

## 2.2 Directorate of Science and Technology

Science, technology and innovation occupy a special place in the human intellectual movement, since they contribute not only to enlarging the horizons for humanity but equally have a marked impact on the human civilization course, thanks to the high-value information they produce. No one disputes the importance of the role played by science, technology and innovation in social and economic development. While the policies adopted by countries in the areas of science and technology are a result of a national consensus, this was made possible only through a series of open consultations characterized by involving all concerned parties and all players from various walks of life. Nevertheless, the Islamic world is marked by the flagrant discrepancy between its countries whether in terms of social and economic development or natural resources. The same discrepancy can also be observed between these countries in terms of the institutions in charge of developing science, technology and innovation policies.

Drawing on the resolutions of the previous Islamic conferences of Ministers of higher education, scientific research, health and the environment, and in compliance with international conventions and treaties and the proposals made during relevant regional conferences, ISESCO, under its Three-Year Action Plan 2019-2021, will continue implementing the contents of the Strategy for Science, Technology and Innovation in the Islamic World and other relevant strategies adopted by the Islamic Summit Conference, the OIC Ten Year Plan of Action (TYPOA) 2016-2025, and the Vision 1441 H.A on Science and Technology.

Considering the importance of scientific research for developing science, technology and innovation policies and the necessity of using its outcomes in promoting, quality, excellence and development in Member States, pursuant to the Resolution n° G.C.13/2018/4.2 issued by ISESCO's thirteenth General Conference, ISESCO General Directorate integrated ISESCO Center for Promotion of Scientific Research in the Directorate of Science and Technology and established for that purpose the following two new divisions at the Directorate: **Division of Science Policies Development and Scientific Research Promotion**, and **Division of Knowledge Transfer**.

In this context, ISESCO's next Action Plan will focus on the concept of science, technology and innovation as a tool to achieve Sustainable Development Goals (SDGs), and will exert every possible effort to help Member States develop strong policies in the areas of science, technology and innovation, relying on the one hand on the political will to improve governance patterns, and on financial support on the other. ISESCO will also continue involving all stakeholders in this area so as to seek counsel on the priorities and legal

arrangements needed to promote science, technology and innovation and promote their role in Member States. Since North-South and South-South cooperation has a decisive role in promoting the status and roles of science, technology and innovation, networking between the partners concerned will be reinforced, as well as between Member States in order to achieve the common goals, and unify efforts so as to attain as many achievements as possible.

Enhancing higher education and scientific research in Member States is also one of the goals that ISESCO aims to achieve through focusing on ways to improve higher education systems and universities' rankings, in addition to strengthening their pivotal role in science, technology and innovation. The latter is directly associated with good governance, innovative education and an appropriate research environment. Needless to say that science, technology and innovation produced by universities are based on theoretical and applied knowledge in a number of areas. The traditional systems of technology and industrialization have become outdated after the emergence of the knowledge economy. The original and desired goal of higher education systems is to produce knowledge and prepare the trained human resources to use it, which is imperative in the areas of science, technology and innovation in order to meet the technological needs in the foreseeable future.

Additional efforts will be exerted to enhance national policies on science, technology and innovation, as well as improve infrastructures to meet the needs of Member States. In this context, and in implementation of the resolution of the 8<sup>th</sup> Islamic Conference of Ministers of Higher Education and Scientific Research, ISESCO established the Digital Integrated Platform for Promoting Quality, Accreditation, Exchange and Cooperation in Member States' Universities. This Platform represents a practical tool for sharing knowledge and expertise through activating the Pan-Islamic Research and Education Network (PIREN), the Key Performance Indicators (KPI), The TAFAHUM Programme for Students' Exchange among universities of the Islamic world, in addition to the Islamic Body for Quality and Accreditation. The Directorate of Science and Technology, in cooperation with other directorates and specialized centers in ISESCO, will ensure the activation of PIREN and will provide educational institutions and research and development centers with the latest results of research, publications and patents. Its efforts will also center on making PIREN a unique and specialized space through enabling interaction between academic circles in Member States, organizing online lectures, conferences and meetings, and holding meetings for think-tanks and experts to allow them exchange knowledge and examine joint cooperation activities.

It is observed that women's role in science in Member States is still very limited, in view of the small number of women scientists in these countries. Many social and cultural factors have led to the poor participation of women in sciences in these countries. Therefore, emphasis will be placed on enhancing confidence in women's participation in the areas of science and technology through providing them with better opportunities in scientific occupations. Women's leadership roles will also be enhanced through involving them in science policies and in the decision-making process. ISESCO will continue, through the

Islamic Network for Women Scientists (INWS) and specialized women science chairs, encouraging women to access the areas of science, technology and innovation.

Policies relating to science represent a new field for multidisciplinary research aimed at developing theoretical and experimental models for science-based projects, which would help public authorities and productive institutions and civil society organizations formulate better decisions in the area of R&D through establishing an accurate scientific database that would allow decision-makers and researchers assess the impact of scientific and engineering projects, understand them in a better way, foresee their outcomes and analyze their outputs. This of course reflects the importance of the role played by sciences in social and economic development and building the knowledge society, hence the importance attached by governments to sciences in international negotiations and the world debate on foreign strategies and policies.

Furthermore, globalization and the international challenges of the 21<sup>st</sup> century, in addition to issues with scientific dimensions, led to the emergence of complex, changing and non-stereotypical issues globally, such as climate change, food security, denuclearization, energy and water resources. These are huge challenges that need a global response and a strong commitment of all countries in international cooperation, and to activate the interactive relationship between diplomacy and sciences. Scientific diplomacy refers to harnessing scientific cooperation to building bridges between societies and strengthening relationships between countries, particularly in areas where there are no other ways or approaches that can be adopted officially. This relationship based on three concepts, which are scientific diplomacy, sciences for diplomacy and sciences in diplomacy, has become very widespread; therefore, it should receive the appropriate attention in the area of developing programmes and policies in Member States.

In addition, information and communication technologies (ICTs) brought about a technological revolution that had a tremendous impact on the lives of individuals across the globe. ICTs also play an increasingly important role in the development process. Scientific discoveries are made on a rapid rate that exceeded all expectations, disrupting current knowledge, analytical methods, methodologies and computer systems, and multidisciplinary approaches. The use of such technologies is not limited to this planet, as a great portion of them covers space too. While the stated goal of all these developments is to improve living conditions and ensure a better future for humanity, they also include negative sides, notably reflected in some destructive technologies with a subversive force that can totally annihilate mankind. These new trends have contributed to changing the concepts of economic and social development.

Biotechnology is one of the specializations that carry a huge potential. At a time when the world is witnessing a rapid development of scientific discoveries, Member States are in dire need of biotechnology applications in different areas, particularly in food and agriculture, as most of these countries' economies rely on agriculture. In other words, biotechnology can help millions of the poor living in rural areas whose income depends on local food production to improve their produce. Biotechnology also provides every day new and better

alternatives for curing common illnesses, and they are projected in the offing to induce major changes in the health industry.

