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Economic and Social Commission for Western Asia (ESCWA)

Report

The Expert Group Meeting on the Water-Energy-Food Security Nexus in the Arab Region Amman, 24-25 March 2015

Summary

The Expert Group Meeting on the Water-Energy-Food Security Nexus in the Arab Region was convened by the League of Arab States and the United Nations Economic and Social Commission for Western Asia (ESCWA) to strengthen understanding of the water-energy-food security nexus and foster discussions on how this conceptual framework can support efforts to improve integrated natural resources management and progress towards sustainable development in the Arab region.

The objectives of the Meeting were to build understanding of the overall scope of the nexus as a conceptual framework for advancing sustainable development by examining its core elements, to review examples of applying the nexus conceptual approach, to discuss the opportunities and challenges presented by applying the nexus within the context of existing institutional and policy frameworks, and to exchange information on regional initiatives, projects and partnerships in Arab countries. Discussions also took into consideration the post-2015 development agenda and the indicators and targets being formulated within the context of the sustainable development goals.

The Meeting was held back-to-back with the tenth session of ESCWA Committee on Energy and the eleventh session of ESCWA Committee on Water Resources to provide a platform for inter-sectoral exchange on the nexus between members of both committees and regional experts. Participants highlighted the need to examine the inter-linkages between the water, energy and food sectors, the importance of identifying priorities within the context of natural resource scarcity in the Arab region and existing governance structures at the national and regional levels, while focusing on the importance of resource and ecosystem management.

The Meeting concluded with a series of recommendations related to the opportunities and challenges of applying the nexus as an analytical framework in the Arab region; efforts to apply the nexus should seek to do so through an inclusive approach, taking into account institutional and policy considerations and regional and national specificities.

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Introduction

1. The Economic and Social Commission for Western Asia (ESCWA), in partnership with the League of Arab States, organized the Expert Group Meeting on the Water-Energy-Food Security Nexus in the Arab Region, held in Amman on 24 and 25 March 2015. The Meeting was held back-to-back with the tenth session of the ESCWA Committee on Energy and the eleventh session of the ESCWA Committee on Water Resources.
2. The main objectives of the meeting were to undertake the following:
 - (a) Build understanding of the overall scope of the water-energy-food security nexus as a conceptual framework for advancing sustainable development;
 - (b) Examine the core elements of the water-energy-food security nexus and related components so as to frame the nexus within the context of the Arab region;
 - (c) Review case studies and examples of applying a nexus conceptual approach in strategic areas of concern for the Arab region;
 - (d) Discuss the benefits, opportunities and challenges of adopting a nexus approach to strengthen integrated natural resources management within the context of existing institutional and policy frameworks in the Arab region;
 - (e) Exchange information on regional initiatives, projects and partnerships on the water-energy-food security nexus to support Arab countries.

I. CONCLUSIONS AND RECOMMENDATIONS

3. The discussions conducted at the Meeting led to the following conclusions and recommendations:
 - (a) The nexus is not a new concept, but offers a way to focus analysis on the inter-linkages that naturally occur between sectors; as such, there is consensus to support further work on the nexus in the Arab region, taking into consideration national and regional specificities;
 - (b) The analytical framework offered by the nexus can support the achievement of sustainable development in the Arab region, but the approach should be tailored to the specificities of the region in terms of its needs, resources, challenges and strengths, and should benefit from the experiences of other regions;
 - (c) The nexus analytical framework should be practical, adaptive and flexible enough to satisfy various scales of analysis, ranging from the local to the global, while avoiding an over-simplistic boxed approach;
 - (d) Examining the nexus depends on determining the systems targeted for analysis, whether at the firm, community, national, basin, ecosystem, regional or global levels;
 - (e) Applying the nexus should be based on a participatory and inclusive approach that engages stakeholders at all levels, while respecting good governance practices;
 - (f) A nexus approach should ensure coherence across policies, initiatives and projects at the national and regional levels, taking into account differing natural resource endowments across countries in the region, with a view to minimizing negative tradeoffs across sectors;
 - (g) There are different tools available for monitoring and measuring water and energy, but they need to be supported by the development of cross-sectoral datasets, such as the consumption of water by the

energy sector and the consumption of electricity by the water sector; this requires careful consideration of different indicators that measure water and energy intensity rather than water and energy productivity;

