

**2020-2023 National Program  
for Research and Innovation**

**I. DESCRIPTION OF THE SITUATION IN THE FIELD AND IDENTIFICATION OF PROBLEMS**

*Description of the situation*

1. It is indisputable that research and innovation are the engine of economic growth and generator of solutions to overcome the challenges that society face. The level of development of these areas directly affects the economic competitiveness of a country and the level of population's resistance to the consequences of changes experienced by the humanity.

2. According to the *economic rationale for public R&I Funding and its Impact* study, implemented by the European Commission in 2017, about two thirds of European economic growth are due to investments in innovation <https://publications.europa.eu/en/publication-detail/-/publication/0635b07f-07bb-11e7-8a35-01aa75ed71a1/language-en>. Overall, the return on public investment in research and innovation is estimated at about 20%, their 10% increase leads to the 1.7% increase in total productivity of production factors, which leads to a higher rate of economic growth. The importance of tangible and intangible results of research and innovation activities made the most European countries recognise these areas as strategic ones.

3. In case of the Republic of Moldova, 'MOLDOVA 2020' National Development Strategy, approved in 2012, stipulated that the paradigm of economic development during the Strategy implementation will imply attracting the investments, developing the export industries, promoting a knowledge-based society, by strengthening research and development, innovation and technology transfer activities focused on effectiveness and competitiveness. However, despite this goal, the reality of recent years provides us an underfunded and fragmented research and innovation system. It is far from being considered strategic and relevant for the real sector of the economy.

4. Taking into account the importance and relevance of the research and innovation activities' results in achieving the Sustainable Development Goals (SDGs) in the three main areas – economy, society and environment, the fields of research and innovation will be fully involved in achieving the targets of SDGs. The Republic of Moldova took over these SDGs according to the 2030 Agenda, adopted on 25 September 2015 at the Sustainable Development Summit in New York by 193 UN member states, including the Republic of Moldova.

5. The Republic of Moldova was the first country in the Eastern Partnership to obtain the status of associated state in the European Union Seventh Framework Program for Research, Technological Development and Demonstration Activities (2007–2013), and subsequently under the 'Horizon 2020' EU Framework Program for Research and Innovation (2014–2020). Due to this fact, Moldovan entities had much more opportunities to access European research projects. At the same time, the impact of this key outcome on national research and innovation system was reduced thanks to lacking national investments in the development of the research and innovation organisations' capacities to join transnational projects and initiatives equally with European research and innovation organisations (including the lack of co-funding to date), and thanks to rigid national procedures, which hindered the management of the projects received.

6. Analysis of expenses for research and innovation activity, covered by 2018 National Public Budget, shows that only 3.1% of them were focused on capital investments, while the remaining 96.9% were current expenditures. Compared to 2017, by MDL 31.8 million (7.9%, respectively) more funds were spent for research and development activity in the public sector <http://statistica.gov.md/newsview.php?l=ro&id=6348&idc=168>. In case of our country, the total costs

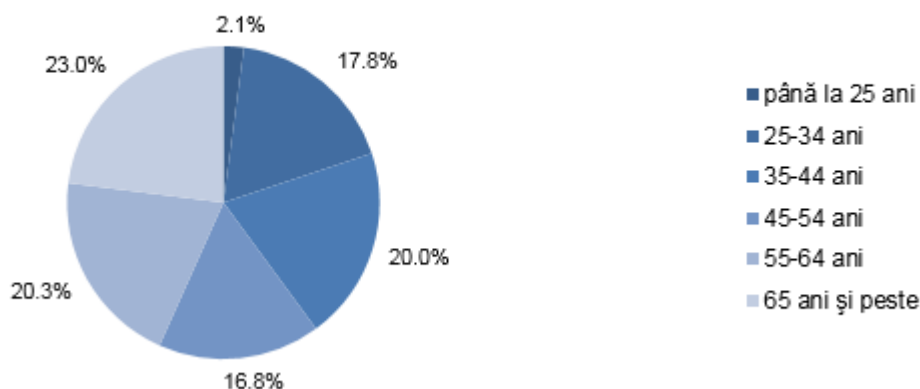
for research and innovation *per capita* amount to about EUR 6.6, 80 times less than the European Union average (data from *Peer Review of the Moldovan Research and Innovation System* <https://rio.jrc.ec.europa.eu/en/library/horizon-2020-policy-support-facility-peer-review-moldovan-research-and-innovation-system>). Under these funding conditions it is difficult to design a trajectory of accelerated development of the field and achieving the European goals for funding research and innovation.

7. This National Program for Research and Innovation (hereinafter – National Program) is based on the premise that expenditures for research and innovation should be considered rather national investments, than budget expenditures.

8. The research career is not in the top of the young people’s preferences, in 2018 there were 1569 PhD students, by about 50 and 100 persons less than in 2017 and 2016.

9. We will state that the number of researchers reported per million inhabitants by 4.5 times lower in the Republic of Moldova than the European average. Other negative phenomena affecting the quality of staff involved in research are emigration and increasing average age (in 2017, about 22% of researchers were aged 65 and over, and in 2018 this percentage reached 23%) <http://statistica.gov.md/newsview.php?l=en&id=6348&idc=168>. Note that, according to the 2018 Report on the Global Competitiveness Index, the Republic of Moldova ranked 88 (from 140 countries analysed) <http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf>

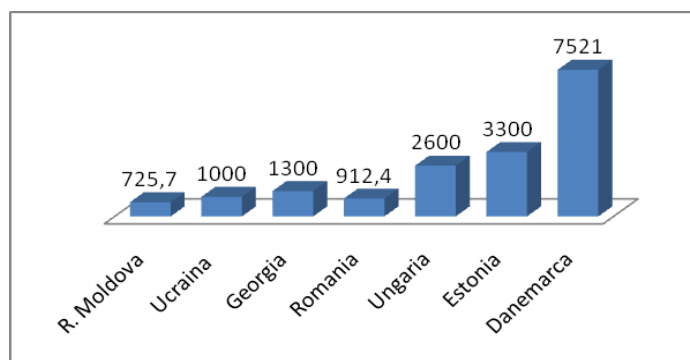
Figura 1. Structura cercetătorilor pe grupe de vârstă, în anul 2018



Source: National Bureau of Statistics

10. A constant vulnerability of the scientific activities’ relevance is related to the weak connection between the scientific community and the business environment. The result of the lack of dialogue between representatives of the two spheres at the national level is that business environment insufficiently implements results of research in practice and absorbs new technologies (including from outside). Note that, according to the data of the ‘2015-2016 Innovation Activity of Enterprises in the Republic of Moldova’ study of National Bureau of Statistics, under the cooperation on the innovation of products and processes, only 13% of the innovative enterprises indicated the universities and research institutions as cooperation partners, 28% indicated the equipment, materials, components or software providers as cooperation partners, 26% – other enterprises and 25% – clients or buyers.

