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Educational, Scientific and
Cultural Organization

منظمة الأمم المتحدة
للتربيـة والعلم والثقافة

Regional Bureau
for Science in the
Arab States

المكتب الإقليمي للعلوم
في الدول العربية

Cairo-القاهرة

# Regional Strategy

**of the**

# UNESCO Regional Bureau for Sciences in the Arab States

# 2016-2021


**Egypt / Cairo - 2016**

# Contents

# I. INTRODUCTION

Undergoing major transformations, the Arab region is facing challenges across the social, economic, and environmental arenas of sustainable development. High population growth rates, rapid urbanization and other compounded socioeconomic challenges are most evident. Challenges are multiple, extending to include threats to basic livelihoods, social cohesion, as well as the escalating pressures on the environment and ecosystems. In light of the overwhelming water scarcity, the Arab region is likely to suffer most of the adverse impacts of climate change, with evident repercussions on water, food, and energy security. The region is also suffering from a wide "science[1] and knowledge gap". Despite the evident role of knowledge in general, and science, technology, and innovation (STI) in particular, in supporting and accelerating socioeconomic development, and notwithstanding the modest advances made by some Arab countries, the Arab region as a whole continues to lag behind on most knowledge and STI indicators. Swift measures should be adopted by Arab countries to mobilize their natural, institutional, and most importantly, their human capital to transition from the current unsustainable patterns of development into building an inclusive, sustainable and resilient future for the people of the region. The mobilization of these resources to address the above challenges requires knowledge and innovation, both of which are strongly linked to the realization of sustainable human development.

**The transition to sustainable future in the Arab region requires the transformation of Arab societies into inclusive knowledge societies along with a significant enhancement of the share of knowledge, science, and innovation in their economies.**

Along with the UNESCO Medium Term Strategy (37 C/4), this ***"Regional Strategy of the UNESCO Regional Bureau for Sciences in the Arab States: 2016-2021"*** outlines how the UNESCO Regional Bureau for Sciences in the Arab States (URBS-Arab States) will marshal UNESCO's available resources and expertise to proactively engage with all stakeholders including member states, and national, regional and international partners to make effective and impactful contributions to sustainable development in the Arab region. With knowledge and science recognized as entry points for achieving sustainable development in the Arab region, the strategy outlines how URBS-Arab States will transform UNESCO's strategic objectives in Science into regionally and nationally relevant and tangible programmes and projects that are aligned with regional and national sustainable development priorities. The strategy stands on three pillars of action focusing on (a) fostering science and knowledge creation, sharing, and localization, (b) promoting integrated, evidence-based, participatory, ethical and inclusive science and knowledge policies and practices, and (c) supporting the buildup of institutional and human capacities necessary for the transformation toward resilient and sustainable knowledge societies and economies. These three pillars form the foundation upon which the Bureau will integrate UNESCO's Science competences in the major arenas of action namely; STI, Water, Energy, and Ecology and Environmental Protection, into a coherent outcome-based delivery.

Guided by UNESCO's overall science policy, science professionals in the URBS-Arab States and throughout the region will plan strategically, implement with regional perspective in mind, strengthen existing partnerships, build new cooperation alliances, and engage with regional and international partners to mobilize resources in support of this strategy. Functioning as one science team, URBS-AS team shall capitalize on optimal use and support of all available internal science resources in the region, HQ, and within UNESCO at large. Synergistic cooperation with other sectors within UNESCO in culture, education,

communication and information, and social and human science is another corner stone in the Bureau's strategy to ensure integration and complementarity of joint efforts in addressing pressing challenges and priorities such as gender equality, open access and knowledge diffusion, indigenous knowledge and heritage protection, and provision of quality education for all.

# II. VISION:

Champion and foster the development and harnessing of science, technology, and innovation and realization of inclusive knowledge societies towards the building of peace and eradication of poverty within the overall framework of achieving sustainable development in the Arab Region.

# III. MISSION

Towards the realization of the above vision, and within the overall framework of achieving sustainable human development, the URBS-AS's mission is anchored on:

- Promoting STI and Knowledge society policies and practices at all levels.
- Building STI and Knowledge institutional and human capacities of member states.
- Facilitating STI and Knowledge international, regional and inter-country alliances and partnerships.

The Regional Bureau will support Arab member states, individually and collectively, to establish policies, action plans, partnerships, and alliances that facilitate: enhanced access to knowledge diffusion mechanisms; the bridging of technological gaps; the adoption of proven technologies; and the acceleration of building human and institutional capacities in relevant fields. The Bureau will focus its support on areas of science and technology that are identified as most essential for the realization of the sustainable development agenda in the Arab region.

# IV. STRATEGY: ACTIVE ENGAGEMENT…

To fulfill its mission, the URBS-AS adopts active and meaningful engagement with relevant stakeholders as its main strategy and moto. The Regional Bureau, through proactive engagement with stakeholders and partners at all levels, and through a synergistic multidisciplinary approach, will develop programmes, projects, and targeted interventions along with national and regional sustainable development needs and priorities. To that end, URBS-AS shall capitalize and take advantage of UNESCO's intellectual capital in all of its areas of competence including its regional and global science networks; and delivering as one science team in the region.

# V. KNOWLEDGE AND SUSTAINABLE DEVELOPMENT IN THE ARAB REGION

Drawing on lessons from the Millennium Development Goals (MDG) era, nations of the world recognized the need for universally applicable goals that are also adaptable to regional and national realities. The Sustainable Development Goals (SDGs) address the systemic barriers to sustainable development and offer better coverage of, and balance between, the social, economic, and environmental dimensions of sustainable development to encourage the required transformation across these three dimensions. The universality and flexibility of the new Sustainable Development Agenda enables these SDGs to become highly potent planning tools, and provide an ideal platform for the much needed coordination, cooperation, and integration at the national and regional scales, and within an increasingly globalized community.

The sustainable development agenda 2030 is ambitious. Its means of implementation take advantage of current and anticipated achievements in numerous fields of science, technology, and innovation; communication and information; and knowledge in its comprehensive sense. Knowledge is a major organizing principle for a comprehensive human development that aims to expand the opportunities available to both Arab individuals and societies in order to enjoy an honorable and prosperous life. Knowledge—its acquisition, production, indigenization and deployment—thus becomes at once a tool and a goal whose influence should reach all levels of society equally and involve all fields, from the scientific to the artistic, cultural and accumulative societal heritage[2]. The intense acquisition, production, exchange, and management of science and knowledge give rise to the aspired knowledge economy, where science and knowledge become economic products, capable of being developed and transferred, protected by intellectual rights, engaging an increasing number of workers; including youth, in their production and management. Knowledge economy is also an incubator of vital innovation and modernization systems, which are in themselves necessary for the creation of new knowledge.

Despite progress made by some Arab countries towards establishing knowledge societies and economies, successive studies and reports point to persistent, multifaceted science and knowledge gaps; as indicated by the poor regional average performance on several knowledge and competitiveness indices. The region's knowledge economy index is below the world's average and is higher only than that for South Asia and Africa. A similar pattern is observed for other indices such as the innovation index, and global competitive indicators. Despite the significant expenditure on education, reaching 5% of GDP and 20% of governments' budget, illiteracy rates remain at nearly a quarter (1/4) of the population over 15 years of age, with females representing 66% of them. Knowledge is inherently tied to development, therefore, and notwithstanding the diversity in knowledge indices among Arab countries, the prevalence of science and knowledge gaps is hindering the opportunities for sustainable development in the region. There are major structural challenges facing the evolution of STI and knowledge societies and economies in the region, and by definition, its capacity to achieve sustainable development.

The Regional Bureau's Strategy for Science Support of Sustainable Development in the Arab Region approaches its mission from the perspective of fostering STI and knowledge society/ knowledge economy in the region. Mainstreaming knowledge and the advancement of science, together with enhancing the utility of ICT in knowledge transfer are integral components of this strategy. Mainstreaming gender equality

[2] Arab Knowledge Report, 2014, Youth and Localization of Knowledge. UNDP and Mohamed Bin Rashed Al Maktoum Foundation.

and promoting women's participation in the process is another organizing principle. The significant gains that could be made in closing the knowledge gaps in the Arab region should Arab women become equally engaged in the science and knowledge process should not be missed. (ibid).

# • Challenges to Sustainable Development in the Arab Region

Undergoing major transformations, the Arab Region is facing challenges across the social, economic, and environmental arenas of sustainable development. High population growth rates, rapid urbanization and other compounded socioeconomic challenges are most evident. Challenges are multiple extending to include threats to basic livelihoods, social cohesion, as well as the escalating pressures on the environment and ecosystems. Despite advancement at the various arenas of development, the region continues to face structural challenges. According to the latest Human Development Report issued by UNDP, the Arab region stands at 0.686 on the Human Development Index (hence classified as achieving "medium" human development), unemployment among youth is 29%, and adult illiteracy rate is 22%.[3] The percentage of population living below USD 2/ day is 19%. Although economic growth has been acceptable over the recent years (reaching 5.1%), the region has been unable to effectively translate economic growth into greater income for the overall population.[4]

As URBS-AS' major lines of action are linked to the environmental, energy and water issues, they are particularly outlined in the section below.

