Report of the Western Asia Regional Preparatory Meeting on "Science, technology and innovation for sustainable development" for the 2013 Annual Ministerial Review of the Economic and Social Council

Summary

In the preparation of the 2013 annual ministerial review of the Economic and Social Council, a regional preparatory meeting on the theme *"Science, technology and innovation (STI) for sustainable development"* was held on 26 November 2012 in Amman, Hashemite Kingdom of Jordan. The meeting was hosted by the Government of Jordan, in cooperation with the United Nations ESCWA Technology Centre, the United Nations Department of Economic and Social Affairs (UNDESA) and United Nations Educational, Scientific and Cultural Organization (UNESCO).

The meeting brought together a diverse group of regional stakeholders to discuss the state and present role of scientific research and innovation in Western Asia and North Africa and options for improving policies and incentives for increasing investment in, and benefits from STI in the region. The meeting consisted of two roundtable panel discussions over the course of one afternoon.

Key policy messages

The following key messages emerged from the discussion:

Building and nurturing innovative societies

- **Building and nurturing innovative societies requires commitment from all levels of society, based on the promotion of science, knowledge and openness.**
- **Governments have a central role to play in encouraging innovation, even if it usually originates in the private or voluntary sectors.**
- **Policies that encourage adaptation to new challenges and provide incentives to build capacities for innovation should be embraced.**
- **Policies for innovation should be holistic ranging from basic education and skills systems for young people to creating the necessary enabling environments for investment and opportunities for commercialization.**
- **A good initial policy step is the adoption of a national innovation strategy and clearer science policies which improve the STI "ecosystem" by establishing a policy framework for transformative change.**

Ensuring that advances in STI are inclusive

- **Acquiring global knowledge and technology, adapting it and assimilating it to local contexts has wide multiplier effects, resulting in an environment in which everyone can work to achieve their potential and**

contribute to society, especially young people and women.

- **Open access resources – whether open educational resources, research publications, virtual libraries or open patent information – are important tools for developing solutions to sustainable development challenges. To ensure their effective use, methods for promoting their accessibility in the region (e.g., language translation, access to infrastructure needed to support them) will be essential for innovation.**
- **In the current context, where globalization and technological development reward innovation and dynamic systems, excluding significant segments of the population from participating and contributing to their societies' development holds back countries' potential and increases social instability.**

Improving partnerships within the region and beyond

- **Greater efforts toward developing regional cooperation and intra-regional partnerships are urgently needed. Many successful partnerships in the region have focused on international linkages with partners from outside of the region. Although the region is diverse socio-economically and culturally, there are some common priorities and challenges, as well complementary capacities and needs, which could benefit from collective, regionally driven solutions.**
- **There are a number of STI "islands of excellence" dispersed throughout the region which could initiate productive partnerships to address regional sustainability challenges. These partnerships should maintain, where necessary, ties to other stakeholders from outside the region, while ensuring that problem-solving reflects regional – not external – priorities.**
- **Regional stakeholders – particularly universities and research centres – should take advantage of the dramatic increase in large-scale international research collaborations (as the necessary research facilities and staff incur high costs). The subsequent opportunities for knowledge and information exchange help to subsidize strengthened research networks and promote innovation.**

I. Introduction

In July 2013, the United Nations Economic and Social Council will hold its seventh Annual Ministerial Review in Geneva, Switzerland. The Review will focus on *"Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the MDGs"*.

On 26 November 2013, a Regional Preparatory Meeting for the Western Asia region was hosted by the Government of Jordan and the United Nations Economic and Social Commission for Western Asia (UN ESCWA) Technology Centre, in cooperation with the ESCWA Technology Centre, the United Nations Department of Economic and Social Affairs (UNDESA) and United Nations Educational, Scientific and Cultural Organization (UNESCO).

The meeting brought together a diverse group of regional stakeholders, experts from the United Nations system and other international organizations, non-governmental organizations (NGOs), academia, and the private sector. They discussed how national and regional systems for science, technology and innovation could not only improve wages and the quality of life for people in the region but also contribute to more inclusive, sustainable growth and development patterns.

