ORGANISATION OF ISLAMIC COOPERATION

STATISTICAL, ECONOMIC AND SOCIAL RESEARCH
AND TRAINING CENTRE FOR ISLAMIC COUNTRIES

STATISTICAL EVALUATION OF THE CURRENT SITUATION OF OIC COUNTRIES TOWARDS THE IMPLEMENTATION OF THE "OIC STI AGENDA 2026"

Ankara, September 2020

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ACRONYMS USED

COMSTECH	Standing Committee on Scientific and Technological Cooperation
CPIA	Country Policy and Institutional Assessments
CSP	Concentrated Solar Power
DTP3	Three doses of diphtheria, tetanus, and pertussis
ECA	Europe and Central Asia
EGDI	E-Government Development Index
EPI	Environmental Performance Index
ESALA	East and South Asia and Latin America
EurepGAP	European Retail Protocol for Good Agricultural Practice
GDP	Gross Domestic Product
GPS	Global Positioning System
HPCCs	High Performance Computer Centres
IAEA	International Atomic Energy Agency
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	Information and Communication Technology
IFS	Food Safety Initiative
IOFS	Islamic Organization for Food Security
IsDB	Islamic Development Bank
LDCs	Least Developed Countries
MDR	Multiple-drug-resistance
MENA	Middle East and North Africa
NAPA	National Adaptation Plans of Action
ND-GAIN	Notre Dame Global Adaptation Index
OIC	Organisation of Islamic Cooperation
PPP	Purchasing Power Parity
R&D	Research and Development
RE	Renewable Energy
RNSS	Regional Navigation Satellite System
SDGs	Sustainable Development Goals
SESRIC	Statistical, Economic and Social Research and Training Centre for Islamic Countries
SMIIC	Standards and Metrology Institute for Islamic Countries
SSA	Sub-Saharan Africa
STEM	Science, Technology, Engineering, Mathematics
STI	Science, Technology and Innovation
T&D	Transmission and Distribution
TFEC	Total Final Energy Consumption
UAE	United Arab Emirates
UNFCCC	UN Framework Convention on Climate Change
USD	United States Dollars
WIPO	World Intellectual Property Organisation

INTRODUCTION

Throughout the human history, knowledge and critical thinking, of which science and technology are the most visible symbols, were and still representing the key drivers of change not just in terms of economic growth and development, but also in all human enterprises. Today and in the years to come, science and technology will continue to play a critical role in addressing contemporary challenges of development across multiple dimensions including poverty alleviation, health, environmental preservation, and ensuring security of food, water, and energy.

Over the last two decades, encouraging advances have been recorded in many OIC Member Countries in the areas of higher education, science, and technology. This has been reflected, for example, in the tripling of scientific publications and researchers and major investments by many Member Countries in education and scientific infrastructure. However, the OIC Countries, as a group, are in general still lagging behind the group of other fast developing nations.

In this regard, the OIC STI Agenda 2026 proposes a mechanism for building collective competence in a wide array of themes ranging from water, food and agriculture to energy, basic and applied sciences, and large multinational projects, in addition to strengthening international linkages with the best in the world.

The OIC STI Agenda 2026, which was adopted by the First Summit of the Organization of Islamic Cooperation on Science and Technology in Astana in September 2017, has a focus on 'high technology' within the context of the ongoing global imperatives and the accompanying techno-economic-information revolution. This transition has resulted in a massive realignment and shift in centres of economic activity and relocation of manufacturing, services and design from developed to developing countries, globally and regionally.

The OIC STI Agenda 2026 identifies specific aspirational recommendations and targets as with each government setting its own national targets guided by global level of ambition but taking into account national circumstances. The Agenda is proposed to be implemented through a series of interconnected interventions detailed in the Work Plan, which has been prepared by the COMSTECH Secretariat.

Against this background, this Report aims to provide a statistical evaluation of the current situation of OIC Member Countries towards the implementation of the OIC STI Agenda 2026 using the most recent available data. The Report also serves as a call for action to encourage the changes needed to ensure the achievement of the targets identified in the STI Agenda 2026.

PRIORITY 1: NURTURE THE THINKING MIND: BUILD A CULTURE OF SCIENCE AND INNOVATION

Notwithstanding some important gains in the past decade, a true scientific culture is conspicuous by its absence. There should be no fears about the disruptive nature of knowledge and science, as this has been part of our heritage and traditions for centuries.

Science is nurtured as much by governments as by the social norms of a country, which must be willing to embrace the pursuit of knowledge and its accompanying disruptions. Building a true scientific culture in Muslim countries would require a paradigm shift and greater commitments from governments for building an enabling eco-system.

Recommendations and Targets:

i. Ensure universal, equitable and inclusive quality education at all levels of education, and promote life-long learning opportunities that advance knowledge and skills needed for gainful employment, entrepreneurship, innovation and sustainable development.

ii. "Catch them young" at the school, so that critical thinking, integrity, curiosity, and creativity can flourish in the school systems.

iii. Select teachers and develop curricula with care, especially the former. Critical thinking skills can only be taught to students if teachers go through effective communication training.

iv. Provide broad based quality education, including the social sciences, which includes appreciation of one's own cultural heritage and that of others.

The Current Situation:

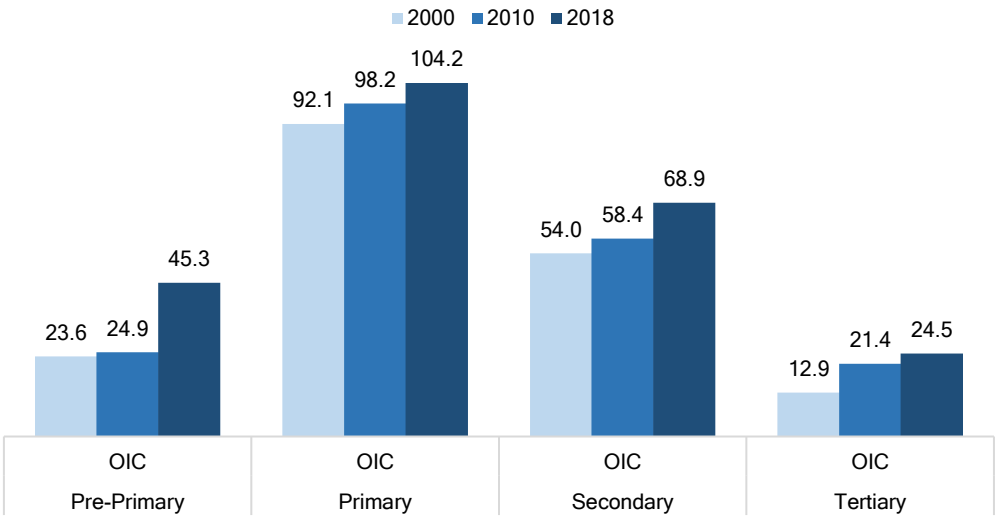
Participation in Education

Education is a primary driver for sustainable development as it helps to improve employability, productivity, innovation and competitiveness. Furthermore, education is crucial for fostering tolerance, which contributes to prevent growing dissention in the Muslim societies.

The OIC average gross enrolment rate at all levels of education including pre-primary, primary, secondary and tertiary increased between 2000 and 2018. In pre-primary education, there is a 22-percentage points increase from 23.6% to 45.3% between 2000 and 2018. For primary level of education, in 2000 the OIC average was 92.1% and increased to 104.2% in 2018. For secondary education level, there is a 15 percentage

points increase from 54% to 68.9% between 2000 and 2018. Moreover, for tertiary education, there is a 12 percentage points increase from 12.9% to 24.5% in the same period (Figure 1).

Figure 1: Gross Enrolment Rates, Total (%), 2000 vs. 2010 vs. 2018



Source: SESRIC, Statistical Yearbook on OIC Member Countries 2019

Quality Education

Despite the improvements in enrolment figures at different education levels, the quality of education across the OIC countries — particularly in the OIC Least Developed Countries (LDCs) — has remained low. According to the UN (2019), 88% of children in Sub-Saharan Africa in primary and lower secondary school age were not proficient in reading, and 84% of them were not proficient in mathematics in 2015. As 21 out of 47 LDCs are the OIC countries, equivalent results may also be expected for the majority of OIC countries.

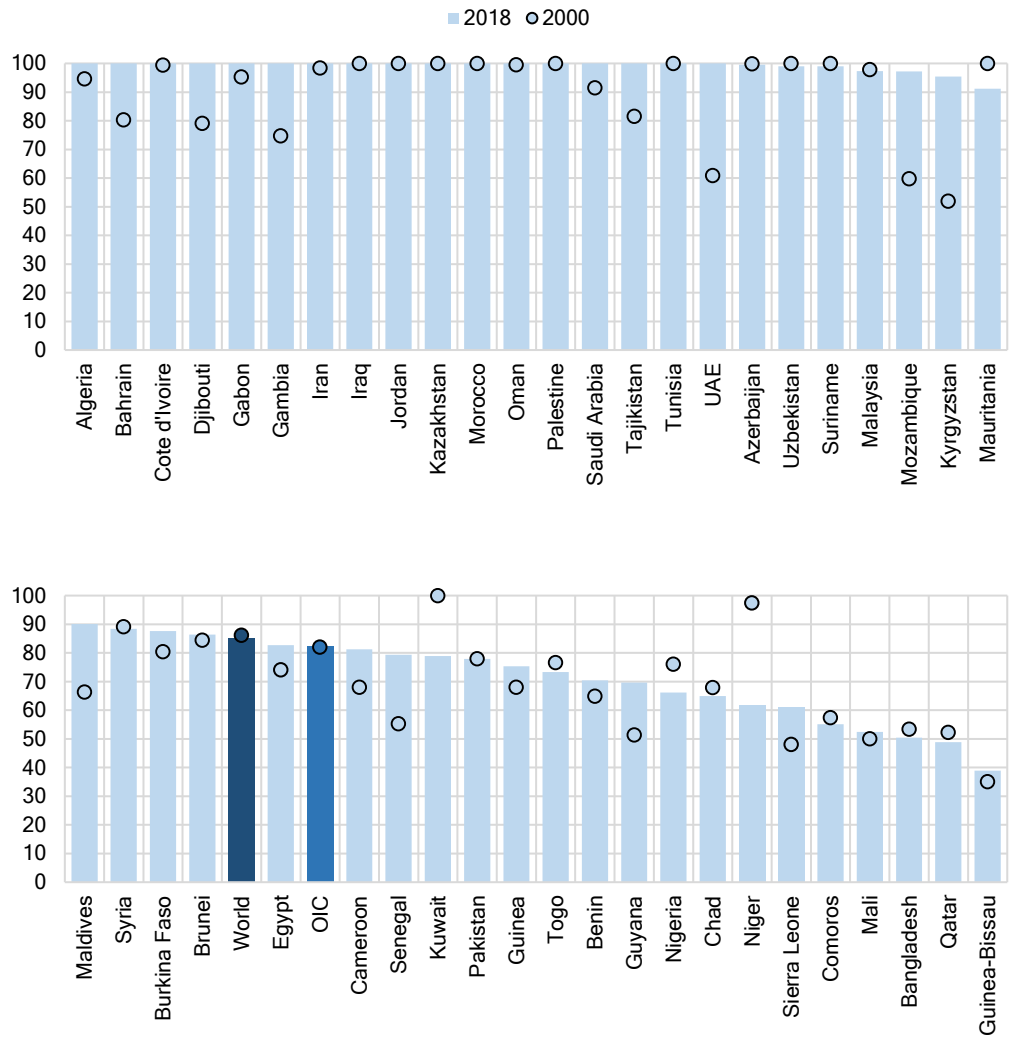
Qualified School Teachers in OIC Countries

Qualified specialists, professionals and overall human resources play a critical role in the development and prosperity of any country. Lacking to provide adequate education for youth hinders the future economic growth of any country. In this regard, adequately trained teachers are considered important for the long-term progress of a country.

The proportions of primary level teachers who received organised teacher training have increased in 25 out of 46 OIC countries with available data in the period 2000-2018. In 17 of these OIC countries (Algeria, Bahrain, Cote d'Ivoire, Djibouti, Gabon, Gambia, Iran, Iraq, Jordan, Kazakhstan, Morocco, Oman, Palestine, Saudi Arabia, Tajikistan, Tunisia, and UAE), 100% of the teachers have received organised teacher trainings in 2018. On the

other hand, the proportion of teachers in primary education that received minimum required training have decreased in 15 OIC countries between 2000 and 2018 (Figure 2).

Figure 2: Proportion of Teachers in Primary Education who have Received at least Minimum Organized Teacher Training, 2000 vs. 2018



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

Educational Attainment

Educational attainment, at least completed upper secondary, for population ages 25+ is the percentage of population ages 25 and over that attained or completed the corresponding education level. Upper secondary education is typically designed in

preparation for tertiary education or provides skills relevant to labour market entry, or both.

There is a large disparity across the OIC countries in terms of educational attainment. In 2018, the percentage of population who finished upper secondary education ranged between 2.8% (Burkina Faso) and 92.6% (Uzbekistan). Thus, the highest and lowest educational attainment rates across the OIC countries are close to 90 percentage points for the attainment of upper secondary education.

Gender Parity

The OIC countries achieved notable progress in gender parity at almost all education levels, notably in early childhood and secondary education. In the OIC countries group, the gender difference at the pre-primary and secondary education levels have almost disappeared in most of the OIC countries by 2018 and will have disappeared in others by 2025 based on their current trajectories.

Graduation Rates in Social Sciences, Arts and Humanities in Tertiary Education

The UNESCO Institute for Statistics (UIS) disseminates the percentage of graduates from Social Sciences (together with Journalism and Information programmes), Arts and Humanities programmes in tertiary education (both sexes) for 20 OIC countries. Based on the last year available data (2018 and 2019), the share of graduates from Social Sciences programmes in tertiary education was over 10% in only four OIC countries (Albania, Bangladesh, Burkina Faso, and Qatar). Whereas, the share of graduates from Arts and Humanities programmes in tertiary education was over 10% for only six OIC countries (Albania, Bangladesh, Burkina Faso, Morocco, Qatar, and Saudi Arabia).

At the pace of growth since 2000, 13 out of 20 OIC countries have experienced an improvement for the percentage of graduates from Social Sciences programmes. Similarly, 11 out of 20 OIC countries have experienced an improvement in the percentage of graduates from Arts and Humanities programmes.

PRIORITY 2: MAKING PEOPLE EMPLOYABLE: EDUCATION AND SKILLS

Every OIC Member State shall increase public investments at all levels. It is imperative to ensure universal and equitable access to education up to the secondary level, irrespective of gender, coupled with major investments in development of skills and vocational training for the youth as well as adults. A better balance also needs to emerge between graduate and post graduate education. There is a general consensus that proficiency in mathematics and science, as well as computer skills are essential enablers for learning, generation of new knowledge, enhanced competitiveness, and providing decent employment with decent jobs and wages, leading to a new set of entrepreneurs.

Recommendations and Targets:

i. Consider increasing the allocation for all tiers of education to a minimum of 8% of annual national budgets in accordance with the relevant national legislation in each member state.

ii. Focus on the technical and vocational levels and development of common curricula and standards for enhanced productivity in agriculture, industry and service sectors, with a target of minimum 20% enrolment in technical / vocational education among the 15-19 year age cohort. In this regard it is important to engage industrial and professional organizations.