## o *Environmental Challenges*

### Climate Change

Historical observations and climate model projection[5] point to the significant impacts of climate change in the Arab region. Average precipitation will see marked decrease along the Mediterranean coast, while increasing in the southwestern part of the Arabian Peninsula. Coupled with increases in temperature and population growth, the likely climate change impacts on water resources, water-related disasters (floods and droughts), energy consumption, marginal ecosystems, and food production are projected to range from high to severe for most Arab countries.

Despite its limited greenhouse gas emissions, the Arab region is among the most vulnerable regions to the effects of climate change. It is the home to 5 of the top 10 countries at risk of impacts of climate change: Djibouti, Egypt, Iraq, Morocco, and Somalia. However, no country shall be immune from climate change risks. By the next two decades, the Intergovernmental Panel on Climate Change expects an increase of 2°C in the region's temperature, reaching 4°C by the end of the century as well as rainfall decease of about 30%. Climate change will alter the hydrological cycle affecting the function and operation of existing water infrastructure, as well as vital services provided by natural ecosystems.

[3] Human Development Report 2015: Work for Human Development, UNDP
[4] Economic Growth, Inequality and Poverty in the Arab Region, ESCWA, 2015
[5] IPCC Climate Change 2014 Synthesis Report Summary for Policymakers

| Regional Climate Model Projections (Hadley Centre) of Average Temperature Changes ('C) for the 2020s, 2040s and 2070s, relative to 1990s. | Regional Climate Model Projections (Hadley Centre) of Precipitation Changes (%) for the 2020s, 2040s and 2070s, relative to 1990s |
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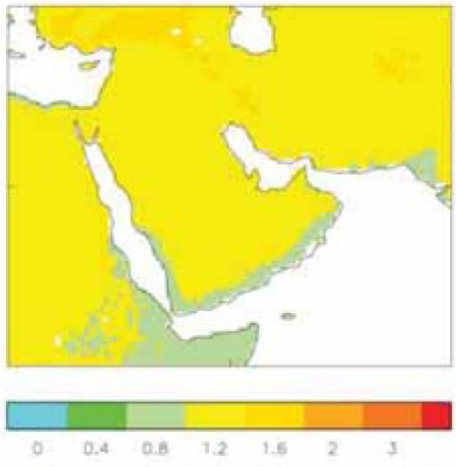
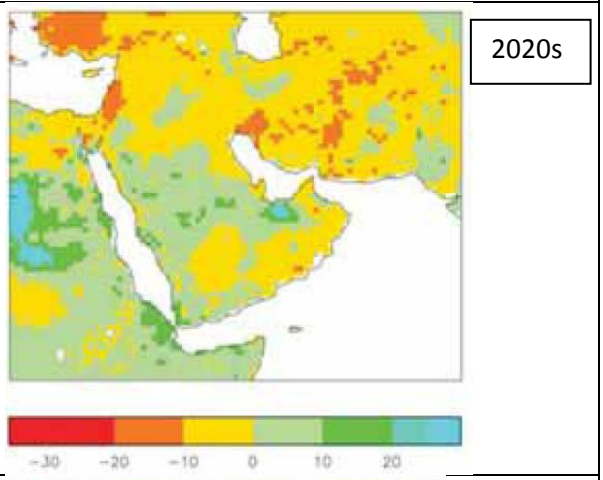
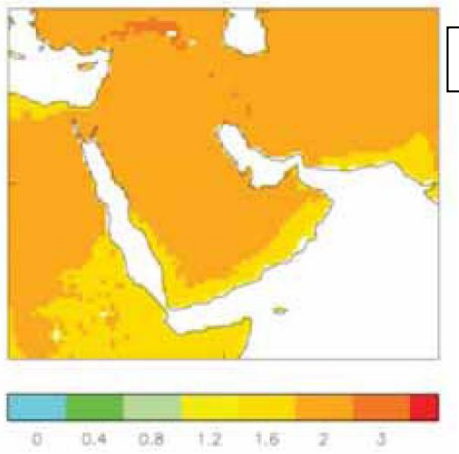
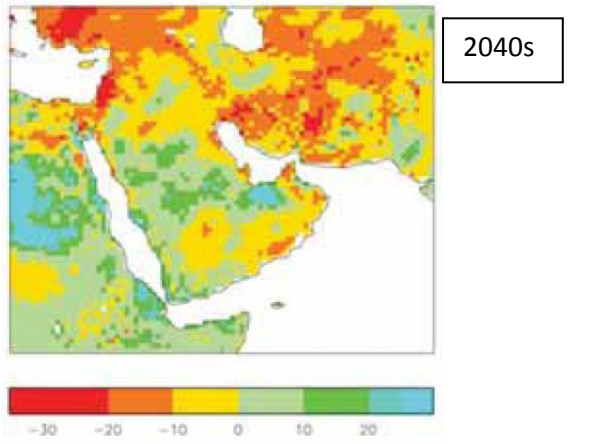
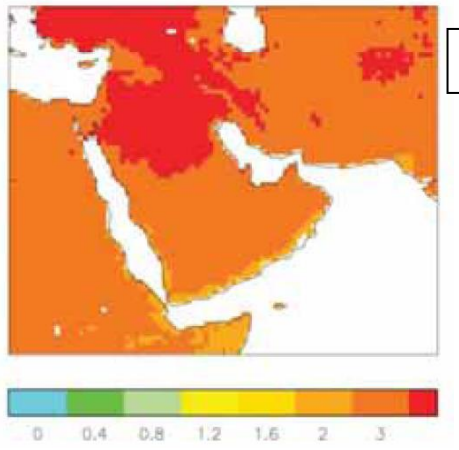
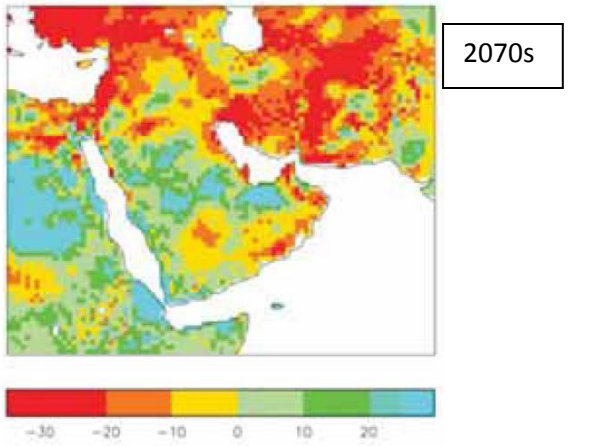
|   |   |
|   |   |
|   |   |

Source: Hemming D, Betts R, & Ryall D. 2007. Here from Tolba & Saab, 2009. The results are based on AR4

## Water Scarcity

With 18 out of the 22 Arab countries falling below the water poverty threshold (1000 $m^3$/person/year of renewable freshwater resources) and 13 of which are suffering extreme water poverty (500 $m^2$/person/year), water scarcity remains one of the most critical sustainable development challenges in the region. Until recently, national responses to water scarcity have ranged from overexploitation of non-renewable groundwater resources (UNDP 2014) to increasing reliance on energy-intensive non-conventional resources such as wastewater reuse. Ongoing regional and national efforts to develop integrated water resources management strategies are yet to lead to policy integration between sectors. Alarms calling for optimization of water governance have been repeatedly raised. The acute water status in region is prompting increasing calls for introduction of sustainable consumption practices particularly in the agricultural sector. Stakeholder driven participatory governance is in the early stages. Water issues are complicated further with regional geopolitical realities. Nearly two thirds of the fresh surface water resources of the Arab region originate outside each individual country, with major rivers such as the Euphrates, Tigris, and the Nile originating outside the region. Likewise, countries in the region share several major groundwater aquifers among themselves and with neighboring countries. Regional and sub-regional cooperation modalities and frameworks are yet to evolve into joint management of shared water resources[6], with only few exceptions.

## Unutilized Renewable Energy Potential

The Arab region holds 43% of the global oil and nearly a quarter of its proven natural gas reserves[7]. Consequently, energy plays a significant role in the region's economy and livelihood. Most Arab countries have been working to diversify their own energy mix, albeit through a greater reliance on natural gas for their electricity generation. Despite being located within the "sun-belt" where Direct Normal Radiation is ideal for solar energy development (2050-2800 kWh/$m^2$/year) along with high number of clear sky days[8], wide-scale utilization of solar energy in Arab countries remains hindered by institutional, technological, and political constraints. Localized high potential for wind and geothermal energy remain untapped as well[9]. The significance of energy diversification in the Arab region becomes more acute in light of the growing proportion of the regional energy output being dedicated to sea-water desalination and other non-conventional sources of water. These increasing energy-for-water requirements can be met by renewable energy sources to enhance the options for sustainable development[10].

