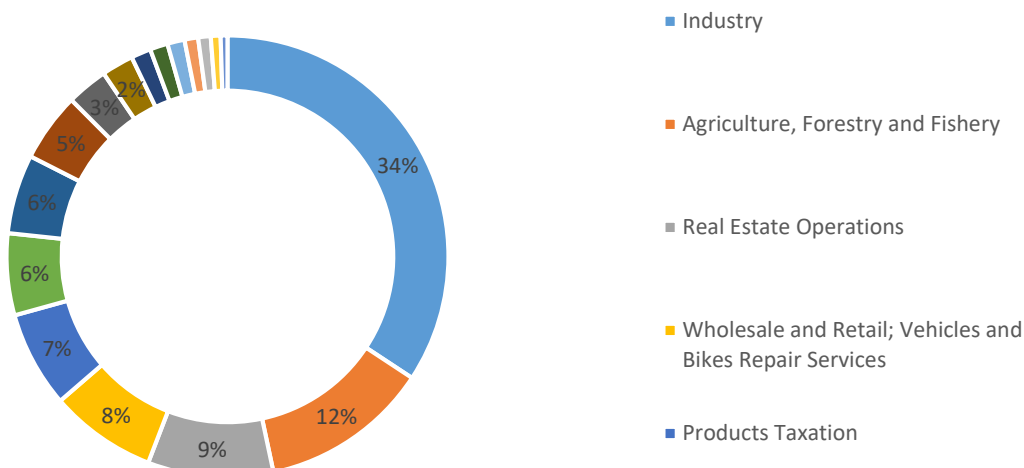# REGION ADVANCEMENTS AND PROSPECTS

II.

II.1. Economy

The Akmola Region demonstrates a positive development dynamics, successfully integrating traditional economic trends with innovative industrial and agricultural projects. Over the last few years gross regional product rose consistently, the region developed its infrastructure and enhanced its investment appeal.

GRP growth and active attraction of investments into regional economy boosted the population income. Average annual GRP growth went along with average

materials promoting mining and processing sector development.

The data on the share of the Akmola Region GRP in Kazakhstan GNP during 2014-2023 demonstrate the regional economy growth during such a period: from 2.6% (in 2014) to 3.22% (in 2023) with significant improvement during recent five years. The Akmola Region is qualified an agri-industrial Kazakhstan region where both agricultural and industrial sectors are developed (Figure 1).

- Industry
- Agriculture, Forestry and Fishery
- Real Estate Operations
- Wholesale and Retail; Vehicles and Bikes Repair Services
- Products Taxation

Figure 1. The Akmola Region GRP Structure in 2023

salary increase. In 2023, the annual average per capita income was 1.2 million tenge, which is above the national average. Income disparity in urban and rural areas persists; however, positive dynamics is noted in rural areas caused by agriculture development and new jobs creation. The following were core contributions to population income: wages (specifically, in processing industry and agriculture), growth of income from entrepreneurial activities due to small and medium business support.

Environmental assets are the region area of strength. The Akmola Region has significant reserves of gold, uranium, industrial grade diamonds and construction

The Akmola Region agriculture is a core sector securing regional economic stability. Having vast farmlands (9.4% of total Kazakhstan agriculturally used areas) the region plays a crucial role in the national food security. Crop farming with its 57.4% share in GDP is the main agricultural sector of the region. Stock-raising rates second despite its considerable growth capacity. From 2014 through 2023, the investments to the region agriculture amounted 15.7% of the total regional investments. Funding fueled labor efficiency in animal husbandry sector as the result of process flow automation. Nevertheless, the return on investments is lower than in other sectors,
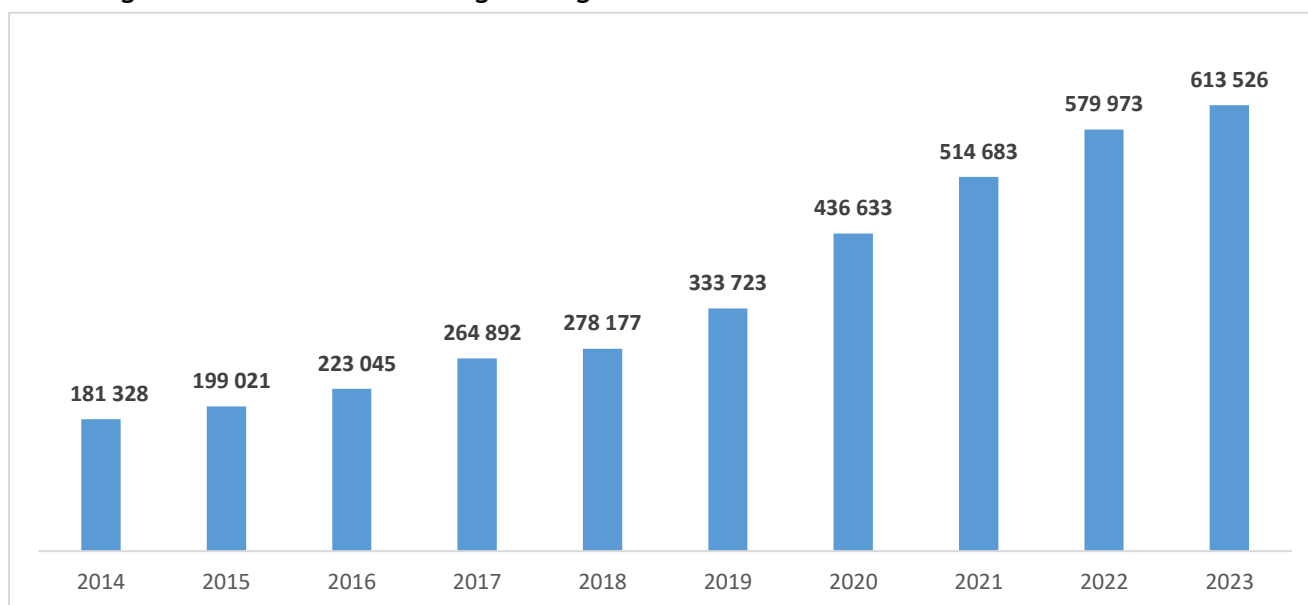
i.e., processing industry, resulting from the seasonal character of operations, climate dependence and lack of diversification.

Processing industry is the primary driver of the Akmola Region economic upturn with its consistent increase of the GRP. During recent 10 years, the sector considerably strengthened its position due to the increase of its share in the GRP from 14% (in 2014) to 26.5% (in 2023). The advancement is secured by production of noble metals, machine building and food processing industry. New agricultural produce processing plants scheduled to commence operations during next years can significantly expand manufacturing industry share in the region GRP.

Services play an increasingly important role in the Akmola Region economy raking third after manufacturing industry and agriculture. Tourist infrastructure, retail, transport and warehousing demonstrate the most active growth. These sectors promote employment growth and improve population life quality. Accommodation and catering services (constituting integral

Despite positive changes the region faces certain challenges, including negative migration balance (particularly, that of employable population) restricting access to highly qualified manpower. The standards of living of urban and rural population differ drastically, triggering migration of rural residents to cities and the capital. Environmental issues caused by increased pollution require more active measures aimed at production modernization and introduction of low-emission technology.

Social infrastructure positive advancement during recent ten years can control migration. Investments into housing construction rose annually by 20.7% in the average during most recent 10 years, promoting housing standards. New residential complexes were built in Kokshetau and Stepnogorsk going along with modernization of educational and healthcare institutions. This made the region livable and more attractive for new residents. In rural areas the investments were channeled to utilities systems

Figure 2. Fixed Capital Investments in the Akmola Region during 2014–2023, in KZT mln

parts of tourism) added momentum due to national and inbound tourism expansion. The demand for such services grows annually, especially in summer, a high season in Shchuchye-Borovoye resort.

upgrade. Such measures elevated the living standard in rural areas and bridged the gap with the urban environment.

Investments into the Akmola Region are evidenced by annual growth of contributions to fixed capital. Over the most recent ten years the investments were primarily channeled to capital-intensive industries, i.e., real estate, agriculture and manufacturing industry, demonstrating the region long-term strategy to bolster basic industries and to develop its infrastructure. Special attention is given to small and medium businesses showing high potential for economic growth, chiefly, in processing industry and services sectors.

Foreign trade activities remain moderate in the region. Its exports primarily contain agricultural produce and groceries in line with the regional focus on farming. However, low export diversification and it dependence on CIS make the region vulnerable to external factors. Process industry development can drive exports added value increase.

There is a shortage of personnel in education and labor market, particularly, in high technology sectors. Professional conversion and vocational education programs can make up for the deficiency of manpower and improve job market.

In general, the Akmola Region has a significant potential for growth, most notably in processing and mining industries, agriculture and services. The region further development calls for a complex solution including infrastructure upgrade, living standard raising and investments into high technology sectors.

Based upon the analysis of the following 10 year performance indicators: sector share in GRP, its 2014-2023 growth dynamics, investments to the sector, capital intensity and sector labor force, the following top priority sectors were defined: processing industry, agriculture, forestry and fishery, wholesale and retail, real estate operations, construction, accommodation and catering services, other services, mining and quarrying.

II. 2. Challenges and Prospects of Education in the Akmola Region

Preschool Education
Challenges:
- **Non-Uniform Access:** It implies significant variation in preschool education coverage in urban and rural areas. For example, the preschool coverage fell from 56.9% (in 2014) to 47% (in 2021); however, it exceeded 80% in rural areas.
- **Personnel Shortage:** The growth of number of pedagogues fails to meet international standards (9.7 kids per one teacher, with the best number being 6-8 children).
- **Physical Infrastructure:** Many preschools fail to comply with modern standards, especially those located in rural areas.

Prospects:
- Preschool network expansion through public and private partnership mechanisms.
- Teachers' professional development under preschool modernization programs.
- Introduction of new state standards focused on the development of educational environment.

Secondary Education
Challenges:
- **Reduction of the amount of schools:** The number of schools fell from 613 (in 2014) to 554 (in 2024), in particular, in rural areas.
- **Nonequivalence of Education Quality:** Ungraded schools, with the share amounting 62.45% of the total number, have difficulties with provision of high quality educational services.
- **Achievements Gaps:** Rural schoolers demonstrate worse academic achievements based upon PISA tests which evidences unequal access to educational resources.

- **Infrastructure Overload:** Despite new schools introduction in cities there is a capacity shortage.

Prospects:

- Schools construction in urban areas to eliminate three-shift schooling.
- Professional development of pedagogues and use of digital technology promoting teaching and learning.
- Implementation of the programs supporting rural schools, including infrastructure upgrade and training rooms equipping.

Vocational Education and Training (VET)

Challenges:

- **Reduction of the Number of Colleges:** The number of VET institution fell from 42 (in 2014) to 29 (in 2024), in particular, in rural areas.
- **Insufficient Staff Competencies:** More than 40% of pedagogues have no professional category and the ratio of tutors and students exceeds the one provided for in international standards (1:14 as opposed to 1:10-12).
- **Restricted Resources:** Low level of colleges equipping with interactive devices and computers.

Prospects:

- Participation in Zhas Maman Project involving modernization of physical infrastructure and introduction of state-of-the-art educational technologies.
- Expansion of the list of in-demand jobs, in particular, in engineering.
- Increase of the share of students trained under free of charge educational programs which expands education accessibility.

Higher Education

Challenges:

- **Limited Network of Educational Institutions**: There are only 4 higher educational institutions in the region, of which two are private institutions, which restricts the choice for the students.
- **Competition with Other Regions**: Students migration to major cities, e.g., Astana and Almaty.
- **Insufficient Level of Cooperation with Business**: Dual education and internship programs shortage.

Prospects:

- Development of a multi-layer personnel training system focused on the region-specific demand in professionals.
- Introduction of dual education and creation of new joint internship programs with business.
- Expansion of student exchange programs with foreign educational institutions, as well as faculty and teaching staff professional development.

Science

Challenges:

- Insufficient funding of scientific research, in particular, in higher educational institutions.
- Lack of strong scientific base limiting the granting opportunities and innovative projects.
- Poor involvement of young people in scientific workflow.

Prospects:

- Increase of scientific research funding through granting programs.
- Scientific centers development on the basis of higher educational institutions and international partnerships.
- Young scientists support through start up incubators and research platforms.

BUSINESS', PEDAGOGUES' AND RESIDENTS' OPINIONS ON THE FUTURE OF THE REGION

III.

III.1. Business: Anticipated Future

The future for business is conditioned on its ability to meet current challenges, to introduce innovations and to efficiently use available resources. Against the background of dynamic economic growth the Akmola Region entrepreneurs face the necessity to rethink their strategies of competitiveness, stability and efficiency enhancement. Provision of skilled personnel able to work in digital and automated environment, as well as to meet rising sustainability requirements becomes a key factor of business success.

In order to identify key business need in and expectations from personnel as well as to determine the factors impacting business development in the region we interviewed 200 respondents representing main economic sectors in the region, including agriculture, services, industry, hotels and restaurant and tourism. The majority of survey respondents (63.5%) represent small business, with 33.5% and 3% shares of medium and major business, respectively.

In-depth interviews were conducted with 30 businessmen engaged in processing, tourism and agriculture.

PLANNING HORIZON

The respondents demonstrate the following various approaches to planning:

• Long-term horizon (exceeding 10 years) was selected by 29% participants in line with their business strategy.

• Short-term planning (1-3 years) was preferred by 26% respondents.

• Medium-term horizon (3–10 years) was specified by 45% respondents reflecting the balance between operational and strategic approaches.

TRENDS IMPACTING BUSINESS

Entrepreneurs highlighted the following key trends:

• Production Digitalization: 38.5% respondents ranked it a top factor and 22.5% respondents rated it high.

• Process Flow Automation and Robotization: 31% of respondents emphasized this trend and 26% of respondents qualified it very important.

• Toughening environmental requirements and fall in the raw materials accessibility were also defined as important challenges by 28% and 31.5% respondents, respectively.

USE OF INNOVATIONS

The survey findings demonstrate the following tendencies related to innovative technologies introduction to business:

• Sustainable and Environment-Friendly Technology: 42.5% of respondents expressed their readiness to introduce innovations.

• Data Analysis and Customization Systems: 42% of respondents were interested in them.

• Robots and Automation: 38% of entrepreneurs were considerably interested in them.