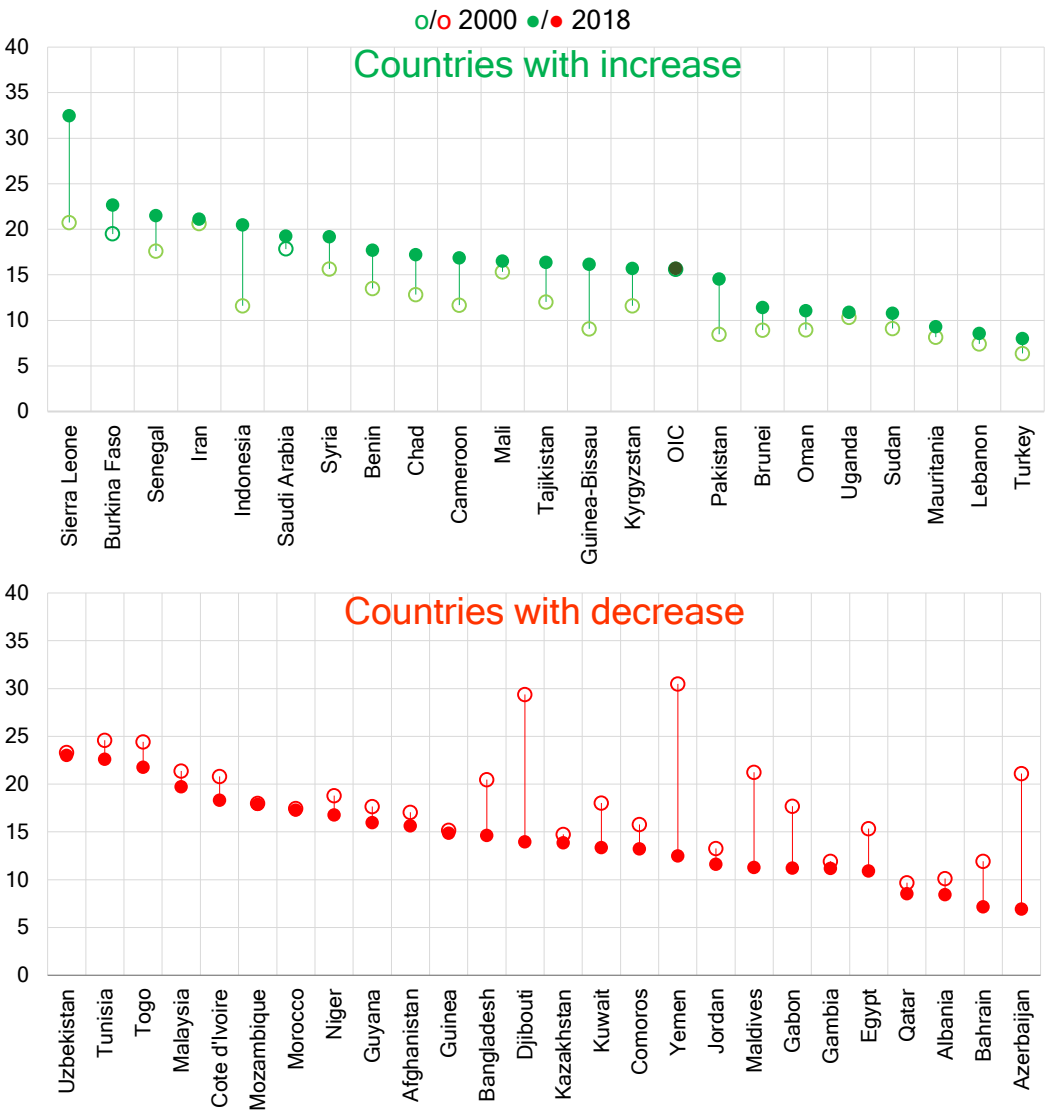
iii. Elevate STEM education (science, technology, engineering, mathematics), as a key priority in OIC Countries, while skills in ICT and digital technology must be made compulsory at all tiers of education, especially in high schools, where appropriate.

The Current Situation:

Total Public Spending on Education

The share of government spending on education in total public spending in the OIC countries group has shown limited growth from 15.6% to 15.7% in the period 2000-2018. At the individual country level, the government spending on education increased in 22 OIC countries and decreased in 26 OIC countries with data available in the same period. Progress has been most fruitful for nine OIC countries (Sierra Leone, Indonesia, Guinea-Bissau, Pakistan, Cameroon, Chad, Tajikistan, Benin, and Kyrgyzstan) with more than 4 percentage points increase in share of government spending on education (Figure 3).

Figure 3: Proportion of Total Government Spending on Essential Services, Education, Percent, 2000 vs. 2018



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

Technical and Vocational Education

The UIS disseminates data on the proportion of 15-24 year-olds enrolled in vocational education for 43 OIC countries. Based on the last year available data (2015 to 2019), the proportion of 15-24 year-olds enrolled in vocational education were over 10% for seven OIC countries (Turkey, Uzbekistan, Kazakhstan, Suriname, Azerbaijan, Indonesia, and Egypt). Out of these countries, Turkey and Uzbekistan have already achieved the target

of minimum of 20% enrolment in technical/vocational education. Moreover, Indonesia is also expected to be close 20% by 2025 based on the pace of growth. It is also noteworthy that the proportion of 15-24 year-olds enrolled in vocational education was less than 1% in 13 out of 43 OIC countries in 2019 or in the year with latest available data.

Share of Youth Not in Education, Employment or Training

The share of youth (aged 15-24) not in employment, education or training represents a measure of youth who are outside the educational system, not in training and not in employment. It is also known as the "NEET rate". It serves as a broader measure of potential youth labour market entrants than youth unemployment as it also includes youth outside the labour force such as discouraged worker youth as well as those who are outside the labour force due to disability or engagement in household chores among other reasons.

The performance of the OIC countries concerning the youth NEET rate has been quite heterogeneous. Out of 24 OIC countries with data available, the youth NEET rate decreased in 13 of them and increased in 11 of them between 2000 and 2018. At the individual member country level, the situation is generally less favourable. More than one fifth of youth was not engaged in employment nor in education and training in 19 of the 24 member countries with available data.

STEM Education (Science, Technology, Engineering, Mathematics)

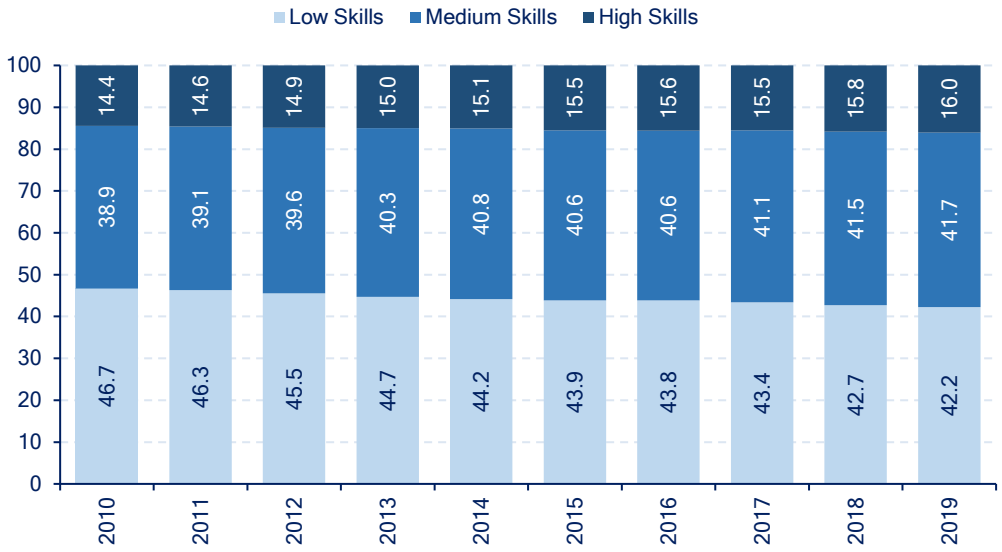
The UIS disseminates the data on percentage of graduates from Science, Technology, Engineering and Mathematics (STEM) programmes in tertiary education (both sexes) for 40 OIC countries. Based on the last year available data (from 2017 to 2019), the share of graduates from STEM programmes in tertiary education were over 30% for eight OIC countries (Oman, Tunisia, Iran, Brunei, Malaysia, Uzbekistan, Algeria, and Mauritania). At the pace of growth over at least a five-year time span since 2000, 15 out of 24 OIC countries have experienced an improvement for the percentage of graduates from STEM programmes.

Employment by Skills Levels

Figure 4 shows the distribution of workers in the OIC countries by their skills levels based on their occupations under three categories of low, medium, and high skills. While the shares of employed people with medium and high skills increased, the share of employed people with low skills is falling over the years across the OIC countries. The share of people with medium and high skills reached 41.7% and 16%, respectively in 2019 as compared

to 38.9% and 14.4% in 2010. The share of people with low skills in total employment, however, decreased from 46.7% in 2010 to 42.2% in 2019.

Figure 4: Skills Levels in OIC Countries, 2010-2019



Source: SESRIC, OIC Labour Market Report 2020.

PRIORITY 3: SAFETY OF WATER, FOOD AND THE ENVIRONMENT

Food safety and security is affected by several factors. First, the "green" revolution is essentially over and high growth rates in agriculture will not be sustained through current technology, practice and attitudes alone. Second, the use of genetically modified seeds is increasing. Third, climate change has increased the vulnerability of farming communities. Fourth, food processing is widespread. This brings about long shelf life of products.

Recommendations and Targets:

a) Water Use, Re-cycling, and Management:

i. Increase efficiency in water use and combat desertification through the use of new technologies and farming methodologies;

ii. Aim for maximum recycling of urban waste water;

iii. Prepare national water budgets at the 'local' levels where possible, supplemented by monitoring of sub-aquifers, glaciers, and loss in canals;

b) Farm Productivity and Plant Biodiversity:

i. Encourage setting up National Gene Banks for conservation and exchange of PGR (plant genetic resources) with research centres in Member States;

ii. Undertake legal and other measures in Member States for protection of the 'geographical' origin' of their traditional foods and crops;

iii. Increase farm productivity through sharing and adoption of modern and indigenous technology, based on specific case studies and best practices in the world;

iv. Promote cooperation in the development and adaptation of the concept of "personalized agriculture", which is the transfer of knowledge and experience of modern sciences to a specific genotype of crops based on its response to a specific environment, soil, fertilizer, water and bio-stimulators".

c) Food Safety and Halal Standards:

In concert with the Islamic Organization for Food Security (IOFS) and Standards and Metrology Institute for Islamic Countries (SMIIC) and national legislations;

i. Re-organise National Food Safety Authorities for integration of safety and security of the entire food chain, from the land to the factory and the table by verification of hygienic, nutritional and organoleptic qualities;

ii. Ensure proper identification to avoid adulteration and misrepresentation;

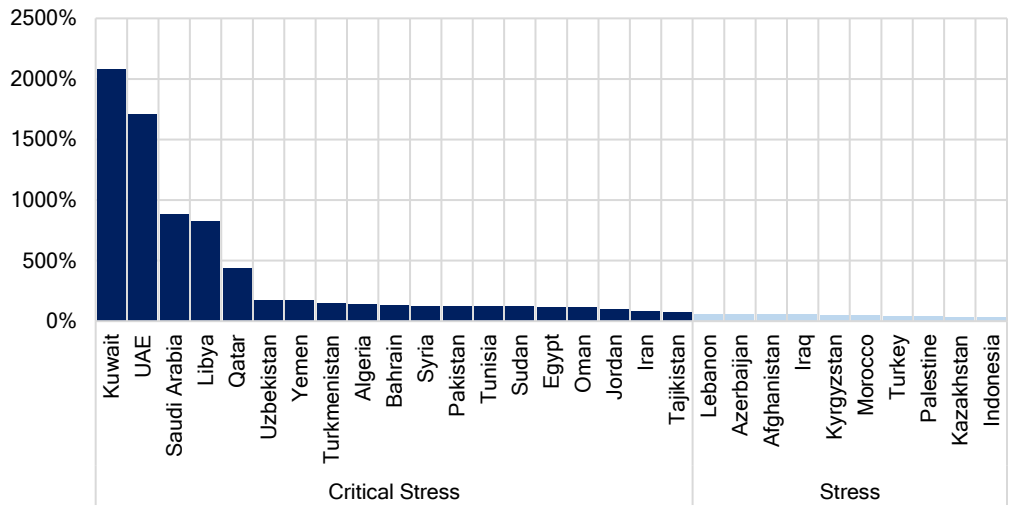
iii. Encourage Member States to consider implementing International Standards such as IFS (Food Safety initiative), BRC (British Retail Consortium), EurepGAP (European Retail Protocol for Good Agricultural Practice), and ISO 22000 (Food Safety Management System) as well as the OIC/SMIIC standards and national legislations of the Member States.

The Current Situation:

Water Stress & Water-Use Efficiency

During the period 2000-2017, the global water stress level was estimated at 19%, while the average stress level for the OIC countries was observed at 33%. At the individual country level, there were 29 OIC countries undergoing water stress (stress level more than 25%), 19 of which were experiencing critical stress level of more than 70% (Figure 5). Most OIC countries that suffer water stress were the ones in arid and semi-arid regions, where, water resources are scarce.

Figure 5: OIC Countries Experiencing Water Stress, 2000-2017



Source: SESRIC, OIC Water Report 2020: Towards Sustainable Water Management.

The water use efficiency level in the OIC countries was recorded at 6 USD/m^3 in 2017, which was significantly lower than the world level of 18 USD/m^3. Among the 43 OIC member countries with data, 70% have water use efficiency level lower than the global average. OIC countries in Europe and Central Asia (ECA) and East and South Asia and Latin America (ESALA), in general, recorded lower than the global average. Most countries with

an average of water use efficiency higher than that of the world are from the Middle East and North Africa (MENA) region. Some of the countries in Sub-Saharan Africa (SSA) region also recorded higher than the global average level such as Cameroon, Côte d'Ivoire, Nigeria, and Uganda.

Desertification

Vulnerability to desertification is largely high and very high especially among the OIC countries located in ECA and SSA. Member countries in the MENA region also have substantial coverage of hyper-arid and semi-arid areas. Some member countries are particularly vulnerable due to the high prevalence of dryland systems. At least 90% of the surface area of Burkina Faso, Egypt, Iraq, Kazakhstan, and Turkmenistan is classified as drylands.

Wastewater Treatment

According to the latest data from Food and Agriculture Organization (FAO)'s AQUASTAT, about 17 km^3 of municipal wastewater was treated in the OIC countries. Around 18% of this treated water is reused for various purposes. Disparities of treated wastewater and its direct-use exist in the OIC countries. Member countries in the MENA region account for almost 60% of total treated wastewater in OIC and more than 90% of OIC's total direct-use of treated wastewater. Top five OIC countries with largest direct utilization of treated wastewater are Egypt, UAE, Syria, Saudi Arabia, and Kazakhstan.

Agriculture Productivity

Between 2007 and 2017, agricultural land productivity of the OIC countries group grew annually by 3.1%. In 2017, the land productivity of the OIC countries group was 522.2 USD (constant 2010) per hectare (ha), compared to the global average level of 636.1 USD (constant 2010) per ha. More than half of the OIC countries had lower land productivity level compared to the world average, most of which were countries in the SSA region. Maldives, Bahrain, Egypt, Brunei, and UAE were among the OIC countries with the highest land productivity. On the other hand, Kazakhstan, Mauritania, Somalia, Libya, and Djibouti were observed as the lowest land productivity countries in the OIC countries group.