Addressing environmental issues on the local, national or regional levels requires the adoption of a comprehensive methodology, the integration of all knowledge and sciences, whether natural or social sciences. Environmental issues represent big challenges to the Islamic world. Human activities, no doubt, cause major environmental damages such as the excessive exploitation of natural resources without caring about their renewal, deforestation, degradation of biodiversity and exacerbating environmental pollution. Indifference to these damages threatens the survival of the human species as the degradation of bio-diversity and increasing pollution reached alarming and critical levels. Our world today is no doubt in need of mustering national and international efforts to take urgent and concrete measures likely to reduce the volume of waste, curb pollution and protect natural resources so as to preserve our planet for the next generations.

This alarming situation, which keeps exacerbating due to the ongoing degradation of the environment and the depletion of natural resources, represent an increasing risk to the Islamic world and a real threat to the desired goals of Member States in terms of social, economic and environmental development. Therefore, ISESCO included the issues of preserving the environment and the achievement of sustainable development goals among its strategic priorities, thus truly enabling it to be involved in the efforts of the international community in this area, through a set of qualitative and specialized activities that it has implemented under its successive action plans, with the objective of raising awareness of these challenges and building the capacities of Member States in relevant areas. For instance, during the last three years, many achievements were made in the areas of preserving the environment and environmental management, mitigating the impact of climate change, preparations for natural catastrophes, risk management and reduction, food security, green economy and power efficiency. ISESCO will continue under this action plan focusing on such issues in view of their importance.

The objective behind bringing together science and technology is to use resources jointly and encourage further innovation in this area. As multidisciplinary research in exact sciences, such as biology for instance, requires large scientific programmes and high-tech laboratories, it is imperative to encourage some sort of grouping between laboratories and institutions that aim to achieve similar objectives. As some Member States have achieved a high level of technical expertise in a set of specializations, they are now able to transfer and exchange with countries that seek to achieve the same purposes in the areas of research and technology. Therefore, ISESCO will work in cooperation with institutions and other relevant parties on strengthening science parks and technology incubators.

In light of the preceding, ISESCO's action will focus on the following **3 action priorities**: “**Fostering the system of science and technology to achieve development**”, “**Achieving sustainable environmental balance in Member States**”, and “**Encouraging scientific research and harnessing technological innovation to**

serve sustainable socioeconomic development”. Four projects will be implemented under these priorities. These are:

- 1- **Developing science, technology and innovation policies and systems and renewing their governance to achieve Sustainable Development Goals (SDGs);**
- 2- **Sustainable protection of the environment and the facilitation of transition to the green economy;**
- 3- **Activating nanoscience and science technology applications to achieve sustainable social and economic development;**
- 4- **Transferring knowledge, marketing the findings of scientific research, encouraging the innovative enterprise and youth employment.**

## Project 1: Developing science, technology and innovation policies and systems and renewing their governance to achieve Sustainable Development Goals (SDGs)

### General framework

The objective behind science, technology and innovation policy is to establish an infrastructure in the areas of science, technology and innovation, so as to promote its use to achieve economic development, improve the level of physical and spiritual welfare of mankind as it represents an integral part of the policies aimed at achieving economic and social development, thanks to the efficiency and sustainability of scientific systems and the availability of the favorable environment for the advancement, sustainability and development of science, technology and innovation.

The project aims at highlighting science, technology and innovation policy, and what it reflects in terms of ambitions, values, virtues, wisdom, history, traditions and diversity in Member States. In addition, ISESCO will focus on strengthening science, technology and innovation policy whose main characteristics are already present in some Member States, including the presence of experts and actors in the areas of science and technology, and the institutions capability to address the challenges at hand and use the available opportunities in this field. It will also prepare objective studies on the current situation of the infrastructure dedicated to science and technology in Member States, and its present economic capacity. Taking a set of measures on national policies and adopting their implementation mechanisms represent as well decisive steps towards achieving the expected goals.

The difficulties relating to the governance of science, technology and innovation, which are closely related to the sophistication of the current systems for science and technology, have become an issue that legislative bodies in Member States should give attention to. Indeed, parliaments play an apex role in framing the legal context for developing science, technology and innovation. Parliamentary commissions concerned with science also have an important role in the effective implementation of science and technology policies, and the strengthening of cooperation between the different components of innovation systems and the concerned parties. These are two prerequisites to achieve the desired progress and mobilize and harness resources to develop and enhance the advancement of sciences. In this context, emphasis should be placed on strengthening the legislative capacities of Member States so as to achieve the aspirations of their peoples for sustainable development and address the societal challenges of the 21<sup>st</sup> century, through a joint formulation of the legislations in the areas of science, technology and innovation.

### Objectives:

- Make science, technology and innovation policies more efficient and improve the quality of higher education and research centers in addressing issues that limit the development of science, technology and innovation;
- Build the capacities of institutions in charge of science, technology and innovation policies so as to improve their performance and impact in the areas of science and technology and strengthen their implementation mechanisms;

- Enhance awareness and build capacities in the areas of science, technology and innovation and establish science parks and technology incubators;
- Encourage women’s participation in science through facilitating their initiatives in the areas of science, technology and innovation and incentivizing related policies;
- Provide a special network for electronic resources and the exchange of knowledge.

**Areas of intervention:**

1. Science, technology and innovation: tools for achieving sustainable development;
2. Factors conducive to the creation of an appropriate environment for improving the quality of higher education and entrenching good governance in this sector;
3. Women's participation in sciences;
4. Networking for electronic resources and knowledge sharing.

**Total budget: US\$ 1,684,000.00.**

**Area of intervention 1: Science, technology and innovation: tools for achieving sustainable development.**

Under this area of intervention, ISESCO will focus on strengthening the role of decision-makers, particularly members of parliaments and legislative institutions in Member States, in view of the missions assigned to them in enhancing and promoting science, technology and innovation policy, and the necessary related legal texts. ISESCO will encourage the setting up of a reference framework for supporting and coordinating initiatives at the national level in order to take the scientific dimensions more seriously when drawing up national and international policies aimed at achieving sustainable development. Scientific diplomacy is also one of the major goals that ISESCO seeks to achieve so as to enhance joint scientific objectives and promote dialogue and international cooperation in a bid to achieve SDGs.

The Islamic Observatory for Science, Technology and Innovation will be ready, which would help Member States elaborate their policies through managing statistical information and using them in a better way. ISESCO will also be able, through the action of the Islamic Observatory for Science, Technology and Innovation, to pursue its activities relating to research, development and capacity-building, so as to enable Member States obtain science and technology data and improve its indicators to achieve SDGs.

**Expected outcome 1: Improving the impact of science, technology and innovation policies to achieve SDGs.**

Performance Indicators	Measurement Indicators
- Promoting the role of parliaments and different competent authorities and involving them in the achievement of social and economic development of Member States.	- Organizing 3 gatherings on science, technology and innovation for MPs.
- Disseminating and implementing the concept of scientific diplomacy at the regional level.	- Holding 4 workshops and training sessions on scientific diplomacy.

Performance Indicators	Measurement Indicators
- Establishing the Islamic Observatory for Science, Technology and Innovation and seeing to the fulfillment of the missions assigned to it.	- Holding 6 gatherings on the Islamic Observatory for Science, Technology and Innovation as part of the preparations for its launch and its publicizing as tool at the service of Member States.
- Enhancing suitability between science, technology and innovation policies to the current needs and trends.	- Organizing 3 workshops and 2 forums on capacity building in the area of science, technology and innovation policy.

### Area of intervention 2: Factors conducive to improving the quality and systems of higher education and entrenching good governance in this sector.