• Artificial Intellect and Machine Learning: 35.5% of respondents were ready to use them.

• Blockchain and Genetic Editing: The relevance of these technologies is poor which fact is evidenced by the significance placed on them by 8-9% respondents only.

Conclusion: The Akmola Region entrepreneurs demonstrate diverse planning approaches preferring medium and long-term horizons and focusing on digitalization, automation and

environmental challenges, and high interest in introduction of sustainable technologies and data analysis systems reflecting their strategic trajectory to innovation and adjustment to modern trends.

STAFFING PROBLEMS

The following core staffing issues were identified in the course of polls among the Akmola Region entrepreneurs:

Rapid Staff Turnover:
• 39% of respondents qualified this issue as very acute;
• 24% believed it significant.

Recruitment Problems:
• 34.5% of respondents consider this issue critical;
• 29.5% of respondents assess it significant.

Young Professional Lack in the Industry:
• 33.5% of respondents noted this problem as very acute;
• 27% of respondents valued it important.

Challenges of Employee Adaptation to New Conditions and Digital Skills:
• Only 23% of respondents considered this issue critical;
• However, 26.5% of respondents believed it significant which highlights the need in employee training.

Low Motivation and Involvement of Employees:
• 27.5% of businessmen believe this issue severe;
• Additional 26.5% note the significance of this problem.

Young Employees Retention Due to Remote Jobs and Flexible Schedule:
• 28.5% of respondents consider this problem burning.

Lack of Management Personnel and Leadership Development Issues:

• 31% of entrepreneurs believe this an important and severe issue.

Recruitment and Training Costs:
• 20% of respondents believe this issue critical;
• 26.5% of respondents consider it significant.

Gap Between Employees Skills and Business Needs:
• 24.5% of entrepreneurs highlighted this problem as one of the most acute ones;
• 28% of entrepreneurs consider it significant and emphasize the necessity to revise educational programs and improve their employees' skills.

Conclusion: The staffing problems faced by the Akmola Region entrepreneurs relate to rapid staff turnover, difficult recruitment of highly qualified personnel, lack of young talent and a gap of personnel skills and business needs calling for heightened attention to competencies development and educational programs revision.

Evaluation of Personnel Competencies: Actual and Expected
The Akmola Region entrepreneur's poll demonstrated a significant mismatch of actual competencies of their personnel and the ones expected by business. The respondents were suggested to assess the actual level of competences their employees have and to define the ideal expected level thereof. The analysis identified the key gaps requiring attention to enhance competitiveness.

Lean Production
• **Actual Level**: 45% of respondents noted sufficient level of this competence, but 23% considered it underdeveloped and calling for improvement.
• **Expectations**: 68% of respondents believed that lean production competency must be highly developed, including process flow optimization and losses elimination skills.

Multiculturality

- **Actual Level**: 50% of respondents considered their employees to have this competency on a sufficient level, however, 24.5% think it underdeveloped in their personnel.
- **Expectations**: 61% of entrepreneurs anticipate their employees to be sufficiently multicultural to efficiently work in international and cross-regional teams.

Projects and Process Flows Management

- **Actual**: 44% of respondents recognized that this competency is sufficiently developed, however, 26% of respondents considered it requiring improvement.
- **Expected**: 72% of respondents deemed it important for their employees to have good project management skills to successfully implement their tasks and lower the risks.

Software and Robot Engineering, Artificial Intelligence

- **Actual**: 28.5% of respondents rated this skill underdeveloped, and another 18% believed it poor.
- **Expected**: 74% of respondents expected their employees to have well developed software engineering skills and digital technology competencies against the background of global digitalization.

Operational Mindset

- **Actual**: 43.5% of respondents noted sufficient development of this skill in their personnel, however, 27.5% of respondents believed it subject to improvement.
- **Expected**: 67% of entrepreneurs anticipate their employees to have highly developed operational mindset to build long-strong strategies and complex approach to tasks.

Green Thinking

- **Actual**: 44% of respondents were satisfied with this competency, however, 26% of entrepreneurs noted lacking thereof.
- **Expected**: 64% of respondents believed advanced green thinking to be important to meet sustainability standards.

Client Centricity

- **Actual**: 42.5% of respondents rated this competency satisfactory, however, 24.5% of businessmen considered it underdeveloped.
- **Expected**: 66% of entrepreneurs expect their employees to have a customer-oriented approach to ensure client satisfaction.

Cross-Sectoral Communication

- **Actual**: 42.5% of respondents considered that their employees have sufficient competency, but, 28% of them believed it underdeveloped.
- **Expected**: 65% of entrepreneurs expect high level of cross-sectoral communication development promoting interindustry cooperation.

Artistic Endeavors

- **Actual**: 43.5% of respondents valued this competency sufficient, but, 27.5% entrepreneurs believed it subject to improvement.
- **Expected**: 58% of businessmen participating in the poll anticipate systems thinking outside the box from their employees, in particular, in the spheres involving interaction with clients and creativity.

Conclusion:

As the result of the survey it was found that in most cases actual personnel competencies fail to answer entrepreneurs' expectations to a significant extent. Special attention should be given to development of technical (software and robot engineering, systems thinking) and soft skills (multiculturalism, customer-oriented approach). This gap bridged will enhance regional business competitive edge.

RESULTS OF INTERVIEWS WITH AKMOLA REGION ENTREPRENEURS

As the result of in-depth interviews of businessmen involved in processing industry, agriculture and forestry, as well as services sector a number of common challenges and opportunities were identified determining these sectors development trajectory in the Akmola Region. Manpower shortage, technology use, environmental challenges and new technologies integration prospects were in the limelight.

Understaffing is a key issue noted in all industries. The experts put emphasis on lack of operators of automatically programmed tools and automated production lines as well as engineers.

"Personnel move abroad or go to the sectors offering higher wages. And it is impossible to replace them."
Respondent 5

Youth flow from rural areas to cities is a crucial issue in agriculture and a root cause of professional staffing bottleneck in the key sectors of animal and crop farming.

"Youth urbanization is a core threat. Young people choose more popular careers leaving agriculture without professionals."
Respondent 4

HoReCa personnel turnover and scarcity of English speaking guides narrowing regional opportunities to attract international travelers are topical issues in services sector.

"Personnel training must take into the account today realities of services sector. We lack professionals speaking foreign languages and experienced in international operations."
Respondent 2

Use of technology and modernization are common for all industries. Slow introduction of automation and obsolete equipment prevent performance raise in processing sector.

"Nowadays various sensors and control systems track all process flow in real time reducing the scope of defects and improving products quality. However, not all producers use such technologies."
Respondent 5

Not all agriculture businesses have digitized their operations, drones and satellite monitoring inclusive, which impairs the performance in the sector.

"Not all businesses introduce high technologies. Many farms still use the machines produced in 80-90-ies"
Respondent 6

Despite active introduction of digital routes and virtual tours IT specialists and analysts required to maintain new technology are scarce in the services sector.

"Technology is both costly and requires proficient personnel. The number of such professional is still insufficient."
Respondent 2

The experts placed a significant emphasis on environmental challenges. Climate change, droughts and abundant precipitation complicate long-term planning.

"Climate is becoming less predictable. It is the main challenge for the farmers."
Respondent 3

Tourism caused man-induced burden to nature is an ecological threat.

"Ecosystem load is growing, in particular, during summer months. Natural resources may suffer damage if we fail to control tourist traffic."
Respondent 1

Notwithstanding the challenges the experts note significant potential of the region. State support in the form of subsidies and grants help modernize the equipment and introduce new technologies, especially, in industry and agriculture.

"State support in the form of modernization subsidies, perhaps, is the only factor promoting small business survival in current economic climate."
Respondent 1.

It is important to develop educational programs, including dual education and short-term training courses, based upon modern industry needs. This will permit training the professionals able to adapt to changing conditions.

"Dual education is not only a trend, but a necessity. We must train the specialists ready to work efficiently from their first day of employment."
Respondent 8

The experts devoted special attention to local production development as well as raw materials processing adding value to products. Grain and oil-yielding crops processing in the agriculture and productions using local raw materials are the sector components.

"Should processing and logistics are arranged, the grain crops form the Akmola Region may compete in global markets."
Respondent 3

Services industry greatly emphasizes ethnic, cultural and gastronomic tourism combining promotion of local traditions and meeting modern tourists' needs.

"Our cuisine is a unique resource subject to development and promotion among tourists"
Respondent 3

Conclusion: The Akmola Region key industries face the following common challenges: manpower shortage, technological underdevelopment, environmental issues and bureaucratic hurdles. The region has significant potential that may be unlocked through technology upgrade, human capital development, and local content in manufacturing and cross-sectoral cooperation enhancement. These measures will permit the region not only to meet existing challenges, but also to move to a new level of competition both on the national and global scale.

RECOMMENDATIONS BASED UPON BUSINESSMEN POLL AND IN-DEPTH INTERVIEWS:

1. Proficiency Enhancement and Staff Training Programs Development
In order to bridge the gap between personnel skills and modern needs it would be necessary to expand access to training programs focused on staff training and retraining. Special attention should be put on dual education, integrating theory and practical experience, as well as on short-term training courses in the sphere of digital technology, modern management methods and ecological standards.

2. Young Talent Attraction and Retaining
In order to make up for personnel shortage it is critical to enhance employer-sponsored training and internship securing

employment for graduates. Favorable employment conditions, especially in rural areas, including subsidies and state support, will help stimulate the youth to opt for technology and engineering careers.

3. Inciting Innovations

It is necessary to expand state support the use of innovations (through subsidies and grants), in particular, by small and medium business. The development of automation, digitalization and raw materials processing with added value must become a top priority for regional business enhancing its competitive edge. It would also be important to maintain business advice and access to innovative solutions.

4. Optimization of Personnel Recruitment and Retention Approaches

In order to reduce staff turnover business should introduce adequate incentive systems, including loyalty bonuses, career development programs and corporate training. Improved employment conditions, flexible schedules and additional social guarantees are sure to boost the attractiveness of jobs and to reduce manpower instability.

5. Strategic Planning Development

In order to improve business performance it would be necessary to introduce long-term planning based upon the analysis of global economic and industry trends. Regional programs must include strategic planning support, exposure forecasting and use of modern management technologies.

6. Enhancement of Industry Sustainability

In order to minimize its adverse impact on the nature business should review its environment standards and waste treatment technologies. State support of environment friendly production and ecotourism development will become an important move to the region sustainable development.

7. Infrastructure and Logistics Development

In order to expand the export opportunities of regional business and cut its transportation costs it would be necessary to invest into logistical centers and transportation routes development as well as into key economic facilities accessibility. Modern infrastructure will ensure efficient integration of local business both into the national and global economy.

8. Inducing Partnership Relations among Business and Educational Institutions

Cooperation of business and educational institutions through employee-sponsored training courses, joint training programs and dual education will promote meeting the labor market needs and train highly qualified professionals.

III.2. Pedagogues: Education Gravitates Future

A poll was conducted among secondary school teachers (318 respondents) and pedagogues of VET and HEI (100 respondents, including 29 and 71 representatives of HEI and VET, respectively) within the framework of the Akmola Region education system studies. The main goals of the poll were as follows: identification of current issues in education, analysis of pedagogues'' readiness to introduce innovations and revise educational programs, and researching the expectations and perception of prospects for further development of various competencies in students.

Secondary School Teachers Poll Findings

Staffing and Teaching/Learning Process Issues:

• **Shortage of teachers** is the most acute problem mentioned by 36.5% of respondents. It is particularly severe in rural areas.

• **Education quality mismatches in urban and rural schools** are recognized a significant issue by 26.4% of respondents aggravating inequality.

• **Poor accessibility of higher education** due to high price and complexity of state grant obtaining makes it difficult for kids from families with financial limitations (23.9%) to enter higher educational institutions.

• **Teaching quality gap between state and private schools** was emphasized by 17.9% of respondents.

• **Insufficient schools capacity** was deemed an important issue by 13.8% of the poll respondents.

• **Substandard quality of career guidance in higher educational institutions and colleges** was noted by 12.3% and 4.4% of

respondents, respectively, which impairs a well informed choice of the career path.

• **Poor accessibility of co-curricular activities for schoolers** is deemed a problem by 9.4% of respondents.

Development Potential during Next 5-10 Years:

• Digitalization, IT and ICT are the most forward-looking disciplines. The development of these sectors is rated at 5 points by 69.5% of respondents. They are perceived the main driver of economic and technological growth.

• Education and pedagogy were also rated high, given that 42.1% of respondents believed such spheres crucial for social stability and welfare.

• Health care is a significant priority with its prospects rated at 5 points by 34.3% of respondents.

• Transportation and logistics, economics, trade and building were rated moderately with prevailing 3 and 4 points, which indicates the importance of these sectors for stable development of the region.

• The ratings of industry and agriculture were less optimistic which may be attributed to limited investments and complexity of innovations.

Dependence of Prospects Assessment on the Respondents' Age:

• Young people (18–25 years of age) highlighted digitalization, IT and ICT (with the average rating of 4.22 points) and education (4.11) stating the significance of technology and education in the future.

• The respondents aged 26–35 years demonstrated a balanced vision giving precedence to digitalization (4.29) and health care (4.24).

• Middle-aged people (36–45 years) believed digitalization to be a key driver (4.65) and distinguished economics and finance (4.35).

• Elderly people (46–65 years) were moderately optimistic about majority sectors giving top rating to digitalization (4.47–4.81).

Results of VET and HEI Pedagogues' Poll

Competencies Assessment

Pedagogues were suggested to assess the development of various competencies, including both professional and soft skills, on a 1 to 5 scale.

The following skills were rated low:

• Lean Manufacturing: 73% of respondents rated this skill at 1 or 2 points.
• Multiculturalism: 71% of respondents graded this competency at 1-2 points, which evidenced insufficient attention to cultural diversity.
• Projects and Processes Management: only 2% of respondents gave this skill a top rating.

Average Scores:

• Software and robot engineering, AI were rated above average (3–4 points) by 44% of respondents, which indicates initial steps towards digitalization.
• Thirty five per cent. of pedagogues scored operational mindset at 3 points, however, 58% of them believed this competency underdeveloped (1–2 points).

The Highest Rating:

• Forty two per cent. of respondents rated interaction between pedagogues and students at 4 or 5 points.
• Forty six per cent. of pedagogues noted a high level of learning process organization skills.