The average use of fertilizer per ha of the arable land in the OIC countries group climbed up from 69.7 kg in 2007 to 85.9 kg in 2017. In comparison, the average levels of the world and other developing countries were 141.9 kg and 164.9 kg, respectively. Developed countries, on the other hand, used 136.8 kg of fertilizer per ha in 2017.

The latest data on agricultural mechanization is outdated and therefore, the available estimates should be interpreted with caution. As per the available data from FAO on the OIC countries, the total number of tractors per 1000 ha of arable land declined from 11.9 during the period 2000-2002 to 8 in the period 2007-2009. A similar downward trend was

also experienced by other country groups. As of 2007-2009, the world average was 11.8 and the average of other developing countries was 11.6. In other words, compared with other developing countries and the world average, the use of tractors in OIC countries remained low.

National Gene Banks PGR Status

As per the available information, a few OIC countries do maintain national gene banks. Nevertheless, majority of OIC countries are parties to international biodiversity agreements such as Convention on Biological Diversity in 1992 (56 OIC countries are party) and International Treaty on Plant Genetic Resources for Food and Agriculture in 2001 (44 OIC countries are party). In 2019, plant genetic resources accessions in the OIC countries were reported at nearly 250 thousand or equivalent to 5% of accessed plants genetics worldwide.

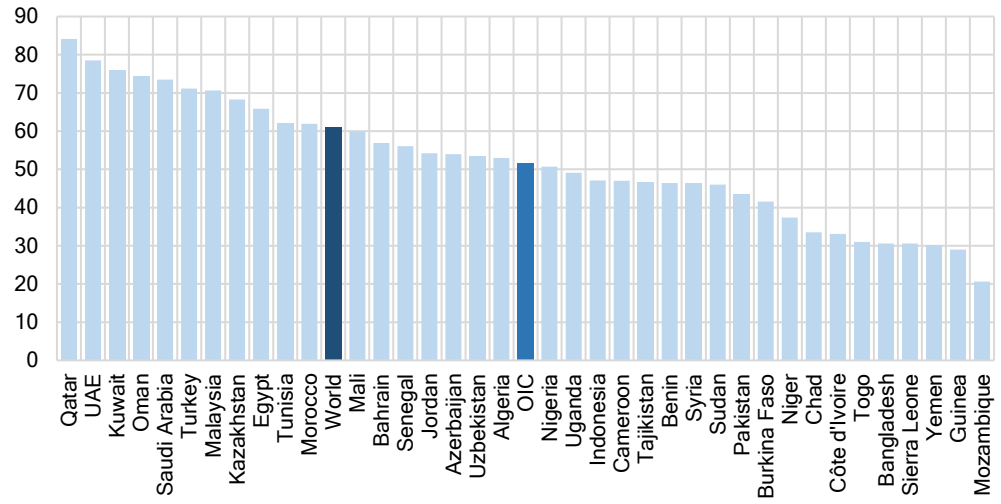
Food Safety & Quality

The Global Food Security Index (GFSI) (The Economist Group, 2019) evaluates 'how food-secure are countries around the world?' by considering core issues of availability, affordability, and quality and safety using a set of 34 indicators, scoring countries from zero to 100, where 100 = best. Comparing the GFSI values of 2018 to 2019, the performance of OIC member countries is highly variable depending on their geographical location, income status, and current political climate (stability/conflict). On one hand, high-income member countries such as Qatar, Kuwait, UAE, and Saudi Arabia are amongst some of the most food secure countries in the world. On the other hand, some of the more food insecure member countries are also those experiencing violent conflicts such as Yemen and Syria.

The GFSI's Food Safety & Quality dimension measures the variety and nutritional quality of average diets as well as the safety of food. Based on the GFSI Food Safety & Quality dimension scores of 39 OIC countries covered in the GFSI 2019, the OIC average was 52 compared to the global average score of 61. Based on the same index, 11 OIC countries (Qatar, UAE, Kuwait, Oman, Saudi Arabia, Turkey, Malaysia, Kazakhstan, Egypt, Tunisia, and Morocco) have food safety & quality score higher than the global average (Figure 6).

FAO reported that in most SSA countries, poor packaging is one of the main constraints of local food products to compete with imported ones. In 2019, in terms of food safety sub-indicator of GFSI, 18 out of 37 OIC countries have food safety score lower than the global average. Four OIC countries (Qatar, Bahrain, Kuwait, and Saudi Arabia) had perfect scores (i.e., 100) in food safety.

Figure 6: Food Safety & Quality, 2019 (score 0-100, where 100 = best)



Source: SESRIC staff calculation based on GFSI.

Halal Certification & Institution

Currently, 39 OIC countries are members of SMIIC. Out of that, 23 countries participated in the Technical Committee of Halal Food Issues (TC1) while one country acts as an observer. Out of 78 halal certification bodies worldwide, 14 bodies originate from 11 OIC countries.

PRIORITY 4: ENSURE HEALTHY LIVES FOR ALL CITIZENS

Together with education and skills, and food security, it is necessary to ensure that the determinants of effective public health are firmly in place to ensure well-being of citizens.

Recommendations and Targets:

i. Strengthen commitment for developing public health systems;

ii. Consider increasing health financing in order to raise it to a minimum of 10% of national budgets by 2025 and allocate nearly half to cover essential scientific healthcare and financial risks in accordance with the relevant national laws in each member state.

iii. Improve training of all para-medics and technicians in conformity with the best international practices;

iv. Consider providing reliable access to safe, effective, quality and affordable essential medicines and vaccines for all, and increase the capacity for their indigenous production;

v. Promote rational use of drugs as a public health priority to confront the challenge of antimicrobial MDR (multiple-drug-resistance);

vi. Create a cadre of trained epidemiologists to reduce the burden of communicable / non-communicable diseases;

vii. Implement fast and cheap diagnostic systems allowing early disease prognosis and containment of epidemic cases;

viii. Promote healthy lifestyle to prevent chronic diseases that would help in reducing expenditure on health;

ix. Encourage R&D in neglected tropical diseases in the OIC Member States;

x. Promote cooperation in alternative healthcare/medicines; tele-medicines; epidemiological studies and R&D for healthcare and pharmaceuticals.

The Current Situation:

Health Expenditure

According to the available data from the World Bank, WDI Database (2020a), domestic general government expenditure on health as a share of general government expenditure

has substantially increased in the OIC countries group in recent years as it increased from 6.94% in 2000 to 8.98% in 2017. The OIC STI Agenda 2026 encourages the OIC member countries to consider increasing their health financing to a minimum of 10% of their national budgets by 2025. In 2017, only 10 OIC countries (Iran, Maldives, Albania, Tunisia, Lebanon, Jordan, Suriname, Algeria, Uzbekistan and Saudi Arabia) were able to allocate at least 10% or more of their national budgets to health. However, the remaining 42 OIC countries with available data for the same year allocated less 10% of their national budgets to health.

Immunization Coverage

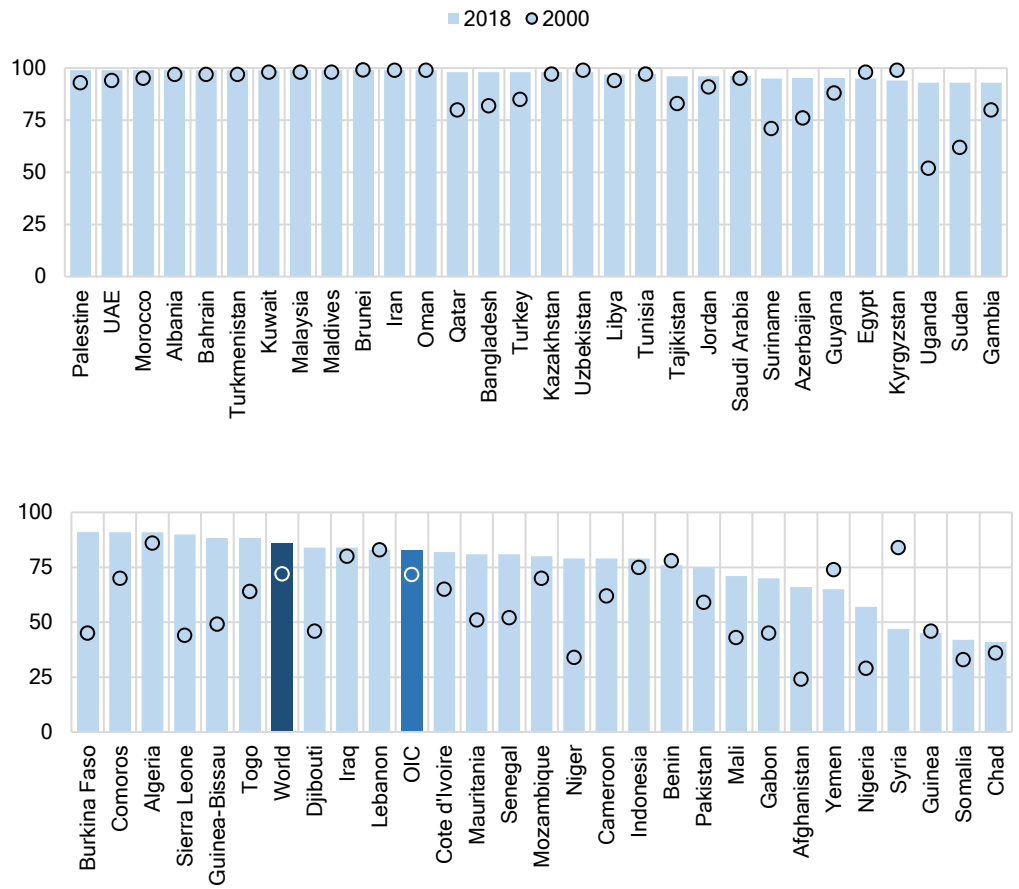
The proportion of the target population with access to three doses of diphtheria, tetanus, and pertussis (DTP3) refers to the percentage of surviving infants who received the three doses of diphtheria and tetanus toxoid with pertussis containing vaccine in a given year (UNSD, SDG metadata).

The DTP3 immunization coverage has been steadily improving in the OIC countries group where it increased from 72% in 2000 to 83% in 2018, equivalent to a 11-percentage-points increase, in the OIC countries group within the year under consideration.

In 2018, the DTP3 immunization coverage levels in 53 OIC countries were over 50%. Among them, 12 OIC countries (Palestine, UAE, Morocco, Albania, Bahrain, Turkmenistan, Kuwait, Malaysia, Maldives, Brunei, Iran, and Oman) had DTP3 immunization coverage levels of 99%. However, in four OIC countries (Syria, Guinea, Somalia, and Chad) had less than 50% of coverage levels. In general, the OIC countries have made significant progress in DTP3 immunization coverage between 2000 and 2018 with increases observed in 45 OIC countries whereas decreases were observed in seven OIC countries, and figures remained unchanged in five OIC countries (Figure 7).

In addition to the DTP3, among the OIC countries with available data for proportion of the target population with access to affordable medicines and vaccines on a sustainable basis for human papillomavirus (HPV), Turkmenistan, Brunei, Malaysia and Uganda had more than 70% access rate meanwhile Suriname (38.1%), UAE (26.2%), Guyana (9%) and Indonesia (0.5%) had the least proportions.

Figure 7: Proportion of Target Population with Access to DTP3 Vaccine, Percent, 2000 vs. 2018



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

Communicable Diseases

Based on the UNSD Global SDG Indicators Database (2020), the burden of communicable diseases such as tuberculosis and malaria is still high in the OIC countries, an indication of inadequate epidemiological surveillance due to limited number trained epidemiologists to curb these diseases. In 2018, 19 OIC countries had more than 100 incidences of tuberculosis per 100,000 population whereas 38 of them had below 100 incidences per 100,000 population. Among them, Palestine, UAE, Jordan, and Oman had less than 10 incidences of tuberculosis per 100,000 population. Such similar trend has been observed in malaria incidence per 1,000 population at risk. In 2018, out of 47 OIC countries with available data, malaria incidence per 1,000 population at risk in 15 OIC countries were above 100 per 1,000 population and 32 had less than 100 per 1,000 population. 16 OIC countries had zero malaria incidence per 1,000 population.

Preventing Chronic Diseases

Chronic diseases such as heart disease, cancer, and diabetes emanate from a short list of risk behaviours including tobacco use and exposure to second-hand smoke, poor nutrition, lack of physical activity, and excessive alcohol use.

In 2018, the average rates of age-standardized prevalence of current tobacco use among persons aged 15 years and older were more than 10% in 35 OIC countries and the prevalence rates were less than 10% in six OIC countries (Cameroon, Senegal, Niger, Togo, Benin and Nigeria). Of the OIC countries with the available data on the age-standardized prevalence of current tobacco use among persons aged 15 years and older, the rates declined in all the countries except Niger with slight increment between 2000 and 2018 (UNSD, 2020).

In 2018, alcohol consumption levels varied widely across the OIC countries with the lowest per capita consumption levels in 24 OIC countries with less than 1 litre per capita within a calendar year. However, 32 OIC countries had alcohol consumption levels of more than 1 litre per capita within a calendar year with Suriname, Guinea-Bissau, Cameroon, Sierra Leone, Kyrgyzstan, Guyana, Albania, Gabon, Nigeria, Burkina Faso and Uganda all having more than 5 litres of consumption per capita within a calendar year. Considering the period between 2000 and 2018, annual alcohol consumption per capita declined in 28 OIC countries with notable decreases in the range of 2 and 5.8 litres per capita in seven OIC countries (Oman, Cote d'Ivoire, Kazakhstan, Kyrgyzstan, Uzbekistan, Chad, and Guyana) (UNSD, 2020).

The OIC countries group progressed well in reducing the prevalence of current tobacco use among persons aged 15 years above and per capita alcohol consumption between 2000 and 2018 though action is needed to strengthen the prevention of these two harmful substances to promote a healthy lifestyle.

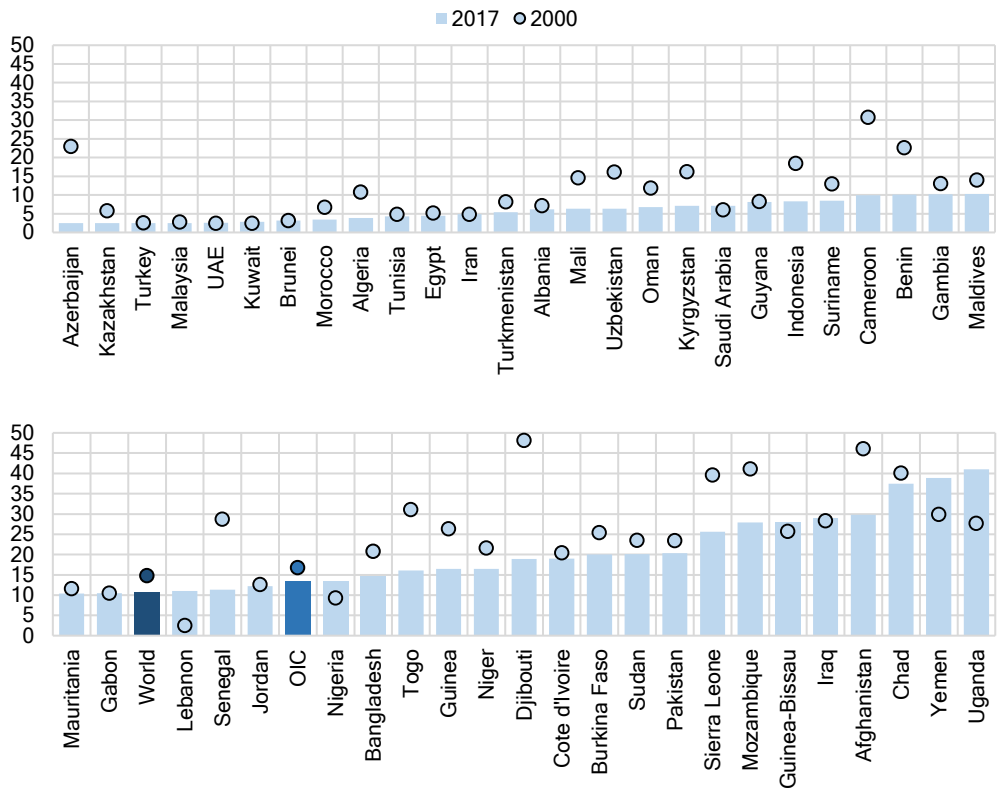
Total Official Development Assistance to Medical Research and Basic Heath Sectors

Research is indispensable for resolving public health challenges especially in tackling diseases of poverty, responding to rise of chronic diseases, or ensuring that mothers have access to safe delivery practices among others. In the aspect of cooperation to promote R&D for healthcare and pharmaceuticals, OIC member countries have received the net disbursement of total official development assistance to medical research and basic heath sectors in 2018. Among them, 12 OIC countries (Nigeria, Pakistan, Afghanistan, Uganda, Bangladesh, Mozambique, Yemen, Mali, Sudan, Burkina Faso, Palestine and Niger) received more than 100 million USD of net disbursement of ODA to enhance their medical research and basic heath sectors. 38 OIC countries received below 100 million USD.