At the same time, the alarming trend in global energy demand and the need to reduce greenhouse gas (GHG) emissions justify the need to identify and develop adequate alternative energy solutions to the depleting fossil fuel reserves. Parallel focus should be placed on attaining sustainable development by moving away from a purely fossil fuel economy[11]. With the increasing energy demand in the already energy-intensive transport sector (about 45% of the region's consumption of gas and fuel) and the expanding buildings sector (about 55% consumption of region's generated electricity), the national development plans of member

[6] Stephen R., 2010, Trans-Boundary Water Resources, in Arab Environment, Water: Sustainable Management of a Scarce Resource, 2010 Report of the Arab Forum for Environment and Development

[7] Arab environment 6, Sustainable Energy Prospects, Challenges, Opportunities, 2013 Report of the Arab Forum for Environment and Development

[8] Pan-Arab Renewable Energy Strategy 2030, Road map of actions for implementation (IRENA, LAS, 2014)

[9] ibid

[10] Water Governance in the Arab Region, Managing Scarcity and Securing the Future, UNDP, 2013

[11] The Arab Strategy for renewable energy (LAS) adopted an approach to use both fossil fuel and renewable energy sources to meet the region's energy demand.

countries in the region, focusing on urban development and a higher level of industrialization, should incorporate new and innovative renewable energy technologies and energy-efficient systems, to ensure increased energy security, improved energy access and contribute to climate change mitigation measures.[12] There is still significant scope for adopting more efficient and innovative new technologies in buildings, industry and transport in the Arab region. These represent necessary and vital basic requirements towards achieving sustainable development in the region.

**Declining State of Natural Resources and Biodiversity**

Several countries in the Arab region made significant progress in increasing the coverage of protected land-areas, especially in Gulf Cooperation Countries (GCC) and the Maghreb region. Yet, and like other regions, biodiversity faces major challenges. In 2014, there were a total of 1046 species of birds, mammals, reptiles, amphibians, fish, and plants threatened with extinction[13] in the region. Losses of forest cover, desertification, and arable land degradation are at alarming levels. These losses, which have been linked to resource exploitation and increasing severity and frequency of droughts, have also amplified the critical decline of water levels, water resources pollution and increasing salinity in over-exploited groundwater aquifers (UNDP-8). The drastic impacts on forest and land resources in war-torn countries remain to be adequately evaluated, although early assessment are beyond alarming[14].

- ***Knowledge and STI Institutional Challenges:***

**Poor State of Science and Innovation Systems**

UNESCO Science Report (2015) point to a weak innovation systems in the Arab region. As indicated in in the report, STI platform in the Arab region is far from having the critical mass required for vibrant innovative environment[15]. In Sudan, there are only 19 researchers (FTE) per million inhabitant (2013) while the highest value is found in Tunisia at 1394 FTE researcher per million inhabitant (2012). The region has also the lowest GERD/GDP ratio with its highest in Libya and Egypt at 0.86% and 0.68% respectively (2013).

The weakness of innovation systems in the region has been attributed to a variety of factors which include: (a) overall underfunding of science and technology, (b) deficiencies in education systems in coverage and qualitative terms[16], (c) inadequate research infrastructure[17], (d) disconnection between academia and research/society/economy[18], (e) poor governance systems of the nascent scientific enterprises, (f) lacking of adequate support within the wider socio-political environment, and most important of all (g) the need for establishing/enhancing effective STI strategies and policies that are properly linked to a country's development plans. Social and educational norms that do not incentivize collaborative evidence-based

[12] Diversifying Solutions to meet future power and water demand, Abu Dhabi Water and Power Forum, 2012
[13] Compendium of Environment Statistics in the Arab Region 2014-2015, ESCWA, 2016
[14] Trees in Syria becoming lucrative business, A. Halabi, ALMONITOR, Posted October 26, 2014
[15] In developing countries without an industrialized economy, a minimum threshold of R&D personnel (i.e. 1000/1200 full time equivalent (FTE)/million inhabitant per sector) is required to have an impact on economic growth. *Source: Mapping Research and Innovation Series/Volume 4. GO SPIN Country Profiles in STI Policy. UNESCO 2015*
16 This is despite the recent creation of several universities with a focus on science and engineering in the region.
17 UNESCO Science Report: Towards 2030. UNESCO, 2015.
[18] The missing link between universities and research and society in the Arab Region, Proposal for change ) ESCWA, 2014

scientific inquiry also play a role in the continuing disconnection between the increasing number of basic and applied science graduates and innovation capacities.

**Lack of Policy Integration**

The transformative nature of the sustainable development agenda can only be realized should policy integration take hold as an alternative to business as usual in the development and implementation of relevant policies and action plans. Policy integration encompasses political, economic, scientific, and governance dimensions. The foundations required for policy integration include empowering stakeholders - including those outside the traditional sectoral boxes-, together with the establishment of knowledge networks and institutional mechanisms that are conducive to cross-boundary multi-sectoral thinking and problem-solving. [19].

# VI. THE ROLE OF SCIENCE AND KNOWLEDGE

The crucial role of science in meeting the challenges for sustainable development is undeniable. Science is the universal tool to better understand and quantify existing complex and interacting challenges. It is also a tool to develop foresight of emerging risks and opportunities. Its role has been extended from formulation of evidence-based goals and targets, to assessing progress and testing solutions. Science is also a universal language, with both of its basic and applied facets being essential for the generation of knowledge and the development of innovative solutions and practices. It is transformative due to the inherent educational component of its process, and it must be viewed as a public good that can further support democratic practices[20]. Through knowledge generation, science literacy empowers societies to develop innovative solutions to everyday problems. The transfer and localization/ indigenization of scientific knowledge is the processes by which knowledge is transferred to an organization, a unit within the organization, or to a country. In the context of sustainable development, effective technology transfer (i.e. transfer of tools, machinery, equipment) must include knowledge transfer. The anticipated role of knowledge and science in the region can be summarized in:

- ✓ Providing scientific and technological solutions to pressing livelihood challenges in all spheres and sectors (water, energy, agriculture, industry, environmental protection…etc)
- ✓ Enabling the marginalized sectors to actively engage in socioeconomic advancement.
- ✓ Providing scientific basis for addressing social and economic challenges

Sustainable development requires answering numerous scientific and practical challenges. Multiple disciplines of knowledge are needed, taking into consideration the multiplicity of scales from local to global and social, economic, and political perspectives[21]. Knowledge in terms of its acquisition, production, indigenization, and deployment, is a tool and goal that affects all levels of society equally and involves all fields, from the scientific, artistic, cultural and traditional and indigenous know-how to accumulated social experiences. The emerging field of Sustainability Science deals with the concept of "*integrated management of human, social, and ecological systems and of the engineering and policy studies that*

[19] Policy integration in government in pursuit of the sustainable development goals, Report of the expert groups meeting (28-29 Jan, 2015). UNDESA, 2015.
[20] The Crucial Role of Science for Sustainable Development and the Post-2015 Development Agenda. A preliminary reflection and comments by the Science Advisory Board of the Secretary General of the United Nations, UNESCO, July, 2014.
[21] Stuart R.J, P. Paskin, and J. Robinson, The problem of the future: sustainability science and scenario analysis, Global Environmental Change 14, (2004) pp. 137-146.

*support and enable them*[22]*"*, as the cross-cutting theme of disciplinary studies. It is inherently the appropriate collaborative scientific framework in support of sustainable development. Sustainability Science, in its collective interdisciplinary nature and as evidence-based integrator, draws on collaborative contributions from developed and developing countries. It responds by its nature to both of UNESCO's strategic objectives in science and offers a substantive platform for South/South, North/South and triangular cooperation.

Science, technology, and innovation provide the main entry points for the URBS-Arab States's support of sustainable development priorities in the region. Aligned with UNESCO's mandate in science and the strategic priorities of Member States, and along with the recently adopted SDGs, the Bureau will focus its strategy along the following Sustainable Development Goals:

- Goal 6[23]. Ensure availability and sustainable management of water and sanitation for all
- Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all
- Goal 13. Take urgent action to combat climate change and its impacts
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Naturally, URBS – Arab States' contribution to the implementation of the above SDG's is aligned with the science and technology and capacity-building targets under Goal 17:

- Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

These goals will be the main areas of engagement with Arab Member States and regional organizations, including the League of Arab States (LAS) as a primary partner. The Bureau will take advantage of the opportunity provided by the regional efforts to jointly reflect on and address sustainable development challenges in the Arab region. The Arab Initiative for Sustainable Development was launched during the 2002 Johannesburg conference[24], and is currently being aligned with the SDG's. The framework identifies Water, Food and Agriculture, Energy, Climate Change and Green Economy as highly pertinent emerging challenges. It calls for adopting the Water-Food-Energy nexus approach as a mechanism for planning and monitoring these critical areas. The framework also addresses science, technology, and innovation but as persistent and cross-cutting challenges. The strategy provides opportunities and entry points for the Bureau's support of sustainable development in the region.