High Priority Issues

1. Substandard Quality of Selected Prospective Students:

o This issue was deemed the most pressing challenge by 49% of respondents.

2. Critical Deficiency of Academic and Teaching Staff:

o Twenty five per cent. of pedagogues considered it to be a key issue.

3. Absence of On-Job Training for Graduates:

o Twenty one per cent. of pedagogues at VET and HEI believed it to be a serious issue.

Willingness to Reform

• **Willingness to Participate in Educational Programs Development:**

o Thirty six per cent. of respondents expressed such a willingness, however, only 34% of respondents declared their readiness with respect to competencies.

• **Available Resources:**

o Only 26% of pedagogues stated availability of necessary resources.

Conclusion: The poll of pedagogues employed by the Akmola Region educational institutions identified the following core system issues. Shortage of young professionals and high average age of pedagogues call for youth attraction into this profession. In the respondents' opinions, the educational programs in VET and HEI hardly meet labor market needs. In secondary schools there exists a mismatch in the quality of education in urban and rural areas. Project management, multiculturalism and lean production competencies are underdeveloped requiring the revision of approach to education. Pedagogues are willing to participate in reforms; however, they face resources scarcity and low motivation.

Recommendations for the Akmola Region Education System Development

1. Improvement of Career Guidance and Prospect Students Selection

It is recommended to establish regional career guidance centers, integrate profession guidance into school program and organize tours to production facilities. It is also advisable to reduce admission scores for vulnerable communities.

2. Education Programs Revision

It is recommended to devote more time to practice, to introduce modular programs and to cooperate with local employers. It is also advisable to regularly monitor the quality of educational programs using the feedback from graduates and business.

3. Further Training of Pedagogues

It is advisable to organize regular digital technology trainings, sharing the experience among teachers and to introduce mentoring for young talent.

4. Bridging the Education Gap

It is recommended to provide modern equipment, Internet and access to distant learning educational resources to schools in rural areas. It is also suggested to establish digital libraries and online training courses.

5. Pedagogues' Motivation Development

There is an urge to introduce bonuses for achievements, conduct professional contests and introduce recognition and rewards programs. The employment conditions and professional welfare of pedagogues call for improvement.

III.3. Population: Preparedness for New Professions

The results of the poll among the Akmola Region population were analyzed for population preparedness for new professions. Seven hundred forty three respondents (18 to 65 years old) participated in the poll, including both urban and rural residents. The main conclusions are set out below.

1. Preparedness for a Career Switch

The aptitude to transition to new profession varies considerably and depends on the respondent's age and place of residence:

- **Young People (18–25 years old)** have the best appetite for a career switch which is evidenced by 34.9% of respondents. Among 26–35 year old people this aptitude reduces to 38.0% and significantly falls among older people.
- Only 8.1% **56–65 year old** respondents stated their readiness to change profession.
- **Urban residents** were more prepared to change career (30.8%) than ruralists (22.8%).

2. Main Career Switch Causes

The respondents named the following key causes urging their profession change:

- **Desire to increase salary:** 25.2%.
- **Relocation to a different region:** 19.4%.
- **Willingness to work closer to home:** 17.5%.
- Striving for personal and professional growth was also a significant factor: 27.3% of respondents noted their intent to broaden their horizons and build their competencies.

Lack of career development (6.1%) and discontent with current profession (2.7%) were mentioned as less significant causes of a potential career change.

3. Interest in New Professions

The respondents demonstrated their outstanding interest in the following spheres:

- **Education and Science:** 33.0%.
- **Health Care and Medicine:** 13.9%.
- **Industry:** 8.5%.

- **Agriculture:** 7.6%.

Social Work (3.6%) and **Environment Protection** (1.2%) still remain among the most underappreciated sectors.

4. Preferred Modes of Studies

The respondents gave their preference to more flexible modes of studies making it possible to combine their existing commitments with learning.

- **Distance (Online) Learning** was the most popular variant opted for by 43.1% of respondents.
- **Mixed Mode (Online and Off-Line)** was appealing for 26.8% of the respondents.
- Traditional daytime classroom learning was selected by 23.4% of the respondents, and only 6.7% of the residents preferred evening time studies.

5. Professional Skills Assessment

Majority respondents were certain about their knowledge and skills

- Believing that their skills fully complied with existing professional requirements **(48.2%)**;
- Noting the necessity to improve their competencies to match modern environment **(32.7%)**.

Special emphasis should be placed on digital literacy, especially among younger people, 45% of whom pointed out insufficient development thereof.

6. Future Perception

Majority respondents demonstrated optimism about their future

- **32.5%** of respondents were confident about their future;
- **27.6%** of respondents assessed their future "good and bright".

- **19,2%** of respondents, however, were concerned about their future, and 4.6% of the respondents anticipated difficulties.

Conclusion: The findings of the poll among the residents of the Akmola Region evidence young people's and urban residents' readiness for career change, with lower aptitude for such a switch among elderly people and residents of rural areas. Striving for income increase, personal and professional development, as well as relocation are the main drivers of a potential professional switch. Education and science spark the most interest in the respondents; however, social work and environment protection are in the lowest demand.

The respondents give preference to flexible modes of studies, in particular, to distance learning. Despite the respondents' confidence in their professional skills, about one third of them note the necessity to develop their proficiency, especially, in the sphere of digital literacy. In general, the respondents have an optimistic perception of their future; however, some of them are concerned and uncertain about their future.

Recommendations Based upon the Results of the Poll among the Akmola Region Residents

1. Development of Accessible Professional Retraining Programs
In order to meet the needs of youth and city residents, prone to change their professions, it is recommended to develop accessible professional retraining programs focused on the most demanded spheres: education, healthcare, industry and agriculture. Special emphasis should be placed on such programs adaptation to elderly people less apt to switch their careers.

2. Emphasis on Digital Literacy
Targeted initiatives are required to enhance digital literacy of population, particularly,

among younger generations lacking it, in the opinion of a significant number of the respondents. These initiatives may be in the form of short-term online trainings and master classes covering the fundamentals of work with modern technology.

3. Flexible Educational Formats Development

It is recommended to introduce and scale up flexible educational formats, i.e., distance learning and mixed (both online and off-line) models. This will enable such trainings participants to combine learning with their employment and other commitments which is of vital importance for adult jobholders.

4. Inspiring Development and Professional Growth

It is important to introduce the following incentives of career switch and professional development: stipends, grants for those undergoing professional retraining or studying disciplines in high priority spheres.

5. Psychological Support and Career Guidance

It is advisable to establish career counselling and psychological support centers helping people select suitable professions, plan their career and adapt for new labor market challenges in order to reduce anxiety and uncertainty related to the future.

OUR DIRECTION: TRENDS REWRITING THE FUTURE

IV.

IV.1. Processing Industry Future Trends

The global manufacturing industry is undergoing significant changes. More and more companies are using modern technologies to make production faster, better and more convenient. Digitalisation is becoming one of the main tools of such progress. Companies are increasingly using artificial intelligence to help predict errors, manage processes and even save resources. The Internet of Things is being actively implemented - it is a technology in which all machines and equipment are connected to each other through a network, allowing them to 'communicate' and work in concert. For example, in a factory, machines can independently report the need for repairs or automatically order the necessary parts.

Smart factory technology is another step forward. These are production facilities where all equipment is linked by a single system and can quickly adjust to new tasks. For example, if such a factory needs to urgently produce a different product model, it will take much less time to adjust.

Much attention is also paid to the protection of the environment. Many companies are switching to environmentally friendly technologies.

They use solar or wind energy, recycle waste and try to reduce air pollution. This approach helps to preserve the planet and makes the products more popular on the market.

Unilever, one of the world's leading food and household products manufacturers, is actively embracing digitalisation and sustainable practices. The company's factories in Europe and North America are already fully powered by renewable energy, with plans to convert all global operations to sustainable sources by 2030. Unilever is committed to zero carbon emissions in its manufacturing processes by 2039, utilising energy efficient equipment and heat recycling.

The company is actively adopting blockchain for supply chain transparency, for example in the palm oil chain, to trace the origin of raw materials and minimise environmental damage. Product packaging is moving towards recycled materials, with the Knorr brand already using recycled film for soup packaging.

An important trend is flexibility in production. Today, many customers want customised products, so companies are starting to use technologies such as 3D printing to produce small batches of products. This makes it possible to respond faster to requests and save resources.

John Deere, the world's leading manufacturer of agricultural equipment, is actively embracing digitalisation and sustainable practices. In 2020, the company invested $546,000 in CBRS technologies to support 5G and IIoT, modernising plants and improving communication between equipment and control systems. This promotes automation and increased productivity.

On the environmental front, John Deere has reduced operational greenhouse gas emissions by 29% since 2017, recycles 84% of its waste and uses more than 50% renewable electricity. The company is also introducing electrification and biofuels to reduce tailpipe emissions. To improve data transparency in the agribusiness industry, the company has been certified Ag Data Transparent, which certifies it as compliant with modern standards. These measures make John Deere a leader in integrating digital technology and cleaner production.

Akmola Region is confidently keeping pace with global trends by introducing modern technologies in the manufacturing industry and adapting them to regional conditions. Digitalisation is becoming an important tool for increasing efficiency: the region's enterprises are actively using automated management systems, which not only increase productivity but also improve product quality. These steps allow the region to compete successfully in domestic and international markets, meeting the strict requirements of modern standards.

Environmental sustainability also occupies a key place in the development of the region's industry. More and more companies are switching to renewable energy sources, implementing waste recycling systems and working to reduce air emissions. These measures help to preserve nature and at the same time strengthen the region's economic position.

Special attention is paid to the training of qualified specialists. The region is developing dual training, which combines theory with practical training in the workplace. Co-operation between colleges, universities and enterprises helps to train young people in the skills required in modern production. However, the problem of staff shortage is still relevant, especially against the background of competition with high-tech industries.

One of the promising trends is the introduction of flexible production models. This allows enterprises to produce small batches of products, focusing on local demand and reacting faster to changes in consumer needs. At the same time, a challenge remains - dependence on imported equipment and technologies. The development of in-house scientific developments and their integration into production can become an important step towards strengthening the region's technological independence.

GLOBAL TRENDS

1. Technology Digitalization
The manufacturing industry is increasingly utilising modern digital technologies that cover almost all stages of production. This includes smart devices that are connected via the internet, artificial intelligence and automated systems. Such technologies help to make production more efficient, reduce costs, improve product quality and adapt more quickly to changes in the world.

2. Technology Driven Manpower Reduction

Automation and the use of digital technology in production are reducing the need for human labour at many stages. This is especially true for simple and monotonous tasks, where robots and intelligent machines are increasingly replacing humans. This means that fewer employees are needed for such operations in companies.

3. Skills Standards Raising

In modern companies, employees are not only required to have a general education, but also specialised skills. For example, they need to be able to use complex programmes, understand production technology and work with modern automated systems. Employers want graduates to be better prepared to work in this environment.

4. Additional Resources Expansion

The use of recycled materials and waste is becoming a favourable and nature-friendly solution in industry. It helps factories to reduce waste, cut costs and operate in a more environmentally friendly way.

LOCAL TRENDS

5. Innovations Driven Equipment Upgrade

Plants and factories in the region are introducing new technologies, so they need to gradually update their equipment. Old machinery is being replaced with more modern and economical ones so that the enterprises can successfully compete with others.

6. Demand Expansion Implies Fiercer Competition

The demand for manufacturing products is growing, so new companies are emerging and existing companies are trying to strengthen their positions. To remain competitive, companies need to make better and cheaper products.

7. Product Range Expansion in Processing Industries

Companies are producing more and more different products in order to find new customers and respond to people's changing needs. This requires that production is flexible and that companies are constantly coming up with new products.

8. Improvement of Infrastructure Around Production Facilities

When new plants and factories appear, infrastructure is developed near them. Roads are built, schools, hospitals and other important institutions are opened. All this helps people to live more comfortably.

9. Government Control Advancement

When laws and regulations for businesses become better and clearer, it becomes easier for companies to operate. This attracts money for business development and makes their work more open and honest.

10. Labor Practices Amelioration

Automation and digitalisation in production help to produce more products and make work more convenient for employees. Employers are trying to improve conditions by offering social guarantees, collective bargaining agreements and safety to attract and retain good employees.

11. Scientific and Technological Progress and Young Talent Knowledge Gap Increase

The rapid development of technology in production requires young professionals to learn new programmes. If educational institutions do not keep up with these changes, graduates are not adequately prepared for the modern work environment.

12. Jump in Imports of Processing Equipment

Much of the equipment for plants and factories in our region is bought abroad. This makes enterprises dependent on foreign suppliers, complicates the creation of uniform standards and requires a lot of

money for maintenance and renewal of equipment.

13. Low Appetite of Young People to Engage in Technically Sophisticated Labor

Young people are choosing technical jobs less and less often, preferring easier specialities with the same salary. As a result, there is a shortage of specialists in complex and modern industries.

14. Production Duration Increase Due to Geopolitical Climate

When factories depend on foreign materials and parts, this often causes delays in operations. Political problems and delivery difficulties make it difficult to bring in the right raw materials.

15. Accretion of Demand for a Number of Kazakhstan Products

Kazakhstani goods made with care for the environment are becoming more popular. This helps to sell them not only in the country, but also abroad, providing new opportunities for our producers.

IV.2. Future Agriculture and Forestry Trends

Agriculture and forestry are undergoing major changes to cope with global challenges and become more environmentally friendly. Today it is important not only to grow crops and take care of forests, but also to do it using new technologies and taking into account climate change. These changes also concern Kazakhstan, especially Akmola Region, which is one of the main agricultural regions of the country.

One of the main global trends is the introduction of 'smart' agriculture. This means that farmers use special technologies such as drones, sensors (devices that measure indicators in real time) and big data. All of this helps to monitor the condition of fields, save water and fertiliser, and produce more crops. Such technologies are already beginning to

be applied in Akmola Region, which is especially important for combating droughts and other climatic problems.

Another direction is the transition to organic farming. This is a way of growing plants without the use of harmful chemicals. Such products are considered safer and healthier, and they are also becoming popular in markets around the world. Agricultural producers in Akmola Region, who are already successfully growing grain and oilseed crops, can use this trend to offer organic products not only in Kazakhstan, but also abroad.