Prevalence of Undernourishment

Between 2000 and 2017, the prevalence of undernourishment as percentage of population in the OIC countries group dropped from 17.8% to 13%. At the country level, Azerbaijan, Kazakhstan, Turkey, and Malaysia achieved in 2017 the "zero undernourishment by 2030" with proportion of undernourished population below 2.5% of their total populations. Overall, 36 OIC countries demonstrated positive improvements in tackling the prevalence of undernourishment (Figure 8). The prevalence of underweight among children under 5 years in the OIC countries group also declined from 17.8% in 2000 to 14.2% in 2017.

Figure 8: Prevalence of Undernourishment, Percent, 2000 vs. 2017



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

PRIORITY 5: IMPROVE THE QUALITY OF HIGHER EDUCATION AND RESEARCH

With the foundations of education and skilled healthy manpower firmly in place, it will be possible to focus on promotion of higher education and research in emerging areas of science and technology. This requires building up sustainable infrastructure in universities and research institutions, and preparation of programmes for building domestic innovation and technology capabilities.

In an environment of rapid growth in enrolments and expectations from higher education, it is emphasised that these challenges will basically have to be managed by each and every member state itself.

Although several OIC Member States have developed and strengthened national policies in recent years, the quality of higher education and research intensity still lags behind the developed countries.

University education in Member States must move beyond simple expansion in enrolment and faculty numbers or publications, and shift the focus towards contemporary knowledge generation, excellent teaching, expanded international linkages and societal impacts.

Recommendations and Targets:

i. Consider doubling the annual expenditure by 2025 on scientific infrastructure and R&D in those countries which spend less than 0.3% of GDP, and aim for a target of 2.0% in countries which are at a relatively advanced level, in accordance with the relevant national laws in each member state.

ii. Increase the share of Member States in global scientific output (publications and patents) by 100% in the next ten years.

iii. Double the number of R&D workers (all levels of scientific manpower, including certified technicians) per million population.

iv. Increase the share of high technology goods and services in the economies and trade of Member States, aiming for 10% by 2025.

v. Encourage Technology Parks adjacent to leading universities in OIC Member States. This will promote linkages with industry and business.

vi. Aim for a minimum of 50 universities for inclusion among the top 500 universities according to recent international ranking by 2025.

vii. Support the basic sciences and develop ethics and social responsibility;

viii. Make faculty the 'long pole' in the tent of education and research and allow time to build a critical mass of teachers and research groups in key areas, especially for fresh PhDs;

ix. Promote networking and linkages within OIC and with leading world universities for research partnerships sharing of knowledge and experience and best practices.

x. Reduce exclusive dependence on government financing or student fee, by returning to the traditional 'Waqf', as is the case in many universities in the developed countries.

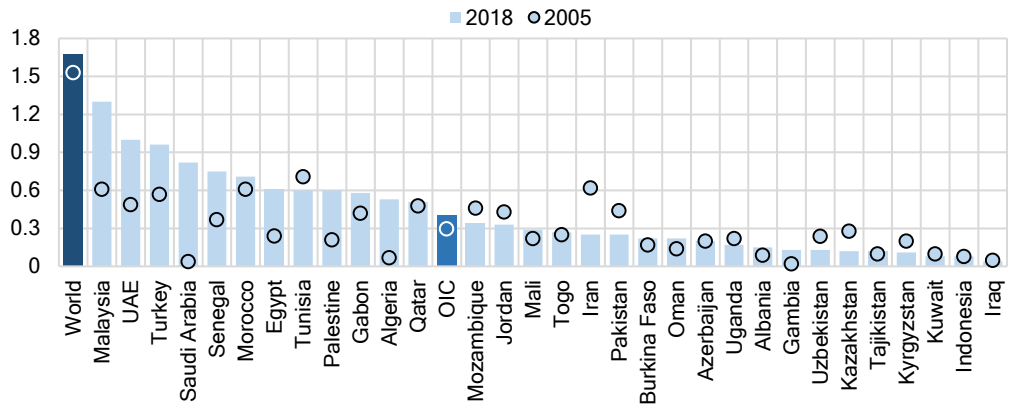
xi. Establish centres for Young Scientists to share their experiences and knowledge and to carry out joint research projects.

The Current Situation:

Expenditure on Scientific Infrastructure and R&D

Expenditure on R&D in relation to GDP of the OIC countries group has shown only limited growth from 0.3% to 0.4% during the past 13 years since 2005. Less than half of OIC countries may achieve the target of doubling the annual expenditure on scientific infrastructure and R&D by 2025 with this slow pace of progress recorded so far (Figure 9).

Figure 9: Research and Development Expenditure as a Proportion of GDP, Percent, 2005 vs. 2018



Source: SESRIC, Road to 2025 Gains, Challenges and Opportunities.

At the individual OIC country level, 18 out of 31 OIC countries with available data increased their expenditures on R&D as a percentage of GDP between 2005 and 2018. Nevertheless, only Malaysia and UAE exceeded an R&D expenditure above or equal to 1% of GDP during this time period across the OIC countries. Moreover, all OIC countries with data available are lagging behind the world average in R&D spending in 2018 or the latest year with available data.

Articles Published and Patents

Articles published refer to the number of scientific articles published in journals covered by Science Citation Index Expanded (SCI-EXPANDED), Social Science Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI). Number of articles published in the international academic journals by the OIC countries group has increased significantly over the last decade from 82,234 in 2010 to 261,549 in 2019. Based on the progress demonstrated during this period, both OIC countries as a group and 33 individual member states are expected to increase the number of publications by more than 100% until 2025.

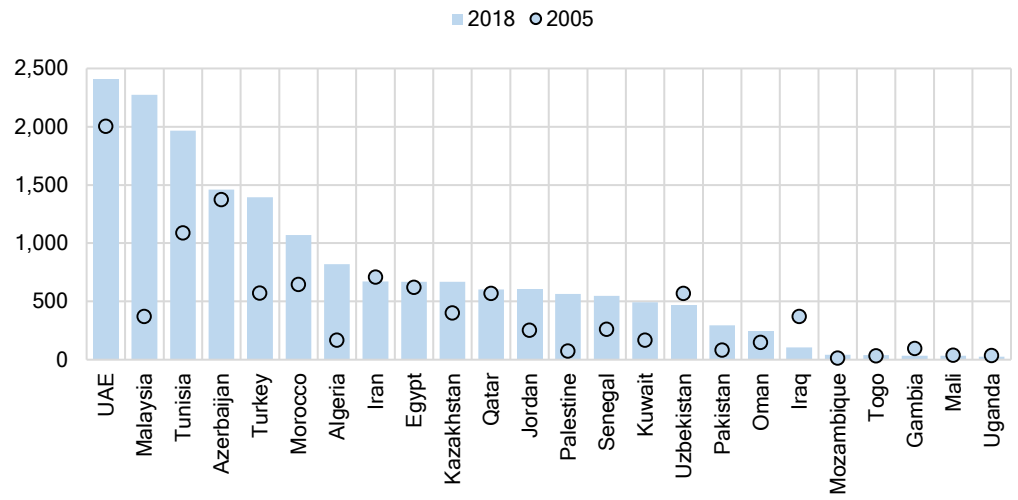
On the other hand, number of patent applications of OIC countries increased from 38,654 in 2010 to 58,222 in 2017. This progress rate is not sufficient to achieve the target of increasing output by 100% in the next ten years. At the individual OIC country level, Iran made the largest number of patent applications (12,823) among the OIC countries, accordingly, claimed 27.9% of the total OIC patent applications in 2017. Following Iran came Indonesia with 16%, Turkey with 14.7%, Malaysia with 12.1% and Saudi Arabia with 5.5% of the total OIC patent application in that year.

Researchers

The availability of abundant and highly qualified researchers is an essential condition to foster innovation and promote the scientific and technological development of a country. The researchers (in full-time equivalent) per million inhabitants is a direct measure of the number of R&D workers engaged in the conception or creation of new knowledge per 1 million people. The full-time equivalent of R&D personnel is defined as the ratio of working hours actually spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group (UNSD, SDG metadata).

During the period 2005-2018, out of 24 OIC countries with available data, the number of R&D workers saw an increase in 18 countries and a decrease in six countries. The growth rate in researchers per million people was over double in nine OIC countries (Palestine, Malaysia, Algeria, Pakistan, Kuwait, Mozambique, Turkey, Jordan, and Senegal) between 2005 and 2018. The number of researchers was highest in UAE, Malaysia, Tunisia, Azerbaijan, Turkey, and Morocco with over 1,000 researchers; however, it was significantly lower in some OIC countries mostly in Africa (Figure 10).

Figure 10: Researchers (in Full-time Equivalent), per Million Inhabitants, 2005 vs. 2018



Source: SESRIC, Road to 2025 Gains, Challenges and Opportunities.

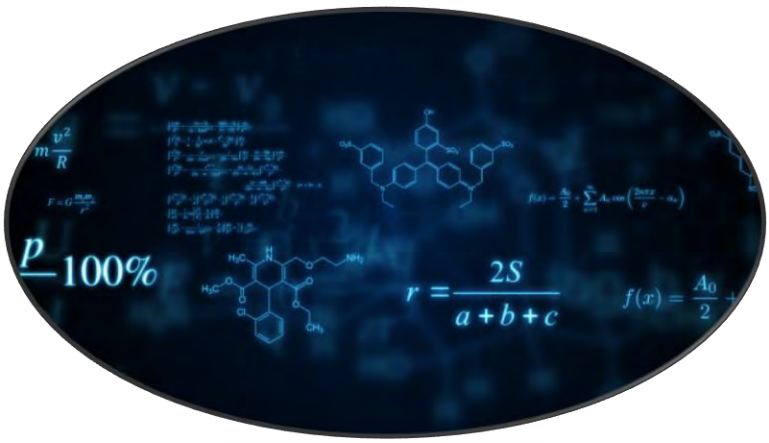
Higher Education World University Rankings

According to the Times Higher Education World University Rankings 2020 that includes almost 1,400 universities across 92 countries, 16 universities of the OIC countries were ranked in top 500. In comparison, according to World University Rankings by Round University Ranking that evaluates performance of 829 world's leading higher education institutions, 24 universities in the OIC countries were ranked in top 500 higher education Institutions globally.

Research Partnerships

In order to expand the scientific and technological progress of OIC countries, the "OIC-15 Dialogue Platform" was proposed by Kazakhstan. The platform will bring together 15 leading OIC countries with strong credentials in the STI field to suggest practical measures to help the OIC countries in their efforts for the development of STI. A brainstorming session was held in Almaty, Kazakhstan to deliberate upon various aspects of the establishment of the platform with the participation of representatives of member countries, the OIC General Secretariat, OIC Institutions (COMSTECH, SESRIC, IOFS) and officials from Al Farabi Kazakh National University on 19 November 2019.

PRIORITY 6: THE CASE FOR MATHEMATICS AND PHYSICS; BIOLOGY AND BIOTECHNOLOGY; AND THE CHEMICAL SCIENCES



Basic sciences have quite often been neglected at the altar of patents and economic gains, even though these have unintended disruptive consequences for society at large.

The trend is now for multidisciplinary research with mathematics, physics, biology, chemistry, material science, and computers coming together to create a complete new value set, including exciting new measurement and characterisation tools for industry and the sciences.

At the theoretical level, mathematics and physics have always produced excellent science in areas of general relativity and gravitation, cosmology, particle physics, group theory and nonlinear problems.

The 21st century will probably belong to biology and new materials. The drug discovery paradigm has shifted from the traditional hit-and-miss affair to computer aided drug design for target-based discovery to improve bioavailability and biological activity.

The excitement in recent years is the application of quantum mechanics to molecular and chemical systems resulting in designer molecules. Computational chemistry and computational biology now offer the possibility of manipulating atoms and molecules to create totally new entities, systems, membranes, materials, and also fuel cells, which are critical for energy storage.

Recommendations and Targets:

i. Promote physics and mathematics at all levels, from the school to the university, since their rigorous foundations provide excellent applications in research and industry.

ii. Invest in the better physics centres in OIC Member States to enable them to grow into 'Mother Institutes', focussing on specific groups of activities, which can be shared by other countries.

iii. Encourage designing and development of modern teaching equipment and aids for schools and universities (this capability exists already in some countries, and can be shared).

iv. Expand work on biotechnological tools, using novel strategies and animal models;

v. Support and leverage indigenous knowledge and medicine;

vi. Expand research in genomic and proteomics studies, regenerative medicine for congenital defects, disease, trauma and ageing, and cultivation of medicinal plants;

vii. Apply biotechnology and Next Generation Sequencing for personalized medicine, and development of antibodies and recombinant antibodies for disease detection and theranostics;

viii. Initiate and expand research and development of biosensors and rapid and cheap disease detection kits (real time monitoring, serologic detection system, DNA/RNA arrays) ;

ix. Manage issues related to patents for bio-similars, or indefinite extension of pharmaceutical patents through 'data exclusivity' ;

x. Support nanosafety as a means for safer design of nanomedicine;

xi. Assist academia and industry for research in industrial high value-added chemicals, catalysts, polymers, composites/non-composites, nano-materials;

xii. Expand research in fuel cells as priority;

xiii. Employ regional high-performance computation centers (HPCCs) in Member States to be shared by researchers from all Member States.

xiv. Encourage research in the design of electrical and mechanical systems.