The meeting provided an important opportunity for stakeholders from the 17 Arab countries of Western Asia and North Africa to contribute to the Annual Ministerial Review, including by sharing best practices and lessons learned.

II. Proceedings of the regional preparatory meeting

A. Opening Session

In his welcome remarks, **H.E. Dr. Jaafar Hassan, Minister of Planning and International Cooperation, Hashemite Kingdom of Jordan,** welcomed the timing of the meeting against the backdrop of Jordan's drafting of a national strategy on innovation. He outlined the approach Jordan was taking by encouraging innovative partnerships in the education and research sectors, including through the establishment of a new center for education, innovation and competitiveness. At the same time, he underscored the need to improve the jobs environment to ensure that graduates gaining new skills in science and technology could be absorbed successfully by the labor market. He stated that countries in Western Asia could not succeed in the global economy without sharing experiences with one another – and those outside of the region – on strategies for promoting STI advances. In this regard, Dr. Hassan welcomed the establishment of the ESCWA Technology Center which served to bring actors from the region together – in a venue away from ESCWA headquarters, which the Minister sees as a useful way of connecting the regional and national dimensions – to discuss strategies for using STI for sustainable development.

Dr. Rima Khalaf, Executive Secretary of the UN Economic and Social Commission for Western Asia (ESCWA), said that technology will have a critical role to play in transitioning to sustainable development patterns in the region, noting the importance of science and technology in almost all of the recent UN resolutions focusing on economic, social and environmental issues. The Arab region will have to rely on technology for

future socio-economic progress given the importance of knowledge in determining the wealth of nations in the 21st century. In this context, several regional realities and priorities should be taken into consideration. First, technology, especially home-grown innovations supported by some selected transferred technologies, is needed to increase economic productivity. Second, increased productivity should lead to higher wages and quality of life. Third, harnessing local knowledge and technology, and its wide multiplier effects, will create dignified jobs for the majority of educated young people not employed. Next, "islands of competence" dispersed in the Arab world must build productive partnerships to address regional sustainability challenges. Open knowledge sources and innovation products and services should be channelled for socio-economic gains. The youth population have the chance to "leapfrog" into developing technology tools. Finally, Ms. Khalaf noted that investing in technology partnerships makes simply good business sense, as there are lucrative market opportunities to be developed in solving pressing sustainability problems in the region.

In her opening remarks**, Ms. Gretchen Kalonji, Assistant Director General for Science, UN Educational, Scientific and Cultural Organization (UNESCO),** thanked Mr. Hassan for highlighting key STI priorities in the region for which UNESCO could lend expertise and support. Ms. Kalonji acknowledged that most of the meeting's discussion would focus on higher education and research systems, but wanted to remind participants of the fundamental importance of high-quality basic education – especially basic science education – for other aspects of sustainable development, such as health literacy and basic understanding of the natural environment, among other things. Reverting to the meeting themes, Ms. Kalonji honed her opening remarks on two tools lacking in the region that prevent making progress on STI. First, too few large-scale international science and research collaborations involve actors from the region. This is especially troubling since research collaborations of this type have increased significantly in recent years, contributing to the dispersion of knowledge. Second, she referred to gaps in the "ecosystems" for STI advances in the region, and stated that some basic first steps for addressing these would include better articulated science policies at the national and regional levels, as well as capacity-building projects in science and technology.

On behalf of H.E. Ambassador Desra Percaya (Indonesia), Vice-President of the UN Economic and Social Council (ECOSOC), **Mr. Navid Hanif, Director, Office for ECOSOC Support and Coordination, DESA** spoke about the historical role played by science and technology in solving the problems of past eras and its role in addressing future and emerging global challenges. However, given the current state of STI in Western Asia, it is uncertain how much the region will be able to contribute to solving these challenges. For instance, spending on scientific research and development is significantly below the global average. If this does not change, not only will voices from the region be left out of global problem-solving, Western Asia will also struggle with its limited capacities to address local challenges which might go ignored by the international community. Therefore, governments need to get incentives right, starting with the skills being developed in early educational years through to creating the necessary enabling environments for investment and innovation in the private sector. Mr. Hanif concluded by emphasizing the role of ECOSOC in partnering with national and regional actors to pursue jointly strategies for using STI for sustainable development.