# VII. STRATEGY OF THE BUREAU FOR SCIENCES

The Bureau's strategic approach to support the sustainable development agenda in the region is based on ***active engagement with stakeholders and partners at the national, regional and international levels, to realize established strategic objectives and translate them into programmes and projects aligned with national and regional needs and priorities in the Arab region.***

[22] Bettencourt, M.A. L. and J. Kaurc, Evolution and Structure of Sustainability Science, 2011. PNAS, vol. 108. No.49.
[23] URBS-AS is a member of the regional expert group on Water-related Sustainable Development Goals
[24] The Arab Framework for Sustainable Development 2015-2025 (draft revisions). ESCWA, LAS.

The strategy is closely aligned with UNESCO's strategic objectives, and regional/ national strategic objectives and plans. It has been also developed along the major outcomes and recommendations of the URBS- AS' regional workshop on "*Science and Knowledge for Advancing the 2030 SDG's in the Arab Region*", whose main objective was to formulate a joint vision and outline of a master plan for the effective activation and deployment of science and knowledge for achieving the SDGs in the Arab region[25].

- # Alignment with UNESCO's Strategic Objectives

By coordinating with the Natural Science Sector and with field offices in the region in the cooperative strategic planning exercise for the preparation of quadrennial and biennial programmes and projects, the Bureau will ensure the alignment with UNESCO's strategic objectives. URBS-Arab States will provide a framework for regional implementation, emphasizing delivering as one and acting as a regional hub for intercommunication and exchange of experiences.

**Arab countries, along with other UNESCO's member states, adopted the medium-term (2014-2021) strategy of the organization (37 C/4). The strategy defines UNESCO's two strategic objectives in science as:**

**Strategic Objective 4: Promoting the interface between science, policy and society and ethical and inclusive policies for sustainable development; and**

**Strategic Objective 5: Strengthening international science cooperation for peace, sustainability and social inclusion**

Through active cooperation with the secretariats of relevant intergovernmental programmes and specialized divisions of UNESCO, the Bureau will align regional and national interventions with approved budget and programmes. At the same time, it will support the overall global implementation and link relevant UNESCO

[25]The workshop gathered 30 selected regional experts from 10 Arab Countries (Lebanon, Sudan, Egypt, Kuwait, Bahrain, Saudi Arabia, United Arab Emirates, Algeria Jordan, and Morocco, four regional organizations including the League of Arab States (LAS), the Arab Countries Water Utilities Association (ACWUA), the Arab Water Council (AWC), Middle East and North Africa Network of Water Centers of Excellence (MENA-NWC), two national science institutions concerned with STI, knowledge societies, and knowledge economy(KISR, Lebanon Research Council); three regional offices of UN agencies: Economic and Social Commission for Western Asia (ESCWA); Food and Agricultural Organization/Regional Office for Near East and North Africa (FAO/RNE); World Health Organization Eastern Mediterranean Regional Office (WHO/EMRO); in addition to the World Federation of Engineering Organizations. Though a series of interactive roundtable discussions (Annex II), workshop participants explored the regional perspective on Science, Knowledge & the SDGs with emphasis on key related issues including the Science/Knowledge – Development Nexus, STI/SDGs Nexus, as well as governance of Science and Knowledge Strategies. The participant thoroughly discussed the above topics and recommended specific actions that may be classified along the following SDG relevant axes:

I. Science/knowledge the gateway for achieving the SDGs
II. STI-SDG Nexus
III. Science/Knowledge Economy NEXUS
IV. Science/Knowledge, Society and Education/Language NEXUS
V. Science/Knowledge and Pressing Environmental Challenges
VI. Science/Knowledge and regional and international cooperation

regional networks with the global networks to enhance South-South, North-South, and triangular scientific cooperation.

The Bureau will pay special attention to UNESCO's global priority on Africa. Seven of the sixteen concerned Arab member states are in North Africa. Through engagement and cooperation on joint activities and planning with relevant UN/UNESCO offices, the Bureau will strive to foster scientific cooperation between Africa and the Arab States.

As highlighted in the previous sections of this strategy, gender equality remains as one of the critical challenges to the emergence of knowledge society and economy in the Arab region. As enshrined in the objectives of the Arab Network for Women in Science and Technology, established in 2005, the Bureau will mainstream gender across the board and promote the role of female scientists and practitioners in various fields of sciences. Targeting increased participation of women in policy and decision making at various levels (including the local level) is also part and parcel of the Bureau's strategy towards fostering ethical and inclusive policies and practices for sustainable development.

- ## Alignment with Declared Regional and National Strategic Priorities, Objectives and Plans

Alignment of URBS-Arab States support and activities with national and regional priorities is a declared objective, goal and commitment. The strategy remains responsive to sub-regional and national policy and capacity needs as they reflect the economic, developmental, environmental and socio-political diversity among member states of the region.

Through the League of Arab States, Arab countries have jointly reflected on the challenges to sustainable development at both sectoral and comprehensive levels. Along with the Arab Framework for Sustainable Development, regional ministerial councils on energy, water, environment, and higher education have adopted relevant sectoral strategies and frameworks, and in some cases, action plans. Regional UN organizations including UNESCO and specialized NGOs are commonly tasked with implementing regional components of the action plans, should such plans exist, such as in the case of the Action Plan for the Arab Strategy for Water Security.

Likewise, through strong cooperation with cluster offices, and direct engagement with regional experts, the Bureau will align its programmes with sub-regional strategies that are relevant to sustainable development.

At the national level, the Bureau's strategy shall also focus on extending technical backstopping and support to all cluster and national offices in the preparation of UNDAF and UCPD plans and during the implementation phase of UNESCO's contributions to these strategic plans.

# VIII. IMPLEMENTATION FRAMEWORK: FOSTERING THE ESTABLISHMENT OF KNOWLEDGE SOCIETIES AND ECONOMIES

- **Fostering cooperative science and knowledge creation, sharing, and localization as cornerstones for sustainable development in the Arab Region**

URBS – Arab States will work together with UNESCO's networks including Category 2 Centers under the auspices of UNESCO in the region and worldwide, national committees of UNESCO's intergovernmental programmes including the IHP and MAB, and UNESCO chairs.

The Bureau will expand existing partnerships with National Academies for Sciences, professional associations, scientific unions, universities and national and regional research centers with emphasis on South/South, North/South and triangular scientific partnerships. The Bureau will proactively engage experts from the region in addressing water, energy, ecosystem, and science policy issues. Surveying and mapping existing networks of Arab scientists and experts in diaspora, and engaging emergent networks of young Arab scholars and science enthusiasts are also important aspects of the Bureau's science mobilization strategy.

Strengthening existing networks such as NECTAR and the Arab G-WADI and reviving successful science cooperation networks, is of paramount importance in fostering regional and cross-regional scientific collaboration and knowledge creation and sharing.

Open science is an enabler of sustainable development. The Bureau, in collaboration with CI colleagues at URBS-AS and HQ will advocate open access and explore initiatives to launch technically-oriented open access journals, information platforms, and data exchange hubs in the Arab region. Maintaining the highest scientific standards will be an important guideline in this process. This includes the promotion of UNESCO's open access initiatives such as the HOPE initiative, and the UN-Energy Knowledge Network.

- **Promoting integrated, evidence-based, participatory, and inclusive policies and practices**

The Bureau will enhance its presence on the high-level technical committees of relevant Ministerial Councils (Higher Education and Science, Water, Environment, and Energy) in the region. Through proactive participation, regular consultations, and technical support, the Bureau will advocate evidence-based policies and action plans, and will identify, together with relevant partners, pathways to support Member States in the region towards national implementation of these plans. Parallel to that, promoting participatory approaches that foster the meaningful engagement of relevant stakeholders, including civil society, NGOs and INOS; shall be an integral component of this endeavor.

- **Supporting the institutional and societal transformations toward resilient and sustainable knowledge societies and economies through the provision of institutional and human capacity development**

The Bureau will continue to emphasize its institutional and capacity development programmes. Strategic alignment of these programmes with national and regional institutional development plans will be accomplished through continuous consultations with stakeholders and partners. To ensure national and regional ownership of capacity development, while achieving long-lasting impacts, the Bureau will prioritize its capacity development activities along the lines of training trainers and the transfer and diffusion of knowledge/technology know-how. Supporting gender equality will be a common characteristic of all such activities.

Recognizing the brain-drain phenomenon in the region and its impact on advancing the knowledge and science agendas, the Bureau shall focus on promoting policies that encourage the establishment of adequate environments that foster the effective engagement of Arab scientists, regardless of their location, in building the aspired knowledge societies.