The Current Situation:

Scientific and Technical Journal Articles

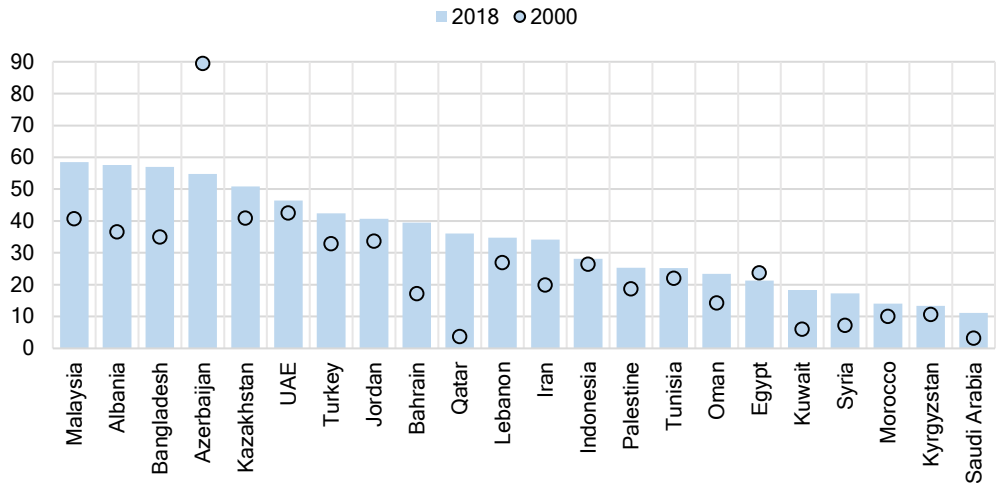
The World Bank disseminates the data on scientific and technical journal articles for 57 OIC countries through its World Development Indicators Database. The data covers the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences.

In 2018, the number of scientific and technical journal articles were over 5,000 for 12 OIC countries (Iran, Turkey, Indonesia, Malaysia, Egypt, Pakistan, Saudi Arabia, Iraq, Nigeria, Tunisia, Algeria, and Morocco). With the pace of growth recorded since 2000, 55 OIC countries have experienced an improvement for the number of scientific and technical journal articles published. However, the improvement was in different degrees. In 23 OIC countries, the annual progress rates were over 10%, 27 OIC countries were observed to have annual progress rates between 5% and 10%, and remaining five OIC countries' annual progress rates were below 5% during the 2000-2018 period.

Proficiency in Mathematics

Twenty out of 22 OIC countries with available data demonstrated an increase of approximately more than 2 percentage points in the proportion of students achieving minimum proficiency in mathematics in lower secondary from 2000 to 2018. Five OIC countries with the proportion of students achieving minimum proficiency in mathematics in lower secondary over 50% were Malaysia (58.5%), Albania (57.6%), Bangladesh (57%), Azerbaijan (54.7%), and Kazakhstan (50.9%) in 2018 (Figure 11).

Figure 11: Proportion of Children and Young People Achieving a Minimum Proficiency Level in Mathematics, Lower Secondary, Both Sexes, Percent, 2000 vs. 2018



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

R&D Expenditure by Fields

The UIS disseminates the total intramural expenditure on R&D performed during a specific reference period, broken down by the following fields of research and development: natural sciences, engineering and technology, medical and health sciences, agricultural and veterinary sciences, social sciences, and humanities and the arts. The number of available data varies between 22 and 24 OIC countries according to the fields as end of September 2020.

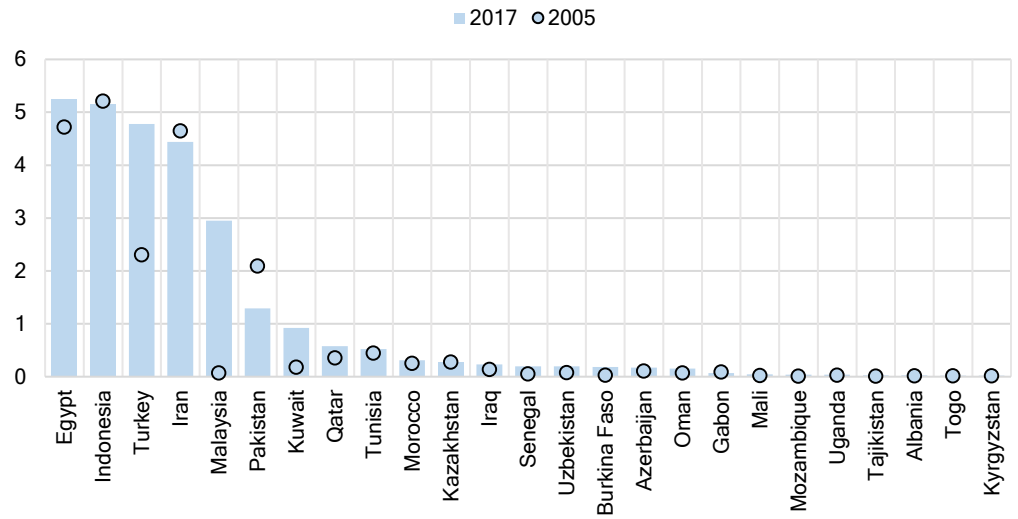
For the R&D expenditure on natural sciences, 10 out of 12 OIC countries have experienced an improvement from 2005 to 2018 in terms of constant 2005 USD PPP at the pace of growth over at least a five-year time span. Similarly, it is also observed that the R&D expenditure have increased in 10 out of 12 OIC countries in engineering and technology,

in 9 out of 11 OIC countries in medical and health sciences, in 8 out of 12 OIC countries in agricultural and veterinary sciences, in all 12 OIC countries in social sciences, and in 9 out of 10 OIC countries in humanities and the arts. Overall, the majority of OIC countries with data available have increased their R&D expenditures in different fields from 2005 to 2018.

Government Expenditure on R&D

Twenty-five out of 57 OIC countries with available data, 10 OIC countries (Malaysia, Burkina Faso, Kuwait, Mozambique, Senegal, Tajikistan, Uzbekistan, Mali, Oman, and Turkey) increased their government R&D spending more than double and this growth was more than 50% in four more OIC countries (Albania, Iraq, Azerbaijan, and Qatar) during the period 2005-2017 (Figure 12).

Figure 12: Government Expenditure on R&D, Billions of Constant 2005 USD PPP, 2005 vs. 2017



Source: SESRIC, Road to 2025 Gains, Challenges and Opportunities.

Medium and High-Tech Industry Value Added

A modern, intricate production structure based on R&D and innovation offers better opportunities for skills development and economic growth. Industrial development requires a structural transition from resource-based and low technology activities to MHT activities. The proportion of medium and high-tech (MHT) industry value added in total value added of manufacturing (MVA) is a ratio value between the value added of MHT industry and MVA. The share of MHT industries in total MVA decreased by 0.1 percentage-point from 31.1% in 2005 to 31% in 2018 in the OIC countries group.

In 41 out of 57 OIC countries with available data, the proportion of MHT industries in total MVA increased by more than 5 percentage-points in 10 OIC countries including Qatar, Tunisia, Kuwait, Uzbekistan, Iraq, Kazakhstan, Afghanistan, Senegal, Oman, and Morocco. Overall, while the share of higher-tech manufacturing increased in 15 OIC countries, it stagnated in 11 OIC countries and decreased in 15 OIC countries during the 2005-2018 period. At the individual country level, only Qatar and Iran had a higher share of higher-tech manufacturing than the world average in 2018 or the latest year with available data.

PRIORITY 7: MANAGING BIG DATA WITH SECURITY IN THE DIGITAL ECONOMY

Information and Communication Technology (ICT) is a major catalyst and enabler for socio-economic development with a strong footprint in many sectors where it can directly add value.

ICT is also a unique factor in the emerging relationship between science and society in the 21st century digital economy, whereby physical proximity is no longer necessary in making key decisions, or implementing them. This requires seamless matching of transnational skills, which can facilitate low cost solutions in developing countries.

However, availability of wider bandwidth, cheap storage and easy access to the digital media, the internet, and social networking and personal management, has exposed the vulnerability of individual privacy and privileges, especially the well-being of young children.

Recommendations and Targets:

i. Review cyber security strategies, programmes and laws and best practices in leading OIC countries for their uniform adoption and to cooperate in case of cyber-attack.

ii. Counter the adverse effect on young children, and protect them by disseminating awareness about better parental control/ child protection tools;

iii. Review curricula and delivery of IT education, in order to bridge the academia / industry gap, and undertake 'train the trainer' courses, workshops and security exercises.

iv. Harmonize regulatory policies, frameworks and IP laws to facilitate easier sales, and commissioning of IT products and services across Member States.

v. Connect OIC Member States through secure, high speed, fibre-optic land and sea-based networks and satellite links. This would need to be a secure intra-OIC network in addition to SEAMEWE 3 and SEAMEWE 4, with service nodes within the OIC Member States, in order to avoid disruption and enhancing security;

vi. Ensure faster transition to e-government for faster and more transparent decision making;

vii. Protect TLDs with Islamic identities at the Internet Corporation for Assigned Names and Numbers (ICANN) through a coordinated approach by all OIC Member States.

viii. Establish additional library to collect information about ancient manuscripts and historical works in the OIC Member States.

ix. Consider establishing a consultative mechanism to periodically review ethical and legal issues emanating from the growth of technology and developments in the field of medicine, with a view to evolve consensus positions on these issues.

The Current Situation:

Next Generation Network (NGN) Systems

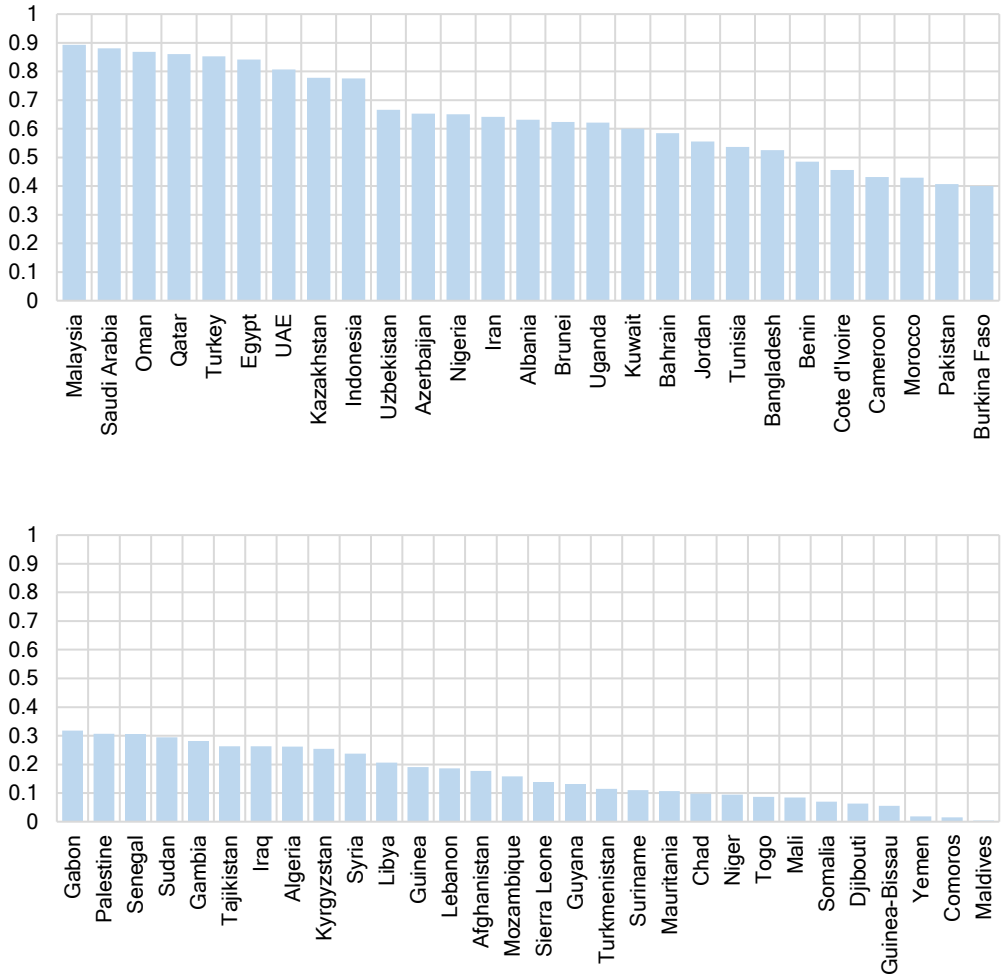
International Telecommunication Union (ITU), the UN specialized agency for information and communication technologies, evaluates the level of introduction of the Next Generation Network (NGN) systems by country, and the data are disseminated for 52 OIC countries through ITUICT-EYE: ICT Data Portal. As of 2019, 12 OIC countries have completed the introduction of the NGN systems, in comparison; no OIC country was in the stage of completion of NGN systems in 2010. Twenty-nine OIC countries were in the implementation stage of the introduction of NGN systems in 2019, compared to only 14 OIC countries were at the implementation stage in 2010. Seven member states were in the process of either planning, introduction, or were still conducting a feasibility study in 2019. Only Afghanistan has no plans for the introduction of NGN systems, while the other three member countries were remaining in unidentified stages of the introduction of the NGN systems as of 2019.

Cyber Security

ITU has developed the Global Cybersecurity Index (GCI) that evaluates the countries' commitment to cybersecurity at a global level. The cybersecurity is multidimensional and applied in different sectors and industries, thus countries' levels of advancement are assessed along five pillars – (1) Legal Measures, (2) Technical Measures, (3) Organizational Measures, (4) Capacity Building, and (5) Cooperation – and then aggregated into an overall score.

In 2018, OIC countries with the highest GCI scores, including Malaysia with 0.893, followed by Saudi Arabia (0.881), Oman (0.868), Qatar (0.860), and Turkey (0.853) were ranked among the top 20 countries globally. On the contrary, 30 OIC countries were ranked from 100th (Gabon) to 175th (Maldives) in the world based on their GCI scores (Figure 13).

Figure 13: Global Cyber Security Index (GCI) 2018



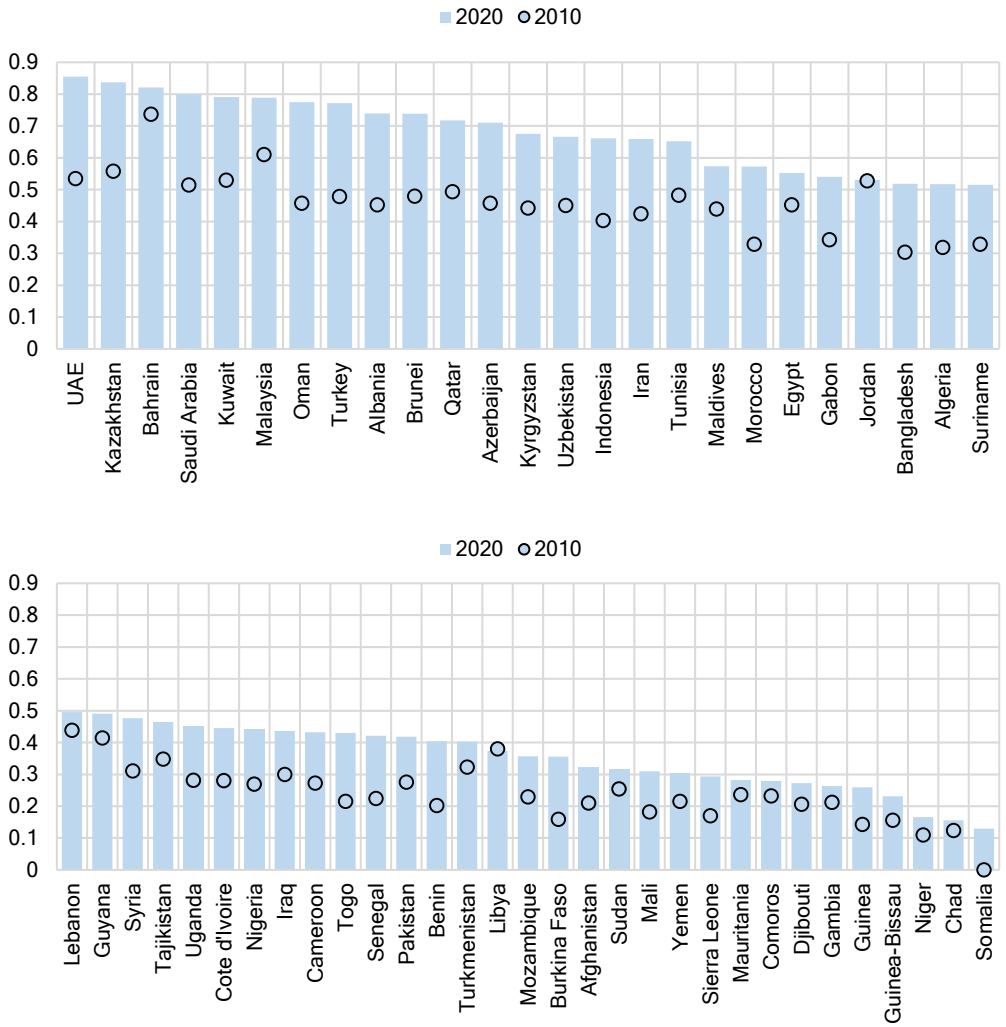
Source: SESRIC staff calculations based on data extracted on 08/10/2020 from International Telecommunication Union (ITU), Global Cybersecurity Index 2018 Report.