Figure 2 Number of researchers (full time) reported per million population (2016)



Source: UNESCO Institute of Statistics

11. In 2016, the research and innovation system in the Republic of Moldova was assessed thanks to the involvement of a group of international experts under the H2020 Policy Support Facility. This resulted in seven political messages, supported by twenty four detailed recommendations. These messages mainly refer to the proposals to strengthen the research and innovation system in the Republic of Moldova by addressing a set of structural deficiencies and enhancing the existing strengths. As a result of the recommendations, the Government of the Republic of Moldova empowered the Ministry of Education, Culture and Research (MECR) to develop public policies in the field of research and development. At the same time, Government established the National Agency on Research and Development (NARD), which implements the state policy according to the Action Plan approved by the Government to implement the National Program and sectoral strategies. NARD also manages the budget approved for funding the projects, in line with the regulatory framework.

12. This National Program aims to implement a complex set of activities designed to address the deficiencies identified and provide the conditions needed to increase the effectiveness, relevance and international competitiveness of the research and innovation system in the Republic of Moldova. National Program also has a comprehensive vision on research and innovation, thus overcoming the fragmentation created by the existence of two sectoral Strategies, *Research and Development Strategy of the Republic of Moldova until 2020*, approved by GD No 920/2014 and the *'Innovations for Competitiveness' 2013-2020 Innovation Strategy of the Republic of Moldova, approved by GD No 952/2013*.

13. In the context of the purpose to enhance the impact of research and innovation results' activities on the business environment and society as a whole, the National Program aims to adopt and transpose the principles of smart specialisation. **Smart specialisation** sets the priorities identified in a participatory manner, to create a competitive advantage by developing own research and innovation's strengths and correlating them with the business environment's needs to coherently address the emerging opportunities and market developments, avoiding overlapping and fragmentation of efforts <http://s3platform.jrc.ec.europa.eu/home>.

14. At the same time, the development of the National Program complies with the provisions of the Code on Science and Innovation of the Republic of Moldova No 259/2004 with further amendments. At the same time, the National Program's actions are congruent with the activities stipulated in *the 2019-2021 Roadmap for the Integration of the Republic of Moldova into the European Research Area*, approved by the Government Decision No 1081/2018, building the capacities necessary for the research and innovation system to explore the opportunities resulting from the status of country associated to European Union research and innovation framework programs and promoting the national priority of integration in the European Research Area (ERA).

#### *Identifying issues*

15. Research and innovation system in the Republic of Moldova faces a number of vulnerabilities limiting its functionality and relevance, the most important ones being:

- The modest role assigned to the research and innovation activities under the public policy system;

- Insufficient funding of research and innovation system, low value of research and innovation under government policies and sectoral programs;
- Low efficiency of research and innovation activities and sporadic implementation of research results;
- The shortage of researchers and small share of young people;
- Outdated facilities and research infrastructure not connected internationally;
- The lack of convergence between research and innovation activities in the public sector and the country's social-economic needs;
- Low visibility of research and innovation at the level of society and of results of national scientific research at the international level;
- Relatively modest participation in international projects and initiatives.

## **II. PURPOSE, GENERAL AND SPECIFIC OBJECTIVES AND ACTIVITIES OF THE NATIONAL PROGRAM**

**16.** The National Program aims to increase the effectiveness of the national research and innovation system and ensure the optimal conditions in order to generate new knowledge based on fundamental and applied research, and apply this knowledge to increase the competitiveness of the national economy and general welfare level. This National Program will favour the excellence in research and innovation, contributing to the implementation of national policy, stimulation of productivity and competitiveness, and developing the national economy by promoting national values.

**17.** Thus, the National Program is the main policy document establishing both the strategic priorities and directions, and objectives of development in the field of research and innovation for a period of 4 years. When responding to global trends, the coherence between policies is ensured through investments in research and innovation, so that results of research and innovation help solve problems that society face through synergy.

**18.** The National Program intervenes with a long-term systemic approach to the sustainable development of a healthy, harmonious, education-oriented, knowledge-based, competitive society, a society able to meet the challenges of time. A society, where, taking into account contemporary requirements for sustainable development, fundamental and applied research aims at achieving and providing scientific support needed to solve social issues. Fundamental and applied research, innovation and technology transfer will help to increase synergy between research areas and state needs, to develop integrated research meant to become structural support for carrying out projects, to acquire new knowledge and hypotheses, develop products, technologies and new competitive services, widely used in industry and economy.

**19.** Aiming to strengthen the impact of research and innovation activities' results on the business environment and society as a whole, National Program is based on the following principles:

- increase the synergy between the research fields and the state needs, enable the revival of national cross-sectoral coordination;
- intensify international cooperation in multidisciplinary and cross-border networks;
- strengthen the collaboration between the public-private fields, research-business, create new market opportunities and increase competitiveness;
- strengthen human capital, raise interest in the field of research and innovation and attract the best talents;
- support the business environment enabling for innovation;
- rationalise the funding framework, ensuring the use of the level of excellence and visibility of the best projects.

**20.** To achieve the stated goal and priorities identified in Table No 1, the National Program sets the following **general and specific objectives and actions**:

**General objective I: Improve governance and increase the efficiency of the research and innovation system** – it is proposed to implement a range of measures meant to make processes under the research and innovation system more efficient, increasing its transparency, social impact and economic relevance. Optimise the procedures and avoid repeated requests for information with the help of automatic data transfer, allow researchers to fully devote themselves to creative activities. At the same time, analysis of the data collected will be emphasized to substantiate public policy development in this area.

*Specific objective 1.1 Ensure an effective, high performance, predictable and financially sustainable research and innovation system, managed on the basis of data collected*

1.1.1. Organise and carry out competitions of research and innovation projects according to bilateral and multilateral agreements.

1.1.2. Assess research and innovation projects at all stages of their implementation

1.1.3. Develop the reports on the implementation of research and innovation projects

1.1.4. Achieving Sustainable Development Goals (SDGs) through research and innovation projects

*Specific objective 1.2. Identify the smart specialisation niches of the Republic of Moldova in order to promote excellence-based research in strategic fields that are relevant to and have impact on economy and society*

1.2.1 Carry out the Entrepreneurial Discovery Process

1.2.2 Approve strategic priorities of research and innovation activities for 2023-2027 according to smart specialisation niches identified

1.2.3 Identify areas for which the creation of new research centers is needed

*Specific Objective 1.3 Increase the number of projects implemented by groups of researchers from research institutes and universities*

1.3.1 Stimulate collaborative research between universities and research institutes through funding joint projects, including PhD programs

1.3.2 Organise scientific and social activities involving universities and research institutes

**General objective II: Competitive human potential involved in research and innovation** – the quality of human capital involved in the research process largely predetermines the process' success. The local research and innovation system has pressing necessity for immediate actions, in order to improve working conditions and remuneration based on researchers' performance, as well as to motivate young people to start a scientific career, especially in areas relevant to the smart specialisation niches of the Republic of Moldova.