- **Outreach and Awareness**

Outreach and awareness raising focused on science literacy is an important tool towards the building of inclusive knowledge societies. To that effect, the Bureau will continue its leadership in the areas of water education, promotion of biosphere reserves and science popularization activities within the context of promoting sustainable practices and environmental responsibility. In this regard, the Bureau will engage relevant civil society members, and will work closely with colleagues in CI, Education, and Culture to draw on the widest possible experience in formulating specific outreach plans.

# IX. THEMATIC FOCUS: AREAS OF ACTION

In consultation with member states, and in cooperation with relevant specialized divisions and secretariats of concerned intergovernmental programmes at UNESCO, the Bureau shall implement programmes along the following thematic areas.

- **Science, Technology and Innovation (STI)**

The Bureau aims at supporting the Arab countries in mobilizing and committing the required resources and capacities for developing Science, Technology and Innovation (STI) and applied research platforms, with stronger participation from private sector and non-profit organizations. This support is intended to lead towards the successful implementation of national and regional projects associated the newly adopted Sustainable Development Goals (SDGs). Efforts to achieve such an objective are undertaken through the Bureau's collaboration with a number of regional and international partners such as; the League of Arab States (LAS), ISESCO and UN ESCWA, and where such collaborations focus on the following main areas:

(1) Strengthening STI governance by monitoring[26], evaluating and advocating best practices in building the technological capabilities and industrial base of member states in the Arab region;
(2) Improving capacities of Arab countries and regional organizations to foster the use of Innovative Green Technologies for development;
(3) Building up the necessary national and regional critical mass to ensure quality STI knowledge generation and application towards sustainable development;
(4) Developing a conducive environment for innovation and supporting the best talents through easing the terms of doing business and releasing the forces of competition.
(5) Meeting countries' STI needs through preparation of relevant programs and projects that will attract flow of funds and investments, and piloting innovative technologies. As enablers of developing and advancing industry in the region, potential approaches and projects can include –and are not limited to- the introduction of 3D printing, utilization of nanotechnology, and dissemination of alternative energy solutions.

Understanding that for STI to live up to its full scale and to be truly transformational, people's knowledge, talent and skills need to be developed and strengthened with a particular focus on mastering science, technology, engineering and mathematics (STEM). In that context, URBS-AS is engaged in developing regional science and engineering capacity building programs particularly in STEM, which will support the creation of the required critical mass of experts, scientists, and technical force in strategic spheres such as water, energy, agro-food, innovative technologies applications and manufacturability.

The Bureau will also explore means to strengthen the network of UNESCO Chairs in STI and basic sciences' related fields, focusing on areas that can also support science curricula reform in the context of building knowledge societies. The Network for the Expansion of Convergent Technologies in the Arab Region (NECTAR) was launched by UNESCO Cairo Office in June 2011 to help correct the mismatch between the skills companies seek and the programmes provided by most universities. Since the conception of its NECTAR network, the Bureau has been developing e-programs to support building the technological and innovation capabilities of Member States. Linking these networks with the recently formed "Arab Network for Knowledge and Sustainable Development" (Annex 1) will further support the implementation of the Bureau's strategy.

- **Science Education in the Arab Region:**

In the area of Science education, the Bureau will focus on strengthening the college/university science curricula across the spectrum of science majors. In parallel, the Bureau will support the strengthening of national innovation systems of Arab Member States. This will be accomplished by expanding partnerships that aim to ensure the broadest possible access to state-of-the-art science and engineering knowledge through the deployment of ICTs to enhance outreach in Arab countries and accelerated the conversion of generated knowledge into wealth by fostering an entrepreneurial culture.

In addition to developing and raising skills in scientific research, injecting new knowledge into the current science curricula in a cost-effective and practical manner will equip new college graduates with the

[26] The establishment of a regional observatory on SDG indicators was recommended during the regional workshop on Science and Knowledge for Advancing the 2030 SDGs in the Arab Region (Cairo, 2016) (Annex 1) . Such observatory is envisioned to start with STI indicators and expand to cover additional Science/knowledge related indicators in various SDGS.

necessary and required current market skills. It will also influence the development of innovation policies at the national level.

The Bureau will continue and strengthen its commitment to promote the popularization of basic sciences (STEM) amongst school students. Among possible approaches, this can be achieved by offering a number of opportunities for students to polish their scientific knowledge and develop their creativity, criticism, and interest for scientific and technical progress in a well-defined scientific approach.

Climate Change The main objective of UNESCO strategy on climate change is to enable Member States to take urgent action to combat climate change and its impacts through education, sciences, culture, communication and information. The Bureau will align its support to Arab Member States on climate change to this strategy by drawing on its existing programmes and mobilizing regional partnership to raise awareness of climate change issues. More specifically, the Bureau will:

1. Within the U4COP *(UNESCO for COP)* initiative, the Bureau shall:
    a. Support Member States in the implementation of their Identified Nationally Determined Contributions (INDCs) within the framework of the UNFCC-COP, the Paris Agreement, and the outcome of COP22 and subsequent COPs. Emphasis will be put on mainstreaming of Climate Change and INDCs in national strategies particularly in fields of relevance to UNESCO areas of competence including STI, Water, and ecosystems.
    b. In partnership with the League of Arab States and engaged UN and regional entities, proactively engage in building capacities and supporting Arab climate change negotiators in all COPs and in developing a shared view of climate change impacts, adaptation, and mitigation strategies.
2. Provide technical backstopping and expertise to Member States in assessing sectoral climate change impacts, especially on the water and energy sectors
3. Support Member States, in accessing climate change funds in areas within approved UNESCO programmes and budgets.
4. Support Arab Member States in implementing the Arab Strategy on Climate Change.

Inter-sectoral multidisciplinary approaches and expanded regional partnerships are central elements of the Bureau's climate change strategy. In that regard, the Bureau will strengthen the ongoing partnership with the League of Arab States and other regional organizations such as ESCWA, UNEP/ROWA, and FAO.

- # Water Security

In alignment with the strategic plan of the Eighth Phase of the International Hydrological Programme (IHP-VIII 2014-2021), and with regional priorities as established through the Arab Strategy for Water Security and the strategic framework for sustainable development, the Bureau aims at supporting Arab member states in enhancing their resilience and the sustainability of livelihood and economies in the face of water scarcity and climate change impacts. Efforts to achieve this will focus on the following themes in the water sciences:

(1) Support member states' capacities to address water scarcity challenges through enhanced participatory governance, including gender equality, groundwater governance, governance and management of shared water resources and the promotion of demand management and sustainable consumption practices in the municipal, industrial and agricultural sectors.

(2) Support the capacities of Arab member states to enhance resilience to water-related disasters through the provision of technical expertise, tools, and training in the areas of flood forecasting, management and drought assessment.
(3) Support member states' capacity to mainstream climate change into water resources management policy and action plans, and promote enhanced linkages between the water sector and climate change impact and vulnerability assessment scientific communities.
(4) Promote sharing of knowledge through proactive support of and engagement with regional networks such as the UNESCO-based Arab G-WADI and expand partnerships with NGOs to support the implementation of the Bureau's strategy through joint activities and programmes.
(5) Enhance access to, and utility of state-of-the-art water management technologies, tools, and software through: dedicated technology and knowledge transfer partnerships and alliances, promotion of open access to such tools, and support for the development of national and regional strategies of relevant technology and knowledge localization, particularly in the areas of desalination, wastewater treatment and safe reuse, remote sensing observation, and climate change impact assessment and modeling.
(6) Enhance awareness, particularly of children and youth through the development of water educational materials emphasizing conservation, healthy hygiene, and scientific curiosity. At the tertiary level, promote the development of sustainability curricula linking water, energy, food and society.

The Arab Non-conventional Water Resources Initiative, launched by the Bureau in partnership with FAO and the Arab Water Council will provide the basis for thematic integration of water scarcity, groundwater, water quality, waste water and water demand management. It will also be the Bureau's main vehicle for promoting the Water-Food-Energy nexus as a policy integration approach in the context of integrated water resources management.

The National Committees of the International Hydrological Programme, , the four water-related category 2 centers and water chairs in the Arab region are key implementation partners. Through engagement with the National Commission of UNESCO and consultations with water ministries in the region, the Bureau will develop a long-term strategy for empowering Arab National Committees as key stakeholders and partners in their countries' plans for sustainable development. The Bureau will also engage key IHP initiatives such as the International Initiative on Water Quality (IIWQ), the international drought initiative (IDI), the international flood initiative (IFI) and the International Groundwater Governance initiative, among others.

- # Energy Diversification

During the past two biennia, URBS-AS has been actively advocating for innovative modalities that could effectively streamline the necessities of SMEs in implementing renewable energy projects through the creation of a socio-economic network geared towards innovation and a supply of ready capital.