Organic Valley is a co-operative founded in 1988 in La Farge, Wisconsin, USA. It brings together about 2,000 farmers from the USA, Canada, Australia and the UK specialising in organic agriculture. The company produces and distributes organic dairy, meat, eggs and other food products under the Organic Valley and Organic Prairie brands.

The company actively promotes transparency in food production and agriculture by publishing reports on its impact on the environment and society. Organic Valley is committed to 100% renewable electricity at its facilities and is implementing climate smart programmes focused on regenerative farming systems and soil improvement.

Through its sustainability efforts and support of family farming, Organic Valley has become the largest cooperative owned by organic farmers in the U.S. and continues to make significant contributions to organic agriculture internationally.

Forestry is changing too. Around the world, more trees are being planted and forests are being reforested to slow climate change and protect nature. In Akmola Region, millions of coniferous trees and thousands

of hectares of hardwoods have already been planted. This helps to preserve soil fertility, increase the diversity of plants and animals, and reduce the number of harmful gases in the atmosphere. However, further development requires new machines for planting trees and more specialists in this field.

The lack of human resources remains an important problem. Young people often choose to work in cities because the conditions in rural areas are not always attractive. To change this, we need to create comfortable jobs, improve life in villages and offer training programmes for future agrarians and forestry specialists.

Agrisen is an educational project of Aitas Agro created to prepare students, farmers and teachers to work with modern technologies in agriculture. Implemented in collaboration with the French Ministry of Agriculture and the Kazakh Agrotechnical University, the project aims to bridge the gap between educational programmes and the real needs of the agro-industrial sector.

Participants are trained in precision farming, the use of drones, sensors and weather stations to monitor fields, and the analysis of big data using BI systems. Special attention is given to working with automated machinery and the application of the Internet of Things to manage agricultural processes. Practical training is carried out on real sites, allowing students to apply what they have learnt in a real production environment

Despite all the challenges, agriculture and forestry in Akmola Region have great prospects. Rich natural resources, successful greening programmes and new technologies create a strong foundation for development. If we continue to innovate and support the training of specialists, the region can become an example for others, showing how productivity and environmental care can be combined.

GLOBAL TRENDS

1. Expansion of Demand for Organic Produce
People are increasingly choosing organic products grown without chemicals to eat healthier and care about the environment. Akmola region, as a major producer of cereals, can develop organic farming and enter international markets.

2. Growth of Interest in Resource-Saving Technologies and Transition to Green Economy
It has been proven worldwide that the correct utilisation of resources such as water, energy and soil is essential for successful and sustainable agriculture. Precision technology, drip irrigation and modern agro-technologies help farmers to harvest more crops and do less damage to nature.

3. Acceleration of Geopolitical Developments Deepening Trade Ties
International trade is becoming increasingly connected, opening up new opportunities to sell agricultural products abroad. The Akmola Region, which produces a lot of grain in Kazakhstan, can use this opportunity to export more of its produce, especially now that the demand for food in the world is growing.

LOCAL TRENDS

4. Increased Demand for Farmland Mapping Services, Determination of Agricultural Land Boundaries, Satellite Monitoring and Aerial Survey Services
Agriculture in the region is increasingly using new technologies to better manage the land. Drones and satellites are helping to map fields, monitor their condition and even predict what the harvest will be. This makes farmers' work more accurate and efficient.

5. Increase of Drones Number Used for Forest Management Operations

The Akmola Region forest management introduces drones to monitor forest areas, assess forest condition and take inventory. This technology accelerates process flows, cuts costs and improves forest resources management.

6. High-Margin Crops Production Increase

Farmers start to pay closer attention to growing crops with high added value, i.e., oilseed rape, flax and other oil bearing crops, which increases farmers' growth and enhances their economic stability.

7. Deeper Cooperation between Production and Educational Institutions with a Focus on Dual Education

Continuously increasing number of social agreements among the business involved in agriculture and educational institutions dealing with manpower training targeted at the advancement of staff skills and securing highly professional personnel for the business evidence active development of cooperation of business and education sectors in the Akmola Region.

8. Professionals Shortage Widening

Professional staff shortage is a key issue in agriculture and forestry. Young people ever less often choose agriculture and forestry as the sphere of their endeavors which results in personnel crisis and underperformance.

9. Growth of Multimodal Transportation

Railway, road and water transport is used to ship agricultural produce with ever increasing frequency. Multimodal transportation streamlines logistics and cuts produce delivery costs.

10. Increasing Number of Scientific Brainpower without the Growth of R&D Products and Inventions

Despite the growth in the number of scientific professionals, their work is not efficient enough to transform into applied research and development products supporting agriculture modernization. This

calls for the reinforcement of ties between science and production.

11. Young Professionals Lack of Appeal for Livestock Farming

Cattle breeding loses its appeal to young people. This state of affairs is caused by the sector labor intensity, limited career growth opportunities and insufficient funding.

12. Growing Dependence on Agricultural Produce Imports Impairs National Food Security

The region faces growing volume of produce imports taking down its food independence and requiring government support of local producers.

These global and local trends evidence that the future of the Akmola Region agriculture and forestry will be built using innovations, human capacity expansion and adaptation to changing market environment. Resolution of such challenges will result in new opportunities for the sustainable development of the region.

IV.3. Future Trends in Services Sector

The service industry is changing all over the world, following new technologies and changes in people's needs. Today, more and more attention is being paid to comfort, convenience and personalised service. Global trends show that success in this area is linked to the introduction of digital technologies, environmental care and the creation of unique customer experiences.

One of the most notable trends is digitalisation. More and more people are used to ordering goods and services online, booking restaurant reservations through apps and participating in virtual events. Convenience and speed have become the main criteria for many customers. At the same time, the use of big data and artificial intelligence allows companies to offer personalised offers, taking into account the

preferences of each customer. This is particularly relevant in tourism, education, healthcare and commerce.

Booking.com is a global travel company that uses digital technology to conveniently book accommodation and services. It offers personalised recommendations based on user data and actively supports sustainable tourism. Its eco-tagging system helps travellers choose eco-friendly hotels and properties. Booking.com also introduces new technologies such as mobile apps and virtual tours to make travelling more convenient and accessible.

Environmental friendliness is becoming another important trend. People are increasingly choosing companies that care about nature. This applies not only to tourism, where routes with minimal environmental impact are popular, but also to other services. For example, eco-friendly transport, the use of renewable energy sources in hotels and offices, waste reduction - all this is becoming an integral part of modern companies.

There is also a growing interest in services that give people the opportunity to learn, develop and enjoy new experiences. For example, educational programmes, cultural events, cooking classes and personal growth training are becoming increasingly popular. People want not just to use services, but also to be inspired and benefit from them.

Akmola region is actively introducing modern approaches to the development of the service sector. Tourism remains important, but along with it, such areas as transport, education, healthcare and entertainment are growing in importance. Digital technologies make services more accessible to people, even in remote areas. Cultural and educational initiatives inspire

young people, and environmental projects help to preserve the region's nature.

Nevertheless, the region faces challenges that need to be addressed for further success. These include infrastructure development, training of qualified specialists and introduction of new technologies. If these challenges are met, the region can become an example for others, offering residents and tourists modern, convenient and high-quality services that meet global standards.

GLOBAL TRENDS

1. Increased Interest in Traditions and History

There is a global surge in demand for cultural heritage tourism: travelers strive to learn ethnic customs, visit museums, historical and archeological sites. This promotes broadening of knowledge in cultural heritage and bridging generational gap.

2. Sustainable Tourism Development

Tourists tend to opt for soft tourism, namely, agricultural and ecological tourism. These activities are targeted at minimization of the environment impact, interaction with the nature and support of local communities.

3. Green Technology Use

Introduction of environment-friendly transportation, power saving and wastes management systems has become a mandatory element of modern tourism making it more stable and attractive.

4. Tourist Experience Digitalization

Virtual tours, online reservations, tailored routes and other digital technologies make travel planning more convenient, offer new selection and voyage arrangement opportunities.

The Akmola Region Local Trends
5. Patriotism Based Tourism Development

National tourism goes mainstream. The residents of the region discover the nature and cultural legacy of their country by

visiting Shchuchye-Borovoye Recreational Zone, Burabay National Park and ethnographic complexes.

6. Hotel Services Improvement

Hotel infrastructure modernization and improvement of the standards of services make the Akmola Region facilities more comfortable for tourists meeting modern visitors' expectations.

7. Restaurant Services Improvement

Restaurants development focused on the diversity of the national and international cuisine improves general experience of the region visitors.

8. Reduction in the Number of Tourist Camps for Children and Young People

Despite overall tourism growth the number of camps for children and young people reduces due to insufficient financing and infrastructure problems. This tourist sphere calls for recovery and support.

9. Increased Interest in Cultural and Ethnic Heritage

Tourists ever more frequently select the routes related to ethnic customs, crafts and cultural events which promotes local business and strengthens regional identity.

10. Reduction of Visits to the State National Nature Parkes and Accessibility Thereof

Insufficient infrastructure and complicated transport accessibility restrict the increase of the number of visitors, in particular in remote areas of the region.

11. Investments Growth

The investments into the sector are allocated to construction and modernization of tourist facilities, transport infrastructure improvement and introduction of digital technology.

12. Crafts Driven Tourism Expansion

Artistic routes, including festivals, master classes and cultural events, offering unique experience are gaining popularity among tourists.

13. Increase of Tourist Traffic in Kazakhstan

Domestic tourism active growth is triggered by the improvement of transport infrastructure and tourist routes diversity. Transport infrastructure and organization of transfers make it more convenient to travel in the region and boosting tourist flow.

14. Increased Use of New Tourist Technologies, Green Ones Inclusive

Introduction of power efficient systems and environment-friendly solutions make the region attractive for environment conscious travelers.

ATLAS OF NEW PROFESSIONS IN THE AKMOLA REGION

V.

V.1. New Professions

PROCESSING INDUSTRY

AI ENGINEER FOR MINING

Description:
This specialist develops and introduces artificial intelligence (AI) systems to analyze data and manage process flows; mainstreams existing process flows using AI tools; integrates AI into mining, transportation and processing materials management; trains personnel to work with AI and adapts AI for production needs, as well as introduces changes, and flexibly reacts to modern trends in a speedy manner.

Key Competencies:
awareness of the minerals mining process flows, processing and transportation thereof; proficiency in programming languages required to create and configure AI models; knowledge of big data tools; experience in data collection and visualization to enable decision making; competence in AI algorithms integration into production process flows.

Soft skills:
critical reasoning, system-oriented analysis, forecasting, analytical thinking.

Educational Background:
Bachelor's degree, potentially in an institution cooperating with an R&D establishment and business.

Year to Emerge:
2030

INTEGRATION ENGINEER RESPONSIBLE FOR PROCESS FLOWS AUTOMATION

Description:
This specialist integrates modern automation systems into existing manufacturing processes; develops and tests process lines control algorithms; configures and programs the equipment used for automation; introduces the solutions improving the performance, cutting costs and minimizing human impact.

Key Competencies:
knowledge of fundamentals of automated control systems (ACS) related to production process flows; proficiency in the tools used to create layouts, drawings and technical documents; awareness of relations between various phases of production process flows; competency in the analysis and mainstreaming production chains; having a vision of the manufacturing process flow as a whole; making targeted changes; proficiency in data collection, processing and analysis tools.

Soft Skills:
communication skills, team work, time management, ability to make critical thinking.

Educational Background:
Bachelor's degree potentially in an institution cooperating with an R&D establishment and business; short-term training courses.

Year to Emerge:
2028

IT PROJECT MANAGER FOR PROCESSING INDUSTRY

Description:
This specialist analyzes process flows to identify weak points and gaps in the efficiency thereof; identifies the need in digital and automated solutions; plans and implements projects covering all phases starting from the idea to end product manufacturing.

Key Competencies:
ability to learn current processes, determine weak points and potential improvement points; determination of the requirements applicable to digital and automated solutions; proficiency in data processing tools; knowledge of fundamentals of local area networks, data bases and cloud solutions; knowledge of Industry 4.0 technology (IoT, Big Data, artificial intelligence, machine learning); skills in IT solutions integration into existing manufacturing systems; experience in project management tools use.

Soft Skills:
team work, communication skills, leadership, creative thinking, ability to work under pressure.

Educational Background:
Vocational education and training, Bachelor's degree.

Year to Emerge:
2026

REVERSE ENGINEER

Description:
This specialist reverse engineers software applications to identify the data used in the software application in order to detect weak points and to verify emergency response. His/her task is to improve software applications and ensure technical competitiveness.

Key Competencies:
experience in reverse engineering and analysis of software applications used to determine the structure, algorithms and data thereof; proficiency in reverse-engineering tools; ability to analyze complex algorithms and calculations; experience in the software security analysis, including identification of vulnerabilities, errors in the code and incorrect data processing.

Soft Skills:
mathematical mindset, critical thinking.

Educational Background:
Bachelor's degree, Master's degree.

Year to Emerge:
2028

(RE-)TRAINING COACH

Description:
This specialist identifies the need in new competencies and develops efficient re-training programs for employees.

Key Competencies:
expertise in employee competencies assessment; ability to work with various personalities; experience in conflicts management; ability to develop and update educational programs intended for employees having various level of expertise and to comply with the tasks of specific functions.

Soft Skills:
analytical and creative thinking, emotional intelligence, efficient time management, flexibility and adaptability.

Educational Background:
VET, Bachelor's degree, Master's degree.

Year to Emerge:
2025

HARDWARE RESEARCH AND DEVELOPMENT ENGINEER

Description:
This specialist designs, develops, tests and customizes industrial electronic hardware to meet the needs of a specific company, shop, section in order to streamline its process flows.

Key Competencies:
knowledge and skills in the sphere of digital circuit engineering, design of circuit printed boards, reading and use of modern electronic components; proficiency in special software; competencies in the work with microcontrollers and processors; expertize in the development of production systems interfaces
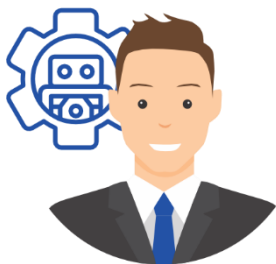
Soft Skills:
communication skills, creativity, focus on innovations, adaptability.