*Specific objective 2.1 Increase the share of young people in the total number of researchers*

2.1.1 Increase the number of young people (students, Master students, PhD students, etc) involved in research and innovation projects

2.1.2 Launch the STEP IN Program – internship and mentoring program under research laboratories for students and pupils

*Specific objective 2.2 Develop collaboration with representatives of the scientific diaspora*

2.2.1 Cooperation of the scientific diaspora's representatives in the field of research and innovation and within support mechanisms

2.2.2 Relaunch the short-term mobility grants program for the representatives of the scientific diaspora

**General objective III: Infrastructure in line with international standards** – current

investments in developing the research and innovation infrastructure are far below the needs. At the same time, developing infrastructure jointly with the private sector will lower the pressure on the national public budget and will guarantee the use of the relevant infrastructure, including during the process of technological transfer. This will not lead to increased costs in the state budget.

*Specific objective 3.1 Develop a short- and medium-term vision of developing the national research infrastructure*

3.1.1 Take inventory of the national research infrastructure of the public law organisations in the field of research and innovation

3.1.2 Develop and approve methodology for institutional funding

3.1.3 Develop a methodology for assessing organisations in the field of research and innovation

3.1.4 Assess organisations in the field of research and innovation

3.1.5 Develop regulatory framework on access of public law organisations in the field of research and innovation to the research infrastructure.

3.1.6 Ensure access of public law organisations in the field of research and innovation to research infrastructure

*Specific objective 3.2 Create scientific-technological clusters*

3.2.1 Increase the number of scientific-technological clusters

3.2.2 Implement joint projects under science and technology clusters

*Specific objective 3.3 Connect the research infrastructure of the Republic of Moldova to the pan-European infrastructures.*

3.3.1 Continue the program of connecting research centers and laboratories of the Republic of Moldova to the pan-European infrastructure included in the ESFRI (European Strategy Forum on Research Infrastructures)

3.3.2 Develop cooperation with consortia of important infrastructures of the region (ELI NP, DANUBIUS, CERIC-ERIC, etc.)

**General objective IV: Research and innovation for the social-economic needs** — over time, mechanisms for supporting science-business cooperation evolved from the goals of ‘technology transfer’ to the goals of ‘knowledge transfer’. This had an effect on developing policies supporting collaboration, moving from short-term project-oriented tools to long-term platforms (or other institutional forms), for the actions of collaboration. The objectives of the National Program aim to create joint innovation platforms organized around research and innovation infrastructures.

*Specific objective 4.1 Develop tools for transferring scientific knowledge and results to potential users*

4.1.1 Launch and organise collaborative and practical projects between the scientific community and the business environment.

4.1.2 Boost research activities to create innovative start-ups and/or additional spin-offs

4.1.3. Stimulate the activity of scientific-technological parks and innovation incubators

*Specific objective 4.2 Strengthen the public perception of the role of research and innovation in mitigating social challenges and generating prosperity*

4.2.1 Organise programs for hosting pupils, students and teachers on the occasion of open days and thematic holidays (World Science Day, International Day of Women and Girls in Science, European Researchers’ Night, etc.)

4.2.2 Strengthen interaction with the media and the key opinion leaders from online environment.

4.2.3 Maintain the dialogue with civil society representatives

**General objective V: Coherent policy of European and international cooperation** –

participating in international collaboration activities is not only an opportunity to develop one's own capacities, through obtaining additional funding sources and accessing new knowledge and performance research infrastructure, but also a way of recognising the local scientific potential.

*Specific objective 5.1 Fully tap into the opportunities resulting from the status of a country associated to Horizon 2020*

- 5.1.1 Permanently assess the results of participation in Horizon 2020 calls and publish this data
- 5.1.2 Actively participate in the meetings of the program boards and advisory bodies of the European Research Area
- 5.1.3 Strengthen and enhance the capacities of the National Network of National Contact Points
- 5.1.4 Organise campaigns of dissemination of calls for open projects and provide assistance in the process of application
- 5.1.5 Implement support programs (European BONUS, mobility) to stimulate participation in the framework programs of the European Union
- 5.1.6 Promote the visibility of European research and innovation networks and of their benefits with the involvement of end users
- 5.1.7. Tap into the opportunities resulting from being a member of the European Cooperation in Science and Technology (COST)
- 5.1.8 Obtain the membership in EUREKA
- 5.1.9 Make sure the members of the National Network of National Contact Points organise information days on topics related to obtaining and managing European grants, including by involving National Contact Points from the EU Member States and other associated states

*Specific objective 5.2 Prepare the association process to the 'Horizon Europe' EU Framework Program for Research and Innovation*

- 5.2.1 Harmonise the national financial-administrative procedures to the international ones
- 5.2.2 Ex-post assessment of participation of entities from the Republic of Moldova under the 'Horizon 2020'
- 5.2.3 Develop an action plan disseminating the calls of the 'Orizont Europa' Program

**21.** The National Program is implemented via institutional funding and research and innovation projects that are in line with the strategic development priorities approved by the Government.

### **III. STRATEGIC PRIORITIES IN THE FIELD OF RESEARCH AND INNOVATION**

**22.** The strategic priorities in the field of research and innovation for 2020-2023, set in the National Program, correspond to the priorities in the country's strategic development paper – 'MOLDOVA 2030' National Development Strategy, to the sectoral strategies and the EU research and innovation framework programs. These priorities were determined after extensive public consultations of Moldovan researchers' community, relevant central public authorities and foreign experts under the TAIEX experts' mission (Technical Assistance and Information Exchange instrument of the European Commission) held during 10-14 September 2018 (<https://mecc.gov.md/en/content/recommendations>) with participation of the strategic partner – Academy of Sciences of Moldova.

**23.** The research and innovation projects used to implement National Program fall under the strategic priorities in the field of the research and innovation included in Table No 1.