ISESCO will continue enhancing and upgrading technical education and vocational training through the double diploma programme, so as to train intermediate-level workforce to meet the needs of Member States. It will also work on improving higher education systems which play a key role in increasing productivity and improving the quality of life. ISESCO's activities will also focus on enhancing and improving the quality of higher education, supporting research and exchange at the local level, and encouraging cooperation with the most prominent universities in the world. The activities to be implemented in this area aim at enhancing the quality of higher education in Member States, aligning its systems with international standards, keeping it abreast with the rapid pace of developments and making it meet the requirements of the market and competition, through laying the foundations of a fruitful cooperation with universities from both the public and private sectors, so as to promote the education sector and guarantee its quality.

Under this area, ISESCO will strive to strengthen good governance systems in universities through the implementation of a number of associated activities.

### Expected outcome 2: Entrenching quality and governance mechanisms in higher education in Member States.

Performance Indicators	Measurement Indicators
- Improving higher education quality mechanisms. - Enhancing accreditation in Islamic universities. - Strengthening higher education governance. - Capacity-building in teaching sciences.	- Organizing 6 workshops on quality and accreditation in higher education, in cooperation with OIC. - Organizing 3 gatherings on teaching sciences. - Holding 3 training workshops on good governance for senior university officials.

### Area of intervention 3: Women's participation in science.

The human development indicator on gender equality, developed by the United Nations, reveals a sharp contrast between men and women, as women face marginalization. Women are still weakly represented in many areas, particularly in science and technology, in addition to being discriminated against. Women scientists' contribution in the areas of science and technology is still very limited in a number of Member States. Therefore, ISESCO will endeavor to participate in facilitating and promoting the participation of

women in sciences, as well raise awareness of the importance of their role in this area through organizing specialized workshops and colloquia, in addition to activating the Islamic Network of Women Scientists (INWS) as its being a platform for the exchange of knowledge and expertise between women scientists. ISESCO will initiate the development of programmes to strengthen women’s participation in teaching sciences and enhance their leading role in the field of science.

**Expected outcome 3: Active and positive participation of women in science in Member States.**

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Supporting activities on women in science and activating their role and effective involvement in important areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Organizing 3 workshops on empowering women in the areas of science and technology.</li> </ul>
<ul style="list-style-type: none"> <li>- Activating the Islamic Network of Women Scientists (INWS) and enhancing its effective roles in promoting social gender to reach excellence in science and technology.</li> </ul>	<ul style="list-style-type: none"> <li>- Supporting the organization of 4 forums for the Islamic Network of Women Scientists (INWS) under the supervision of ISESCO.</li> <li>- Supporting the organization of workshops on ways to combat cancer for women leaderships, in cooperation with the OIC.</li> </ul>

**Area of intervention 4: Networking for electronic resources and knowledge exchange.**

One of the challenges facing Islamic countries is the smooth transition towards the knowledge-based economy and making knowledge a basic ingredient in their people’s culture. This requires making the exchange of knowledge a subject of research since the exchange of real-time data is a flexible operation that needs constant monitoring and adaptation so as to enable the uninterrupted accumulation and exchange of knowledge throughout generations. Efforts in this area will focus on strengthening networking so as to promote joint production of recent knowledge, in addition to sharing current knowledge and implementing them effectively to address various issues. ISESCO looks forward to developing knowledge acquisition in the area of research and development, particularly knowledge relating to building the technological capacities to be used in processing industries.

ISESCO will continue its efforts aimed at providing a platform for the exchange of knowledge through activating the Pan-Islamic Research and Education Network (PIREN), as part of ISESCO’s integrated digital platform so as to promote quality, accreditation, exchange and cooperation between universities in ISESCO Member States. ISESCO will also continue its efforts aimed at reinforcing the exchange of knowledge and connectivity between universities and research centers in Member States through publishing the findings of young scientists’ scientific research on the relevant electronic platform and in ISESCO Journal of Science and Technology.

**Expected outcome 4: Launching the Pan-Islamic Research and Education Network (PIREN) to exchange knowledge and improve research findings.**

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Consolidating connectivity and communication between scientists and researchers.</li> <li>- Implementing ICTs in different work areas.</li> <li>- Strengthening the action of the Pan-Islamic Research and Education Network (PIREN) and improving its efficiency.</li> </ul>	<ul style="list-style-type: none"> <li>- Holding 3 meetings of the Advisory and Executive Commission of the Pan-Islamic Research and Education Network (PIREN).</li> <li>- Organizing 3 workshops on ICTs and their different applications in a number of key sectors.</li> <li>- Organizing 3 activities for the development of an electronic portal of the Pan-Islamic Research and Education Network (PIREN).</li> </ul>
<ul style="list-style-type: none"> <li>- Promoting and updating the website: <a href="https://www.science4innovation.org">https://www.science4innovation.org</a></li> </ul>	<ul style="list-style-type: none"> <li>- Enriching the contents of the website with scientific research indicators for Member States, providing electronic links for scientific research centers, universities in Member and non-member states, providing an electronic version of ISESCO Journal of Science and Technology, announcing ISESCO awards and grants in the field of science and technology, and publishing data pertaining to the programme “Tafahum” on the Exchange of Students and Researchers.</li> </ul>
<ul style="list-style-type: none"> <li>- Publishing scientific and innovative articles in the fields of scientific research.</li> </ul>	<ul style="list-style-type: none"> <li>- Publishing an issue of ISESCO Journal of Science and Technology every year.</li> </ul>

## Project 2: Sustainable protection of the environment and the facilitation of transition to the green economy

### General framework

Preserving the environment and mitigating environmental challenges is not only a priority for ISESCO, but the foremost priority in its strategies and action plans. To this end, the sessions of the Islamic Conference of Environment Ministers, held on a regular basis, outline the guiding principles for policies and action plans in this regard. As usual, ISESCO will continue organizing the sessions of the Islamic Conference of Ministers of the Environment, and the meetings of the Islamic Executive Bureau of the Environment, which elaborates guiding principles for joint environmental Islamic action and adopts its reference documents. In addition, ISESCO will continue its efforts aimed at promoting the contribution of traditional knowledge and common values among religions in protecting the environment.

Climate change has dangerous impact around the world. Accordingly, ISESCO will continue, under this project, activating the resolutions of the Conference of the Parties (COP) and coordinating related activities to be implemented in Member States. Action will then focus on the impact of climate change and the efforts aimed at alleviating it, through the implementation of activities aimed at increasing awareness and providing training in mitigating measures of the climate change, in addition to promoting the concept of green economy.

Renewable energies are the cornerstone of the energy transition and a real alternative to fossil fuel. The use of new sources of renewable energies keeps increasing at a rapid speed, and represents therefore a good opportunity for the Islamic world countries which do not have fossil fuels, to develop sustainable energy sources, provided they possess the appropriate modern technology. Starting from its firm conviction of the importance of this issue, ISESCO was anxious during its consecutive action plans to implement numerous programmes for Member States, aimed primarily at deepening awareness and promoting the culture of energy preservation, and working for the encouragement of the use of renewable energies. ISESCO will strive under its next three-year action plan to continue its activities aimed at encouraging the preservation of energy and promoting renewable energies.