Educational Background:
VET (applied Bachelor's degree), Bachelor's degree.

Year to Emerge:
2029

ROBOTICS ENGINEER

Description:
This specialist operates the robots used to perform certain complex or routine types of production tasks.

Key Competencies:
proficiency in programming languages, ability to engineer the software controlling manufacturing robots, to model the robot design, and configure software; competencies in coordinating operations and working with big data.

Soft Skills:
critical thinking, communication skills, adaptability, creativity, time management skills.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2029

RECYCLING PROCESS ENGINEER

Description:
This specialist develops recycling processes and creates new materials using industrial wastes for the purpose of zero waste production.

Key Competencies:
proficiency in recycled materials analysis, using specialized software applications; recycling processes creation; wastes recycling equipment operation; experience in the development of closed-cycle technology minimizing wastes and integrating recycled materials into process flows; experience in the development and testing of the materials on the basis of recycled wastes; skillful use of mathematical modelling and data analysis methods.

Soft Skills:
analytical thinking, communication skills, creativity, focus on innovations, adaptability.

Educational Background:
VET, Bachelor's degree, Master's degree.

Year to Emerge:
2029

AGRICULTURE AND FORESTRY

Year to Emerge:
2028

FORESTRY DIGITAL ANALYST

Description:
This specialist uses data processing technology and AI to monitor, analyze and streamline forestry management. His/her duties can include the use of satellite images, data obtained using drones, geographic information systems (GIS) and machine learning algorithms to forecast forest growth, to assess the condition thereof, to monitor biodiversity, and to identify threats.

Key Competencies:
experience with GIS, satellite data and other digital tools; software engineering skills and work with big data; experience in the analysis and interpretation of ecological and forest related data; experience in the sphere of AI and machine learning.

Soft Skills:
analytical and creative thinking, focus on innovations, communication skills.

Educational Background:
VET, Bachelor's degree, Master's degree.

Year to Emerge:
2027

SUSTAINABLE FOREST RESOURCES MANAGEMENT EXPERT

Description:
This specialist is involved in the development and implementation of the strategies targeted at long-term preservation of forest ecosystems against the background of their reasonable use; works to reduce an adverse impact on the nature and to recover ecosystems as well as implements sustainable forestry approaches, e.g., certification (e.g., FSC) and impact monitoring.

Key Competencies:
understanding introduction of sustainable forestry principles; experience in the sphere of forest resources management and sustainable use of natural resources; competencies in ecological and environment protection projects development; skills in monitoring and assessment of impact on ecosystems; keen understanding of sustainable forestry standards (e.g., FSC, PEFC); experience in work with GIS and other forests monitoring tools.

Soft Skills:
analytical thinking, communication skills, creative thinking.

Educational Background:
Bachelor's degree, Master's degree.

EXPERT IN AGRICULTURAL EXPORTS AND PRODUCE TRADE

Year to Emerge:
2027

Description:
This specialist develops export strategies, analyzes the demand in various countries and customizes the produce to meet the existing market requirements.

Key Competencies:
understanding of international trade, commerce, world economy and international economic affairs; experience in marketing studies; competencies in statistical analysis tools and specialized software applications used to analyze data; proficiency in the principles of export and import operations.

Soft Skills:
analytical thinking, communication skills, creative thinking, cross-cultural competencies.

Educational Background:
VET, Bachelor's degree.

SUSTAINABLE WOOD PROCESSING TECHNOLOGY ENGINEER

Year to Emerge:
2027

Description:
This specialist is involved in the development and introduction of innovative and environment friendly methods of wood processing. This may include the use of recycled materials, design of more efficient processing and wastes reduction methods. He/she works on the projects targeted at the establishment of green and efficient technologies in wood processing industry.

Key Competencies:
knowledge and experience in engineering and wood processing technology; skills in the development and introduction of sustainable technology; ability to work with environmental standards and the methods of assessment of the impact on the nature; ability to design and manage projects.

Soft Skills:
analytical thinking, communication skills, creative thinking.

Educational Background:
VET, Bachelor's degree, Master's degree.

SATELLITE IMAGES INTERPRETER

Description:
This specialist interprets satellite images to detect weeds, pests and diseases.

Key Competencies:
understanding the structure and biology of agricultural crops; digital cartography skills; fundamental remote sensing skills; skills in data analysis and findings interpretation, proficiency in images processing tools.

Soft Skills:
analytical thinking.

Educational Background:
VET.

Year to Emerge:
2026

PRECISION FARMING EXPERT

Description:
This specialist uses the following modern technology in crops farming: GPS navigation, sensors, software applications, etc.

Key Competencies:
proficiency in core software applications used to analyze soil, weather, condition of plants, and to decide on irrigation; experience of work with GPS navigation and equipment; data analysis skills.

Soft Skills:
analytical thinking.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2026

BIOENGINEER

Year to Emerge:
2026

Description:
This specialist develops and introduces biological methods of crops quality and quantity improvement.

Key Competencies:
development and use of complex biological methods of corps quality improvement; sorting and selection; minimization of the adverse environmental impact; use of biological methods of crops increase; analyzing and testing both raw materials and the environment; assessment of the anthropogenic impact; development of biological fertilizers; experience in modern equipment operation.

Soft Skills:
analytical and creative thinking, communication and organizational skills.

Educational Background:
Bachelor's degree.

AGRICULTURAL DRONES OPERATOR

Year to Emerge:
2025

Description:
This specialist is able to operate unmanned aerial vehicles to perform various tasks in agriculture.

Key Competencies:
ability to operate UAVs; proficiency in the use of software applications; experience in agricultural processes alignment using drones.

Soft Skills:
analytical and creative thinking, communication skills.

Educational Background:
secondary vocational education.

AUTOMATION AND ROBOT ENGINEER

Description:
This specialist develops and installs automated control systems on agricultural equipment.

Key Competencies:
software engineering skills and knowledge in IT; automated systems development skills; knowledge and skills in the sphere of modern agricultural technology.

Soft Skills:
analytical and creative thinking, communication skills.

Educational Background:
Bachelor's degree.

Year to Emerge:
2025

FORESTRY MONITORING DRONES OPERATOR

Description:
This specialist operates UAVs monitoring forest condition.

Key Competencies:
UAV operation skills; proficiency in the obtained data analysis; understanding forest ecosystems; drones technical maintenance skills.

Soft Skills:
analytical and creative thinking, communication and organizational skills.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2025

FOREST ECOSYSTEM BIOENGINEER

Description:
This specialist develops and designs artificial forest ecosystems using gene engineering and biotechnologies.

Key Competencies:
forest crops creation and change skills using gene engineering; artificial forest ecosystems design; re-engineering process flows in the sphere of biotechnology and ecology; ecosystems design skills; knowledge of standards/regulations.

Soft Skills:
analytical and creative thinking, communication and organizational skills.

Educational Background:
Bachelor's degree, Master's degree.

Year to Emerge:
2026

FORESTRY ECOLOGICAL PSYCHOLOGIST

Description:
This specialist is involved in the development of ecotourism programs and the research in the impact of stay in forests on the mental health of tourists.

Key Competencies:
creation of a complex environment integrated with nature in order to ensure mental toughness; assessment of the impact of forests on people; ability to develop rehabilitation programs using natural resources with the focus on avoiding the adverse impact on plants; knowledge of ecotourism fundamentals; analytical and programs efficiency evaluation skills.

Soft Skills:
analytical and creative thinking, communication and organizational skills.

Educational Background:
Bachelor's degree, Master's degree.

Year to Emerge:
2026

WOOD WASTES BIO-ENERGY ENGINEER

Description:
This specialist develops and introduces the technology of biofuel and other power sources production from wood wastes.

Key Competencies:
knowledge in various wood processing methods; experience in process flows design and streamlining; equipment operation skills; assessment of compliance with the environmental regulations and standards; analytical and waste management skills.

Soft Skills:
analytical thinking, communication skills.

Educational Background:
Bachelor's degree.

Year to Emerge:
2026

Agriculturist, Provender Milling Expert

Description:
This specialist controls provender milling for all animal types.

Key Competencies:
chemical analysis of field crops and animal products; forage/fodder/food analysis skills; new food and feeding technology creation; process flows streamlining skills; process flows arrangement subject to animal husbandry peculiarities.

Soft Skills:
communication skills, adaptability.

Educational Background:
Bachelor's degree.

Year to Emerge:
2025

AGRICULTURIST, BREEDER

Description:
This specialist will work in breeding centers. He/she analyzes and assesses the breeding stock, introduces innovative breeding methods, and controls new varieties testing and introduction.
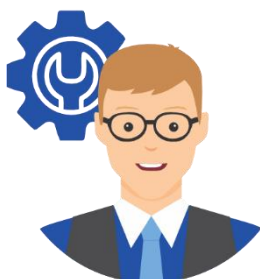
Key Competencies:
ability to breed main agricultural crops (rape, flax, sunflower, grains, vegetables); experience in field work and testing; knowledge and skills in the sphere of plant genetics and physiology; data analysis and processing skills; ability to analyze regulations and standards.

Soft Skills:
communication skills, adaptability.

Educational Background:
Bachelor's degree.

Year to Emerge:
2025

AGRICULTURAL CYBERNETICIST

Description:
This specialist applies modern information technology, automation, data analysis and AI systems in the sphere of agriculture.

Key Competencies:
ability to develop and introduce agricultural production control systems, including the solutions applied to planning, monitoring and automation of process flows; data analysis and big data skills; modern equipment operation skills; experience in introduction of AI and machine learning based solutions for forecasting, streamlining and diagnostics.

Soft Skills:
analytical thinking, communication skills, adaptability.

Educational Background:
Bachelor's degree.

Year to Emerge:
2026

DIGITAL AGRICULTURE EXPERT

Description:
This specialist analyses data in order to streamline agricultural production, develops and supports digital platforms and IoT devices used in agriculture.

Key Competencies:
proficiency in data analysis tools; ability to program and to work with IoT devices; experience in creation of complex smart systems; experience of work with GIS.

Soft Skills:
analytical thinking, communication skills, adaptability.

Educational Background:
Bachelor's degree.

Year to Emerge:
2026

SUSTAINABLE AGRICULTURE SPECIALIST

Description:
This specialist develops and implements sustainable agricultural practices minimizing the impact on the environment.

Key Competencies:
experience in introduction of sustainable development principles; data analysis and monitoring skills; communication and learning skills; ability to use big data analysis methods and statistics to assess sustainable practices efficiency; experience in the analysis of the impact of agricultural operations on the climate, soil, water resources and biodiversity.

Soft Skills:
analytical skills, communication skills, adaptability.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2026

WATER RESOURCES MANAGER

Year to Emerge:
2027

Description:
This specialist manages and streamlines water resources use in agriculture, develops drip irrigation and other water saving technologies.

Key Competencies:
experience in water resources management; ability to develop and implement rational water use strategies in agriculture; experience in the design and implementation of various water saving technologies; data monitoring and analysis.

Soft Skills:
analytical thinking, communication skills, adaptability.

Educational Background:
VET, Bachelor's degree.

AGRICULTURAL ECONOMIST

Year to Emerge:
2025

Description:
This specialist analyzes farms efficiency, assesses profitability thereof, and designs sustainable development strategies.

Key Competencies:
proficiency in data analysis tools; work with big data and economic forecasts generation; project management skills.

Soft Skills:
analytical thinking, communication skills, adaptability.

Educational Background:
Bachelor's degree.

Year to Emerge:
2027

EXPERT IN BIODIVERSITY AND PRESERVATION OF FOREST ECOSYSTEMS

Description:
This specialist assesses biodiversity in forest ecosystems and preserves thereof; develops the strategies to protect rare and vulnerable animals and plants; monitors ecosystems condition; researches human impact on forests biodiversity and takes measures to recover damaged ecosystems.

Key Competencies:
skills in biodiversity monitoring and environmental research; competencies in development and introduction of environment protection programs; experience of work with environmental standards and projects; proficiency in the use of GIS and analytical tools monitoring ecosystems.

Soft Skills:
analytical thinking, communication skills, adaptability.

Educational Background:
VET.

SERVICES

ECOTOURISM MANAGER

Description:
This specialist is responsible for monitoring and minimization of load on tourist facilities and for introduction of green technologies.

Key Competencies:
skills in tourism development strategies and plans, as well as flexible implementation thereof; efficient resources management based upon forecasts and big data analysis; re-engineering of processes bases upon green technology integration; skills in monitoring using big data analysis; analytical skills; analysis of tourist traffic data and natural objects conditions; legal knowledge in the sphere of ecology and tourism, green technology implementation skills.

Soft Skills:
communication skills, adaptability.

Educational Background:
Bachelor's degree.

Year to Emerge:
2028

SUPERVISOR OF DIGITAL TOURIST PLATFORMS

Description:
This specialist creates/customizes (existing platforms) and manages digital platforms used by tourists to make reservations, pay and navigate, including AI application to tailor the services.
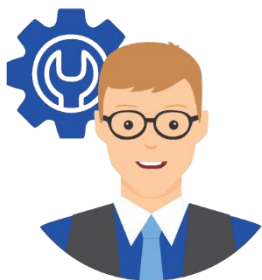
Key Competencies:
big data skills, skills in communications with clients and partners; competencies in AI technology use to customize the services.

Soft Skills:
communication skills, adaptability, analytical thinking, adaptability.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2035

CARAVANNING INSTRUCTOR

Description:
This specialist arranges and supports caravanning tours.

Key Competencies:
competency in planning and coordination of events related to caravanning tours, use of modern IT technologies; proficiency in GPS navigation, tracking and routes management tools; competency in identification of clients' needs and customizing the routes and services to meet such needs; skills in the establishment and maintenance of cooperation with campings, service stations, tourist agencies, and other stakeholders.

Soft Skills:
organizational skills, communication skills, analytical thinking, adaptability.

Educational Background:
VET.

Year to Emerge:
2030

REGION BRAND MANAGER

Description:
This specialist creates and promotes the culture image of the region, including its ethnic, historical and gastronomic peculiarities to attract tourists.

Key Competencies:
proficiency in marketing analysis tools; experience in creation of a strong and identifiable brand of the region; knowledge of the region cultural heritage; digital promotion skills; proficiency in SMM, SEA, SEO optimization tools; competency in the use of analytical platforms; project management skills.

Soft Skills:
creativity, organizational skills, communication skills, analytical thinking, adaptability.