**Table No 1**

<b>Strategic priorities</b>	<b>Strategic directions</b>
<b>I. Healthcare</b>	Non-communicable diseases – epidemiological monitoring, prevention, diagnosis and treatment
	Epidemiological monitoring – control and response measures, diagnosing and treating communicable diseases
	Pharmaceuticals and nutraceuticals
<b>II. Sustainable Agriculture, Food Security and Safety</b>	Food security and safety
	Varieties and hybrids of high-performance agricultural, technical and forage crops
	Sustainable management of agricultural ecosystems
	New technologies for processing agricultural raw materials. Agri-food biotechnologies
<b>III. Environment and climate change</b>	The impact of biological and non-biological factors on the environment and society
	Safe, clean and effective energy
	Waste, plastics and pollutants
	Ecological security
	Conservation of biodiversity
<b>IV. Social challenges</b>	Social, educational and cultural innovations for integration and adaptation
	Migration, diaspora and socio-demographic changes
	Tangible and intangible heritage
	Tapping into human and social capital
<b>V. Economic competitiveness and innovative technologies</b>	Nanotechnologies
	Information technology and digital development
	Innovative materials, technologies and products

24. The research, defined as any activity of fundamental, applied and experimental development research, taken as a whole, innovation and technological transfer will be the main pillar of each priority of the National Program.
25. A number of expected results will be achieved thanks to the implementation of research and innovation projects according to the strategic priorities and directions of the National Program, as follows:

**Strategic Direction I:  
HEALTHCARE**

26. The priority includes three *strategic directions*:

1) *Non-communicable diseases – epidemiological monitoring, prevention, diagnosis and treatment.*

The burden of non-communicable diseases is the main cause of deaths at the national and global levels. Premature mortality can be avoided: it is estimated that at least 80% <http://lex.justice.md/viewdoc.php?action=view&view=doc&id=343682&lan> of all non-communicable diseases can be prevented. The prevalence of this group of diseases in the country is very high – more than half of population suffers from non-communicable diseases, including diseases of the cardiovascular diseases, diseases of the circulatory system, cancer, chronic respiratory diseases, digestive diseases and diabetes. Research on non-communicable diseases and their monitoring can help



reduce premature mortality, morbidity and disability through comprehensive action on causal factors and primary conditions for diseases' emergence. At the same time, it is necessary to optimise the management of the cross-sector activities' functioning and operating in public health.

Expected outcome:

- new policies on the risk factors causing the most widespread non-communicable diseases developed and scientifically justified;
- systemic diagnostic approaches scientifically justified;
- new methods and technologies in the diagnosis and treatment of non-communicable diseases developed, tested and launched;
- systemogenesis of risk factors, sustainable assessment and mathematical modeling of non-communicable diseases;
- cancer mortality reduced by developing and implementing modern methods of screening, early diagnosis, personalised treatment and palliative care;
- scientific and practical basis for creating, maintaining and strengthening mental health developed.

**2) *Epidemiological surveillance – control and response measures, diagnosis and treatment of communicable diseases.***

Epidemiological surveillance system for immunological and uncontrolled through vaccinations communicable diseases, especially priority diseases with viral genesis, faces challenges that are caused by vaccinations coverage decreasing in recent years <http://lex.justice.md/md/331169/>. Major public health issues in the Europe region are tuberculosis (TB) <http://lex.justice.md/md/367268/>, HIV infection, acute and chronic viral hepatitis (A, B, C, D), including the etiologically unidentified hepatitis (E, G, TTV, F and SENV), measles, rubella, seasonal and pandemic flu, healthcare associated infections, blood-borne infections, especially resistant to antiviral products, antibiotic-resistant bacterial infections, etc. Although the rates of TB incidence, prevalence and mortality in the region are low, the frequency of multidrug-resistant tuberculosis is the highest globally. An alarming issue is viral hepatitis, especially chronic viral hepatitis evolving into cirrhosis and primary liver cancer. Most of them remain etiologically undiagnosed. Challenges regarding the risk of emergence of flu viruses' strains with epidemic and pandemic potential are of interest. These challenges require conducting in-depth studies, including studies with molecular biology techniques.

Research on epidemiological surveillance and controlling, diagnosing and treating communicable diseases provide a consolidated and participatory response to the society's welfare.

Expected outcome:

- scientific solutions for lowering premature mortality caused by communicable diseases developed;
- prophylactic and prevention solutions related to solutions of specific diseases' treatment scientifically justified;
- measures needed to improve health services, treatment of diseases and epidemiological risks avoidance scientifically justified.

**3) *Pharmaceuticals and nutraceuticals.***

Developing pharmaceutical industry guarantees that population will be provided with essential medicines, new jobs will be created and country's economy will be improved. Modern pharmaceutical industry is based on a significant amount of scientific research. The industry uses herbs, chemical synthesis, biotechnological methods, genetic engineering and others.

In order to create new drugs, there is a need for further research focused on identifying biologically active substances, studying their pharmacological properties and side effects, assessing their safety, therapeutic effectiveness, developing their pharmaceutical forms, analysis methods and criteria. There

is also a need for standardisation criteria and analytical-normative documentation for their broad implementation.

Expected outcome:

- pharmaceutical and nutraceutical products manufactured from local raw materials;
- existing natural sources and local pharmaceuticals used in medical practice;
- potential of local pharmaceuticals, vitamins and antioxidants capitalised;
- natural food supplements for preventive treatment developed.

## **Strategic Priority II. SUSTAINABLE AGRICULTURE, FOOD SECURITY AND SAFETY**

27. The priority includes four *strategic directions*:

### **1) Food security and safety.**

Food security is the most important aspect of the national security, referring to the availability of agricultural products, foodstuffs, and raw material of animal and vegetable origin that can meet all inhabitants' food needs. Food safety is an aspect important by involving all factors and applying all rules that support and ensure manufacturing foodstuffs, whose nutritional value and consumption are the basis of a healthy nutrition. Food safety refers particularly to hygiene, supplements used, toxic residues, pollutants.

According to the policy documents, the presence of risk factors in the population's nutrition causes acute or latent health disorders, multiple chronic morbid and premature deaths, and negatively affects the quality of life, life expectancy and economic security of the country.

Expected outcome:

- foodstuffs' safety ensured in order to modernise the national quality management system;
- higher nutritional coverage of different segments of population and lower risks of nutritional diseases;
- risks of nutritional diseases reduced through biotechnology and food engineering;
- sustainable-development based on the rational use of groundwater resources;
- system of supplying with drinking water from various sources modernised;
- effective use of water resources, soil and biodiversity;
- more effective use of fertilizers, including biofertilizers, harmless plant and animals protection systems expanded to increase soil fertility.

### **2) Varieties and hybrids of high-performance agricultural, technical and fodder crops.**

It is imperative to maintain crops' genetic fund – the main source of genes favourable for improvement. At the same time, it is necessary to create new varieties and hybrids and improve the existing ones, having high productivity, specific qualities for nutrition and use in other areas for the country's agricultural sector, varieties and hybrids resistant to biological and non-biological factors. In this respect, technological transfer of scientific achievements is very important.

Expected outcome:

- advanced use of genetic methods and modern biotechnologies to mitigate the impact of environmental changes;
- competitive varieties and hybrids of crops with high yields and increased resistance to drought, diseases and pests cultivated and put to production;
- higher productivity and adaptation of agricultural crops to climate change;
- more effective use of water and nutrients (for plants) and food (for animals);
- more effective agricultural production systems, with less impact on the environment;
- plant genetic resources for nutrition and agriculture inventoried, collected, assessed,

documented and prepared for long-term storage in order to effectively use them in country's agricultural sector.