B. Roundtable discussion I: Enabling productive capacities in science, technology and innovation (STI) in Western Asia

H.E. Dr. Lahcen Daoudi, Minister of Higher Education and Scientific Research, Morocco, who chaired the roundtable discussion, warned that only the strongest will prevail in the current hyper-competitive global economy. For countries in the region to compete, gross expenditure in research and development (GERD) will need to increase dramatically. Dr. Daoudi identified a few areas for immediate improvement. First, universities in the region need to become better hubs for scientific and technological development, as well as innovation. For example, why not develop programmes that focus on successful technology transfer opportunities in university departments and research centers? Even more importantly, higher education systems in the region need to be reoriented more strategically toward future investment opportunities and high-growth sectors. Second, exports from the region are not value-added products and it is difficult to see how countries in the region can grow sustainably if this does not change. Next, brain drain of researchers and budding entrepreneurs continues to hinder Arab countries' development potential. Fourth, actors in the region should put just as much energy into strengthening intra-regional networks as they do to linking with partners in Europe and North America. While linkages between local and foreign universities have resulted in some innovative education partnerships, too few ties – through research partnerships, education exchanges – bind together universities within the region. This is problematic, as the region does have some common priorities which could benefit from collective, locally based problem-solving. One option for encouraging stronger regional partnerships could be a common Arab fund for intra-regional research collaborations on local sustainable development challenges.

Ms. Gretchen Kalonji, Assistant Director General for Science, UN Educational, Scientific and Cultural Organization (UNESCO) delivered her keynote address to the meeting, which served as the basis for the first roundtable discussion. After listening to some of the initial comments made by speakers, Ms. Kalonji shifted the focus of her presentation to posing two questions to the participants. In her view, the answers to these questions would help to solve some of the critical weaknesses on STI in the region. First, she asked whether it was possible for regional actors to take advantage of developments in science, technology and innovation in order to leapfrog intermediary steps in technological development. This takes on new importance given growing global trends in STI: the democratization of science; new dynamics of international cooperation on scientific projects; increases in inter-disciplinary, team-based research collaborations; and the unexplored potential of big data. Second, she proposed to the participants that when discussing this theme, it should be recognized that scientific enterprise will not thrive in environments where other forms of free expression are restricted. Therefore, discussions about innovative societies need to take into consideration how features of the wider social and political environment do or don't encourage innovation.

Dr. Mouin Hamze, Secretary-General, National Council for Scientific Research, Lebanon, wished to remind participants that it is important to acknowledge the successes in STI in the region, rather than focus exclusively on shortcomings. For example, national commitments to investing in education have improved dramatically, with consequent increases in enrolment rates of girls and general educational attainment of societies. With regard to research systems in the region, Dr. Hamze noted the dramatic increase in multi-disciplinary research approaches and projects which have the potential to result in innovative solutions to development challenges. Although there are a number of successes

worth noting, Dr. Hamze also identified opportunities for improvement in the region. Regional cooperation is one area on which Western Asia is lacking. Although countries in the region often partner together on various projects, they are usually financed and administered through outside intermediaries (e.g., European Union), and as a result can reflect external rather than regional needs. Considering the advanced economic status of some countries in Western Asia, there could be options to think in terms of stronger local and regional partnerships. The speaker was also concerned that, relative to other countries, the production of knowledge in the region is much more easily achieved than the implementation of knowledge. The relationship between research and higher education systems needs to be re-examined, as too much research undertaken in the region is linked neither to innovative nor problem-solving on sustainable development challenges. At the same time, Dr. Hamze acknowledged that prioritization of issues for research is necessary but difficult, given the diversity of emerging challenges faced by the region.

Ms. Rana Zayadin, Executive Director of Outreach, Royal Scientific Society (RSS), Jordan, spoke on behalf of HRH Sumaya Bint El Hassan President of RSS. She highlighted a few critical challenges to STI advancement in Jordan. First, most small and medium enterprises in Western Asia – over 95 per cent – are actually micro-enterprises, making it very difficult for entrepreneurs to take risks that might drive innovation. As the result of their small size and limited resources, many of these enterprises have limited knowledge of the standards within their sector, without which innovation is unlikely to occur. Ms. Zayadin suggested that the region may have more to offer in innovations occurring outside of the science and technology sectors.