On the other hand, natural resources play a key role in social and economic development of the Islamic world, although their efficient use remains a prerequisite for achieving sustainable development and prosperity for nations and peoples. Therefore, the preservation of natural resources and bio-diversity will be one of the important issues for ISESCO under its new Action Plan, through pursuing its efforts in this area and implementing UNESCO-ISESCO joint initiative on biosphere reserves. To this end, numerous associated activities will be implemented over the next three years in order to enhance capacities in the sustained use of natural resources, to implement the initiative of biosphere reserves and to preserve bio-diversity.

ISESCO has always considered water as one of the strategic sectors. Today, this sector faces huge challenges due to many problems such as governance, water scarcity, excessive use, pollution ...etc. In this context, ISESCO prepared in 2017 an ambitious action plan for water during the period 2018-2022 under its strategy in this field. Therefore, the next three years will be dedicated to implementing this Action Plan in cooperation with ISESCO partners and specialized international and regional organizations in this area. The implementation of this action plan will likely improve the current situation and strengthen cooperation and coordination between Member States and the different institutions of the Organization of Islamic Cooperation. Other associated issues will also be addressed in the next action plan through supporting the implementation of a number of activities, such as education on the rational use of water, capacity-building, promoting scientific research and activating cooperation and the sharing of knowledge about these issues.

Being fully aware of the alarming increase of natural disasters around the world which have become more recurrent and violent, with destructive impact, ISESCO will continue its efforts in this area so as to implement the Strategy on Reducing the Risks of Natural Disasters and their Management in Member States. As part of the proceedings of the 7<sup>th</sup> Islamic Conference of Environment Ministers held in 2017, ISESCO presented the first phase of a pilot programme on implementing the Strategy during the period 2019-2018. The programme includes a number of regional and international activities, alongside other regional activities that will be implemented during similar and consecutive periods. Being keen to improve the efficiency of these activities, ISESCO plans to strengthen cooperation with OIC institutions and bodies and specialized international organizations specialized in this issue. In addition, the food production chain also faces a disruption as a result of severe climate change and increasing demand for food and animal feeds, as the output capacity of many traditional biological resources and production systems are at their near depletion. The whole international community has become aware of the pressing need for sustainable agriculture and food security due to climate changes which keep exacerbating day in day out until they now threaten food security across the globe. Since most Islamic countries rely primarily on agriculture, ISESCO focused its attention on capacity-building in the area of agricultural production to ensure food security and meet the needs in terms of food and animal feeds.

Two main activities are implemented in 2018 in cooperation with UNESCO, the Environment and Development Centre for the Arab Region and Europe (CEDARE) and the OIC. It is also projected to implement other activities in the subsequent years.

**Objectives:**

- Unify visions and strategies and mobilize efforts on environment issues in the Islamic world;
- Increase awareness of environmental challenges and climate change issues and build capacities in this field;

- Encourage the adoption of the new concept for the transition to the green economy and to enhance the preservation of the energy and the use of renewable energies;
- Encourage the sustainable use of natural resources;
- Help Member States ensure water security and achieve the 6<sup>th</sup> goal of the SDGs;
- Improve the productivity of sustainable agricultural systems and preserve biodiversity.

#### Areas of intervention:

1. Promoting environmental management and strengthening related policies;
2. Enhancing the preservation of energy and the use of renewable energy and the green economy;
3. Ensuring the sustainability of natural resources and addressing water-related challenges;
4. Adapting to climate change and the risks of natural catastrophes and mitigating their effects.
5. Promoting ecological farming systems to satisfy future food needs and preserve biodiversity.

**Total budget: US\$ 1,684,000.00.**

#### Area of intervention 1: Promoting environmental management and strengthening related policies.

A number of activities will be implemented in this area to the benefit of Member States, including launching a new programme for celebrating Islamic capitals for the environment and sustainable development in addition to the Award of the Kingdom of Saudi Arabia Prize for Environmental Management in the Islamic World, and following up the establishment of the Islamic Academy for the Environment And Sustainable Development with the Moroccan government. ISESCO will continue organizing the sessions of the Islamic Conference of the Environment Ministers, and the meetings of the Islamic Executive Bureau for the Environment, which both outline the guiding principles for joint Islamic environmental action, and adopt relevant reference documents. Moreover, under this Three-Year Action Plan workshops will be held for the benefit of competent parties and experts to highlight the best practices and policies in this area.

#### Expected outcome 1: Encouraging countries of the Islamic world and supporting their adoption of comprehensive strategies and policies on environmental issues.

Performance Indicators	Measurement Indicators
- Enhancing awareness, exchanging information and highlighting relevant issues.	- Pursuing the supervision of the Award of the Kingdom of Saudi Arabia for Environmental Management in the Islamic World.

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Promoting the best practices and policies among Member States on environmental management and relevant policies.</li> </ul>	<p>Following up the creation of the Islamic Academy for the Environment and Sustainable Development with the Moroccan government.</p> <ul style="list-style-type: none"> <li>- Launching a new Programme for celebrating Islamic capitals of the environment and sustainable development.</li> <li>- Organizing 3 training workshops for competent parties and experts to publicize best practices and policies in this area.</li> <li>- Organizing 3 activities on interfaith dialogue on environmental issues.</li> </ul>

**Area of intervention 2: Enhancing the preservation of energy and the use of renewable energy and the green economy.**

Within the period covered by this Three-Year Action Plan, the new concept of the transition towards the green economy will be highlighted in the different areas, like energy, transport, agriculture and the industry. On the other hand, the “Islamic Green City Excellence Award” will be launched, as part of the “Award of the Kingdom of Saudi Arabia for Environmental Management in the Islamic World”, as adopted by the Islamic Conference of Environment Ministers. ISESCO will, under its Three-Year Action Plan, continue to fulfil its leading role in this area through implementing numerous activities aimed at capacity-building and encouraging innovation, while focusing on technology transfer in renewable energies. It will also continue its participation in organizing international and regional conferences in cooperation with the World Network for Renewable Energies (WREN), in order to enhance the use of such energies in Member States. ISESCO will continue the organization of expert meetings and training workshops, in addition to developing joint action with its partners in the area of renewable energies.

**Expected outcome 2: Enhancing the culture of saving energy, encouraging the use of renewable energies and the green transition among Member States.**

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Enhancing the culture of preserving energy.</li> <li>- Promoting the use of sources of renewable energy.</li> <li>- Capacity-building and publicizing the concepts of green technology and green cities.</li> <li>- Enhancing knowledge on renewable energy technologies.</li> <li>- Sharing expertise among Member States.</li> </ul>	<ul style="list-style-type: none"> <li>- Organizing 3 activities to enhance technical capacities and deepen understanding of climate change and its impact.</li> <li>- Launching the “Islamic Green City Award” as part of the of the “Award of Kingdom of Saudi Arabia for Environmental Management in the Islamic World”.</li> <li>- Holding two symposiums for raising awareness of and publicizing climate change.</li> <li>- Holding 3 training workshops for experts and competent parties to exchange the best practices and successful policies in this regard.</li> </ul>

### Area of intervention 3: Ensuring the sustainability of natural resources and addressing water challenges.

The preservation of natural resources and their sustainability has a long been an objective and a main project in subsequent ISESCO's action plans. Emphasis will continue under this Action Plan on this issue, and the accompanying measures, as concrete initiatives will be put in place to enhance the sustainable use of natural resources and guarantee a sound management of these resources based on a participatory approach to enable the renewal, sustainability and preservation of these resources, as well as addressing its accompanying risks, like their over-exploitation.