Through cooperation with the League of Arab States, and communication with Ministries of Energy in the Arab region, the Bureau will advocate for the creation of the appropriate policy framework that provides the necessary elements of a CLEAN ENERGY FUND ACT towards a balanced RE/EE Public-Private-Partnership (PPP). Such framework will create an enabling environment and encourage better investment climate in the EE sector. Through the use of the COOP financial models and solidarity rules, which existed for hundreds of years, the framework could support the creation of a citizens-run institute at each municipality level.

To support the implementation of the Arab policy framework for renewable energy, the Bureau will advocate that the following policy measures accompany the implementation of the above mentioned modalities:

(1) Identifying investment incentives e.g. pre-paid (NOT net) metering, Feed-in-tariffs (FITs) with progressive reduction; Power Purchase Agreements (PPA) with competitive bidding, etc.

(2) Creating a national SPECIAL PURPOSE Fund to mobilize the required local financing at each municipality or governorate level, which would also act as a cash-flow incentive to investors to guarantee profitability. The focus here is on cash flow and not one-off incentives schemes, and hence there is a great need for innovative financing structures;

(3) Prohibiting importation of inefficient goods such as inefficient bulbs, and mandating the implementation of quality standards such as ISO 14001, 16001&50001;

(4) Boosting local industries through local manufacturing of most of the required equipment and materials e.g. the different building materials, double-glazed glass windows, photo-sensors, CFL or even LED bulbs, etc. in the construction sector;

(5) Building the required technical critical mass through development of a number of regional pilots and demo renewable energy projects, which will also induce practical interest in establishing industry alliances with each successful experience. It is also important to step-up the development of large-scale pilot renewable energy hybrid systems that could also make available desalinated water for drinking and agricultural use. These pilot systems will be associated with well-established engineering programs with regional universities and used as field educational units. A special curriculum comprising a number of different courses covering the sciences on which these systems are based could be developed and taught in the related schools.

- # Ecology and Environmental Protection

  - ## *Man And Biosphere Programme (MAB)*

This strategy draws on the MAB 2015-2025 strategic vision and Lima Action Plan. The Bureau will continue emphasizing the importance of the MAB Programme and its Regional Network of Biosphere Reserves in the Arab region in addressing the region sustainability concerns and meeting the Sustainable Development Goals through:

(1) Improving management plans of existing biosphere reserves (BRs) and capacity to achieve SDGs goals and multi-lateral environmental conventions
(2) Activating the Arab Network of Biosphere Reserves (ANBR) and ensuring it includes effectively functioning models for sustainable development
(3) Activating communication strategy and ensuring advocacy with all stakeholders including local communities
(4) Developing business plans for generation of income and revenues within the overall vision for achieving sustainability.
(5) Establishing partnerships with relevant universities and research centers and developing a research agenda

(6) Facilitating biodiversity and sustainability science, education for sustainable development and capacity building of BR managers and scientists for better management of BRs and assessment of possible climate change impacts
(7) Contributing to sustainable, healthy, and equitable societies, economies and thriving human settlements in harmony within the biosphere, and enhancing the in-depth knowledge of natural and cultural heritage, socio-economic realities and innovative approaches to increase resilience.
(8) Developing guidelines and establishing private sector partnerships for national committees and BRs

Harnessing lessons learned through sustainability science and education and use modern, open and transparent ways to communicate and share information

The Bureau will contribute to enhancing the regional governance of MAB by strengthening and establishing the MAB National Committees (renewal of existing ones if necessary) while advocating balanced composition of gender and disciplines, and active participation and collaboration between all the different stakeholders, including scientists, policy-makers, members of local communities, and the private sector. Additionally, it is important to enhance capacity building on biosphere reserves' nomination files, periodic reviews, management plans and participatory approaches using indigenous knowledge and sustainability science, and ensure the participation of all stakeholders. Such will enhance the use of BRs as a natural laboratory for enhancing national environmental policies and programs.

### o *The International Geoscience and Geoparks Programme (IGGP)*

The concept of "UNESCO Global Geoparks", and the importance of the conservation of geological heritage in supporting sustainable socio-economic development processes are being increasingly recognized. The Bureau will support the promotion and establishment of UNESCO Global Geoparks in the region and shall work on building capacities of relevant entities and stakeholders. Efforts will also concentrate on raising awareness of geoheritage and the potential contributions of such approaches and practices on advancing the sustainable development agendas.

Given that geological processes and geodiversity have an axial role in sustaining biodiversity and ecological systems and their key role in human affairs, mobilization of geoheritage is indispensable for the objectives of IGGP and the Agenda 2030. Although geoheritage has economic, scientific, educational, recreational and ecological values, it rests low on policy makers' and planners' agenda and remains almost unknown to the public in the region. The Bureau will work, in full coordination with the Secretariat of IGGP, on promoting geoheritage as a platform to highlight the dynamic linkage between natural heritage and society.

There is a need to develop a comprehensive and coordinated management framework and a strategy for sustainable geological heritage sites in region. Along with that, the Bureau will assist Arab countries to develop a regional vision for promoting geoheritage and developing measures for a better management of geoheritage resources. This can include the designation of UNESCO Global Geoparks and the development of geo-tourism as a means for poverty alleviation in marginal desert and rural areas, provision of better education, capacity building, as well as mitigation of the hazards of desertification, soil degradation, and geo-hazards of urban development. Specifically, the Bureau will work on assisting the region to:

(1) Promote research in geoheritage, geoconservation, and geodiversity
(2) Identification of potential UNSECO Global Geoparks in the Arab Region
(3) Increase awareness among public and policy makers of the value and benefits of geoheritage
(4) Develop appropriate strategies for sustainable socio-economic development using geoheritage resources

- ***Disaster Risk Reduction (DRR)***

Several areas of Arab region are vulnerable to potential natural disasters with flashfloods being among the most outstanding risks. Many areas of the region are subjected to deadly flash floods and landslides, resulting from intense rainfall of a relatively short duration. Flash floods are one of the most devastating natural unpredictable hydrometeorological disasters because of their rapid onset, little lead time for warning, and the tremendous amount of water flowing. It has been observed that Flash floods have increased in frequency and magnitude over the last 50 years as a result of global climate change. More importantly, both exposure and vulnerability to flash floods have significantly increased due to expansion of built-up areas. The negative impact of such events is enormous in economic, environmental, and human terms with women and children being among the most vulnerable victims.

; The Bureau shall build on the achieved successful results of the Japan-Fund-In-Trust "Urgent Capacity Development for Managing Natural Disaster Risks of Flash Floods in Egypt, Jordan, Sudan and Yemen. Through the joint collaboration between the DRR and IHP in the Arab region the Bureau will mobilize additional resources to improve Flash Flood emergency aid plans and policies in Arab countries. Special emphasis shall be put on enhancing emergency preparedness by advocating and developing a robust program that identifies the necessary actions to be taken to facilitate rapid, effective and appropriate responses.

# X. APPROACHES:

To realize the above strategy and to ensure effective and meaningful work on the above mentioned areas of action, the following approaches will be adopted.

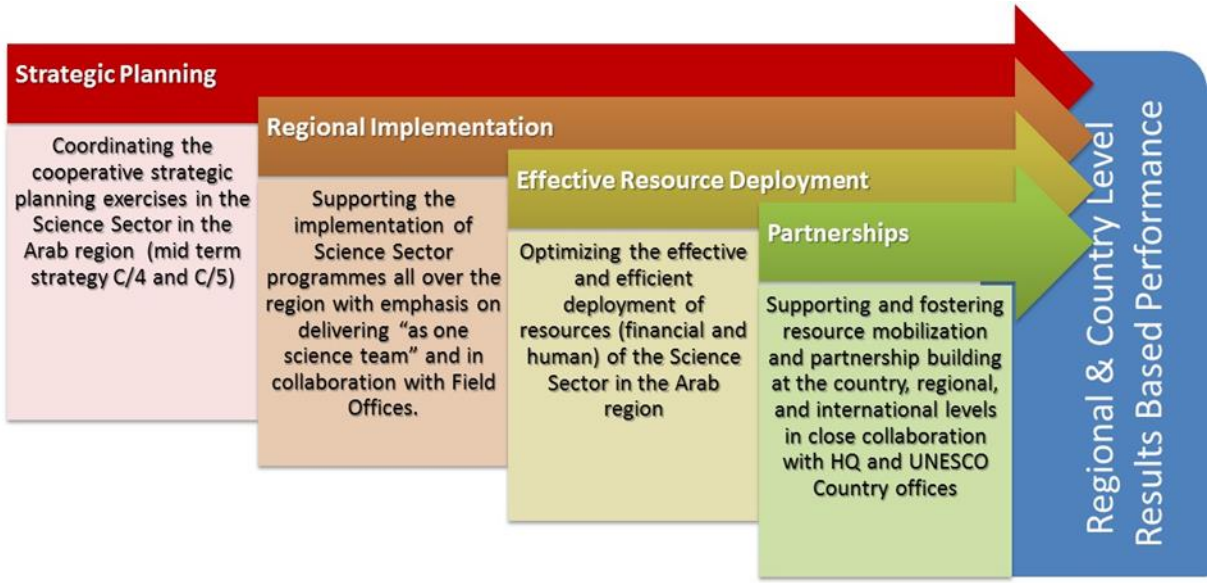
- **Coordinating the cooperative strategic planning exercises in the Natural Science Sector in the Arab region (mid-term strategy C/4 and C/5).**