Dr. Saif Abdullah Al Haddabi, Assistant-Secretary-General, the Research Council, Oman, discussed the importance of technology transfer for successful scientific collaboration. There is still a lot to be gleaned and learned from large datasets being generated by new technologies. This could be better exploited by researchers to promote innovation in the region. Capacities are also under-developed, with a particular need for improved financial capacities and funding opportunities. In line with the previous speaker, Dr. Al Haddabi ended his comments by noting that innovation needed to be better defined and, perhaps, expanded to non-technological innovations occurring in the region, which could be scaled up or commercialized.

Mr. Fouad Mrad, Executive Director, ESCWA Technology Centre, who moderated the first roundtable discussion, suggested the panelists consider several key elements that had been raised thus far by other speakers. First, he asked how "cultures of innovation, or science" could be encouraged in countries in the region. Second, he wondered if the panelists would address how researchers (and funders) could successfully prioritize research needs given the wide range of questions and challenges deserving attention. What kind of science did regional actors want to promote; that is, science and technology for commercial development and application or science and technology for problem-solving? Mr. Fouad noted that these are not mutually exclusive. Finally, he recommended that panelists consider the extent to which local contexts could absorb capacities and the steps needed for improving their potential to do so.

During the interactive discussion that followed the roundtable discussion participants asked a number of questions. Several participants said that innovation will not flourish in the region, unless science is more widely respected and plays a bigger role as an essential tool within societies. In countries in the region where this is not the case, many people with bright ideas relocate elsewhere. **Ms. Kalonji** suggested that governments could commit to a regional STI policy as one practical

concrete step toward more innovative societies. **Dr. Al Haddabi** suggested that "innovation" could be discussed endlessly, but what was really missing is a frank discussion using different indicators on how countries successfully pursue sustainable development strategies. Regarding national investment in research and development, participants questioned whether there was a standard percentage of GDP which had been shown to have causal effects on increases in innovation.

There was also a discussion of how trust between academia and industry could be enhanced to encourage more innovative partnerships, such as in Europe and North America. Another participant asked about how universities could have a greater impact; while an increase in publications could be beneficial for researchers in the region, publications alone do not lead to innovation. Another participant suggested that faculty tenure systems at universities could adapt to take into consideration things like patents and professional consulting, rather than just publications.

It was widely agreed that to encourage reform processes to educational, research and funding systems, incentives would need to change. This requires government commitment. For example, one participant asked if funding sources could not require the formation of intra-regional partnerships as part of their criteria. Another participant noted a subtle change in young people's attitudes toward local challenges and contexts since the Arab Spring, stating that in universities and small and medium enterprises there is a greater drive among young people to take on local problems.

C. Roundtable discussion II: Harnessing global knowledge and technologies for regional sustainable development initiatives

Ms. Dong Wu, Chief of Science and Technology Section, UNCTAD, gave an overview of two essential tools for harnessing global knowledge for initiatives in the region: open access resources – especially publications and research articles – and virtual science libraries. These are part of the larger phenomenon of increasingly available "open educational resources". The number of open access resources has increased dramatically in recent decades, in large part as the result of changing institutional mandates and national norms and regulations. Some of the primary benefits of open access include: improving the speed, efficiency and efficacy of research; enabling interdisciplinary research; increasing impact, especially by researchers from developing countries; and knowledge dissemination to stakeholders outside of academia. Virtual science libraries are also helping facilitate knowledge to potential users from outside of academia. One of the challenges these systems face include the current academic reward system, which privileges journals from Europe and North America, often to the detriment of researchers working outside of these regions. Second, the sheer amount of information sometimes prevents potential users from finding the appropriate material. Finally, the financial sustainability of many virtual spaces is often uncertain and built on short-term funding processes. ECOSOC could consider encouraging the stronger commitments to these resources to ensure their accessibility and financial sustainability, as well as promoting an increase in research and educational networks to pool resources.