Moreover, and as part of implementing its Integrated Strategy for Water Management in the Islamic World, and the Action Plan on Water for the Period 2018-2022, ISESCO will continue, in cooperation with its partners and international and national organizations specialized in this area, to intensify its efforts in this area through implementing a number of new activities; the objective being to improve current conditions, and strengthen cooperation and coordination between Member States and OIC institutions and bodies.

This will be achieved through implementing the programmes that focus on raising awareness about the preservation of water and natural resources and the governance of their use and management, capacity-building, promoting scientific research, activating cooperation and sharing knowledge thereon. These activities will help achieve the 6th goal of SDGs, by improving the infrastructure for water collection, storage and distribution, and facilitating the sustainable access to clean water and sanitation services for all.

### Expected outcome 3: Contributing to the preservation of natural resources and encouraging the adoption of an integrated management of water resources in the Islamic world.

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Ensuring sustainable use of water resources;</li> <li>- Raising awareness of the participatory approach on natural resources management;</li> <li>- Introducing modern technologies and latest research on water and its management;</li> <li>- Promoting water security and achieving SDGs.</li> </ul>	<ul style="list-style-type: none"> <li>- Organizing 3 activities for enhancing technical capacities in the field of natural resources management;</li> <li>- Holding two regional workshops on innovative technologies for research conducted in this area.</li> <li>- Holding 5 training workshops for experts and competent parties to be introduced to the best practices in this field.</li> </ul>

### Area of intervention 4: Adapting to the effects of climate change and the risks of natural catastrophes and mitigating their effects.

Climate change is the main challenge faced by the Islamic world. The rise in temperatures of the planet earth and its accompanying disasters is due to greenhouse emissions resulting from human activity. Climate change causes serious problems. Facing them requires huge efforts that do not only focus on its negative effects, but on proposing solutions and concrete

measures likely to enable adapting to it and mitigate its effects. This can be done only through reconciling visions and strategies and sharing successful experiences in this area.

Being aware of the importance of such issues and the dangerous current situation for the Islamic world, ISESCO will continue under its new Action Plan to be part of international efforts on the issue, adopt the decision of the Conference of the Parties (COP) and cooperate with specialized international institutions on the subject, in addition to organizing training sessions and workshops on alleviating the effects of climate change and highlighting the measures likely to guarantee the mitigation of its impact.

On the other hand, in view of the size and impact of natural catastrophes, and despite the efforts undertaken to counter their risks, there is still a long way ahead before ensuring the security of the Islamic world and enable its countries to address natural catastrophes and mitigate their impact. In front of this daunting challenge, ISESCO will pursue its efforts in this area as part of the "**Strategy for the Reduction and Management of the Risks of Natural Disasters in Member States**", adopted by the Islamic Conference of Environment Ministers, in coordination with specialized institutions and organizations. The activities to be implemented in this regard include identifying the priorities of Member States in this area, organizing training sessions for capacity-building for executive directors, providing expertise and technical counselling in the elaboration of national action plans on the prevention of catastrophes and mitigation of their effects.

**Expected outcome 4: Supporting Member States to enable them face the risks of natural catastrophes, mitigate and adapt to the effects of climate change and promote the latest technologies in this area.**

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Raising awareness of the risks of natural catastrophes in the Islamic world;</li> <li>- Supporting Member States in identifying their priorities and developing capacity-building programmes on adapting to climate change and mitigating its effects;</li> <li>- Encouraging the use of high-end technologies to prevent, assess and analyse the risks of natural catastrophes.</li> </ul>	<ul style="list-style-type: none"> <li>- Organizing 3 activities with a view to strengthen the technical capacities relating to using high-end technologies for the prevention, assessment and analysis of natural catastrophes;</li> <li>- Holding two workshops on early warning systems on Tsunamis and ways to mitigate their effects;</li> <li>- Elaborating three national action plans on the prevention of disasters and mitigating their effects in the three regions of the Islamic world (African, Asian and Arab);</li> <li>- Organizing three training sessions for experts and competent parties to share the best practices in the area of preventing natural catastrophes and reducing their effects;</li> <li>- Holding two regional conferences on the exchange of expertise and achievements in the area of adapting to climate change and mitigating its impact.</li> </ul>

**Area of intervention 5: Promoting ecological farming to meet future food needs and preserve biodiversity.**

ISESCO will continue implementing its capacity-building programme, which focuses mainly on providing the expertise to develop and use new technologies likely to address different agricultural issues that prevent Member States from reaching the desired level in terms of food production. Therefore, ISESCO will, under this programme, highlight and promote future agricultural programmes and provide technical support and counselling to Member States to promote crops which are not properly exploited. In this regard, ISESCO will organize conferences for raising awareness of the importance of such agricultures, in addition to expert meetings from different Member States in order to draw up the strategies and needed tools to preserve bio-diversity and use it in an optimal way.

**Expected outcome 5: Encouraging the use of agricultural potentials to increase production, preserve biodiversity and rely on future agricultures to achieve food self-sufficiency.**

Performance Indicators	Measurement Indicators
<ul style="list-style-type: none"> <li>- Improving agricultural production using effective tools for food production and preservation;</li> <li>- Enhancing the role of unexploited and marginal food agricultures.</li> <li>- Increasing awareness of the deterioration of bio-diversity and ways to face such challenges;</li> <li>- Sharing information on national achievements and current situation of biodiversity.</li> <li>- Strengthening the management of biosphere reserves in the concerned countries and addressing the impact of climate change.</li> </ul>	<ul style="list-style-type: none"> <li>- Launching 3 programmes for strengthening precision agriculture, farming and innovative techniques.</li> <li>- Organizing 3 seminars for enhancing awareness on sea resources.</li> <li>- Holding 3 workshops on integrating new crops and their role in achieving food security.</li> <li>- Organizing a regional workshop on biosphere reservations in the light of climate change and the degradation of biological diversity in the three regions of the Islamic world.</li> <li>- Organizing 3 activities for competent parties.</li> <li>- Holding 3 training workshops and seminars on the concept of Globally-Important Agricultural Heritage Systems (GIAHS).</li> <li>- Organizing 3 workshops and training sessions on the importance of preserving biodiversity both internally and externally.</li> </ul>

### Project 3: Activating nanoscience and modern technology applications to achieve sustainable social and economic development

#### General framework:

Under this project, action will focus on highlighting the role of nanotechnology and its applications in social, economic, health, agricultural and environmental areas, as well as in biotechnology and manufacturing processes. The strength of composite material, new materials and nanomaterials have kept growing, thanks to integrating quality and nanomaterials, which gave new products more efficiency, strength and flexibility. The new trends also include big-data science, the concept of virtual laboratories and technological coalitions. In view of the rapid speed of communication and the ability to programme and process a huge amount of data online, this area opens new opportunities for cooperation and coordination. This trend will be extremely useful to Member States in consolidating joint cooperation ties, through harnessing high-speed communication tools.

In addition, biotechnology is one of the key areas under this project. In this context, ISESCO will undertake to provide and update knowledge about bio-technology for Member States, in addition to analysing the positive impact of scientific and technological progress. These objectives will remain at the heart of ISESCO's action plan in the fields of science and technology. In this regard, ISESCO will ensure, through the International Biotechnology Advisory Committee (IBAC), to take the appropriate measures and guarantee the smooth implementation of programmes and projects aimed at promoting biotechnology. Strong support will be provided to programmes aimed at raising public awareness the public about the latest biotechnology applications in the areas of health, food security and agriculture.