### **3) Sustainable management of agricultural ecosystems**

Agricultural ecosystems are the global priority, which requires an multidisciplinary approach according to the principles of circular bioeconomy.

#### Expected outcome:

- the management of the plant genetic fund and native and foreign animal species strenghtened;
- species and breeds with high productive and adaptive potential identified and/or promoted;
- dangerous phytosanitary hazards forecast and monitored and measures to combat quarantine pests developed;
- alternative plant protection methods developed and organic agriculture promoted;
- sustainable and environmentally friendly technologies in growing fruits, vegetables and winegrowing developed and modernised.

### **4) New agricultural raw materials processing technologies. Agri-food biotechnologies.**

Currently, the Republic of Moldova exports mainly plant-origin raw materials. This is due to the need to technically modernise the food industry, diversify the range of products, increase the local foodstuffs' competitiveness on the local and foreign markets, modernise technologies for raw materials' storing and processing, develop new biotechnological procedures for processing agricultural production.

#### Expected outcome:

- technological performance in processing agricultural raw materials improved, the gaps between the way of transforming local agricultural raw materials' and requirements of sales markets decreased;
- more effective circuit of nutrients and antioxidants, with lower losses of agricultural raw materials and foodstuffs;
- nutritional value ensured and biological impact of foodstuffs enhanced via biotechnology and food engineering;
- the circular bioeconomy ensured, digital networks for traceability of agricultural raw materials and foodstuffs developed;
- innovative technologies for storing and processing agricultural production.

## **Strategic Priority III.**

### **ENVIRONMENT AND CLIMATE CHANGE**

**28.** The priority includes five *strategic directions*:

#### **1) The impact of biological and non-biological factors on the environment and society.**

Currently, maintaining the production capacity of land, protection, improvement and sustainable use of land resources by creating scientific works are essential, especially for reasoned implementation of land improvement projects and applying effective methods to combat land degradation and soil fertility.

Intensified research will help optimise phytosanitary treatments by reducing the phytosanitary products' quantitative pressure per unit of agricultural surface in order to provide consumers with quality and safe plant products and a healthy living environment.

Given the global trends of degradation rates and irremediable losses of agricultural lands and of agriculture development, for our country the issue of maintaining the quality of soil cover on vineyards' agricultural land is a strategic issue of national security.

The research also adds value to the protection of surface water and groundwater, preventing and combating floods, erosion and developing effective measures to combat drought and desertification. Scientific research and practical actions in studying dangerous geological processes will impact the processes of:

- preparing strategic plans for territories' development (including urban plans);
- designing and constructing according to the the actual seismic hazard;
- rational use of construction materials;
- identifying areas the most vulnerable to strong earthquakes;
- identifying the priorities of applying material means, minimising the losses and mitigating the seismic risk;
- increasing the territory's seismic security, reducing human losses and economic damage.

Expected outcome:

- mapping of the environmental components' current state carried out on the basis of modern research tool – Geographic Information Systems;
- the possible changes in the environmental components (relief, climate, water, flora, fauna), caused by rapid change are determined;
- the state-protected natural areas' surfaces expanded by developing ecological passports in order to preserve the nature and rationally use the natural resources;
- areas with landscapes' environmental stability and instability identified;
- the urban ecosystems' stability assessed to ensure sustainable development;
- the cover of soil assessed and the system of land's classification and quality assessment improved;
- the water and soils' quality improved by reducing pollution after the discharging the waste water into the emissary or natural environment;
- alternative methods of plant protection developed, with implementing advanced growing technologies and safe and environmentally friendly best practice;
- pollution sources managed, greenhouse gas emissions reduced and measures to adapt to the climate change taken;
- measures and principles of the *green economy* integrated in the production processes of the national economy' sectors;
- dangerous natural hazards monitored and forecast;
- the impact of toxic chemicals on environment and public health reduced;
- pollution of environmental components resulted from anthropogenic activities reduced;
- scientifically justified solutions for restoring lands contaminated with persistent organic pollutants;
- wastewater treatment technologies in order to protect surface and groundwater;
- seismic risk for infrastructure and population reduced;
- local mineral resources rationally used and capitalised;
- subsoil's natural potential assessed and dangerous geological processes prevented.

## **2) *Safe, clean and effective energy***

Renewable energy is only an aspect of the energy complex. In itself, the energy complex comprises a lot more problems which need to be solved, such as the energy security and how we ensure it, so that consumers will feel the negative effects the least. Developing both traditional and alternative generation sources to reduce energy dependence. Effectively provide thermal energy is another very important aspect. But providing innovative solutions to raise the efficiency of all national economy's sectors should be adequately addressed.

The same renewable sources, depending on the level and place of integration, cause a number of problems

due to the sources' intermittent nature. This and this must be solved appropriately. It is also a priority of European Union research programs.

Thus, ensuring the country's energy security is a priority for the national economy. It can be achieved through diversifying both local and external energy supply sources, using alternative energy sources and increasing energy efficiency.

Diversification of external energy sources and higher local capacity for generating alternative energy sources can bring certain problems to the energy system and consumers as well. Only scientific support can help identify optimal solutions to achieve these three pillars (diversification/generation/energy efficiency).

Expected outcome:

safety and sustainability of the consumers' energy supply ensured;

- scenarios of diversifying energy sources by connecting to the European energy system, including the development of local generation sources;
- impact on the energy system and consumers decreased when implementing various scenarios of energy sources' diversification;
- innovative technical solutions for reliable operation of the energy system, energy conversion and use;
- the increased share of renewable energy sources in the country's energy balance and their effective use;
- innovative solutions for the development and implementation of smart electricity networks;
- innovative solutions for reducing energy losses throughout the chain of energy production, transport, distribution and use;
- level of pollution reduced through higher share of clean energy.

### **3) *Waste, plastics and pollutants.***

Reducing the negative effects of insufficient waste generation and management is a global problem. There is a need for investments in developing effective processes of waste recycling, reuse and reduction, in reducing the risks of environmental pollution and the impact on vital processes. This effect can be achieved only through the research and innovation and implementing new technologies – recycling and bioconversion of plastic objects, reducing the chemicals' migration for an eco-friendly environment, and so on.

Expected outcome:

- integrated waste and chemical management systems that help reduce the amount of deposited waste and increase its recycling;
- sustainable management of chemicals ;
- the circuit of pollutants and technogenic contaminants analysed;
- integrated multifunctional system for recording and managing hazardous substances /objects/equipment, in order to reduce the risks of environmental pollution and the impact on vital processes;
- methods for minimising waste and applying the circular bioeconomy's principles;
- programs for protecting natural ecosystems and restoring degraded ecosystems;
- pollutants' bioconversion technologies.