  In collaboration with HQ and UNESCO field offices in the region, the approach aims at ensuring:
  - ✓ Conformity with national plans and priorities,
  - ✓ Conformity with UNESCO corporate visions and strategic objectives,
  - ✓ Applicability within available and anticipated resources,
  - ✓ Complementarity with regional visions and plans,
  - ✓ Adequate allocation of available resources within the Arab region
  - ✓ Adoption of interdisciplinary approaches and interaction with other UNESCO sectors (Education, culture, CI)

- **Supporting the implementation of Natural Science Sector programmes all over the region with emphasis on delivering "as one science team" and in collaboration with HQ and Field Office**

This will be done through:

- ✓ Providing proactive and demand-driven technical support and backstopping and interventions at the country and field levels
- ✓ Acting as a house of expertise in science and knowledge. Operating in a supply driven mode, this entails provision and dissemination of suggested strategies, ideas, approaches, and best practices that are of relevance to the Arab region and its challenges.
- ✓ Implementing regional programmes, projects, and activities in collaboration with HQ and Field Offices.
- ✓ Acting as hub for intercommunication, exchange of experiences, and managing of knowledge in the Arab region ---particularly in areas of harnessing science for sustainable development and knowledge society/economy building
- ✓ Establishing and enhancing partnerships for effective and efficient implementation with regional and international entities functioning in the Arab region, with special emphasis on the League of Arab States (LAS) and UN agencies to support "Delivering as One UN".




- **Optimizing the effective and efficient deployment of resources (financial and human) of the Natural Science Sector in the Arab region**

This will be done through:

- ✓ Ensuring the effective enacting of the Science team in the Arab region to deliver "as one"
- ✓ Monitoring and managing available regional financial resources to ensure:
  - Responding proactively to country needs (current and evolving)
  - Delivering in an effective and timely manner

- **Supporting and fostering partnership building and resources mobilization and at the country, regional, and international levels in close collaboration with HQ and UNESCO Country offices**

In cooperation with HQ and Field Offices, URBS-AS shall:

- ✓ Support proposal preparation and submission
- ✓ Explore venues for expanding partnerships with the regional and international organizations
- ✓ Manage and monitor resource mobilization
- ✓ Map available/potential donors and partners
- ✓ Manage relations with partners and donor community

# XI. ENABLING ENVIRONMENT:

- **Making an Impact:**

The urgency of bridging the existing knowledge gaps and the severity of challenges to sustainable development in the Arab region require both an internal and external enabling environment. Through planning and implementation of regionally-coherent programmes and project, the Bureau will observe the following requirements:

**Innovative**: Science professionals in the Bureau and throughout the region will model innovative thinking by keeping up-to-date with advances in STI, as well as with those relevant to their fields of specialization. Informed creativity, whilst practicing out-of-the-box thinking will be key in designing programmes and activities.

**Multiplicative**: The Bureau will develop multi-level work plans, especially for outreach and capacity building programmes. Identifying and supporting those who can reach others, including well-recognized champions and advocates of knowledge sharing, and the promotion of success stories are integral parts of the Bureau's approach to multiplying the benefits of the interventions.


**Proficient**: Science professional in the Bureau and throughout the Arab region will be experts in their own domain, demonstrating professionalism, knowledge, and excellence. Likewise, the Bureau will engage top level consultants and experts in its activities. The Bureau will mainstream peer review in its publications and participants' selection processes as means to ensure the quality of deliverables and effectiveness of activities.

**Actionable**: The Bureau will ensure the setting of realistic expectations that are consistent with available resources and informed by factors such as; technology applicability, existing capacities, and economic constrains, among others, in the process of making policy advice/guidance. Plans and activities will be cost-effective to optimize the value of available resource and UNESCO's financial regulations will be strictly applied.

**Connective**: Interdisciplinary and cross-sectoral collaborations will provide the foundation for connecting domains of knowledge required for the effective advice and guidance on cross-sectoral policy integration. In doing so, the Bureau will give utmost consideration to the societal dimensions of science, technology, and innovation, especially concerning the diffusion of knowledge, youth, and gender equality.

**Transformative**: The Bureau will enhance the transformative value of each tangible programme/project, by ensuring alignment with member states' needs, practicing outcome-based formulation of actions and implementation of plans and deliverables, and prioritizing actions with both stakeholders and partners.

- ## Regional Partnerships and Alliances

Partnerships and alliances with regional organizations is at the heart of the Bureau's strategy toward strengthening Science-Policy-Society interface and building knowledge societies for sustainable development in the Arab Region. The Bureau will continue to proactively engage with the League of Arab

States and ESCWA as the two major strategic partners, with ALECSO and ISESCO as potential implementation partners.

The Bureau is increasingly present on the high level technical committees of relevant Ministerial Councils (Higher Education and Science, Water, Environment, and Energy). Through proactive participation, regular consultations, and technical support to the League of Arab States, the Bureau will advocate evidence-based policies and action plans, and will identify, together with relevant partners, pathways to support member states in the region towards national implementation of these plans.

Partnership with regional and country offices of specialized UN agencies is the second axis of the Bureau's strategy to strengthen science-policy-society interface in the region. URBS – AS will expand its cooperation with FAO, UNEP, and UNIDO to explore joint resource mobilization at both regional and national scales. Likewise, expanding partnerships with specialized regional NGOs such as the Arab Water Council and the Arab Water Utility Association (AQWA) will reduce redundancies and overlap of activities, and foster better utilization of resources. Engagement with experts in the region and with stakeholders will complement the strategic alignment.

The Bureau will expand strategic engagement with private sector providers of energy, water, ICT services, as well as technologically-oriented industries. While these entities may become potential donors in support of this strategy, the ultimate objective of engagement would be to promote social-citizenship perspective towards sustainability, and their transformation into technology and knowledge transfer and diffusion partners. The increasing role of large private industries in the region necessitates a paradigm shift towards enhancing their role as incubators of innovation systems and localizers of knowledge and technology.

The Bureau will strengthen established ties with development donor agencies and foundations present in the region. A resource mobilization strategy that takes an interdisciplinary approach will be developed to support the implementation of this science and knowledge support strategy.

# XII. MONITORING AND EVALUATION:

The Bureau will utilize results-based management (RBM) approach to plan, implement and deliver. The IMPACT criteria will complement RBM, particularly in identifying and setting performance metrics.

An important part of RBM implementation is the continuous upgrading of the skills of professionals and general staff. UNESCO career development tools will be utilized to continuously ensure highest standards of programming and reporting documents so that the Bureau's contributions to the global implementation of UNESCO's programmes can be adequately monitored and assessed.

For many agencies, including UNESCO, impact monitoring and assessment remains a challenging issue. During implementation of this strategy, the Bureau will attempt to establish a follow-up mechanism and gear the development of capacity support workshops and activities so that such follow-up with stakeholders, participants, and beneficiaries can be maintained beyond the actual event, with the aim of obtaining an assessment of the actual impact of the activity, both at individual and institutional levels. In that regards, the Bureau will implement UNESCO guideline of allocating 3% of project funds to evaluation, and maintaining regular consultation with IOS and relevant specialized divisions and programmes. It is noted that the Bureau has assigned a senior member of the staff as evaluation focal point.

# XIII. COMMUNICATION:

The Bureau will develop, in cooperation with the Natural Science Sector and with ERI, a communication strategy designed to support the core mission of the Bureau "promoting the building of knowledge society and enhancing the science/policy/society interface for sustainable development in the Arab region". The strategy will also aim to:

- Engage effectively with stakeholders, partners, and donors
- Demonstrate success stories
- Disseminate information to the general public
- Support the regional UNESCO networks

The Bureau will utilize modern communication tools including social media. It will also rely (to the extent possible) on UNESCO's existing collaborative platforms such as UNESTEAMS.

# ANNEX I

## UNESCO CAIRO OFFICE WORKSHOP ON
## "*Science and Knowledge for Advancing the 2030 SDGs in the Arab Region*"
## Semiramis InterContinental Hotel
## Cairo, EGYPT during 25-26 May 2016

**Roundtable 1- Science/Knowledge: The Gateway for Achieving the SDGs**
***Key Recommendations***:

- Benefiting from scientific advances in achieving the SDG requires the creation of adequate enabling environment for Arab Scientists and knowledge workers.
- The Arab region must seize the opportunity provided by the SDGs as ideal platform to establish knowledge societies/economies
- In the strive to establish the science/knowledge societies and economies, it is important to clearly enunciate the specific priorities of the region including issues of social cohesion, occupation, conflicts and refugee, change management, youth engagement, regional integration and synergy, and openness and productive communication.
- There is a pressing need for better utility of STI and ICT, and effective governance structures in achieving the SDG agenda.
- UNESCO, and other UN and regional agencies can/should support formulating and adoption of policies at both national and regional levels to address the specific challenges facing the region, and to define scientifically based indicators to guide and monitor advancement.
- While the challenges may look enormous, there are real opportunities and potentials that can/should be pursued. The Arab region can benefit from the current historic opportunity that includes the triad of; its huge human capital particularly the youth, the existing material and financial wealth/capabilities, and the global science/knowledge revolution that made science more accessible and available.