The issue of health will continue to be one of the main sectors included in all national plans, which requires further consolidation of it as part of the OIC Health Strategic Programme. Estimations suggest that the global economic cost of the Severe Acute Respiratory Syndrome (SARS) stands at around **US \$ 54 billion**, while the influenza pandemic exceeds **U.S \$ 3 trillion**. The cost for fighting the effects of the anthrax attacks in 2001 stood at more than **U.S \$ 1 billion**, while the bird flu cost amounted to **U.S \$ 3.3 billion**. In this regard, it should be pointed out that the OIC Strategic Action Programme in the health sector for the period 2014-2023 focuses on strengthening self-reliance in producing drugs and vaccines. In line with the contents of this strategic programme, ISESCO will center its efforts in the health sector on preventing infectious and non-infectious diseases, and improving conditions and health services through holding a series of international conferences and specialized training workshops in Member States.

There are several vulnerabilities within Member States in view of the new developments, while being limited to the minimum standards of safety and security; thus the need for a strong and highly effective prevention and security system, and the setting up of a criminal body in charge of fighting cyber criminality. This also

presupposes acquiring the needed experience and expertise in these areas, in addition to enacting laws on criminal investigations in cyberspace by legislative bodies. ISESCO will help its Member States put in place highly-effective security and protection systems, through organizing regular training programmes.

There is also a need for protecting the internet and ensuring its security so as to preserve classified and strategic data of countries and organizations. Data security also is very important for many reasons: protecting companies' assets, achieving competitiveness, meeting industrial standards and ensuring associated responsibilities, and preserving positions within the market.

The virtual laboratory is a relatively new concept, yet it is rapidly acquiring notoriety throughout the world. Virtual laboratories allow shifting from the classical teaching pattern and applied work within classrooms to advanced levels of joint research. Based on the internet, it has become easy to obtain the latest equipment from anywhere and at any time. It is no longer important whether the student is present in a nearby laboratory or another spot of the world. Virtual laboratories enable joint work from different geographical sites. Thanks to the expertise, experiences and different resources provided by these laboratories, high-technology laboratories and joint experiences can be carried out within them. In some cases, things or materials subject of research can be located in a remote place from analytical or computational facilities that allow data collection and analysis in real time. In addition, the virtual laboratory provides research opportunities for those with skills and knowledge who need resources and infrastructure as they settle in remote areas. The adoption of virtual laboratories in Member States will represent a unique opportunity to teach sciences online and carry out practical laboratory experiments. Furthermore, it can consolidate linkages between centers of excellence in Member States through carrying out joint research. In addition, Member States, despite their different potential and capacities, can build bridges of joint cooperation in order to maximize the benefits from using these technologies. ISESCO, in keeping up to date with the new technologies, will organize workshops and conferences with the participation of different actors concerned to shed light on this important subject.

In addition, Geographic Information Systems (GIS) and remote sensing technologies open promising horizons before geographical data collection and the design of related models and their applications in different areas of life. In this context, action will focus on establishing a platform on the regional and global levels to benefit from technical expertise in order to promote education and training in the area of earth observation. In parallel, observation and assessment mechanisms will be put in place so as to determine the efficiency of efforts aimed at building capacities in the field of Earth observation.

### **Objectives:**

- Enhance new trends and use new materials for creating economic values;
- Promote nanotechnology and biotechnology to achieve additional social and economic benefits;

- Enhance scientific knowledge on cyber protection and ensure its security.
- Sensitize decision-makers about the importance of preparing laws on cyber forensic investigation and the establishment of related mechanisms.
- Raise awareness of the need for cooperation on programmes relating to big data and virtual laboratories, and provide a platform for technological coalitions.
- Strengthen capacities in the field of space sciences in action areas of extreme importance for countries (Geographic Information Systems (GIS) and remote sensing technologies, the global navigation satellite system (GNSS), and detection and identification range by light system (LIDAR)...etc.).

### **Areas of intervention:**

1. New trends in nanoscience and biotechnology;
2. Internet security, criminal investigation in cyberspace, big data, virtual laboratories and technological coalitions;
3. Space sciences applied to key sectors so as to build a knowledge-based society.

**Total budget: U.S \$ 1,599,800.00.**

### **Area of intervention 1: New trends in nanoscience and biotechnology.**

ISESCO efforts in the fields of nanotechnology and biotechnology focus on adopting the appropriate approaches to encourage Member States develop a comprehensive vision of nanotechnology and biotechnology, identifying priorities in the field of research, opening promising horizons for multidisciplinary work teams, establishing cooperation at local, regional and international levels, and exploring the abilities, opportunities and achievements of nanotechnologies and biotechnologies in Member States.

ISESCO will continue its efforts to update the electronic portal on nanotechnology and the portal of the International Biotechnology Advisory Committee (IBAC). It will also harness these technologies to address the challenges faced in key areas, such as agriculture, health and the environment, energy needs, development and applications relating to the environment in Member States.

Taking into consideration the field of composite materials, which is of high importance to manufacturing industries, and the new materials in the industrialization field, ISESCO will attach special importance to this scientific specialization and keep abreast of the developments taking place in this area. In order to strengthen and promote the use of composite materials, ISESCO will hold training workshops to raise awareness of the importance of this area and build capacities in this field.

**Expected outcome 1: Capacity-building in the fields of nano science and composite materials and enhancing advanced biotechnology.**

Performance Indicators	Measurement Indicators
- Enhancing social awareness of nanotechnology and sharing relevant knowledge.	- Organizing 6 international workshops on nanotechnology and nano materials applications.
- Capacity-building in the area of composite materials.	- Holding 4 conferences or meetings on the use of nanotechnology and biotechnology in the industrial sector.
- Enhancing the benefits from nanotechnology and biotechnology and their application in the industrial sector.	- Organizing 2 workshops and 1 international conference on nanotechnology in the fields of health and agriculture.
- Promoting advanced biotechnology in the fields of health and agriculture.	- Organizing 3 seminars on the importance of sensitizing society on composite materials.
- Enhancing the positive impact of nanotechnology applications and delivering their dividends to society and academic circles.	- Holding a workshop and a symposium on harnessing scientific innovation in the fight against transmitted and chronic diseases, in cooperation with the OIC.

**Area of intervention 2: Cyber security, cyber forensic investigation, big data, virtual laboratories and technological coalitions.**

The beginning of the 21<sup>st</sup> century was characterized by a marked development of the internet, which prompted a revolution in the field of ICTs. While technological progress brings in many benefits, it also entails many risks from a security perspective. Cyber security depends on a set of characteristics and resources that rapidly become out-of-date owing to the rapid development of new software. While cross-border digital communication is an imperative in all Member States, drawing full benefit from the potential of emerging technologies requires highly trained human resources. To this end, ISESCO will continue organizing various training programmes in Member States to raise awareness of these issues and train human resources on using new tools and systems in their areas of expertise.