### **4) *Ecological security.***

Current environmental changes (including climate change) are one of the main threats to sustainable development and one of the most serious environmental problems that have negative consequences for the national economy, exposing the country's ecological security to danger. The accelerated pace of these changes, especially of climate change, is also connected with the manifestation of extreme phenomena, which became more intense and frequent in recent years. Landslides, floods, erosion, heavy rains, droughts, heat and low temperatures of transitional seasons favour the destabilisation of national

economy, annually, with enormous losses. Developing a complex and constantly updated scientific–methodological basis based on Geographic Information Systems, might contribute to implementing appropriate measures for adapting to accelerated environmental changes (including climate change), maintain the ecological balance, and achieve the provisions of the Framework Conventions of Rio de Janeiro: The Framework Convention on Climate Change, Convention on Combating Desertification and Convention on Conserving Biological Diversity ratified by the Republic of Moldova.

Expected outcome:

- mapping the current state of the environmental components on the basis of Geographic Information Systems;
- possible changes in the environmental components (topography, climate, water, flora, fauna) caused by rapid change determined;
- state-protected natural areas expanded by developing ecological passports, in order to preserve the nature and rationally use natural resources;
- areas with landscapes’ environmental stability and instability determined;
- stability of urban ecosystems assessed to ensure sustainable development;
- natural hazards (droughts, floods, etc.) zoned to adjust the national regulatory acts to the European standards;
- identification of areas vulnerable to climate change, highlighting their impact on agricultural and forestry sectors, water resources, tourism potential.

**5) Conservation of biodiversity.**

Biodiversity (the variety of species of animals, plants and micro-organisms) provides a vital life support system and a vital flow of goods and services that are essential to our economic prosperity, health, safety and quality of our life. Conservation of biodiversity becomes increasingly important due to intensification of the human impact on the biosphere. Conservation of biodiversity is necessary not only to ensure life in the present, but also for future generations. Understanding the complexity of biodiversity is a huge scientific challenge, but also a strong support for future policies and actions.

Expected Outcomes:

- long-term ecological monitoring of the biodiversity of species of plants, animals, microorganisms and knowledge base about the functioning of ecosystems in the Republic of Moldova improved substantially;
- capacity of centers of plant and animal genetic resources and collections of microorganisms technologically valuable as the country’s natural heritage developed;
- interoperable biodiversity databases created;
- effective technologies for conserving and capitalising biodiversity.

**Strategic Priority IV.  
SOCIETY CHALLENGES**

**29.** The priority includes four *strategic directions*:

**1) Social, educational and cultural innovations for integration and adaptation.**

This trend is based on the ten Sustainable Development Goals unanimously accepted at the global level. The global appeal is a new approach to the development and is a platform for research in the demographic and socio-economic field.

Starting from the challenges of millennium, research and innovation priorities set at the European level, and trends noted in the national economy, the mission of research and innovation is to provide the necessary scientific support to solve social problems related to the improvement of population’s welfare,

identification of measures for stabilising the demographic situation, increasing the economy's competitiveness, scientific rationale of state policies promoted, political-legal and socio-economic modernisation of the country through development and democratisation, improving the business environment and promoting the development of the small and medium-sized enterprises' sector.

The main employment indicators registered low levels in the last years. Shortage of quality jobs, low labour productivity and incomes, unfavorable rural economic development, discrimination of some population groups on the labour market and modest institutional capacities, have increased poverty, perpetuated social exclusion and caused external labour migration, as an alternative to unemployment and informal employment.

Expected outcome:

- scientific support and innovative tools for small and medium enterprises' development;
- the act of justice assessed by testing the satisfaction of beneficiaries – individuals and legal entities;
- employment increased and competences forecasted by the fields and professions according to the labour market requirements;
- scenarios/models for ensuring national security and defense potential by analysing threats, risks and vulnerabilities both globally, regionally and locally;
- the national security system of the Republic of Moldova strengthened on the basis of principle of 'reintegration through Europeanisation';
- scientific-technological and information support of open science in the Republic of Moldova;
- interdisciplinary scientific research on the evolution of relations between the Republic of Moldova and the European Union in the context of opportunities for political, legal and socio-economic modernisation of the Republic of Moldova;
- strengthening the human rights protection mechanisms and functional capacities of public authorities through development and democratisation, in the context of the needs for modernisation.

## **2) *Migration, diaspora and socio-demographic changes.***

The migration situation is mainly characterised by the emigration of Moldovan citizens, persons who live abroad, went to work, study or to reunite with family. The migration profile is a major strategic factor, but also a potential risk for the country. In order to strengthen the relationships between citizens from abroad and the country, taking into account the diaspora's contribution to the economic development of the country by launching the investment programs, this strategic direction will focus on conducting research to reduce migration, involve the diaspora and mitigate negative changes in the population's dynamics.

Demographic processes led not only to the decrease in population, but also to its ageing, caused by the consequences of demographic transition. Taking into account the priorities of the Republic of Moldova in the field of sustainable development, attention is paid to the change in the demographic status in order to prevent the demographic crisis.

Research of demographic changes will help achieve the main goal of governing demographic policies to consistently solve population's problems in order to reduce the demographic decline, create conditions for quantitative and qualitative population growth, and establish a link between the demographic, economic and social security for the development.

Expected outcome:

- ongoing monitoring and forecasting the dynamics of fertility, mortality and migration in connection with the country's development;
- short-term and medium-term risks of demographic changes in the Republic of Moldova assessed and proposals to solve the situation through comparative studies with states that faced similar crises formulated;
- the emigrants' potential capitalised and measures necessary to ensure their return to the

- country, including those stopping the outflow of labour force and qualified specialists promoted;
- returnees and foreigners integrated on the country's labour market through recognising the qualifications and capitalising professional skills acquired abroad, for sustainable development of Moldovan labour market.

### **3) *Tangible and intangible heritage.***

Taking into account that culture is an important pillar of society, in modern world, the complex processes of society's organisation in different human communities cannot be understood without being revealed through scientific-applied research on cultural integration. Complex processes of modern societies' organisation are understood, explained and managed via competitive theoretical and scientific research of theoretical and applicative nature.

Cultural scientific projects are important in society because they help maintain a community spirit in a world that tends to globalisation and uniformity. The ethnic diversity of the Republic of Moldova is part of the country's history and culture. The state affirmed its commitment to creating a framework favourable for strengthening interethnic relationships, developing civic identity to the state, promoting diversity in society, facilitating intercultural dialogue and language integration, national minorities' inclusion in various spheres of state's life.

At the same time, research projects in humanities and social sciences, aimed to study the national cultural heritage in all its aspects, have a certain socio-political usefulness which helps to strengthen social cohesion, improve decision-making processes at the level of democratic institutions, and develop creativity, innovativeness and critical thinking disseminated through higher education.