Educational Background:
Master's degree.

Year to Emerge:
2030

TOURIST FACILITATOR

Description:
This specialist is responsible for preparation of tourist facilities and infrastructure for visitors.

Key Competencies:
planning and coordination, efficient communication skills; efficient negotiation and conflicts resolution skills; proficiency in foreign languages (English, Chinese, etc.).

Soft Skills:
creativity, organization skills, communication skills, analytical thinking, adaptability.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2033

HEALTH AND WELFARE COORDINATOR

Description:
This specialist develops tailored wellness programs for the clients of resorts based upon the analysis of their medical data, genetic profile, lifestyle and preference.

Key Competencies:
knowledge of medicine, nutrition and physiotherapy; experience with biometric data and AI systems; experience in communication with clients and advising them; proficiency in systematization and analysis of medical data for the purpose of programs customizing.

Soft Skills:
organization skills, communication skills, analytical thinking, adaptability, emotional intelligence.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2040

RENEWABLE ENERGY MANAGER FOR TOURISM

Description:
This specialist is responsible for the implementation and management of the projects related to renewable energy sources at tourist facilities: solar panels, wind generators, power efficient lighting and heating systems.

Key Competencies:
project management skills, expertise in calculation of costs and economic benefit of renewable power sources introduction; proficiency in the instruments used to analyze and model power consumption.

Soft Skills:
organization and communication skills, analytical thinking, adaptability, emotional intelligence.

Educational Background:
Bachelor's degree.

Year to Emerge:
2040

DESIGNING ANIMATOR

Description:
This specialist develops entertaining programs for all types of guests.

Key Competencies:
basic proficiency in operating the equipment intended for entertaining events; competency in the software creating multimedia content, scenarios, real and virtual spaces design for the purpose of entertainment; conduct of interactive events in the designed mixed, real and virtual spaces.

Soft Skills:
organization and communication skills, adaptability, emotional intelligence.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2026

HYBRID EVENTS MANAGER

Description:
It is an event manager arranging the events combining off-line and online formats (hybrid conferences, weddings, seminars) using state-of-the-art technologies and multimedia.

Key Competencies:
event managing skills; proficiency in multimedia software; project management skills; skills of working with clients; knowledge of fundamentals of budgeting and logistics.

Soft Skills:
organization and communication skills, adaptability, emotional intelligence.

Educational Background:
VET.

Year to Emerge:
2027

VIRTUAL CONCIERGE

Description:
It is a specialist organizing and conducting virtual hotel and neighborhood tours assisting the guests with VR technology use to select rooms, restaurants and entertainment.

Key Competencies:
proficiency in VR technologies; experience in conducting tours; ability to identify the needs of the guests and suggest customized solutions; experience in use of multimedia programs; digital marketing skills.

Soft Skills:
organizational and communication skills, adaptability, emotional intelligence.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2028

HOTEL GUESTS DATA ANALYST

Description:
This expert analyzes data regarding the hotel guests' behavior and preferences, forecasting trends and developing recommendations to improve the service and increase profits.

Key Competencies:
proficiency in analytical tools; competency in the development of forecasting models; skills in using digital marketing tools.

Soft Skills:
organizational and communication skills, adaptability, emotional intelligence.

Educational Background:
VET, Bachelor's degree.

Year to Emerge:
2026

V.2. Transforming Professions

PROCESSING INDUSTRY

1. Manual assembly workers, packers, polishers → Operator (on assembly, packing and other lines). Description: The industry will transition to automated control and will require new competencies in equipment technical maintenance.

2. Freight handlers and general laborers → Driver and operator (handling bark, operating stacker-truck). Description: This transformation will be caused by the use of machines (pallet jacks, stacker-trucks).

3. Planners, draftsmen → 3D designer. Description: This transition will be caused by digitalization and AI use.

FORESTRY AND AGRICULTURE

Forest Engineer → Sustainable Forestry Expert

Description: In the past this industry was focused on wood production, now the main emphasis is placed on biodiversity preservation, ecosystem recovery, fighting forest fires and sustainable use of forest resources.

Transformation Cause: Forest engineer's role changes subject to transition to more sustainable and environment focused forest management methods.

Competencies to be Obtained: knowledge in the sphere of ecosystem services, ecosystem recovery, risk management, forests digital modelling.

Forest Technician → Geoinformatics Expert (GIS-Specialist)

Description: Using GIS enables specialists to conduct spatial analysis, monitor forests condition, track ecosystem changes and plan sustainable use of forest resources.

Transformation Cause: Geoinformation technologies (GIS) gaining importance as the tools to manage forest resources.

Required Competencies: knowledge of GIS platforms, distant probing, big data processing.

Forest Entrepreneur → Forestry Startupper

Description: Entrepreneurs operating in forestry sector may develop the projects aimed at forestry sustainability improvement as well as at new markets establishment for the sector products and services.

Transformation Cause: Recently new forestry business approaches have emerged, including sustainable forestry startups, wood wastes recycling, forestry consulting and innovative technologies introduction.

Required Competencies: entrepreneurship skills, innovative technologies, sustainable development.

Forest Ecologist → Climate Caused Forest Change Expert

Description: Climate changes significantly affect forest ecosystems, requiring experts who can assess such an impact on forests, develop adaptation strategies and mitigate consequences thereof.

Transformation Cause: Climate change.

Required Competencies: climatology, climate change modelling, forests adaptation strategies development.

Forest Ecosystems Protection and Recovery Expert → Bio-Economist

Description: With bio-economics development and the increase in the interest in renewable resources, forestry also commences its transition from traditional use of wood to a wider range of forest resources use to produce bio-energy, bioplastics and other green materials.

Transformation Cause: The expansion of threats to ecosystems, e.g., deforestation, climate change and forest fires, boosts the demand in the professionals able to develop and implement forests recovery and protection programs.

Required Competencies: biology and ecology of forest ecosystems, methods of recovery, experience in environmental projects, nature monitoring, sustainable economy, bio-energy, circular economy, wastes recycling technologies.

Environmental Advisor → Forest Wellness Monitoring Expert

Description: In response to climate change and the increasing number of forest fires, forest pests and diseases, forests wellness experts play an important role in forestry. They use modern technology, drones, satellite images and sensors to monitor forests conditions.

Transformation Cause: Given high environmental exposure, namely, deforestation, pollution and climate change, environmental advisors start to play a crucial role in the development of sustainable and environment friendly forestry practices. These experts assist with the development of strategies minimizing damage to the environment.

Required Competencies: Environmental legislation, ecosystem services, analysis of environmental impact, remote sensing, use of drones to monitor forests, data analysis, bio-technology in forestry sector.

Pyrologist → Forest Fires Prevention Expert

Description: These specialists use digital technologies in the sphere of diagnostics and fighting fires.

Transformation Cause: frequent forest fires.

Required Competencies: knowledge of sensing methods and determination of the fire beds using infrared radiation thereof.

Tractor Drivers → Automated Machines Operator

Description: An operator of automated machines drives and services agricultural machines and equipment with automated and control systems; he/she ensures efficient implementation of agricultural operations using modern technology and automation methods; he/she is responsible for equipment technical maintenance and repair, as well as configuration and programming thereof in compliance with specific production tasks.

Transformation Cause: Configuration and maintenance of complex digital systems.

Required Competencies: Knowledge of fundamental agricultural technology, ability to operate robotized machines with automatic navigation.

Livestock Breeder → Animal Farming Bio-Technology and Automated Systems Expert

Description: This specialist uses bio-technologies, sensors to monitor animal health.

Transformation Cause: use of automated animal feeding and caring systems.

Competencies to be Obtained: knowledge of ethology, work with the software used to calculate and analyze data.

Growing House Laborers → Operator of Automated Growing Houses

Description: This specialist operates automated control systems of hothouses.

Transformation Cause: introduction of automated electrical system.

Required Competencies: experience in operation of automated and digital irrigation, climate and lighting control systems.

Logistics Experts → Cold Chain Expert

Description: This specialist uses modern logistics systems with temperature control and products losses minimizing technology.

Transformation Cause: Changing logistics environment and perfection of equipment and technology.

Required Competencies: knowledge in systems and logistics monitoring skills

Agronomist → Agricultural Cyberneticist

Description: Agronomist is becoming a universal specialist combining the skills of a software engineer and an agricultural engineer.

Transformation Cause: Due to quick IT development and use thereof in agriculture it is insufficient to be an agronomist.

Required Competencies: He/she must be proficient in information technologies used in agriculture.

Worker at a Warehouse of Seeds, Fertilizers and Chemicals → Operator of Automated Inventory Management System

Description: This specialist uses automated warehouse systems.

Transformation Cause: Automation of warehouse process flows.

Required Competencies: Experience of work with automated inventory management systems.

Agrochemist → Fertilizers Ecological Control Expert

Description: This specialist uses precision technology to calculate fertilizers dose.

Transformation Cause: Introduction of green technologies and fertilizers use optimization.

Required Competencies: Experience of work with the software calculating and analyzing data.

Electrical Engineer at an Agricultural Production, a Farm → Electrical Systems Automation Expert for Agricultural Production

Description: This specialist uses automated systems controlling electrical supply networks.

Transformation Cause: Introduction of automated electrical systems.

Required Competencies: Experience of work with automated and digital control systems.

Forest Foreman →Forest Digital Monitoring Expert

Description: This specialist applies modern technology to survey and manage forest lands.

Transformation Cause: Use of drones and satellites to monitor forests.

Required Competencies: Experience in operation of drones.

Quality Control Process Engineer → Eco-Process Engineer

Description: It is eco-process engineer's duty to develop and implement the measures aimed at minimization of human adverse impact on ecosystems, to

supervise the compliance with the eco-safety standards, to ensure the compliance with environmental standards and rules.
Transformation Cause: It is necessary to control manufacturing of green products.
Required Competencies: Knowledge of products safety.

SERVICES

Guide → Interactive Tours Guide
Description: A classical guide is transformed into the one conducting interactive and immersive excursions using digital technology.
Transformation Cause: Digital technology development and increased demand for interactive formats.
Required Competencies: Experience of work with VR/AR, multimedia content creation skills, public speeches, foreign languages.

Hotel Administrator → Smart-Hotel Operator
Description: A traditional administrator is transformed into a person operating automated hotel services systems.
Transformation Cause: Introduction of smart hotel business technologies.
Competencies to be Obtained: Experience of work with hotel managing digital platforms, smart systems maintenance, fundamentals of IT and cyber security.

Tourist Manager → Customized Routes Advisor
Description: Tourist management transformation triggers the demand in the personnel developing routes based upon data analysis findings and customer preferences.
Transformation Cause: Widespread use of AI to customize tours.
Required Competencies: Experience in data analysis and CRM systems, knowledge of cultural peculiarities of the region.

Tourist Agency Accountant → Financial Analyst and Tourist Strategist
Description: Now an accountant must combine accounting functions with financial analysis, planning and risk management.
Transformation Cause: Digitalization and automation of process flows, business structure change (globalization), integration of finance and analytics.
Required Competencies: analytical thinking and financial planning skills, knowledge of international financial accounting standards, competency in the sphere of automation and digital technology, cloud accounting systems.

HR Expert/HR-Manager → Talent Manager in Tourism
Description: Human Resources experts/functions transform into the staff responsible for both personnel recruitment and adaptation, as well as for designing talent management strategy, corporate culture development, career development and talent retaining system design.
Transformation Cause: Automation growth and AI use, shift in human resources management philosophy with a focus on talent development, nurturing loyal, efficient and highly engaged personnel.
Required Competencies: experience in HR-technologies and personnel recruitment automated systems, competencies in managing distant and hybrid teams, employee branding experience, knowledge in the fundamentals of psychological wellbeing and corporate social responsibility.

Museum Employee → Supervisor of Digital Cultural Heritage
Description: Now museum personnel morphed into the experts able to create and manage museum exhibitions using modern digital technology, i.e., virtual reality (VR), additional reality (AR), interactive multimedia and AI.
Transformation Cause: Growing interest in virtual and interactive formats of museum exhibitions, necessity to adapt to the needs of new generations of tourists appreciating innovations and customized experience.

Competencies to be Obtained: Digital platforms management to establish interactive exhibitions, experience in VR/AR, multimedia and 3D modelling, experience in AI use to customize museum experience, communication and promotion of cultural content on international platforms.

Tourist Marketing Expert → Digital Marketing Manager
Description: Tourist marketing experts transform into the specialists developing and implementing marketing strategies placing emphasis on digital channels, social media, online reservation platforms and virtual tours.

Transformation Cause: Extensive use of digital technology and online tourist services, tourist behavior change, growth of customer experience significance and tailored offers.

Required Competencies: Knowledge in SEO and SMM, work with Google Analytics, Meta Ads, and other platforms, experience in use of AI to analyze customer related data and trends forecasting, digital reputation and customer feedback management.

EDUNAVIGATOR.KZ – FUTURE PROFESSIONS GUIDANCE

VI.

EduNavigator is a platform specifically designed for professional guidance of school children, guidance counsels and representatives of Kazakhstan education managing bodies.

The platform offers professional diagnostics, being a key component of career guidance, including the following aspects:

− school children's vision of their character traits and interests;

− assistance with professional identity definition and career forecasting;

− career choice subject to personality and aptitude;

− Recommendations regarding professions and educational institutions.

Specific emphasis is placed on secondary and senior school students during their early professional identity building. The platform helps school students get to know their personality, familiarize with professional world and adopt a conscious approach to career choice.

The diagnostic test accessible on the platform consists of four phases:

1. Determination of psychological type and aptitude using RIASEC Code Test suggested by John Holland (realistic, investigative, artistic, social, enterprising, conventional types).

2. Selection of the economic sector of interest.

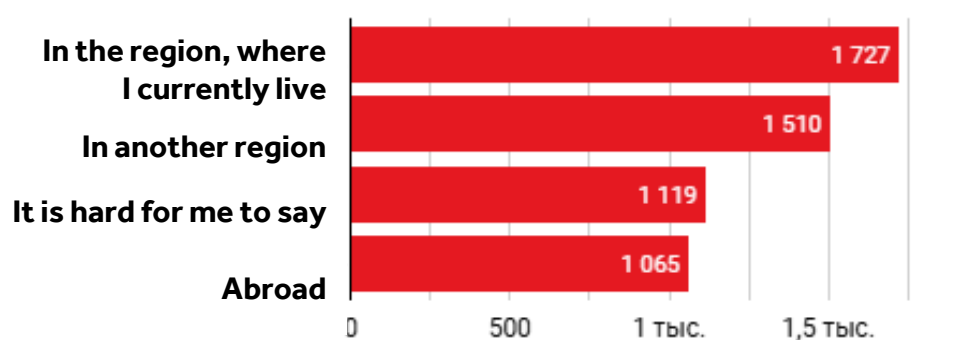**3. Identification of personal values** to clarify career recommendations.