**Expected outcome 2: Capacity-building in cyber security, the establishment of a platform for cyber forensic investigation and raising the awareness of the authorities concerned in Member States about the future of big data sciences.**

Performance Indicators	Measurement Indicators
- Capacity-building on the safe use of the internet and cyber security.	- Organizing 3 training workshops on the safe use of the internet and cyber security.
- Enhancing awareness about the importance of cyber forensic investigation.	- Organizing 3 training workshops on cyber security and relevant laws.
- Strengthening coalitions in big data.	- Holding 3 workshops on big data sciences programme.
- Building capacities in the area of cooperative technology stimulating the exchange of expertise.	- Holding 3 meetings/gatherings on the internet of things and cloud computing.

**Area of intervention 3: Applying space sciences in key sectors towards a knowledge-based economy.**

Earth observation techniques and tools and geographic information systems saw a huge development over the last decades, which would likely help in facing and addressing the different challenges posed in many areas such as the environment, climate change, ecological systems services, water management and drugs, in addition to many other aspects. ISESCO will continue, under its Action Plan for 2019-2021, to support these new technologies in view of the important information they provide in terms of contributing to decision-making. It will also focus under this area on ways likely to meet the needs of users of these technologies and to provide the resources that can be effectively used to observe earth, in addition to building relevant capacities, both in terms of quality and quantity, in Member States. ISESCO will as well work for society to benefit from these technologies applications in many areas, and will raise awareness of potential users and providers of these tools about the possibilities offered by these tools, in addition to publicizing successful applications of this technology in a number of areas.

**Expected outcome 3: Acquiring tools for Earth observation and their application in Member States.**

Performance Indicators	Measurement Indicators
- Improving the use of remote sensing and geographical information systems for the achievement of sustainable development.	- Organizing 3 conferences on remote sensing and Earth observation for decision-makers.
- Building capacities and implementing continued observation mechanisms for the efficiency of Earth observation.	- Holding 3 workshops on tools of Earth observation and their application in many areas.
- Establishing networks for experts and users of Earth observation tools so as to promote open data.	- Organizing 3 activities on regional and international expertise networks for Member States.
- Establishing a regional and international platform for technical expertise in education and training in the field of earth observation.	- Organizing 6 training workshops on open data applications for earth observation for the achievement of SDGs.

## Project 4: Transferring knowledge and marketing the findings of scientific research and encouraging innovative enterprises and youth employment

### General framework

In the era of knowledge and innovation-based economy, Member States have become aware that the achievement of development and growth hinges on their ability to change their economies into knowledge and innovation-based economies. One of the main factors that led to the rapid and deep-seated changes in the world over the last decades is the strong interaction between scientific development and technological progress, and its ensuing outcomes in terms of production, distribution, and consumption of goods and services.

The new economic vision should focus on the role of knowledge as a basis for economic change and its importance in identifying aspects of divergence between the government, the university and the industrial sector in Member States, as well as explore new forms of cooperation between universities, the industry and governmental institutions in a way that better matches the social and economic system, in addition to translating research outputs into a practical technology.

Member States today should take the necessary measures to adopt direct and key reforms through reflecting on the ideal way to finance and manage their higher education systems, so as to address the existing imbalance between supply and demand in the areas of science, technology and innovation, particularly in terms of management. In this context, emphasis should be put on the need to establish private institutions and encourage direct investments to reach the sustainable development goals. Interaction between the academic and the industrial sectors and the improvement of business administration and marketing are also of utmost importance in promoting the professional careers of young students, satisfying their professional ambitions and enhancing their determination and desire to reach their goals. The concepts included in the entrepreneurship spirit strengthen confidence, serve as a catalyst for capacity-building and give new breath to life.

There is no doubt that entrepreneurship strengthens the ambitions of the targeted groups and makes them able to take initiatives and assume leadership roles. It also promotes youth employability and improves entrepreneurs' skills and ability to support the largest proportion of new businesses and help create successful businesses. Therefore, it is important to highlight the importance of the entrepreneurship spirit which makes economies more competitive and innovative through businesses and companies that represent the most important source for job creation. On the other hand, entrepreneurship and free initiative in the field of technology will likely help Member States strengthen their competitiveness on a global scale, achieve economic growth, increase job openings, and integrate training on entrepreneurship in educational programmes in order to develop the skills of new entrepreneurs and support them. Businesses look for solutions developed by universities in order to improve their productivity achieve cost-effectiveness. At the level of skill and capacity development, Member States should enhance their resources from both a technical and administrative

perspective in view of their importance for knowledge-based industries. Higher education curricula which are market-oriented should also be reinforced to improve the level of the labour force, and the private sector should be involved in scientific and knowledge-related activities of the university.

Entrepreneurs in the technology sector provide incentive roles for the creation of a solid knowledge-based economy. Accordingly, the road map on entrepreneurship in the field of technology should be at the forefront of ISESCO Action Plan for the period 2019-2021. In fact, if the capacity-building programme is launched, the research results will be reflected at the level of the market and end-users.

The transfer of technology from universities and research institutions to the industrial and manufacturing sector is one of the key success factors in marketing innovations. To this end, technology-transfer offices and centres must be supported. Specialists in technology-transfer can, in this regard, help with counselling on the obstacles that may prevent the marketing of innovative ideas such as market rules and the accreditations in the field of technology.

It should be noted that there is a need for a support system that guarantees the involvement of both the university and the industrial sector. University institutions are in fact required to develop special systems and measures to meet the expectations of the industrial sector without contradicting academic ambitions. In this respect, universities should shift their focus from the field of basic research to applied research, since research initiatives that seek to involve industry players through flexible models may represent the first step in this direction. Therefore, a mediatory tool should be established so as to ensure closer interaction, starting from the preliminary design to the marketing of the research results. In this context, a methodology and vision for attaining this goal will be developed, in addition to the implementation of a relevant programme and a presentation of some successful experiences in Member States so as to disseminate this programme. In addition, some other aspects will be covered such as developing the pursued policy in this area, establishing technology-transfer centres, protecting intellectual property, and other issues relating to administration governance, good practices, e-commerce, accreditation, regulation and conformity. A roadmap similar to the innovation map will be established to link universities with the industrial sector.

At the same time, ISESCO will focus in its Action Plan 2019-2021 on the rapidly-evolving scientific discoveries. Current knowledge, analysis techniques, methodologies, information systems and the multi-disciplinary approach will pave the way for greater development. These new trends contributed to changing the concepts of economic and social developments, accelerating the drive towards the knowledge economy and the smart technology based on nanotechnologies. It is worth mentioning that applying these technologies is not limited to the surface of the earth but includes as well space. The overriding objective remains to improve the living conditions for human being and guarantee a better future for humanity.

In sum, the project will focus on: (a) using existing coalitions and programmes that promote interaction between research and the industry, and support cooperation between institutions of higher education and the industrial sector; and (b) developing entrepreneurship programmes at all education levels in a way that the outputs match the job market requirements. The development of science and technology parks and incubators for emerging businesses provides a platform for bringing all players together in one technological park. ISESCO will continue strengthening the role of scientific cities and technology incubators in keeping up with the latest technological developments and their use for achieving social and economic development for Member States.

### **Objectives:**

- Transfer of knowledge and technology to contribute to the advancement of scientific and technological knowledge in Member States through encouraging outstanding women and young researchers and supporting their research activities.
- Improve interaction between the university and the industrial sector, to enhance entrepreneurship and to create tech-companies;
- Draw up a road maps to enhance scientific research and innovation; and link academics and researchers with the industrial sector;
- Activate the joint role of scientific parks, universities and the industrial sector;
- Evaluate the impact of technologies and adopt a prospective technological vision.