At the same time, national socio-humanistic sciences have an equally important role, especially historical science and philology, as the main pillars of society that contribute to preserving and strengthening historical memory and identity in a world which increasingly tends to globalisation and uniformity.

#### Expected outcome:

- theoretical studies in the socio-economic, political, legal, humanistic, philosophical, encyclopedic, artistic, museographic and sports field, which will become a solid support for practical projects and research;
- tangible and intangible cultural heritage (historical, legal, linguistic, literary, archaeological, ethnological, artistic, architectural, etc.) capitalised scientifically;
  - creative industries and business climate in the cultural sector developed;
  - tools for protecting and capitalising national cultural heritage analysed;
  - preservation, restoration and management of cultural heritage;
  - cultural products and goods digitised, standardised software developed;
  - programs to facilitate interethnic understanding, encourage inclusive diversity of society in the Republic of Moldova;
  - cultural heritage (linguistic, literary, folklore, ethnological, historical, architectural, artistic, archaeological, legal, etc.) assessed scientifically;
  - electronic platform for the national encyclopedia launched;
  - theoretical, scientific and informational support to capitalise archaeological, ethnological, artistic, architectural heritage in developing and promoting creative industries, developing tourism.

### **4) *Capitalising human and social capital.***

Rapid social changes of recent years impact the quality of life and psychosocial security, as well as aspects of the people's social integration. Capitalising human and social capital is the most important factor in the socio-economic development of our country. Current trends demonstrate the need for more research on human resources.



Expected Outcome:

- reliable and inclusive social protection system developed;
- scientific expertise in the field of educational sciences, social , psychological and psycho-pedagogical assistance strengthened;
- scientific expertise in the field of population’s active ageing strengthened;
- policies reconciling work responsibilities and family life;
- poverty risks reduced (developing resilience, building psychological skills for managing crisis situations, creating psychosocial conditions in assisting the career path);
- education system adapted to new approaches of modern society.

**Strategic Priority V.**

**ECONOMIC COMPETITIVENESS AND INNOVATIVE TECHNOLOGIES**

30. The priority includes three *strategic directions*:

**1) Nanotechnologies.**

The worldwide development of the areas of ‘new materials, micro- and nanotechnologies’ is triggered by evolution in the field of ‘nanotechnologies’. It became the most actual and dynamic field with a ‘destructive/revolutionary’ impact on the industry and society for the next decades.

Global investments in development of nanotechnology doubled thanks to the benefit to the development of the society.

Global and national progress in the field of exact and engineering sciences denote the reporting, consistent connection with the sustainable development of industry, economy and, finally, the society as a whole, which in the long run will benefit from the scientific research’s results. Carrying out practical, experimental research in the field of mechanical engineering, nanotechnology, biomedicine, pharmacology and cosmetology, food safety, energy, etc. is inseparably linked with fundamental research results obtained in chemistry, physics, mathematics. Research and innovation will contribute to enhancing synergy between the research areas and state’s needs, developing the integrated studies meant to become a support essential for specialised educational institutions, enterprises and business environment, carrying out projects, and developing new products, widely used in industry and economics.

Expected outcome:

- infrastructure, tools, standards, capabilities in nanoscale research, development and innovation developed;
- pharmaceutical synthesis, processing and supply of medications through nanotechnologies;
- nanotechnologies used in industry through scientific excellence and competition;
- new theoretical methods and solutions adjusted to the theoretical interpretation of experimental results that will be applied in various sectors of economy (energy, information technology and communications, mechanical engineering, electronics and robotics, geological investigations, pharmaceutical, cosmetology, food industry, etc.);
- developed alternative energy converters based on proportionally reduced layers, using technologies economically available and environmentally attractive for microelectronics, medicine and spintronics.

**2) Information technology and digital development**

The development and wide use of information and communication technologies’ (ICT) potential is supported through research in all areas for citizens’ convenience and well-being. The national vision of developing an advanced information society in which economic competitiveness, effective management and, indirectly, population’s well-being will result from the use of ICT tools, extended access to modern ICT infrastructure, rich digital content and high-performance information services.

Expected outcome:

- electronic data infrastructure in the field of research, development and innovation;
- open source software and free online tools used to create, distribute and use digital content in priority areas of research and innovation;
- mechanisms for creating applications and equipment that ensure access to electronic services;
- theoretical and practical research with a wide impact on the main issues, including indicators and tools for monitoring the society and digital economy;
- technological, environmental, economic and social processes have mathematical rationale and are simulated;
- cybersecurity ensured, new methods for encoding information and cryptology substantiated and developed;
- developed advanced information technologies and systems and innovative solutions focused on: social areas, ensuring cybersecurity, processing large amounts of data, preserving and capitalising cultural heritage (through digitisation).

**3) Innovative materials, technologies and products.**

Introduction of advanced materials and technologies is a niche in a developing economy. Basic and applied research will help diversify products for specific applications in various economy sectors, attract researchers in developing advanced materials and modern technologies to create devices and systems that work in specific environments and research that will increase the access to funds.

Expected outcome:

- technical and production infrastructure connected to public utilities;
- new, innovative materials with outstanding performance and new sustainable technological processes developed;
- new features for special and consumer products;
- materials with advanced properties for using in special conditions;
- high-performance, cheap materials structures, for using in the economy sectors developed;
- results of theoretical fundamental research analysed, systematised and summarised, new methodological approaches in physics, chemistry, mathematics and computer science, geology and seismology proposed;
- electronic and engineering devices and facilities for healthcare system, agriculture and industry developed and manufactured.

## IV. IMPACT

**31.** Effective implementation of this National Program will lead to the following consequences:

1. Increased effectiveness of research and innovation activities;
2. Increased public funding for research projects;
3. Increased private investments in research and innovation activities;
4. Higher degree of implementation of research results;
5. Performance-based system of advancing in the research career;
6. Continuing growth of the share of young people among researchers;
7. Updated and internationally connected research infrastructure;
8. Areas of research and innovation included in the Government policies and sector programs as a resource of growth and development;
9. Visibility and higher confidence of the society and business environment in the local scientific and innovative potential;
10. Internationally recognised and functional networks of excellence centers with impact on

- innovative entrepreneurship;
11. Growing number of international projects involving entities from the Republic of Moldova;
12. Higher degree of representation of research and innovation areas' progress besides European research and innovation structures.