(h) The Arab region can draw upon different assessment tools for supporting nexus applications, such as climate change assessments, ecosystem evaluations, gender screening methodologies, environmental assessments, energy supply and demand forecasts, food security indicators, modelling tools and feasibility studies;

(i) Innovation, applied research and development are needed to support the nexus, but should support local technological innovations and applications for cross-sectoral efficiency gains;

(j) Each country should determine their own energy mix targets, taking into consideration the water and land resources available for achieving those goals;

(k) Capacity-building and awareness-raising are needed to support the application of nexus approaches in the region;

(l) Regional and international institutions and organizations, such as ESCWA and the League of Arab States, should continue to play an important role in the coordination of regional and national efforts to support the nexus and provide the technical support needed to apply the nexus as an analytical framework for supporting sustainable development;

(m) Applying the nexus conceptual approach should be viewed as a dynamic process that requires continuous consultation, engagement, implementation, monitoring and reassessment.

II. MAIN TOPICS OF DISCUSSIONS

4. Presentations and discussions are set out in the following sections by agenda item.

A. CONCEPTUAL FRAMEWORKS FOR EXAMINING THE NEXUS

5. Under this item, an ESCWA working paper on conceptual frameworks for understanding the water-energy-food security nexus was reviewed. The presentation covered the historical development of the nexus concept and the components included in different approaches for framing nexus thinking. While most nexus concepts focused on the inter-linkages between water, energy and food, numerous organizations had also incorporated other aspects into their nexus thinking, such as climate change, ecosystems, land, minerals and biomaterials. The importance of framing the scope of the nexus for the Arab region, based on a set of regional priority issues, was emphasized.

6. The representative of Germany introduced German perspectives on the water-energy-food security nexus, highlighting that increased understanding of the inter-linkages between water, food and energy security could help the region to overcome natural resource scarcity, improve resource efficiency and avoid negative trade-offs. The German Government supported regional nexus dialogues to assist decision-makers and high-level representatives from Government, the private sector and civil society in jointly identifying nexus solutions. Regional cooperation on climate change adaptation under the Adaptation to Climate Change in the Water Sector in the MENA Region (ACCWaM) was one way that the German Government was backing activities in the region, with the support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The Food and Agricultural Organization/Regional Office for Near East and North Africa (FAO/NENA) presented the FAO approach to structuring analysis on the water-energy-food security nexus for sustainable development, illustrating its participatory methodology through two case studies conducted on the Syr Darya Basin and during a water audit in Cyprus.

7. In the ensuing discussions, participants emphasized the importance of adopting a suitable and pragmatic approach for applying the nexus to the Arab region. Emphasis was placed on the need to break down the complex nature of the nexus into manageable components and to consider the specificities of the region. The role of data for informing decision-making and the need for policy integration were also stressed. Natural resource scarcity in the region was also affecting the ability to apply the nexus and policies needed to be optimized to overcome those resource constraints.

B. NATURAL RESOURCE INTERDEPENDENCIES FOR IMPROVED SERVICE DELIVERY

8. Under this item, the ESCWA representative gave a presentation on the Sustainable Energy for All Initiative (SE4All), globally launched by the United Nations Secretary-General, Mr. Ban Ki-moon, at the opening of the sixty-ninth session of the General Assembly, held in September 2014, and regionally launched in Amman prior to the Expert Group Meeting, on 24 March 2015. The Initiative aimed to achieve three interrelated universal objectives by 2030, namely assuring access to modern energy services, improving energy efficiency and increasing the contribution of renewable energy in the global energy mix. The representative of the King Abdullah University of Science and Technology discussed renewable energy initiatives supporting desalination projects in the Gulf region. The water and land resource requirements to support the solar and nuclear energy developments in the Arab region were then considered by a senior energy expert. The representative of the King Abdullah Petroleum Studies and Research Center subsequently reviewed some of the Center's research on policies and economic instruments to support the diversification of the energy mix in selected Arab countries.