### **Areas of intervention:**

1. Building capacities in the field of innovation, entrepreneurship and marketing the findings of scientific research;
2. Enhancing linkage between scientific parks, universities and the industrial sector.
3. Supporting scientific research projects and encouraging excellence in sciences, technology and innovation;
4. Promoting students exchange between Member States universities to improve their skills and employability;

**Overall budget: US\$ 1,026,200.00.**

### **Areas of intervention 1: Building capacities in the field of innovation, entrepreneurship and marketing the findings of scientific research.**

In view of the vital role of linking universities and the industrial sector through capitalizing on the findings of university and scientific research in the industrial sector, ISESCO will focus on strengthening partnership between the university and the industrial sector in order to promote industrial development through strengthening the capacities of researchers in order to translate scientific knowledge and research outputs into socio-economic gains, preparing training programmes, organizing workshops and symposiums, providing the adequate technical assistance to Member States, and transferring competencies. In addition, ISESCO will give

due attention to relevant issues of a cross-cutting nature in order to achieve sustainable development goals in Member States, such as encouraging dialogue between academic circles, civil society and the private sector; supporting innovation systems on the national, sector-based and regional levels; and seeking to harmonize the standards among all actors involved in the knowledge society and technology transfer.

**Expected outcome 1: Developing the system of innovation and creativity in member states.**

Performance Indicators	Measurement Indicators
- Building capacities to increase contribution to economic growth.	- Organizing 3 training programmes on science, technology, innovation and business management.
- Establishing cooperative models on marketing and teaching entrepreneurship.	- Organizing 6 series of workshops to perform a model of marketing and business management in cooperation with the OIC.
- Upgrading the competencies of women and young entrepreneur’s innovators through training and education.	- Holding 3 workshops and conferences on social gender and youth in science, technology and innovation.
- Upgrading national capabilities in the field of maintenance and repair of equipment and tools in scientific facilities in universities, research institutes and small businesses.	- Organizing 3 national workshops on the maintenance and repair of scientific engineering equipment in in universities, research institutes and small businesses. 30 academics, engineers and technicians will be trained each year.

**Area of intervention 2: Enhancing linkage between scientific parks, universities and the industrial sector.**

ISESCO will continue its efforts to strengthen the role of scientific parks and technological incubators and enhance the ability of Member States to benefit from them to achieve further socio-economic development. To that end, focus will be placed on encouraging Member States to set more scientific parks and technological incubators, promoting the exchange of knowledge and best practices, benefiting from the successful experiences of developing scientific parks and business incubators in order to improve and market manufacturing goods, improving innovation in the field of management and intellectual property, and encouraging the private sector to increase investments in research, development and creativity.

**Expected outcome 2: Creating an innovation-motivating environment and preparing marketable programmes and products.**

Performance Indicators	Measurement Indicators
- Identifying the best practices in the policies of scientific and technological knowledge transfer.	- Conducting one study and organizing 3 workshops on a roadmap of technology transfer and innovation.
- Developing local knowledge systems.	- Holding 3 seminars on the added value of the new industrial models in developing local knowledge.
- Promoting smart partnerships and entrenching	
- innovation-based practices	- Holding 3 training workshops on innovation-linked best practices

### Area of Intervention 3: Supporting scientific research projects and encouraging excellence in science, technology and innovation.

In recognition to scientists in the Islamic world, ISESCO Center for Promotion of Science and Technology (ICPSR) has since 1997 been granting the ISESCO Prize for Fundamental Sciences (biology, chemistry, geology, mathematics and physics) and Technology. ISESCO will continue awarding prizes for scientific research either nationally or regionally to encourage excellence and innovation in Member States. The awarding of these prizes will be coupled with a great appreciation for the winners through publishing their articles on ISESCO’s website and in “ISESCO Journal of Science and Technology”. The prizes will be awarded at the sessions of the Islamic Conference of Ministers of Higher Education and Scientific Research.

In addition, young researchers with outstanding expertise in science and technology who have developed innovative projects with real impact in the field of improving the their fellow citizens’ life conditions or in other fields of priority for facilitating access to the society of knowledge and achieve the sustainable socio-economic development, will be encouraged through granting them two-years research scholarships . These scholarships will also seek to provide an environment that stimulates positive and constructive competition between young researchers, contribute to promote their scientific contributions and encourage them to further continue their efforts in that respect.

### Expected outcome 3: Encouraging outstanding and innovating young researchers in the Islamic world.

Performance Indicators	Measurement Indicators
- Encouraging scientists in fields of scientific research, technology and innovation.	- Awarding ISESCO Prize for Science and Technology in six specialties to twelve researchers.
- Awarding ISESCO prizes for scientific research to young scientists to enable them to continue their research and promote their productions.	- Awarding fifteen (15) research scholarships in the fields of science, technology and innovation.

### Area of intervention 4: Promoting students’ exchange between Member States’ universities to improve their skills and employability.

ISESCO will continue activating its Programme “**Tafahum**” on students’ exchange in a number of Member States in cooperation with the Federation of the Universities of the Islamic World (FUIW), higher education and scientific research in Member States, the “Agence Universitaire de la Francophonie” (AUF) (Francophonie University Association) within the framework of its Integrated Digital Platform for Promoting Quality, Accreditation, Exchange and Cooperation between Universities of ISESCO Member States.

The programme, in its new integrated context, seeks to build the capacities and competencies of research students, and supply them with the skills necessary for easing their integration in

the job market and leading to their success in their careers. It further aims to develop ways of cooperation between the universities of the Islamic world, bring the scientific circles together, exchange expertise and share the best practices either through training or implementing research projects.

**Expected outcome 4: Developing the programme of students' and researchers' exchange between higher education institutions in the three regions: the Arab, African and Asian regions.**

Performance Indicators	Measurement Indicators
- Continuing the implementation of the "Tafahum" programme and gradually generalizing it to Member States.	- 50 students and 20 universities will benefit from the "Tafahum" Programme.

## Science and Technology Programmes' Budget

Projects	Project budget	Total budget of the Directorate's programmes In US\$
1. Project on developing science, technology and innovation policies and systems and renewing their governance to achieve Sustainable Development Goals (SDGs).	<b>1,684,000</b>	<b>5,994,000</b>
2. Project on sustainable protection of the environment and the facilitation of transition to the green economy.	<b>1,684,000</b>	
3. Project on activating nanoscience and modern technology applications to achieve sustainable social and economic development.	<b>1,599,800</b>	
4. Project on transferring knowledge and marketing the findings scientific research and encouraging innovative enterprises and youth employment.	<b>1,026,200</b>	

**Breakdown of financial items**  
**Directorate of Science and Technology**  
**(salaries and allowances)**

Items	First year 2019	Second year 2020	Third year 2021	Total (US\$)
<b>Basic salaries</b>	135,345.00	147,406.00	153,352.00	436,103.00
<b>Allowances</b>	74,113.00	77,916.00	83,812.00	235,841.00
<b>Social security</b>	21,788.00	22,681.00	24,065.00	68,534.00
<b>New posts</b>	24,040.00	20,341.00	25,002.00	69,383.00
<b>Total (US\$)</b>	<b>255,286.00</b>	<b>268,344.00</b>	<b>286,231.00</b>	<b>809,861.00</b>