E-Government

According to the UN E-Government Knowledgebase, eight OIC countries (UAE, Kazakhstan, Bahrain, Saudi Arabia, Kuwait, Malaysia, Oman, and Turkey) achieved "very high" E-Government Development Index (EGDI) scores (EGDI>=0.75) in 2020, in comparison; no OIC country had "very high" EGDI scores in 2010. Meanwhile, 17 OIC countries had "high" EGDI scores (0.5<=EGDI<0.75) in 2020, compared to only seven member countries in 2010. Twenty-seven member countries had "medium" EGDI scores (0.25<=EGDI<0.5) in 2020, compared to 31 OIC countries in 2010. Only four member

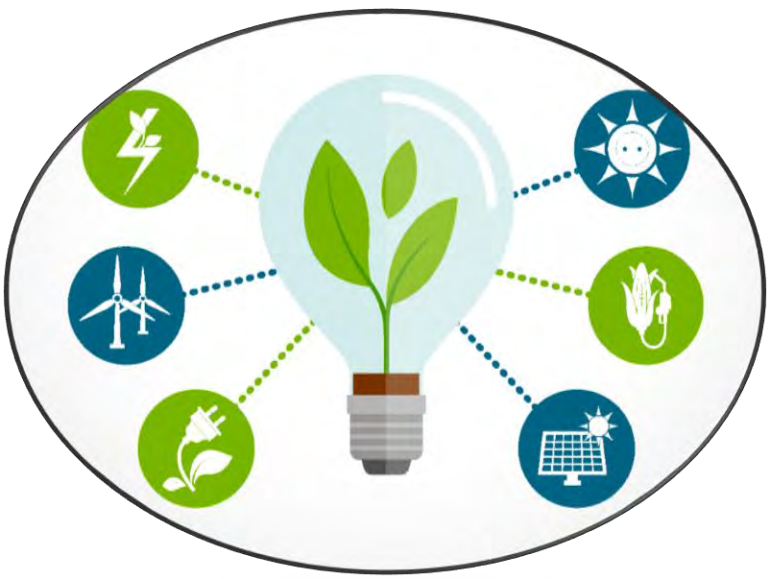
countries had "low" EGDI scores (EGDI<0.25) in 2020, compared to 18 OIC countries in 2010 (Figure 14).

Figure 14: E-Government Development Index (EGDI), 2000 vs. 2018



Source: SESRIC staff calculations based on data extracted on 08/09/2020 from United Nations (UN) E-Government Knowledgebase.

PRIORITY 8: MANAGING ENERGY REQUIREMENTS



The quality of modern human life has been and always will be completely dependent on the availability of affordable energy. There are serious concerns, however, that consumption of water, land, and fuel resources may become unsustainable at the present rates of consumption.

The priority everywhere remains the assurance of universal access to affordable, reliable and modern energy services. More people are moving out of poverty and are demanding and gaining access to energy. Several studies suggest that global energy demand will double by 2040 vs 2000 levels, and emerging economies will be responsible for 90% of growth in energy demand caused by rising populations and a fast growing middle class.

The goal of energy autarky will be met through diversification of primary resources which, in turn, is governed by national domestic resources, policies, and programmes, within the impact of volatility in global pricing, and geo-politics or competition for resources.

Recommendations and Targets:

i. Move towards high efficiency electricity generation systems.

ii. Upgrade national T&D (transmission and distribution) systems and introduce flexible two-way T&D systems and distributed micro-grids to integrate renewable energy (RE).

iii. Promote passive houses, efficient cooling and heating systems, and energy efficient appliances which are certifiable internationally.

iv. Increase the number of human settlements which adopt and implement integrated policies for energy, resource efficiency, mitigation and adaptation to climate change.

a) The Case for Renewable Energy

The move towards RE (renewable energy) will be sustained, although its share in the primary energy mix will still be over- shadowed by fossil fuels which are predicted to have a 60-65 % by 2040.

The problem with RE (solar, wind) is that it does not offer 'base-load' supply, which is only available through fossil or nuclear fuels. The RE output is intrinsically variable and even intermittent, which is the biggest challenge for its integration with existing systems.

There is a need to focus on designing large scale storage technologies, such as covering peak demands and improved power quality and frequency regulation. These requirements are already having major impact on the evolution of flexible two-way T&D (transmission and distribution) systems and grids of the 21st Century.

Another significant source of renewable energy which has lagged behind solar and wind energy is geothermal energy, perhaps due to uncertainties in reservoir capacity even though this source has a greater base-load capability and potential.

Recommendations and Targets:

i. Target a RE share of at least 10% in national energy mix of OIC States by 2025.

ii. Introduce micro-grids and integrate them into national systems, and encourage distributed standalone systems for small communities;

iii. Consider enhancing national research for increasing solar cell efficiencies to reach commercially deployable conversion factors of 40%;

iv. Design and develop energy storage systems such as fuel cells (5 MW for 2 hours) and batteries (such as Lithium Ion and Vanadium Redox) for small storage applications;

v. Design and develop at least 60 MW molten salt storage tank with steam turbine systems, compatible with concentrated solar power (CSP);

vi. Exploit recent advances in geophysical and reservoir engineering for using geothermal energy in OIC countries where it is possible and available;

vii. Enhance intra-OIC and international cooperation to facilitate access to clean energy research and technologies.

b) The Case for Nuclear Energy

There is a revival of interest globally in nuclear power. Many OIC Member States are planning to start constructing nuclear power plants. Excellent opportunities exist for cooperation in peaceful applications of nuclear technology in power and non-power sectors.

Recommendations and Targets:

i. Initiate peaceful applications of nuclear technology in power and non-power sector, consistent with respective obligations of Member States, and their commitments under regulatory safety/security standards as enunciated by the IAEA (International Atomic Energy Agency).

ii. Establish joint projects among Member States for nuclear power plant equipment.

iii. Initiate programmes for manufacturing radio-pharmaceuticals, and using radiation for sterilisation of medical and food products, as per IAEA norms.

iv. Encourage preparing multinational programmes for safe disposal of highly radioactive waste under IAEA guidelines.

The Current Situation:

Adaptation to Climate Change

Adaptation and mitigation measures are integral parts of an effective strategy to address the climate change. In this regard, all countries are expected to prepare their vulnerability assessments, prioritization of action, financial needs assessments, capacity building and response strategies, and integration of adaptation actions into sectoral and national planning. Adaptation is particularly important for the developing countries, especially due to their high vulnerability to the climate change.

In this context, adaptation is a key building block of the UN Framework Convention on Climate Change's (UNFCCC) response to climate change. All LDCs are supposed to prepare their National Adaptation Plans of Action (NAPA) and submit their priority projects to the UNFCCC Secretariat for financing. According to the UNFCCC's NAPA Priorities Database (as of end of September 2020), around half of these priority projects were submitted by the 22 OIC countries. Among them, Mauritania, Guinea, and Sierra Leone submitted more than 20 projects. The implementation of these 255 projects in the OIC countries required over 450 million USD.

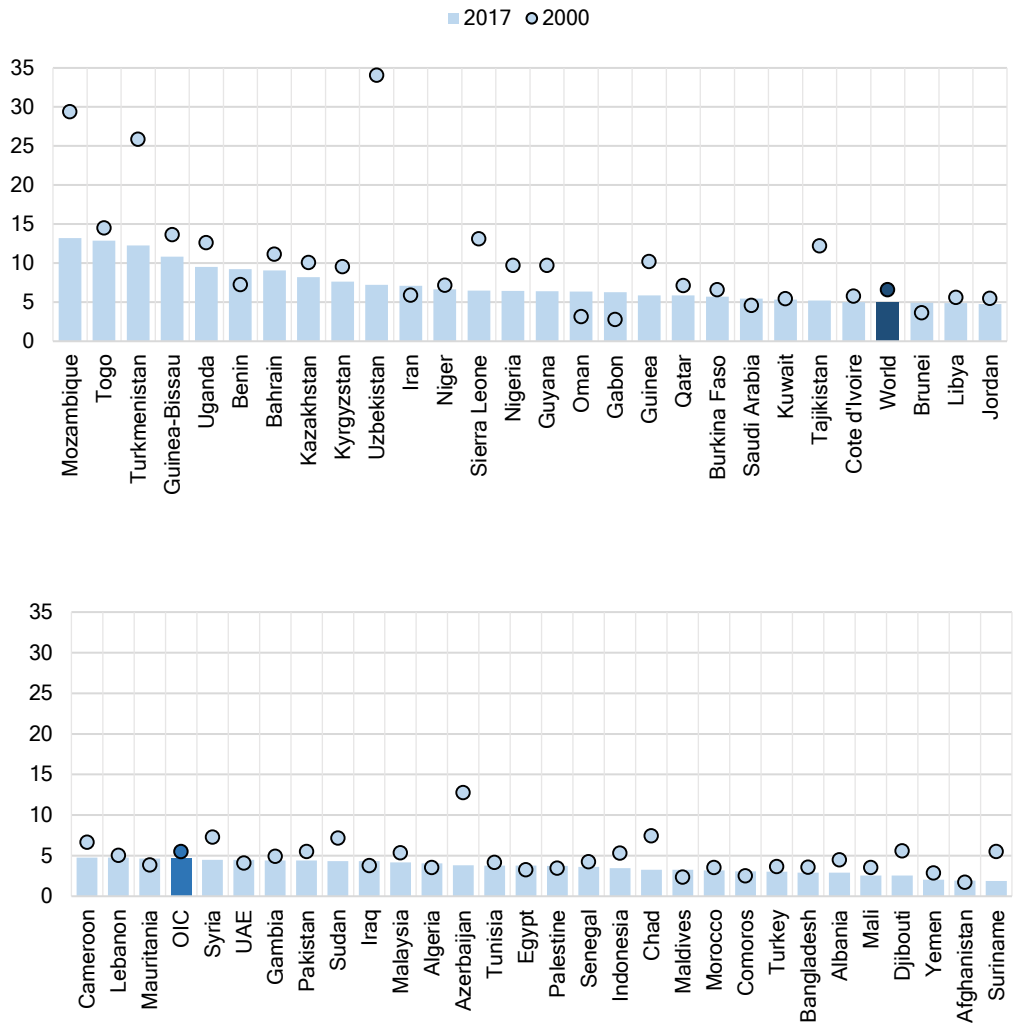
Energy Efficiency

The OIC population with access to electricity showed a significant growth of 10 percentage points from 2000 to 2017 by reaching 73.4% in 2017. Despite the overall

improvements in access to electricity, the OIC countries group still accounts for around 13% of global electricity production, generated mainly from natural gas and coal.

Also known as energy efficiency, energy intensity is used to monitor and analyse how much energy is consumed to produce per unit value of economic output. In the period 2000-2017, energy intensity level of primary energy slightly decreased with 0.8 percentage point in the OIC countries group from 5.5% to 4.6% (Figure 15).

Figure 15: Energy Intensity Level of Primary Energy, Megajoules per Constant 2011 GDP PPP, 2000 vs. 2017



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

At the member country level, the energy intensity level of primary energy improved in 41 OIC countries between 2000 and 2017. Among these countries, six OIC countries (Uzbekistan, Mozambique, Turkmenistan, Azerbaijan, Tajikistan, and Sierra Leone) decreased their energy intensity level by more than 5 percentage points (Figure 15).

Nuclear Energy

Twelve OIC countries (Bangladesh, Indonesia, Jordan, Kazakhstan, Malaysia, Morocco, Niger, Nigeria, Saudi Arabia, Sudan, Turkey and UAE) that are embarking on a nuclear programme have initiated cooperation with IAEA through their Integrated Nuclear Infrastructure Review service. Bangladesh, Turkey and UAE are all constructing their first nuclear power plants. Egypt has signed an initial agreement to build its first nuclear power plant and it will be the only country in the region to have a Generation III+ reactor.

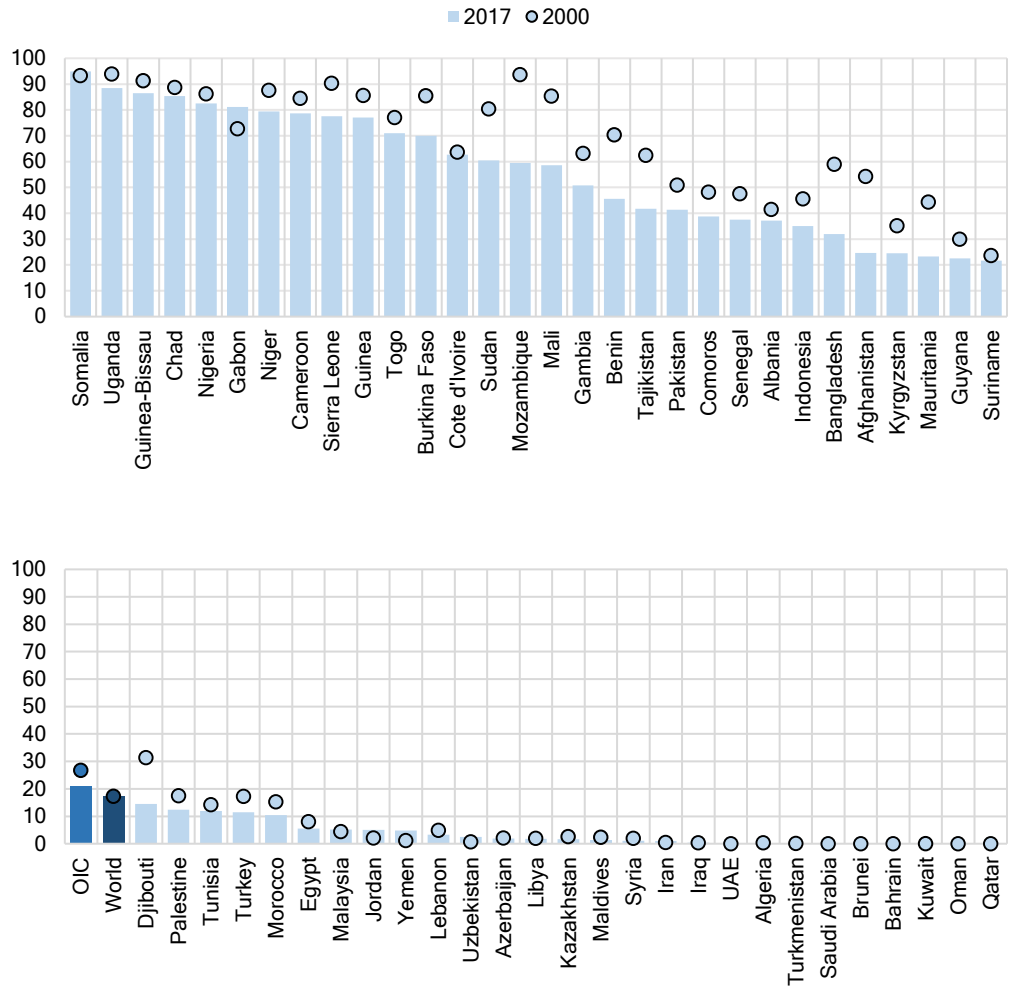
The OIC countries adopted the Resolution No. 29/46-POL on Establishment of a Nuclear-Weapon-Free Zone in the Middle East during the 46th Session of the Council of Foreign Ministers on reaffirming the inalienable right of all states in full compliance with obligations emanating from the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) to develop research, production and use of nuclear energy for peaceful purposes without discrimination in accordance with the NPT provisions and the statute of the IAEA; and, in this regard encourages cooperation among the OIC Member States on the peaceful uses of nuclear energy.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was opened for signature on 29 September 1997 and entered into force on 18 June 2001. So far, only three OIC countries have ratified the convention namely; Indonesia (2011), Kazakhstan (2010) and Morocco (2001). Moreover, 14 OIC countries are in the accession phase.