Mr. Cormac O'Reilly, Strategic Planning Officer, UNIDO, focused his remarks and presentation on "knowledge networks", which he defined as a group of interconnected actors with common interests in knowledge acquisition. Networks are crucial for information exchange and knowledge creation and diffusion, and they contribute significantly to knowledge management. The newest models of cooperation via networks

goes beyond traditional government actors; instead, today's most successful networks are increasingly adapting distinct forms of governance, with the aim of linking different types of public and private actors within and across organizational and national boundaries. Given the increasing choice of networks, the importance of seriously investing in some networks and institutionalising network ties in these networks, it is necessary to develop clear networking strategies with clear objectives. **Mr. O'Reilly** concluded by noting that networks could be essential to the implementation framework of the post-2015 development agenda. Mapping existing and emerging networks – some of which UNIDO has done – would be a useful exercise in this regard.

Opening the roundtable discussion**,** the moderator **Mr. Hanif** asked the panelists to consider two questions. First, how global knowledge could be harnessed for regional initiatives on the next wave of development challenges such as food security, sustainable energy, water access and urbanization. Second, what were the greatest opportunities for forming new partnerships involving non-governmental actors in the region.

Dr. Mohammed Ahmed Al Amer, President, Central Informatics Organization, Bahrain, noted the exciting potential of open educational resources while questioning how accessible and inclusive most of the tools actually are for users in the region (e.g., because of language barriers, content not suited to local contexts, etc.). Referring to earlier discussions in the meeting, he emphasized the importance of networks and the rapidly increasing opportunities for developing these within the region and beyond, with unlimited potential for expanding and deepening the learning environment in particular.

Dr. Salim Alruzaigi, Chief Executive Officer, Information Technology Authority, Oman, echoed earlier comments by acknowledging the dramatic increase in knowledge and information production and sharing, but questioned whether the region was fully taking advantage of these developments. Another issue which had received less attention is the process of modifying global knowledge so that it can be used effectively in local contexts. He described a three-stage process for translating knowledge from global to local, which includes: acquisition (step 1), adaptation (step 2) and assimilation (step 3), and encouraged participants to think about how the region fares on each of these steps.

Mr. Matt Rainey, Director of Innovation Division, World Intellectual Property Organization (WIPO), began his presentation by asking whether participants thought patent numbers were a good measure of innovation. While there is a high degree of correlation between patent volume and innovation, he encouraged participants to think about other forms of innovation as well – in management, business practices and distribution, as a few examples. Look for where innovation is actually occurring within your economies and societies, he said. This could be a potentially important line of inquiry for the region, where – though patent development and registration could be improved – innovations in other areas might have greater potential for scaling up. One of the great innovation trends of recent years is that the increase in knowledge sharing world-wide has often been accompanied by increased numbers of multi-national or multi-sectoral patents. Mr. Rainey reminded participants that patents not filed in certain countries – as filing in every country would be cost-prohibitive – remains an unexploited form of knowledge transfer. In order to assist countries in the Arab region in the creation of innovation infrastructure and larger university-industry collaboration, WIPO has established technology transfer offices (TTOs) in five countries. Drawing on a wide

range of partnerships, each TTO concentrates on country-specific projects while also linking to each other through an Arab region innovation network.

Mr. Talal El Makdessi, CEO, Talal El-Makdessi Foundation, **Lebanon** questioned how fully understood ideas about innovation are in the Arab countries of Western Asia. In his experience in Lebanon, the international community plays a central role in filling innovation gaps left by the public and private sectors. In particular, the Lebanese diaspora have played an important role here, many of them professionals in engineering and medicine who have relocated to Europe and North America. The innovations propelled by this community are welcome, but it is important to have willing and able local partners in government and the private sector to ensure their benefits can be maximized. He expressed scepticism that university research and academia in the region are producing the kind of innovative thinking needed for the future. **Mr. El Mekdassi** concluded by recommending stronger UN support directly to civil society and NGOs.