**Roundtable 2 - STI SDG Nexus:**
***Key Recommendations***

- There is a need to develop collaborative and contributive values among Arab youth especially in science STI and ICT areas that can contribute to the achievement of the SDGs. It is also important, and in the public interest, to distance scientific cooperation in the Arab region from competitive attitude in the interest of collaborative approaches.
- There is also a need to develop regional and local quality indicators for all aspects of development, including scientific elements.
- Establishing policies to support the efficient creation of critical mass in various areas of science and technology requires thorough and agreed upon definition of the concept of critical mass.
- Establishing a regional STI observatory to monitor and evaluate progress on STI platform and its engagement in the development of the different economic sectors and hence contribution to the achievement of the SDG.

**Roundtable 3 - The Science/Knowledge - Economy Nexus:**

***Key Recommendations***:

- There is a need to undertake thorough economic assessments at national and regional scales of the SDG-2030 agenda to identify losses that may arise from failure to achieve the SDG-2030 agenda.
- The science/knowledge and economy nexus is inseparable from governance, primarily in the context of creating and fostering of science/stakeholder partnerships and alliances. Transparency and open access remain most critical in the success of such partnerships.
- It is important to address, through UNESCO, the economic dimension of knowledge and science including those related to fostering the value of knowledge and innovation at early stages of education.
- The role of UNESCO and other International Organizations in promoting the science/policy, science/private sector and science/stakeholders interfaces was also stressed as it relates to recognizing the economic value of knowledge and its contribution to the formulation of SDG relevant strategies and policies. Strong and effective cooperation with Civil Society and NGOs will be essential in that regard.
- It was also recommended that the portfolio for regional cooperation on science and technology in the League of Arab States, which is currently addressed through the education sector, be mainstreamed to all of the sectors within the secretariat.
- It is highly recommended to incorporate a scientific advisory mechanism in support of the national entity charged with SDG coordination at the national scale.

**Roundtable 4- Science/Knowledge; Society/Education and Language Nexus**

***Key Recommendations***

- **Addressing knowledge gaps in the region require the integration of social and natural sciences into science/knowledge policies and practices**. This also calls for engaging civil society in the various knowledge related processes and for prioritizing such engagement especially in light of civil society's inherent role as a key player in achieving sustainable development goals and targets.
- The SDGs must be viewed as an interconnected whole. Planning to achieve the SDGs must be comprehensive and integrated. As such, it is essential to have better integration of social and natural sciences at all levels.
- It is strongly recommended that efforts to engage the youth in science, knowledge, and development processes consider them not only as "recipients and targets" of such endeavors, but rather as "partners and integral part" of the dialogue and discourse. Such approach may moderate the high expectation of youth and facilitate more realistic and applicable approaches to several aspects of development including the generation of job opportunities especially in science, technology, and innovation.
- A well-coordinated science translation initiative is very essential in the Arab Region. UNESCO should lead such initiative. The initiative may be envisioned as focusing on translation of major scientific output and also addressing children and youth at stratified age and educational levels.
- The participants encourage academic and research institutions in the Arab region to better utilize bi-lingual Arab scientists both at home and in diaspora.
- There is a need for national and regional initiatives to foster science and knowledge; creation, dissemination, acquisition, and transfer- as important ***societal values***. Strong cooperation with traditional media and better utilization of social media are both essential components of such initiative. Another important component would be mainstreaming science, knowledge, and innovation as societal values into all stages and elements of the educational systems including formal, informal, vocational, and higher education systems.
- Likewise, campaigns to raise awareness of the SDG 2030 agenda are highly recommended at national and regional levels. UN agencies, in cooperation with national government and civil society can undertake such campaigns.

**Roundtable 5 -Science/Knowledge and Pressing Environmental Challenges in the Arab Region**
***Key Recommendations***

- The water-food-energy nexus provides entry points for science and technology to contribute significantly to addressing the integration of SDG goals 2,6,7, and 13. Policy and decision makers are encouraged to adopt this approach and the science community is also encouraged to consider the synergy of all three sectors, especially with respect to enhancing efficiency of water and energy uses in various sectors of the economy.
- The experience of Morocco is noteworthy in joining the three sectors under one ministerial unit, therefore allowing for better integration of national development plans.
- There is a great potential for scientific cooperation between Arab countries in addressing the sustainability of water, energy, and food.
- Arab scientific community and governments are encouraged to attempt better utilization of available funding mechanisms under the international agreements. This includes, for example, the Green Climate Fund.
- The coming COP-22 event in Morocco will have many ramifications on the implementation of climate change actions and relevant SD Goals. It is recommended that the Arab Region utilize the existing available mechanism, as well as those to become available after COP22, to enhance technology and knowledge transfer.

**Roundtable 6 - Science/Knowledge, the SDGs and regional and international cooperation**:
***Key Recommendations***

- There is a need for the establishment of an Arab forum on sustainable development that includes stakeholders, as well as experts and institutions;
- It is important to map key Science/Knowledge SDG relevant issues at national scale, as well as to map SDG priorities for each Arab country.
- It was also recommended to review successful experience concerning bilateral and multilateral cooperation between Arab countries on issues relevant to any sustainable development goal. A mapping of Arab cooperation on Science/Knowledge needs to be reviewed and assessed, including those under the auspices of the League of Arab States
- It was also proposed that the League of Arab States, through its statistics division, be tasked with coordinating regional monitoring of SDG. All participating/relevant entities and agencies shall support and contribute with available data and information as required.
- Both regional and UN organization are encouraged to establish coordination mechanisms to avoid duplication and overlap and to enhance joint programming and cooperation.

**Workshop Outcome: The Arab Network for Knowledge[27] and Sustainable Development**

Taking into consideration the comprehensive discussions during the 5 roundtables; the complexity of mainstreaming science and knowledge into strategies, policies and plans; and the essential need for identifying, formulating, and undertaking coordinated actions concerning many of the recommendations and findings of the workshop; the participants made a unanimous decision to launch the **"Arab Network for Knowledge and Sustainable Development".**

While the founding nucleus of the networks consists of the participating experts in their individual and/or institutional capacities, the network is envisioned as an open network that will include individuals, entities,

[27] Knowledge term is used as it encompasses all kinds of sciences including natural sciences, indigenous, as well as humanities and social sciences.

and organizations including NGOs who are concerned with Science and Knowledge, education, and the promotion of science/knowledge -sustainable development interface.

***Functions of the Network:***

1. Act as a regional platform for exchange of knowledge and information on "science/knowledge for sustainable development"
2. A platform for fostering and facilitating partnerships and resource mobilization for joint action on deployment of Science and Knowledge for achieving the SDGs. This includes:
    - Conceptualization and formularization of joint programmes, projects, and activities involving 2 or more entities/agencies.
    - Presenting/submitting actionable joint projects and activities to partners, donors and funding agencies.
    - Joint implementation (or coordinated) of projects, activities and programmes of 2 or more entities/agencies.

The network will be coordinated by UNESCO Regional Bureau for Science in the Arab States who will serve as the secretariat for the network. The Secretariat will propose, within a reasonable time frame, to the members of the network a communication plan that makes use of modern communication platforms.

The founding members of the Arab Network for Knowledge and Sustainable Development discussed several potential projects based on the recommendations of the workshops' roundtables. These can include:

- Transfer and localization of technologies: Formulation of joint project on Water Desalination and reuse (in irrigation) using solar energy
- Language in science/knowledge: Regional project "writing and translation for Children" focusing on promoting science and knowledge values.
- Science-SDG Monitoring of evaluation: Establishment of an Arab Observatory for Sustainable Development Indicators. Establishment of an STI platform/portal
- Science-SDG Awareness: Economic value of sciences and SDGs: Assessment of the economic losses stemming from lack of use of science and knowledge in SDG related endeavors.
- Awareness campaign on Sciences/SDGs: A regional campaign to raise societal awareness on SDGs and the 2030 Agenda. Targeting Arab youth and utilizing Social media
- Capacity building particularly for the youth: supporting national and regional efforts to enhance capacities and engagement of the youth in science and technology transfer and localization.

It was agreed that members may transmit to the network brief concept notes further clarifying each of the proposed project for further consideration by the network. UNESCO Cairo will coordinate the process.