## V. PROGRESS AND PERFORMANCE INDICATORS

**Table No 2**

	<b>GENERAL OBJECTIVES</b>	<b>PROGRESS INDICATORS</b>
1.	<b>Improving the management and enhancing the effectiveness of research and innovation system</b>	<ul style="list-style-type: none"> <li>a) Annual and final reports on assessment of research innovation projects are published on the official website of the National Agency for Research and Development and the Academy of Sciences of Moldova;</li> <li>b) Workshops under the entrepreneurial discovery process organised;</li> <li>c) Smart specialisation niches identified;</li> <li>d) Strategic priorities of research and innovation activities for 2023-2027 comply with the specialised niches identified and approved;</li> <li>e) Research centers established.</li> </ul>
2.	<b>Competitive human potential involved in research and innovation from the public and private sectors</b>	<ul style="list-style-type: none"> <li>a) Number of projects involving youth funded;</li> <li>b) STEP IN program developed and launched;</li> <li>c) Number of beneficiaries of the STEP IN Program;</li> <li>d) Number of activities carried out jointly with the scientific diaspora.</li> </ul>
3.	<b>Infrastructure in line with international standards and open to users from the business environment</b>	<ul style="list-style-type: none"> <li>a) Report on taking inventory of the national research infrastructure of public law organisations in the field of research and innovation prepared;</li> <li>b) Assessment reports of the activities of public law organisations in the field of research and innovation developed;</li> <li>c) The institutional funding methodology developed and approved;</li> <li>d) Institutional regulations on access to research infrastructure developed and approved;</li> <li>e) The number of newly created scientific-technological clusters;</li> <li>f) Number of research and innovation organisations with partnerships established with ESFRI infrastructures.</li> </ul>
4.	<b>Research and innovation for socio-economic needs</b>	<ul style="list-style-type: none"> <li>a) The number of collaborative practical projects between the scientific community and business environment, based on smart specialization priorities;</li> <li>b) Number of innovative start-ups and/or spin-offs created annually;</li> <li>c) Number of activities popularising results of scientific research and technology transfer.</li> </ul>

5.	<b>Coherent European and international cooperation policy</b>	<ul style="list-style-type: none"> <li>a) Data published after the assessment of results of participation in ‘Horizon 2020’ calls;</li> <li>b) Number of participations in the meetings of the program boards and advisory bodies of the European Research Area;</li> <li>c) Number of dissemination campaigns about calls for open projects;</li> <li>d) The number of participants in the COST activities;</li> <li>e) Association Agreement of membership under EUREKA concluded;</li> <li>f) The regulatory framework on harmonising national financial-administrative procedures with international ones amended;</li> <li>g) Action plan on disseminating calls of the ‘Orizont Europa’ Program developed;</li> <li>h) Bilateral and multilateral programs in the field of science and innovation launched.</li> </ul>
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## VI. OVERALL ESTIMATION OF COSTS

**32.** The National Program will be implemented through research and innovation projects that are in line with strategic priorities in the field of research and innovation. Activities stipulated in this National Program will be funded from and within the limits of funds approved annually to the national state budget, from revenues collected by budgetary institutions and from resources of projects funded from external sources, in line with the law. The overall estimation of costs for implementing this National Program is based on strategic priorities in the field of research and innovation and activities identified and defined in the Action Plan on implementation of the National Program. Estimation of costs set for each strategic priority may differ depending on the results of competitive activities.

**33.** *Methodology of Funding Projects in the Field of Research and Innovation* will regulate the way of funding public law organisations in the field of research and innovation. Maintaining and developing research infrastructure, and remunerating the staff, will be funded from the state budget depending on the needs identified following the results of competition of national research projects.

**34.** The costs estimated for implementation of projects after the competition, according to the priorities and strategic directions are as follows: MDL 256.3 million for 2020 and MDL 276.6 million for 2021, MDL 288.9 million – for 2022, MDL 309.5 million – for 2023.

The costs for institutional consolidation measures in the field of research and innovation are estimated at MDL 118.1 million for 2020 and MDL 96.2 million for 2021; MDL 71.1 million – for 2022; MDL 50.4 million – for 2023.

The costs of competitive and institutional consolidation actions in the field of research and innovation, covered by the national public budget will be adjusted annually according to available funds stipulated in the medium-term budgetary framework for the respective periods.

The dynamics of distributing funding for projects in the field of research and innovation and for maintaining and developing research infrastructure is presented in Table No 3.

Table No 3

<b>I. COMPETITIVE ACTIONS in the field of research and innovation</b>				
<b>Strategic priorities</b>	<b>Dynamics of funding distribution, %</b>			
	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>I. Healthcare</b>	10.6%	11.6%	12.6%	13.6%
<b>II. Sustainable Agriculture, Food Security and Safety</b>	11.8%	12.8%	13.8%	14.8%
<b>III. Environment and climate change</b>	14.4%	15.4%	16.4%	17.4%
<b>IV. Society challenges</b>	9.4%	10.4%	11.4%	12.4%
<b>V. Economic competitiveness and innovative technologies</b>	13.8%	14.8%	15.8%	16.8%
<b>TOTAL: COMPETITIVE ACTIONS in the field of research and innovation</b>	<b>60%</b>	<b>65%</b>	<b>70%</b>	<b>75%</b>
<b>II. INSTITUTIONAL STRENGTHENING in the field of research and innovation</b>				
1.1 Maintain public infrastructure in field of research and innovation through institutional funding.	35%	30%	25%	20%
1.2. Develop public infrastructure in the field of research and innovation through the central public authority responsible for developing the research policy.	5%	5%	5%	5%
<b>TOTAL: INSTITUTIONAL STRENGTHENING in the field of research and innovation</b>	<b>40%</b>	<b>35%</b>	<b>30%</b>	<b>25%</b>

## **VII. ASSESSMENT AND MONITORING**

**35.** The National Program will be implemented on the basis of Action Plan on its implementation in strict compliance with strategic priorities.

**36.** The Ministry of Education, Culture and Research is responsible for monitoring the implementation of the National Program. Implementation activities will include the following components:

- a. Monitor the implementation of measures provided for in the Action Plan, on the basis of National Program indicators;
- b. nature of implementation (annually, permanently);
- c. the effects of implementation (systemic, economic, social, etc.);
- d. involving people responsible for the enforcement of measures provided;
- e. costs/expenses incurred;

f. implementation deadlines.

**37.** Assessment of the National Program will be systematic and will be carried out throughout the implementation period. The assessment includes preparation of reports on Program's implementation on the basis of progress indicators. In order to ensure transparency of the implementation of this National Program, annual monitoring reports and final assessment report, will be published on the official website of the Ministry of Education, Culture and Research.

**38.** Reporting and monitoring will be based on the following principles:

- 1) The annual analysis of National Program's effectiveness in order to achieve its goals, assimilating short-, medium- and long-term performance indicators;
- 2) The scientific impact, related to supporting the development and dissemination of high-quality knowledge, skills, technologies and solutions to new global challenges;
- 3) The society impact on strengthening the innovative solutions in industry and society to address global challenges;
- 4) The economic impact associated with the stimulation of all forms of innovation;
- 5) Data on management and implementation of the National Program will continuously collected through half-year reporting.