During the discussion that followed, participants questioned whether business models for STI were sufficiently developed in the region. One participant suggested that social entrepreneurship could be a way forward and could prove to serve as a sort of "leapfrogging" on STI advances in the region. **Mr. Rainey** responded to these comments by emphasizing that the primary focus of business strategies should be fulfilling local demand and needs with an orientation toward results. With regard to open education resources, some participants questioned what options local researchers and other actors had to add the greatest value using these tools. **Ms. Wu** reminded participants that global knowledge and resources were important, but could not be used effectively without the necessary domestic capacities and skills. One participant questioned whether these resources were more important than exposure to networks, which lead to the resources necessary for gaining visibility. **Mr. O'Reilly** remarked that a network only makes sense, and remains sustainable, when a shared goal is at its centre. He highlighted the UN Secretary-General's "Sustainable Energy for All" initiative as a success-in-progress that emerged from business interests, genuine household needs and high-level political concerns about climate change. As a successful example of a network that is serving the region well, one participant highlighted the Arab States Research Education Network (ASREN).

Conclusions and recommendations

Mr. Haider Fraihat, Director of Information and Communication Technologies Division, ESCWA emphasized the importance of having regional actors commit to taking action on the challenges identified during the meeting, rather than continuing with "business as usual".

In his closing remarks, **Mr. Navid Hanif, Director, Office for ECOSOC Support and Coordination, UN DESA,** noted the energy animating many of the participants' recommendations for the region and highlighted several key messages that were raised during the roundtable discussions. Firstly, he referred to the establishment of a regional policy framework on STI as an important first step in making progress on improved regional cooperation in Western Asia. Secondly, he noted the concern over inclusive access to knowledge and information provided by new technologies. Regional actors

should be thinking about ways – with partners from outside of the region where possible – to bridge whatever gaps remain in new, open resources which could help drive innovation in Western Asia. Thirdly, there are too few linkages between research systems and productive sectors in the region. States should consider supporting selected strategic areas – such as water, desertification, renewable energy and public health – alongside applied research where public authorities promote active collaborations with dynamic firms and social actors.

He noted that several initiatives being discussed by the ESCWA Technology Centre for 2013 and beyond could be of particular relevance to ECOSOC's mandate. The first of these projects would promote technology transfer in the region by connecting major scientific players with local economies. The second initiative aims to develop intellectual property and commercialization programs at universities and research centres in order to promote wider research commercialization initiatives. Third, ESCWA proposes to hold four workshops on green technology for rural development in order to promote the design and implementation of inclusive sustainable technologies in the region. The fourth initiative would be a series of "proof of concept" workshops in the region, which will support skills development in areas that limit the commercialization of research outcomes. Mr. Hanif encouraged Ministers and participants to remain engaged with ECOSOC through to the Ministerial Review in July 2013 in Geneva, where Jordan will share the highlights of the discussions of the AMR regional meeting with the Council.

Recommendations

1. Governments should adopt national innovation strategies and coherent science and technology policies as important first steps to ensure that the necessary policy frameworks include design incentives for the flourishing of innovation. For even greater coherence, these could also be adopted at the regional level.

2. Governments should increase gross expenditure in research and development (GERD) to demonstrate the national commitment to science, technology and innovation, in line with national sustainable development priorities and strategies to grow sustained scientific research networks.

3. Governments and education providers should work together to ensure that, where possible, degree and research programmes are strategically oriented toward addressing future and emerging challenges in high-demand, high-growth sectors while maintaining important basic science education for many dimensions of the sustainable development agenda, including public health literacy, and general scientific literacy for problem-solving

4. Financing entities should bear in mind that much of the private sector activity in the region occurs among micro-enterprises, making it difficult for entrepreneurs to take risks that could result in innovation.

5. Local private sector actors and policymakers should take advantage of developments in STI made elsewhere, especially through information and communication technologies, to leapfrog the intermediary steps of technological development. They should take into consideration the local absorptive capacities and skills developed in the region.

6. Actors in the region should put just as much effort into strengthening intra-regional networks as they have into forging partnerships with actors outside of the region (e.g., in Europe and North America).

7. The UN system and development cooperation providers should consider the great potential of international research collaborations and other international innovation-oriented networks and partnerships to help deliver on the post-2015 UN development agenda.

8. To maximize the potential for driving innovation, the UN system should consider developing better strategies for directly engaging private sector and civil society actors in STI projects in the region.