4. Final report generation, including the description of the kid's psychological type, skills, interests and a list of recommended professions.

EduNavigator suggests a personalized approach to career guidance promoting conscious choice of profession and educational institution to achieve the career goals.

Five thousand four hundred twenty one students of the 9th grade representing 467 schools throughout the Akmola Region underwent career diagnostics.

The following chart sets out the Akmola Region school students preferences regarding the place of their further education upon graduation from secondary school. The diagnostics finding evidence that the majority of students (1,727) would like to continue their education in the Akmola Region where they currently reside. One thousand five hundred ten students plan to study in a different region, one thousand one hundred nineteen were not able to respond and one thousand sixty five students intend to continue their education abroad.
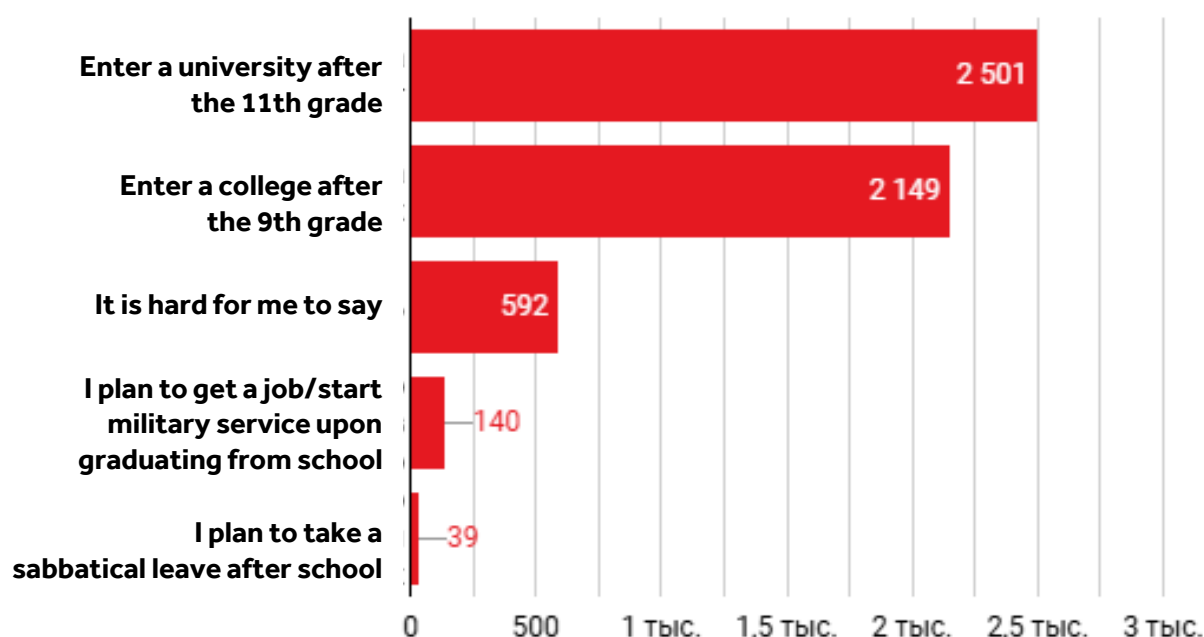
This gives an idea of the education plans of the schoolers in the region. Educational institutions and local organizations engaged in career guidance are urged to intensify their activities targeted at informing school graduates about the possibilities to study and work in the region. This approach may strengthen local potential and retain talent.

Planning the location of studies upon graduation from school

The chart below reflects the Akmola Region school children's preferred post-graduation plans. Majority schoolers (2,501) plan to enter a university after the 11th grade, 2,149 children favor an idea to continue their studies in a college after the 9th grade, and 592 students consider the choice of their further path challenging. Few students (140) plan to find a job or to enter military service, and 39 students think about taking a sabbatical leave.

The above data highlights the importance of active career guidance to support the students in their conscious decision making. It is recommended to arrange personalized advice, career guidance trainings and informative meetings to give the students an impression of the opportunities of higher and vocational education and training, as well as the career prospects in the region and outside thereof.
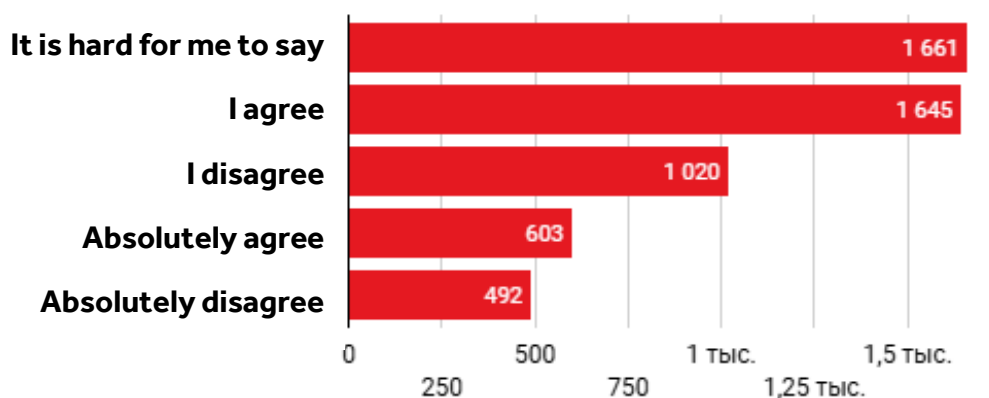

Postgraduate development trajectory planning

The most part of the Akmola Region schoolers were content with the career guidance activities: 2,248 students believed its level appropriate, 1,661 found it difficult to answer (which fact evidences their insufficient awareness of the events conducted), 1,020 school children did not agree with the quality of the career guidance work and 603 absolutely agreed and 492 absolutely disagreed with the quality of such measures.

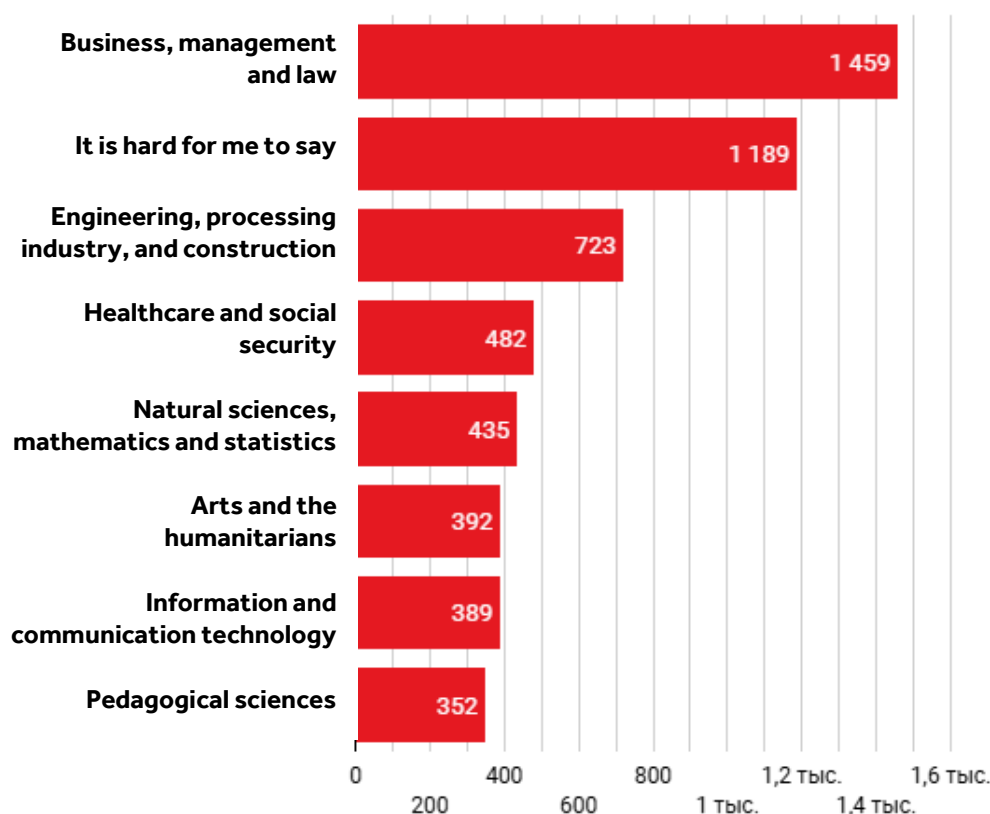This emphasizes the necessity to improve career guidance in the schools of the region. In order to mend the situation it is recommended to expand the information provided to children using individual consultations, group events and tests, and to actively engage experts to conduct occupational guidance sessions. The diversity of forms of interaction with students may boost their involvement and their satisfaction, and may help them get a more clear idea about available career opportunities.

Satisfaction with career guidance counselling activities in schools

In accordance with the data presented on the chart below business, management, and law are the most popular sectors among the Akmola Region school students, which fact is confirmed by the choice thereof by 1,459 people. "It is hard for me to say." is the second most popular answer selected by 1,189 students having no clear preferences. The professions in engineering, processing industry, and construction sectors were appealing for 723 students, with 482 students interested in healthcare and social security. Natural sciences, mathematics, and statistics were selected by 435 people. Three hundred ninety two students opted for the arts and humanities, 389 schoolers preferred information and communication technology and 352 children favored pedagogical sciences, making it the least sought-after occupation.

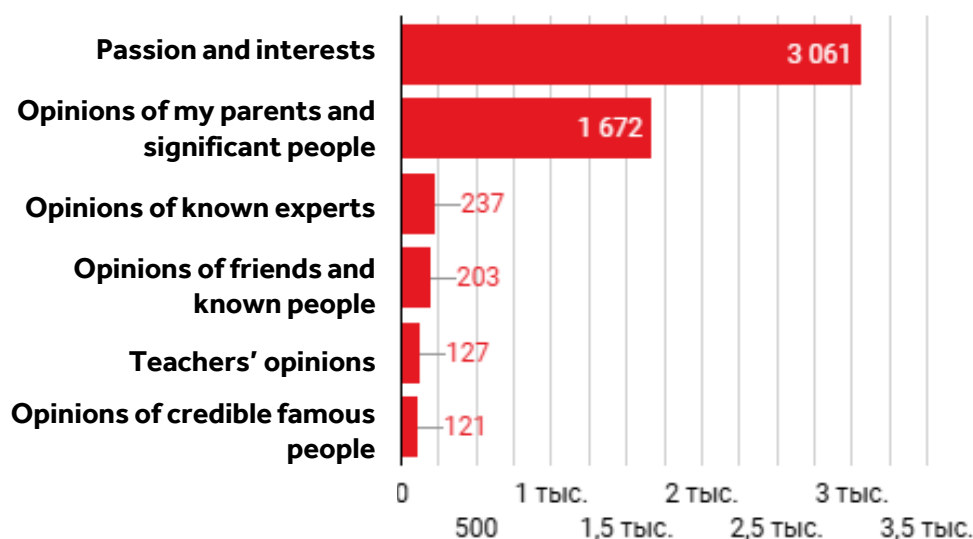**Preferences with a breakdown by the economy sector**

These data point out the need in giving more details regarding professional opportunities and ramping up the promotion of least popular occupations.

The analytical findings related to occupation preferences of school students in the Akmola Region demonstrate that most students (3,061) base their career choice on their passions and interests. Their parents' point of view ranks second determining the profession decision making by 1,672 children. Two hundred thirty seven school children take into the account the opinion of the representatives of the profession of their choice they know, with 203 children taking into the account the views of people they know. Only 127 school children pay attention to the opinions of

their teachers, and 121 respondents are guided by the opinion of famous people they know.

The above findings bring out the importance of personalized approach to career guidance. It is urged to enhance the support of students by studying their interests and informing them of the career opportunities corresponding to their hobbies. It is crucial to get students' parents involved in career guidance through the programs helping them understand their children's needs. School teachers should be offered special training to enable them to actively support their students in the selection of their career path. Such a complex approach will help the students make more conscience career choice.

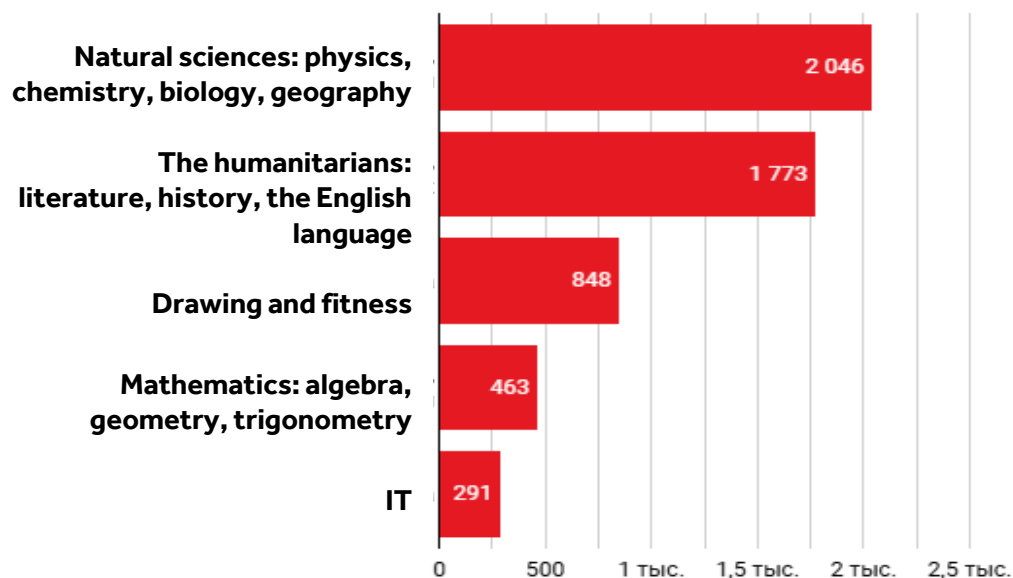**Factors affecting the profession choice by school students**

The findings of the analysis of data related to the choice of major disciplines for the Single National Test (SNT) by the Akmola Region school students reflect that most children (2,046) are interested in natural sciences (physics, chemistry, biology, geography). The humanitarians (literature, history, the English language), selected by 1,773 people, rank second. Drawing and fitness are appealing for 848 students, 463 children are keen in mathematics (algebra, geometry, trigonometry), and 291 student

prefer IT, making this discipline the least popular.