Renewable Energy

Due to the negative environmental impact of greenhouse gas emissions, increasing demand for energy should be supplied by generating energy from renewable sources. The share of renewable energy in total final energy consumption (TFEC) in the OIC countries decreased from 26.7% to 20.8% over the period 2000-2017. As a consequence, the renewable energy share in TFEC decreased in 42 countries whereas it increased in 11 countries. On the other hand, no change was observed in four OIC countries. In 2017, renewable energy share in TFEC of 30 OIC countries was above the world average. Of that, in 17 member countries, more than 50% of the energy consumed came from renewable sources (Figure 16).

Figure 16: Renewable Energy Share in the Total Final Energy Consumption, Percent, 2000 vs. 2017



Source: SESRIC, Towards the Achievement of Prioritised Sustainable Development Goals in OIC Countries 2020.

Apart from a few member countries, the OIC countries group seems to be benefiting from either no or very small amounts of geothermal energy due to its high exploration costs. Indonesia is ranked among the world's top three most developed geothermal electric capacity countries with 14 billion kWh net electricity generation from geothermal resources recorded in 2018 with a 49 % increase from 9.4 billion kWh recorded in 2010. Turkey has also increased its capacity in using geothermal energy for electricity generation enormously from 0.6 billion kWh in 2010 to 5.8 billion kWh in 2018.

PRIORITY 9: ONE PLANET: THE ENVIRONMENT, CLIMATE CHANGE AND SUSTAINABILITY

Climate change is of particular concern for OIC Member States lying in climate-sensitive regions which are already aggravated by desertification, drought, sand and dust storms degradation of land and water, especially the marine environment and fisheries therein.

Recommendations and Targets:

It is recommended to set up an OIC Advisory Group with experts drawn from the Member States to prepare a detailed plan of action including mitigation options in line with the commitment made under the Paris Agreement on Climate Change. It would help the Member States in:

i. Preparing national policies for effective planning and management for the protection and restoration of ecosystems, including the marine environment.

ii. Establishing stations which monitor and collect detailed local data over time for integration into system models, instead of remote foreign studies.

iii. Prepare a template of 'green technologies' which encompass the human habitat;

iv. Encourage Member States to adopt voluntary national targets to achieve land degradation neutrality.

v. Strengthen policy-making by supporting integrated land use planning in the Member States vulnerable to drought.

vi. Exchange experiences among Member States to accelerate the integration of UN Sustainable Development Goals 2030 into national policies in accordance with national legislations, values and priorities and how to track progress in this area.

vii. Strengthen the capacity of the Member States to tackle the adverse impacts of climate change.

viii. Extends support to Climate Vulnerable States to easily access available Climate Financing and to extend Forest and Carbon Sink for mitigation.

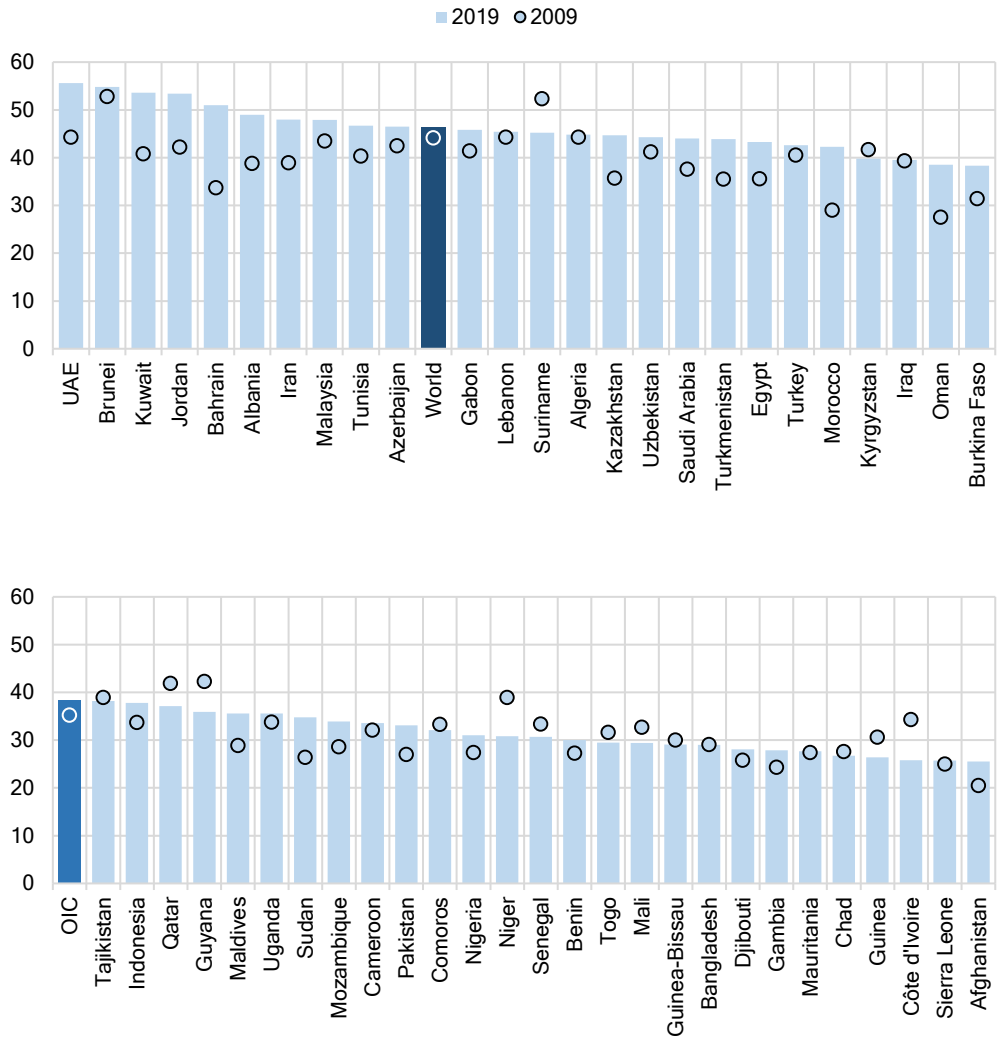
ix. Facilitate technology transfer at cheap and affordable cost to enhance mitigation and adaptation capabilities of the Member States.

The Current Situation:

Environmental Performance & Climate Change Readiness

In 2019, the OIC countries on average scored 38.3 out of 100 in the Environmental Performance Index (EPI) (Wendling et al, 2020) compared to the global average score of 46.4. Nevertheless, during 2009 and 2019, the environmental performance of OIC countries has improved significantly by 9% compared to 5% improvement at the global level and 3% in other developing countries. Figure 17 shows the Environmental Performance of OIC countries in 2009 and 2019.

Figure 17: Environmental Performance, 2009 vs 2019 (score 0-100, where 100 = best)



Source: SESRIC Staff calculation based on EPI 2020.

The OIC countries are the least Green House Gas emitters in the world. However, it is on the rise. During 2000 and 2017, 38 out of 54 OIC countries with data have witnessed an increase in CO_2 emissions per capita. Saudi Arabia recorded the highest increase of 6.7 metric tons per capita in CO_2 emission followed by Kazakhstan (5.9 metric tons), Oman (5.8), Turkmenistan (3.9) and Iran (3). On the other hand, Qatar recorded the highest decline (16.5 metric tons per capita) in CO_2 emissions followed by UAE (6.4), Kuwait (3.3) and Bahrain (2.8).

Notre Dame Global Adaptation Index (ND-GAIN) (Chen et al., 2015) reported that OIC level of readiness to climate change is at 0.32 level (score 0-1, where 1 = best), lower than the world average level of 0.42. At the individual country level, 17 OIC countries have readiness scores higher than the world average, most of which are located in the MENA region. The least ready OIC countries to the impacts of climate change are Chad, Afghanistan, Syria, Somalia, and Guyana. Readiness dimension of ND-GAIN measures the level of effective use of investments for climate change adaptation actions.

Biodiversity & Habitat

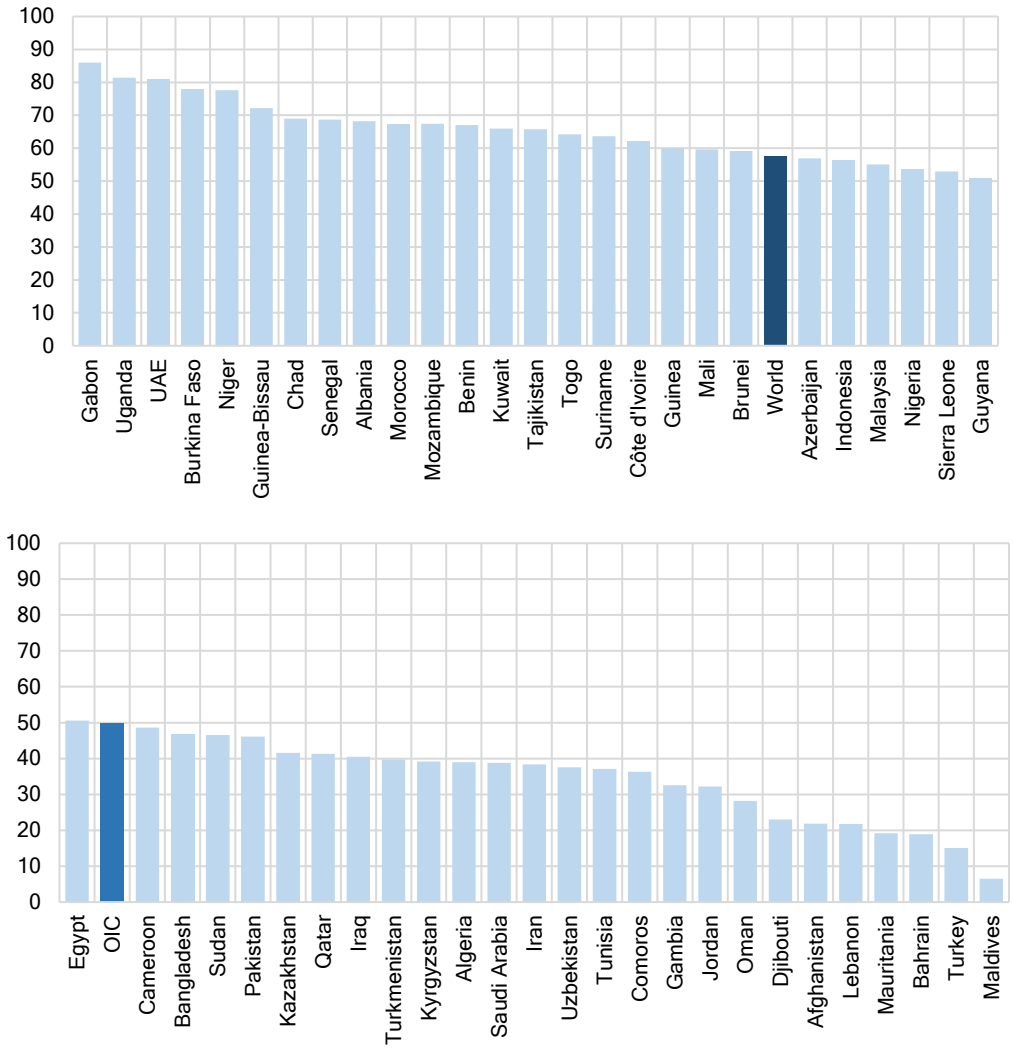
The biodiversity & habitat dimension of EPI measures progress in terrestrial as well as marine protection and biodiversity. In 2019, the OIC countries on average scored 49.9, while the global average, in comparison, was at the level of 57.6. Nevertheless, the OIC countries group significantly recorded an improvement of 8% relative to its 2009 level, while at the same period; the global average saw an improvement of 6%.

As to the country-level biodiversity & habitat performance of OIC countries for 2019, it is observed that 20 OIC countries scored above the global average level. Top five OIC countries with the largest level of biodiversity & habitat performance were Gabon, Uganda, UAE, Burkina Faso, and Niger. Meanwhile, countries with the lowest performance were Maldives, Turkey, Bahrain, Mauritania, and Lebanon (Figure 18).

Biodiversity & habitat is vulnerable to climate change impacts. Based on the ND-GAIN, the average level of habitat vulnerability to climate change in the OIC countries was about the same as the global average in 2018. Top five OIC countries with the lowest level of habitat vulnerability to climate change were UAE, Egypt, Morocco, Qatar, and Kyrgyzstan. On the other hand, five OIC countries with the most vulnerable to its habitat were Cameroon, Guinea, Somalia, Sierra Leone, and Gabon.

According to the latest available information, only 34 OIC countries have so far reported on the development of national urban plans (UN Habitat & OECD, 2018). Most of these plans do not pay much attention to the issues related to environmental sustainability and resilience to climate change.

Figure 18: Biodiversity & Habitat Performance, 2019 (score 0-100, where 100 = best)



Source: SESRIC Staff calculation based on EPI 2020.

Land Degradation & Disaster Risk Reduction

Latest data show that 14% of the land area of OIC countries group is degraded. The OIC countries in ECA sub-region experience the largest land degradation at 30%. Furthermore, the least degraded region is observed in the MENA region. Four OIC countries (Tajikistan, Bangladesh, Kuwait, and Benin) experience land degradation of more than 50% of their land area.

Some OIC countries have managed to implement local disaster risk reduction strategies in line with the national disaster risk reduction strategies. In Turkey and Kazakhstan, for

instance, disaster risk reduction strategies in all local levels have been set up to conform with the national strategies.

Environmental Management Capacities & Policy Integration with SDGs

According to the latest data on the Country Policy and Institutional Assessments (CPIA) released by the World Bank (2019), the capacity for environmental management (in terms of both policies and institutions) in 82 low and middle-income countries is relatively stable at a score of 3.1 since 2005. This database also includes 30 OIC countries. The capacity for environmental management for these member countries is averaged at a score of 3.1 for 2017 (6 being the maximum score). Given the fact that CPIA scores 1 to 4 describe poor capacity and 5 to 6 quite advanced capacity, the majority of these member countries like their developing counterparts elsewhere are characterized by weak capacities.