9. Discussions revolved around renewable energy alternatives, concentrated solar energy investments for desalination and the challenges that renewable energy resources posed for energy security owing to difficulties associated with intermittency and the technological limits of storage capacity, for which solutions were only recently becoming available. The effectiveness of renewable energy options was discussed in terms of energy production capacities and costs. It was suggested that the population distribution in the Arab region, which varied between low-density inhabited areas and highly urban areas, provided a good match for distributed power systems, such as those offered by photovoltaic systems.

C. MANAGING SHARED NATURAL RESOURCES FROM THE PERSPECTIVE OF THE WATER-ENERGY-FOOD SECURITY NEXUS

10. Under this item, the ESCWA representative gave an overview of climate drivers affecting the water-energy-food security nexus and the regional work conducted on climate change impacts on shared water basins within the framework of the United Nations-League of Arab States Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR). This was followed by a presentation on two case studies by ESCWA on the Disi aquifer system and the North-Western Sahara aquifer system to explain the effects of water, energy and agricultural development on the management of transboundary groundwater resources. The representative of the International Union for Conservation of Nature discussed the importance of valuing ecosystem services by presenting experiences working in Bani Hashem, Jordan. The presentation highlighted ways to support poverty alleviation and natural resource conservation through participatory governance tools that involved gender-sensitive approaches and traditional land conservation practices, such as *hima*.

11. The discussions that followed focused on the importance of incorporating climate change considerations in the nexus analytical framework to better inform decision-makers of those linkages. Emphasis was placed on the need to exchange data between riparian countries to improve the management of shared resources. Participants also highlighted the possible advantage of the nexus as an entry point for cooperation between countries sharing groundwater resources for a more integrated and sustainable management of natural resources.

D. WATER AND ENERGY FOR FOOD SECURITY

12. Presentations considered how food security was affected by water and energy constraints and resource management practices. Wheat availability in the Arab region was examined by presenting the findings of the ESCWA study entitled *Pathways towards Food Security in the Arab Region: An Assessment of Wheat Availability*. The presentation provided an overview of global food security indicators and indices, as well as existing regional initiatives aimed at supporting food security in the region. The representative of the Arabian Gulf University made a presentation on water and food security in Gulf Cooperation Council countries, highlighting current efforts to overcome freshwater scarcity to support the agricultural sector and enhance food security. A third presentation by the representative of Sahara Wind demonstrated how wind energy production could significantly contribute to the energy mix and had the potential to provide reliable energy supplies to high-energy and water-consuming industries, such as the fertilizer industry in Morocco. The representative of the International Center for Agricultural Research in the Dry Area analysed the challenge of enhancing food security in the face of increasing water scarcity and the importance of maximizing water use productivity in the agricultural sector.

13. The ensuing discussions stressed the need to increase natural resource productivity, while highlighting the importance of incorporating resource-efficiency initiatives in nexus analytical frameworks. Participants also highlighted the need for demand management, technological innovation and water pricing as innovative approaches formulated in accordance with scale and social sensitivities, and the need to define an appropriate entry point for addressing the nexus when developing an action plan.

E. INSTITUTIONAL AND POLICY FRAMEWORKS FOR SUPPORTING THE WATER-ENERGY-FOOD SECURITY NEXUS IN THE ARAB REGION

14. Under this item, the representative of the League of Arab States outlined the main pillars of the League of Arab States initiative on the water-energy-food security nexus, launched in 2014, discussed regional institutional frameworks and policies in the Arab context and suggested ways for moving forward. The representative of the EastWest Institute reviewed lessons learned from promoting policy coherence at the national and regional levels, and tools for supporting consensus-building among different stakeholder groups. Price reform and the need to consider the socioeconomic and environmental implications of subsidies were the focus of a presentation delivered by the representative of Chatham House, which highlighted the importance of appropriately valuing energy and water to improve management and consumption of those vital resources. During the discussions, the importance of leadership and process thinking in applying nexus thinking was raised, and the need to find tools to measure the nexus so as to assess its progress and benefits.