These findings stress significant interest in the humanitarians and natural sciences potentially related to the career opportunities expectations and to the fact that educational programs are focused on such disciplines. Low interest in IT is, perhaps, caused by insufficient resources, qualified staff or information regarding the opportunities offered in this sector.

It is recommended to enhance the promotion of technology disciplines by way of career guidance events, practical classes and creating the awareness of career opportunities in IT and engineering.
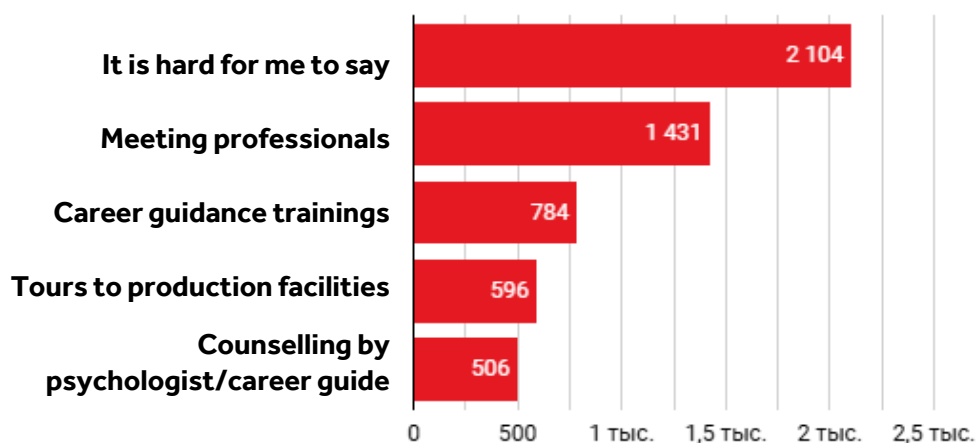
EduNavigator, containing Kazakhstan specific information regarding the sought-after professions in such sectors, can enhance the interest in such occupations.

Preferred SNT major disciplines

The above findings evidence that a considerable part of school children that underwent diagnostics in the Akmola Region are interested in career guidance events involving contacts with professionals, 1,431 students would prefer to meet experts. However, 2,104 students find it difficult to select the most useful activities. Career path determination trainings, tours to production facilities, and psychological advice sparked the interest in 784, 596 and 506 students, respectively.

These findings highlight the importance of interactive forms of career guidance and the necessity to enhance students' contacts with the professional world. It is recommended to develop complex programs including trainings, meetings with various experts, tours and individual counseling. This will help the students better understand their interests and aptitudes as well as to become aware of the opportunities offered by different occupations.

Preferred career guidance events

Internet search used by 2,233 school students appears to be the most popular tool of career path selection in the Akmola Region. Career guidance tests, mentioned by 813 students, rank second. At the same time, 727 students have never reflected on their future profession, and 1,124 noted their inability to find a suitable answer. Five hundred twenty four students were counselled by career guidance experts.

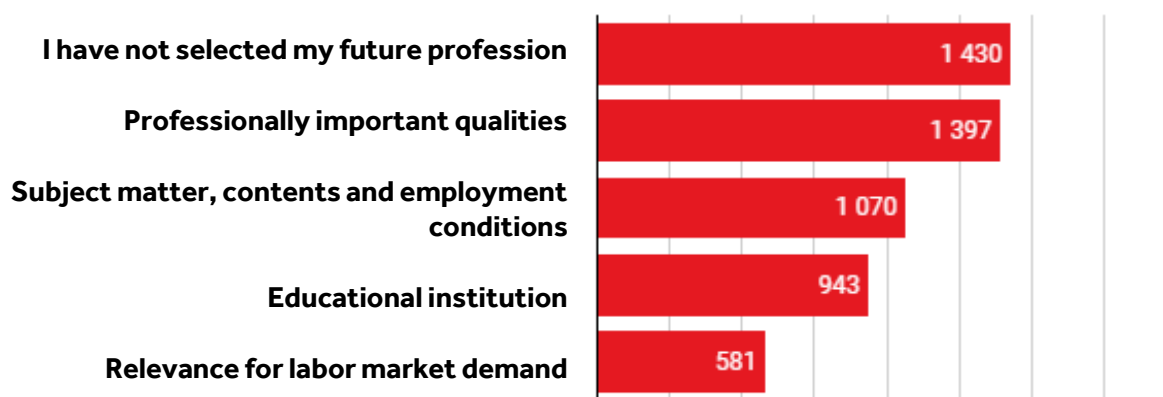This demonstrates that students are in active search for information, however, not always they have access to high quality resources or professional assistance. It is urged to enhance the focus on provision of reliable information through credible platforms, e.g., EduNavigator, offering accurate career aptitude tests and updated Kazakhstan specific information regarding professions in various sectors. This will enable school students make more conscious decisions on their future career paths.

Preferred career guidance tools

Majority students (1,430) in the Akmola Region have not selected their future professions yet, which underlines the importance of career guidance. One thousand three hundred ninety seven students are interested in relevant professionally important qualities, ranking this aspect second in terms of its priority. One thousand seventy students display interest in the subject matter, contents and employment conditions of relevant occupations. Less attention is given to the place of studies (943 students) and the demand for the relevant profession in the labor market (581 students).

This indicates that, currently, career guidance is focused on personal aspects, however, failing to deal with actual employment prospects and educational opportunities. It is recommended to supplement career guidance programs with the information regarding sought-after professions and available educational institutions. Such actions may include master classes, meetings with various experts, and use of different platforms, e.g., EduNavigator, containing up-to-date information on career opportunities and employment conditions.
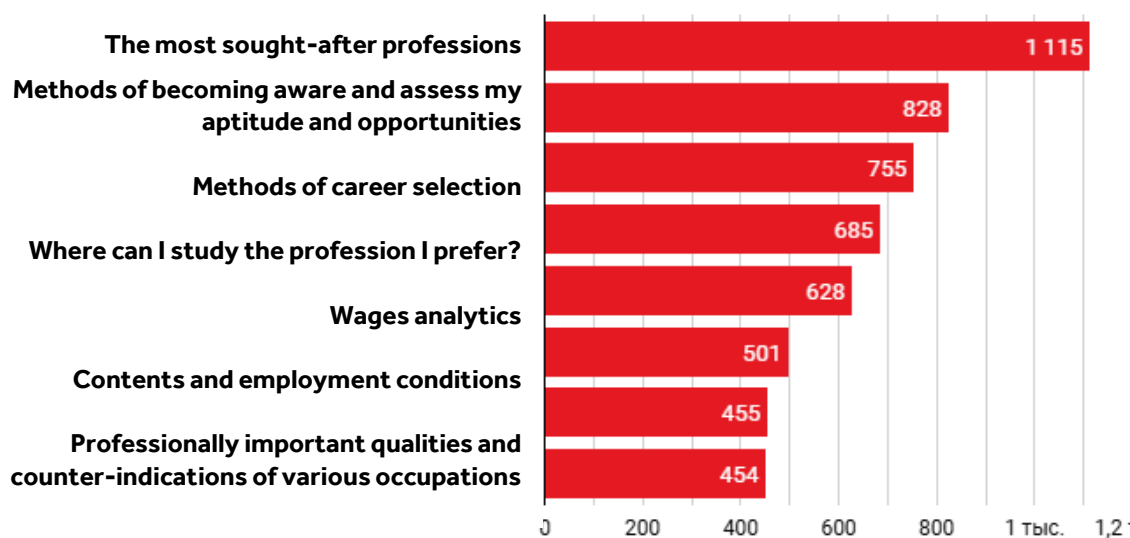
I have not selected my future profession	1 430
Professionally important qualities	1 397
Subject matter, contents and employment conditions	1 070
Educational institution	943
Relevance for labor market demand	581

Students' awareness of their future occupation

When asked the Akmola Region school students (1,115 people) stressed the importance of information on in-demand jobs for their career guidance which reflected their strive for giving consideration to market trends. Significant number (828 people) of students noted insufficient information regarding their aptitudes and opportunities assessment. Seven hundred fifty five students expressed their motivation to know about global occupations, and 685 students required data on career selection methods. It was important to have information on educational institutions offering relevant programs for 628 students, and 501 students were keen on the amount of wages. Less attention was devoted to the contents and employment conditions (455 students) and professionally important qualities (454 students).

These findings highlight the necessity to expand the career guidance efforts focused on provision of actionable insights regarding labor market, sought-after professions and the methods of aptitude assessment. It is recommended to introduce into the educational programs the sections dedicated to the analysis of professional opportunities, market trends and personal skills development. The use of career guidance platforms and special tests can significantly reinforce students' awareness of and readiness to make a conscious choice of their future occupation.
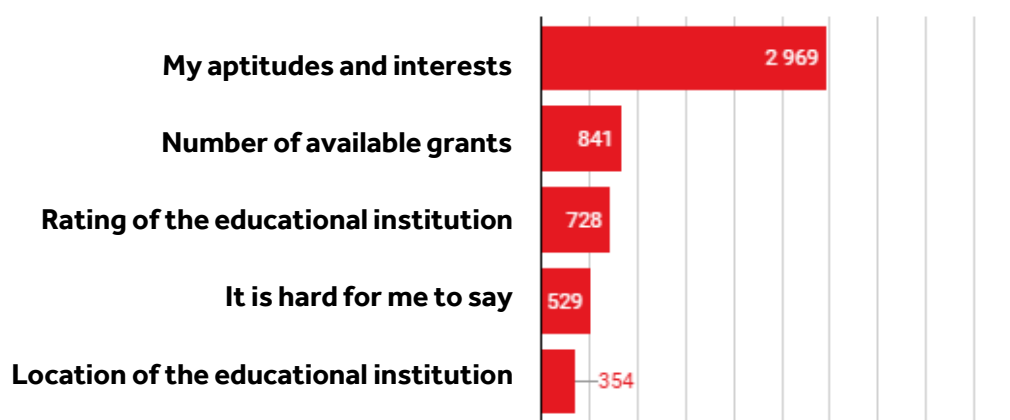
The most sought-after professions	1 115
Methods of becoming aware and assess my aptitude and opportunities	828
Methods of career selection	755
Where can I study the profession I prefer?	685
Wages analytics	628
Contents and employment conditions	501
Professionally important qualities and counter-indications of various occupations	454

0   200   400   600   800   1 тыс.   1,2

Required knowledge of future profession

The chart below sets out the factors that the Akmola Region school students believe important when deciding on their occupations. Students' aptitude and interests are the top rated aspects (2,969 students) defining the tendency to select the profession based upon personal preferences. Financial aspects, i.e., the number of grants available for any specific profession, are important for 841 students revealing their practical approach to education planning. The rating of the educational institution ranks third among the factors stated by 728 students. Five hundred twenty nine students found it difficult to answer, which evidenced the importance of expansion of career guidance activities. The location of the relevant educational institution appeared to be the least important factor mentioned only by 354 students.

This emphasizes the significance of customized approach and provision of comprehensive information to students regarding educational opportunities and available grants driving their conscious and well informed decisions.

Factor	Value
My aptitudes and interests	2 969
Number of available grants	841
Rating of the educational institution	728
It is hard for me to say	529
Location of the educational institution	354

Factors influencing career choice

Recommendations based on the results of the professional diagnostics:

At the level of the Department of Education of Akmola Region

• Involvement of large employers in the region in career guidance events to demonstrate real career opportunities, in-demand professions and employment prospects, especially in such areas as mining and natural resources, information technology and engineering specialties.

• Providing access to complete and standardized information on educational programs, admission conditions and the number of grants for universities and colleges in the Akmola Region.

• Conducting information campaigns on the importance of in-demand professions in the region and career support in key economic sectors.

At school level

• Organizing professional development courses for teachers on career guidance so that they can provide students with relevant advice based on current data on the labor market, working conditions and career prospects.

• Conducting meetings with representatives of various professions, including the extractive industry, IT, healthcare and engineering, to broaden students' understanding of career options.

• Supporting educational psychologists in career guidance work by providing up-to-date information on professions, including their demand, salary levels, working conditions and training.

• Strengthening interactions with professionals who can help students assess their abilities and interests in the context of modern career opportunities.

In the process of career guidance

• Regularly conducting tests and diagnostics to determine the interests, abilities and preferences of students, including the use of digital platforms for automatic analysis of test results, which will reduce the workload of teachers and speed up the process of providing recommendations.

• Implementation of an updated database of professions, adapted to the specifics of the Kazakhstani labor market, to provide students with accurate information on the content and conditions of work in various professions.

• Regularly updating the "Career Guidance Map" of students using digital tools to track changes in interests and adjust recommendations in accordance with labor market trends.

• Organizing excursions to regional enterprises to get acquainted with real working conditions in different industries.

• Strengthening interaction between schools and the education department to analyze students' career preferences, exchange information and develop joint career guidance strategies.

CONCLUSION

VII.

The Akmola Region Atlas of New Professions and Competencies is a tool preparing the region for future challenges. It combines the analysis of current trends, forecasted labor market changes, and recommendations related to educational system development. Atlas is a guide for school children, students, pedagogues, parents and employers assisting them to make an informed choice of a career highly-demanded in the next 5-10 years.

This instrument both permits identification of new and transforming professions and helps designing the educational programs meeting the needs of the regional economy. Special emphasis is placed on the development of future competencies, namely, digital literacy, environmental consciousness, innovations management and ability to adapt to changes.

This Atlas highlights the importance of joint efforts of business, educational institutions and state authorities in creating the opportunities for successful personnel training. The achievement of this Atlas goal will enhance the region competitive edge and ensure its sustainable social and economic development.

The use of this Atlas in educational and career guiding activities will help secure successful future for young generation and strengthen the position of the region on the map of Kazakhstan innovative economics.