For 20 out of 30 member countries, CPIA scores either increased or remained stable between 2005 and 2017. In general, CPIA scores in the OIC countries range from 2 to 4, indicating very low environmental management capacities across the 30 OIC member countries with data.

In 2019, 16 OIC countries presented its voluntary national reviews, as part of the national implementation of SDGs. Those countries reported the integration of SDGs target with its national development strategy.

Technology Transfer & Climate Change Adaptation Projects

As of August 2020, there are 190 projects globally (in various phase) that benefited from the Climate Technology Centre and Network, the operational arm of UNFCCC, which promotes the accelerated transfer of environmentally sound technologies for low carbon and climate-resilient development in developing countries. The OIC countries up to now are taking part in 62 of those technology transfer projects. Most of the projects in the OIC countries are in the area of energy and agriculture.

All LDCs are supposed to prepare their NAPA and submit their priority projects to the UNFCCC secretariat for financing. According to the UNFCCC's NAPA Priorities Database (as of end of September 2020), all LDCs have submitted over 500 projects. Around half of these projects were submitted by the 22 OIC countries. Among these OIC countries, Mauritania, Guinea and Sierra Leone submitted more than 20 projects. The implementation of these 255 projects in OIC countries required around 450 million USD. In general, priority sectors/areas addressed in the NAPAs are agriculture and food security, water resources, coastal zones, and early warning and disaster management.

PRIORITY 10: ENHANCING INTRA-OIC COOPERATION

There is little scientific cooperation among OIC Member States, due to lack of awareness among academics and scientists of the expertise available in different countries, coupled with the heterogeneous nature of educational quality. It is important to build smaller linkages first, which may be bilateral or trilateral initially, and subsequently grow into regional groupings over the next ten years.

Recommendations and Targets:

i. Strengthen the Concept of 'Mother Institutes'; Centres of excellence exist in many OIC countries in all fields of education and S&T. These Centres are expected to emerge as 'Mother Institutes' which will be at the centre of collaborative efforts in OIC Member States and 'transfer' of knowledge in OIC Member States.

ii. There is very little mobility among faculty and researchers in OIC countries. There is urgent need to consolidate and expand the OIC Educational Exchange Programme through a special programme, which would promote exchange of students, faculty and researchers. The OIC Educational Exchange Programme may be named as the Al Haytham Programme, after the Muslim scientist Ibn Al Haytham, regarded as the father of modern optics.

iii. Commend the kind acceptance of His Highness Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah, the Amir of the State of Kuwait, may Allah protect him, to host an international conference to support Education in Somalia, as announced by His Highness at the opening session of the 27th Ordinary Session of the Council of the League of Arab States held at the Summit level in Nouakchott, Mauritania, on 20-21 Shawal 1437 A.H., corresponding to 25-26 July 2016.

The Current Situation:

Centres of Excellence

The Centres of Excellence play a significant role in developing high standards in research, innovation and learning. Mainstreaming the role of Centres of Excellence with the aim of building technical capacities of the relevant institutions in the OIC countries further contribute to attain desired scientific developmental targets stated in the OIC STI Agenda 2026.

In fact, many OIC countries have a diverse portfolio of R&D institutions that have valuable knowledge and deep expertise in their respective fields. However, these institutions are needed to be mapped and scaled up as "Mother Institutes" to increase their role in development cooperation. In this regard, pooling of technical expertise and resources in

the technological and scientific sectors in these Centres would promote efficiency and cost-effectiveness, thereby provides quick-wins towards rewarding multilateral cooperation among OIC countries.

Since the adoption of the OIC STI Agenda 2026, the OIC countries have increased their efforts to map their Centres of Excellence and leverage their resources to strengthen their capacities towards effective development cooperation. Some notable examples include Pakistan, Indonesia, Malaysia, Morocco, and Turkey whose efforts are supported by the relevant OIC institutions such as IsDB and SESRIC.

Within the framework of these efforts, Pakistan profiled 16 Centres in four priority areas including agriculture, agro-based industries, pharmaceuticals industry, and ICT. Similarly, Malaysia identified 28 institutions under aerospace & MRO (maintenance, repair and overhaul), agriculture and R&D, education and training, green technology and environment, ICT, healthcare and pharmaceutical. Turkey presented five to six Resource Centres in each of the following sectors: agriculture, livestock and food security; health and nutrition; technical and vocational education and training. Indonesia mapped 16 Centres of Excellence in the fields of agriculture, marine and fisheries, health, pharmaceutical, and vocational education and training. Finally, Morocco mapped seven Centres of Excellence in the fields of agriculture, food security, and fisheries.

OIC Educational Exchange Programme

Education is central to human capital formation and development. Increasing the mobility among the students, researchers and academics among the OIC countries can advance technological innovation, channel the progress towards a knowledge-based and innovation driven economy, and generate further benefits for all countries involved. Recognizing the importance of this mobility, several OIC countries contribute to educational exchange programmes as exemplified below:

- An increasing number of OIC countries offer scholarships through Al Haytham Programme at masters, doctoral and post-doctoral levels.
- COMSATS Institute of Information Technology, Pakistan Institute of Engineering and Applied Sciences and the Higher Education Commission of Pakistan have offered scholarship awards to students from OIC countries in several fields, including medical, agriculture, nuclear engineering, medical physics, radiation physics, nuclear medicine, radiation and medical oncology.
- The Educational Grant Programmes of Azerbaijan provides an opportunity for the selected candidates from the OIC countries on an annual basis to study in the leading universities of Azerbaijan.

- The Government of Brunei offers scholarships to the eligible students from the OIC countries to study in four-year higher education institutions in Brunei.
- Turkey offers "Türkiye Scholarships" which is a competitive scholarship program awarded to international students to pursue full-time or short-term programs at the top universities in Turkey.
- The Moroccan Agency of International Cooperation (AMCI) offers scholarships for international students at Moroccan public universities at undergraduate, graduate, and postgraduate degree levels.
- The Turkish Cypriot State, an observer member of the OIC, has offered 20 scholarships in 2018-2019 academic year and 5 scholarships in 2019-2020 academic year within the framework of the OIC Educational Exchange Programme (Al Haytham Programme).

International Conference for Supporting Education in Somalia

The State of Kuwait announced in October 2019 that the State will host an international donors conference to support Somalia's education sector. The conference was announced to be held in 2020. The Foreign Minister of Kuwait received head of the organizing committee in early 2020 to discuss the arrangements and the agenda of the event.

PRIORITY 11: BIG SCIENCE PROGRAMS

The present trend in scientific research is for joint 'big' science programmes which encourage multidisciplinary frontier research in basic and applied sciences. All of them have important spill overs in technological innovation and industry.

Several countries can pool their human and financial resources for joint designing, implementation and operation of large programmes which can reduce financial burdens on individual states. This will also lead to better collaboration and collective capacity building which is the Vision of all OIC Member States.

a) Space:

Space has become very important field for R&D which necessitates to explore those horizons for further progress of OIC Member States.

Recommendations and Targets:

i. Design and launch small satellites singly or jointly, for elegant experiments in low orbit;

ii. Jointly design and launch remote sensing satellites for observation, crop estimation and disaster management, rescue at sea, and weather prediction.

iii. Consider establishing a network of remote sensing centres among OIC Member States.

iv. Consider establishing an OIC Communication and Global Positioning System/Regional Navigation Satellite System (GPS, RNSS).

v. Centers for Space Technologies may be established. This may lead to an Inter-Islamic Space Agency, focusing on projects from space launch systems to manned vehicles.

b) Astronomy:

There are no reasonably sized, functional astronomical telescopes in Member States, whereas this is one area where Muslim scientists made seminal contributions in the past.

Recommendation:

A ground-based 4m telescope using adaptive mirrors and laser 'guide stars' can now provide the same or better resolution as the Hubble space telescope. There is need for at least 3 - 4 such observatories in different OIC regions.

c) Accelerators and Synchrotron Light Sources:

Accelerators and synchrotron light sources permit multidisciplinary research at the frontiers of human scientific knowledge in multiple fields, as well as handling of extremely large data, apart from excellent opportunities for technological and industrial development.

Recommendation:

Member States should work to build at least one new 2-4 – 2.7 GeV accelerator. It would provide excellent opportunities for technology and industrial development.

d) Mapping the Marine Environment:

The majority of Member States are maritime states, and are interconnected from the Atlantic to the Pacific Ocean through the Mediterranean, the Red Sea, Arabian Sea, and Indian Ocean. The maritime jurisdiction of OIC Member States needs to be mapped extensively.

Collaborative and cross-disciplinary research is the key to providing the knowledge and tools that we need to achieve ecosystem-based management and protection of valuable marine resources and services.

Recommendations:

We must initiate programmes for reviewing and compiling bathymetric data of the marine environment under the jurisdiction of Member States. The data and map products will provide information on the sea-bed substrate including rate of accumulation of recent sediments. All interpretations and primary information regarding mineral wealth will be owned by the country whose area is mapped, except that in the public domain. Four vessels and 5 years will be needed for the entire exercise (2-3 partners in each sub-region). 21 countries already possess 39 oceanography institutes, with 42 research vessels, and cover the entire OIC region from the Pacific to the Atlantic).

e) The Minerals Directory of OIC Member States:

Apart from oil and gas, the OIC region is blessed with large mineral deposits. The uncharted coastlines promise much more. All this needs to be mapped and disseminated.

Recommendation:

i. It is recommended to prepare a Minerals Directory of OIS States OIC Member States; enhance capabilities of OIC Member States for sustainable exploration and mining, and development of high-value added products, research, training, and safety; and jointly prepare a series of Geological and Geophysical Surveys for more effective site classification and monitoring of geo-hazard assessment of major settlement areas in OIC countries.

f) High Performance Computer Centres (HPCCs):

Modern research demands high performance computing for simulation and modelling of complex systems. It will benefit basic and applied sciences, big science and climate modelling and industry.

Recommendation:

It is recommended to set up at least six HPCCs in the major regions of the OIC.

g) Increasing Public-Private partnership for Science and Technology Projects with Economic Potential:

OIC Countries are major importers of communication and industrial equipment and associated software. It is important to encourage the growth of private sector consortiums specialising in one or more types of equipment. This includes digital equipment (communications, computers, and sensors), power plants and their modules (boilers, generators, turbines, and control rooms, and modern laboratory equipment and associated teaching aids.

h) Harmonising Trade Laws, Industrial Standards and IP:

As trade develops among OIC Member States, it will be necessary to harmonise legal and regulatory framework to facilitate this process. Intellectual Property Laws will be a priority.

The Current Situation:

Space

Currently, 17 OIC countries (Algeria, Azerbaijan, Bangladesh, Egypt, Indonesia, Iran, Iraq, Kazakhstan, Malaysia, Morocco, Nigeria, Pakistan, Qatar, Saudi Arabia, Turkey, Turkmenistan, and UAE) have satellites.

19 OIC countries (Algeria, Azerbaijan, Bahrain, Bangladesh, Egypt, Indonesia, Iran (with launch capability), Kazakhstan (with a launch facility leased to Russia until 2050), Malaysia, Morocco, Nigeria, Pakistan, Saudi Arabia, Syria, Tunisia, Turkey, Turkmenistan, UAE, and Uzbekistan) have space agencies.

Astronomy

Only three OIC countries (Egypt, Nigeria, and Turkey) have telescopes with apertures below about 2 meters.

High Performance Computer Centres (HPCCs)

There are only two HPCCs owned by UAE and Saudi Arabia that have made in the TOP 500 List where computers are ranked by their performance on the LINPACK Benchmark.

Increasing Public-Private Partnership for Science and Technology Projects with Economic Potential

There is no set recommendation. However, based on the 2017-2019 data available on World Bank's Private Participation in Infrastructure Projects Database, there are currently three active projects receiving private sector participation in the ICT sector in Cameroon, Comoros, and Indonesia (all are with 100% private sector participation corresponding to around 596 million USD of total investment). In the energy sector, 24 OIC countries have received private participation in 141 infrastructure projects in the energy sector (corresponding to around 35 billion USD of total investment). In 132 of those projects, the share of private participation is 100%. Nine projects have received private sector participation ranging between 40% to 95%.

Harmonising Trade Laws, Industrial Standards and IP

World Intellectual Property Organisation (WIPO) serves as the global forum for intellectual property (IP) services, policy, information and cooperation. Fifty-six OIC countries are the members of WIPO. In 2018, the Patent Filing Offices in the OIC member states granted 23,126 patents. While, in 2010, there were 13,757 patents granted by the Filling Offices in the OIC countries. In 2018, the largest number of patents among the OIC were granted by the filling offices in Indonesia, 6,374 patents or 27.6% of the total OIC patents granted, in that year. Indonesia was followed by Malaysia with 18.5%, Iran with 14.6% and Turkey with 12.5% of the OIC total patent grants in 2018.

There is no set recommendation concerning the harmonisation of trade laws, industrial standards and IP. According to WIPO LEX, only Somalia does not have an intellectual

property (IP) related law in their judicial system. Concerning Palestine, Gaza (Palestinian trademark and patent laws of 1938 are adopted) and Jerusalem (Jordanian laws are adopted) apply different IP laws but they are similar to each other. On the other hand, nine OIC countries have at least one main legislative text related to IP laws. In Jordan, there are 21 legislative texts related to main IP laws.

PRIORITY 12: FUNDING, IMPLEMENTATION AND MONITORING

No programme would be sustainable without adequate funding and its effective implementation. The goals and work plans listed in the OIC STI Agenda 2026 are extensive, but they are desirable and implementable if Member States can pool the available expertise.

Implementation of the programs for advancing STI should be owned by the Member States for ensuring their effectiveness and sustainability, while the OIC institutions will undertake the monitoring, support and facilitation of such programs. OIC Member States and OIC institutions have to demonstrate solidarity and provide committed support and resources to implement the comprehensive strategic road map outlined in the OIC STI Agenda 2026. Its key features are:

I. Member States will be at the centre of the entire process.

II. There will be a Steering Committee comprising all relevant OIC institutions and organs and headed by COMSTECH for overall supervision. The Steering Committee is meant to 'steer' only, not to 'row'. It will also provide directions and guidelines on all major programmes requiring funds. Existing OIC agencies and organs will be directly involved wherever relevant.

The Committee will meet every six months to review the progress on the implementations of the proposals adopted by the Summit and make necessary recommendations to the Member States.

Recommendation:

Encourage the OIC Member States to establish science and technology funds for joint bilateral and multilateral projects.

The Current Situation:

Since the adaptation of the OIC STI Agenda 2026, establishment of science and technology funds at the national and regional level hastened within the OIC region. At the national level, Turkey is actively engaged in supporting STI researchers and projects through the Scientific and Technological Research Council of Turkey, the leading national institution in this domain responsible for the development and coordination of scientific research in line with the national targets and priorities of the country. On the institution's website, a number of calls for proposals are available in cooperation with different institutions and networks around the world. Similarly, many other national institutions in the OIC countries are active in supporting researchers and projects, such as Ministry of Science, Technology and Innovation of Malaysia, Egyptian Science and Technological Development Fund, Iran National Innovation Fund, Indonesian Science Fund, Kuwait Foundation for the Advancement of Sciences, Qatar Science & Technology Park, King Abdullah University of Science and Technology Innovation Fund of Saudi Arabia among many others.

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