15. Members of the ESCWA Committee on Energy and the ESCWA Committee on Water Resources were then invited to share their experiences on fostering inter-sectoral coordination and planning in their respective countries. The representative of the Palestinian Water Authority presented efforts to build a desalination plant in Gaza, which could be fuelled by solar power, diesel or gas to overcome dependency on energy imports. The representative of the Egyptian Ministry of Electricity highlighted the food gap challenge at the national level and efforts to support energy efficiency and renewable energy projects to offset the water gap and increase the availability of arable land, in coordination with the Egyptian Ministry of Water Resources and Irrigation. The representative of the Egyptian Ministry of Water Resources and Irrigation emphasized the importance of generating more with less, and the difficulties faced in applying integrated water resources management principles, taking into account nexus considerations, across departments at the ministry level and across ministries, including efforts to support wastewater reuse projects in the agricultural sector. The representative of the Moroccan Ministry of Energy, Mines, Water and Environment shared cross-sectoral efforts, noting that each sector had its own special characteristics. He highlighted the current policy to increase energy production and diversify the energy mix to meet energy efficiency targets in tandem with environmental protection goals, and establish a new solar energy institute to support climate change mitigation and desalination initiatives. The representative of the Ministry of Water

Resources and Electricity of the Sudan, responsible for water resources, explained how institutional restructuring had shifted responsibilities for agriculture and irrigation outside the Ministry's remit, but that the two new ministries met periodically to support water resources project planning. His counterpart responsible for electricity projects in the same ministry then elaborated on the functioning of a higher committee established to manage electricity and water resources and to submit joint plans to the Sudanese Council of Ministers for consideration. The representative of the Qatar General Electricity and Water Corporation explained how water and electricity were jointly managed to support desalination facilities and provide water pumping services throughout the day. He noted that the storage of strategic water reserves in aquifers was an important component of crisis management plans and that a significant share of collected wastewater was treated and reused, adding that the Ministry of Environment was responsible for addressing food security in Qatar. An expert from Lebanon said that there were institutions and strategies aimed at supporting the water, energy and agricultural sectors in Lebanon but, while coordination existed, there was limited decision-making power to implement decisions.

F. GREEN TECHNOLOGIES FOR IMPROVED ENERGY, LAND AND WATER USE EFFICIENCY

16. Two presentations on green technology for improved energy, land and water use efficiency were delivered under this item. The representative of the International Renewable Energy Agency provided an assessment of the role of renewable energy in the nexus, available technologies and programmes to support the adoption of renewable energy technologies, and associated decision-making tools. The ESCWA representative introduced the United Nations Development Account project on building capacity to develop appropriate green technology for improving the livelihood of rural communities in the ESCWA region, including the project's objectives and planned activities. The representative from the Wilo Near East Office presented experiences regarding solar water pumping in Jordan as a means of improving energy and water-use efficiency in the delivery of water services, with a focus on energy-saving pumping options.

17. The ensuing discussion focused on the effects of the drop in oil prices, which had been absorbed by the historic cost cuts in renewable technologies, although the latter were not expected to continue at the same pace. The need to utilize the nexus approach to renewable energy technology selection and the challenges presented by the lack of region-specific performance indicators and data were also discussed.

G. REGIONAL INITIATIVES, PROJECTS AND PARTNERSHIPS ON THE WATER-ENERGY-FOOD SECURITY NEXUS

18. A presentation was given under this item on work undertaken by the ESCWA Committee on Energy and the ESCWA Committee on Water Resources to increase understanding of the water-energy nexus through an intergovernmental consultative meeting on the water-energy nexus in the ESCWA region, held in June 2012. The presentation reviewed the seven regional priorities identified by ESCWA member States to support regional work on the water-energy nexus and advised on the launching of a new United Nations Development Account project on capacity-building for member States to address the water-energy nexus, based on those priority areas. A second presentation by the ESCWA representative introduced the launching of another new project on cooperation and capacity-building for food and water security in the Arab region, including its objectives, expected accomplishments and planned activities, implemented in collaboration with the League of Arab States and other partners. Participants were informed of the League of Arab States regional initiative on the water-energy-food security nexus endorsed by Arab member States and the cooperation, under the auspices of the League of Arab States, with regional and international organizations, including GIZ, the Swedish International Development Agency, ESCWA and FAO, to support further work on the nexus. The representative of the League of Arab States emphasized the importance of institutional capacity-building, governance, knowledge and information sharing, monitoring and evaluation.

19. The representative of the Arabian Gulf University presented a project on building awareness for interlinked supply risks, implemented in partnership with the League of Arab States and the GIZ/ACCWaM and GIZ/Washington Post projects; he gave an overview of the five nexus policy briefs that would be

produced by the project. The final presentation covered the American University of Beirut project on promoting regional collaborative research on the nexus. The objectives of the project were highlighted, as well as its activities, scope, technical aspects, institutional framework, policy outlook and social components.

20. The ensuing discussions raised several issues, including improving the linkages between academic research institutions and policymakers, and the need to ensure complementarity between a regional customized nexus approach and regional initiatives.

III. ORGANIZATION OF WORK

A. VENUE AND DATE

21. The Expert Group Meeting on the Water-Energy-Food Security Nexus in the Arab Region was held in Amman, on 24 and 25 March 2015, back-to-back with the tenth session of the ESCWA Committee on Energy (Amman, 22-23 March 2015) and the eleventh session of the ESCWA Committee on Water Resources (Amman, 26-27 March 2015).

B. OPENING

22. The Meeting was formally opened by Mr. Abdullah al-Dardari, Deputy Executive Secretary of ESCWA, on behalf of Ms. Rima Khalaf, Executive Secretary of ESCWA. Opening statements were also delivered by Ms. Shahira Wahbi, Chief of Sustainable Development and International Environmental Cooperation at the Environment, Housing, Water Resources and Sustainable Development Department of the Economic Sector at the League of Arab States; Mr. Ahmad Mahina, Under Secretary of State for Authorities' Follow-up at the Ministry of Electricity in Egypt and Chair of the tenth session of ESCWA Committee on Energy; and Mr. Ali Subah, Assistant Secretary-General for Strategic Planning at the Ministry of Water and Irrigation of Jordan and Chair of the tenth session of ESCWA Committee on Water Resources.

C. PARTICIPANTS

23. The Meeting was attended by 75 participants, of whom 39 were from ESCWA member States, including members of the Committee on Energy and the Committee on Water Resources, as well as government representatives from related sectors. In addition, 36 experts from regional and international organizations and representatives from United Nations and League of Arab States organizations participated in the deliberations. The list of participants is set out in the annex to the present report.

D. AGENDA

24. Presentations and discussions were made over eight sessions. The agenda of the meeting is summarized below:

1. Opening statements.
2. Conceptual frameworks for examining the nexus.
3. Natural resource interdependencies for improved service delivery.
4. Managing shared water resources from the perspective of the water-energy-food security nexus.
5. Water and energy for food security.
6. Institutional and policy frameworks for supporting the water-energy-food security nexus in the Arab region.

7. Green technologies for improved energy, land and water use efficiency.
8. Regional initiatives, projects and partnerships on the water-energy-food security nexus.
9. Conclusions and recommendations.
10. Closing session.

E. EVALUATION

25. An evaluation questionnaire was distributed to participants to assess the relevance, effectiveness and impact of the Meeting. The feedback received was positive with over 80 per cent of participants rating the overall quality of the meeting as very good to excellent. The majority of participants found that the Meeting had achieved its objectives and all agreed that their expectations had been met.

26. The organization of the Meeting was found to be very good and participants considered their expertise well suited to the meeting. Approximately 90 per cent of the submitted questionnaires indicated that the Meeting was a good forum for information exchange and provided an important opportunity to share experiences with other experts and establish new useful contacts in the field. Written materials distributed by ESCWA and the presentations delivered during the Meeting were deemed to be of good quality by around 82 per cent of participants. Most participants (74 per cent) thought that the length of the Meeting was appropriate and 87 per cent indicated that they would like to be involved in follow-up activities on the water-energy-food security nexus.

27. In addition, some participants said that work should be undertaken to develop a methodology to provide a baseline for activating the nexus. Others suggested conducting an assessment of the existing institutional frameworks available in Arab member States from the nexus perspective, and that efforts be undertaken to build the capacity of stakeholders to support the application of the water-energy-food security nexus at the national level. Some proposed the preparation of water and energy action plans at the national level.

F. DOCUMENTATION

28. Meeting documents and presentations are available from the ESCWA website at www.escwa.un.org/information/meetingdetails.asp?referenceNum=3581E.

Annex*

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