



Economic and Social Commission for Western Asia (ESCWA)

United Nations Development Account Project on Developing the Capacity of ESCWA
Member Countries to address the Water and Energy Nexus for Achieving Sustainable
Development Goals

Report

Final Regional Policy Workshop on the Water-Energy Nexus Beirut, Lebanon, 11-12 December 2017

SUMMARY

The Final Regional Policy Workshop on the Water-Energy Nexus was convened by the United Nations Economic and Social Commission for Western Asia (ESCWA) in Beirut, Lebanon from 11 to 12 December 2017 to strengthen the capacity of ESCWA Member States to pursue the integrated and sustainable management of water and energy resources in view of advancing sustainable development in the Arab Region.

The workshop took stock of progress made in advancing understanding and applying the water-energy nexus, reviewed lessons learned from the water-energy nexus operational toolkits, discussed the outcomes of the three pilot initiatives implemented under the project, considered opportunities for launching similar initiatives, deliberated institutional mechanisms for pursuing policy coherence for water and energy security, and exchanged information on global and regional projects and partnerships supporting Arab States on the water-energy nexus, as well as the wider water-energy-food security nexus within a climate change context.

The workshop participants highlighted the benefits of considering the interlinkages between the water and energy sectors for improved management of natural resource and associated services in the Arab region. The importance of data availability and accessibility as well as the effective dissemination of information to support decision-making and policy formulation were recognized. The establishment and strengthening of appropriate institutional mechanisms to facilitate cooperation and coordination across sectors was also emphasized. Workshop participants agreed that an effective transfer of technologies and know-how requires innovative financing tools and policies adapted to the Arab regional context, which could advance the adoption and application of integrated water and energy nexus approach at the policy and operational levels.

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I. INTRODUCTION

1. The United Nations Economic and Social Commission for Western Asia (ESCWA) organized the Final Regional Policy Workshop on the Water-Energy Nexus which marked the completion of the United Nations Development Account (UNDA) project for developing the capacity of ESCWA member countries to address the water and energy nexus for achieving Sustainable Development Goals.

2. The main objective of the workshop was to strengthen the capacity of ESCWA member States to achieve an integrated and sustainable management of water and energy resources as part of reaching the overall goals of sustainable development in the Arab Region. To do so, the workshop set forth the following objectives:

- (a) Take stock of the progress made on raising awareness and advancing work on the water-energy nexus within the context of the 2030 Agenda for Sustainable Development.
- (b) Review the key messages and lessons learned from the Water-Energy Nexus Operational Toolkit three modules.
- (c) Discuss the three pilot initiatives implemented under the project and opportunities for implementing similar initiatives in the future;
- (d) Discuss institutional mechanisms and integrated approaches for pursuing policy coherence in light of ensuring water and energy security at the regional and national levels;
- (e) Exchange information on regional initiatives, projects and partnerships supporting Arab States on the water, energy and food nexus.

3. The meeting spanned over two days and consisted of seven sessions. Section I of this meeting report provides a summary of the presentations and the main topics of discussions held during each session. Section II reviews the organization of work, including information regarding the meeting agenda, participants and a summary of the participants evaluation outcome. The full documentation of the meeting is available at the following address:

<https://www.unescwa.org/events/final-regional-policy-workshop-water-energy-nexus>

II. RECOMMENDATIONS

4. This closing meeting convened under the project concluded with the following findings and recommendations:

- (a) There are benefits to considering the interlinkages between the water and energy sectors for improved management of natural resource and associated services in the Arab region.
- (b) Increased data availability and accessibility as well as the effective dissemination of information are needed to support decision-making and policy formulation.
- (c) It is necessary to establish and strengthen appropriate institutional mechanisms to facilitate cooperation and coordination across sectors.
- (d) The effective transfer of technologies and know-how requires innovative financing tools and policies adapted to the Arab regional context
- (e) The adoption and application of water and energy nexus requires an integrated approach that takes into consideration cross-sectoral dimensions that can be applied at the policy and operational levels.

III. MAIN TOPICS OF DISCUSSIONS

5. Presentations and discussions are summarized in the following sections which are organized according to the substantive sessions of the meeting.

A. WATER AND ENERGY NEXUS REGIONAL INITIATIVES

6. The session opened with a presentation related to the United Nations Development Account Project on Developing the Capacity of ESCWA Member Countries to address the Water and Energy Nexus for Achieving Sustainable Development Goals. The main activities completed within the framework of the project were implemented through two parallel and complementary tracks. Under the first track, senior policymakers were engaged in inter-sectoral analysis and action on the water-energy nexus. An initial regional workshop on water-energy nexus policies was attended by members of the ESCWA Committee on Water Resources and ESCWA Committee on Energy or their designated representatives. The workshop was informed by the *Regional Policy Toolkit* that was launched by ESCWA in 2016. At the closing of the workshop, participants were invited to propose pilot initiatives to promote the water-energy nexus at the national level. Three pilot projects were selected by ESCWA and were implemented in Egypt, the Syrian Arab Republic and Tunisia through the provision of technical support and assistance. Under a second track, the project targeted service providers in the water and energy sectors, and examined the water and energy nexus from an operational perspective. An operational toolkit was prepared comprised of three technical modules on resource efficiency, renewable energy and technology transfer. Each module was discussed at a dedicated training workshop organized by ESCWA in 2017.

7. It was discussed that the 2030 Agenda for Sustainable Development emphasizes interlinkages and interactions in the analysis of the water and energy related goals and targets. Follow-up activities in relation to the water-energy nexus were discussed and participants were engaged in a discussion on regional priority issues in relation to the water, energy and food nexus.

8. A Presentation by the Sustainable Water Policies Programme of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on the Nexus Regional Dialogues Programme highlighted the main objective of the initiative in supporting regions for the achievement of water, energy and food nexus. The program is being conducted in 5 regions of the world and unfolds through two phases. In the MENA region, it is being implemented in cooperation with the League of Arab States (LAS) and has resulted in the adoption of nexus regional policy recommendations. Activities completed under the first phase of the initiative include the development of capacity building training modules, country assessments, capacity development workshops, small scale nexus applications and initiation of work on a draft regional nexus action plan. The second phase of the Regional Dialogue Programme will focus on the completion of the action plan.

9. Ensuing discussions focused on the decreasing availability of water resources in the Arab region, which is further exacerbated by the impacts of climate change. It is expected that the primary response to increased water shortages in the Arab region will heavily rely on water desalination. The improved cost effectiveness of desalination technologies as a result of scientific advancements will instigate private sector investments. Nevertheless, despite the importance of engaging the private sector in water development projects, there is an important role for the government in overseeing public private partnerships. Furthermore, it was agreed that more efficient irrigation technologies need to be pursued in the Arab region especially that irrigation accounts for the largest amount of water consumption in Arab countries.

10. A presentation by the American University of Beirut on the challenges and lessons learned from a nexus perspective highlighted the projected increase in demand for energy, food and water resources. Agro-voltaics was presented as a promising nexus based approach for the Arab region. It consists of harvesting renewable energy through the installation of solar panels on cultivated land resulting in reduced water loss through evapotranspiration while allowing for a dual-purpose land use for agriculture and PV farms. The presentation also introduced a mathematical model based on a simplified water-food nexus framework that considers water, land, and weather input parameters to optimize water and food security. The model outcomes support decision making and policy formulation for the allocation of land and water resources from a water-food security perspective. The main challenge facing the application of such models is the availability of accurate and reliable data. In that context, a framework or platform for data exchange between academics and government entities based on harmonized definitions and standardized measurement approaches within and across countries was suggested to advance work on model computation.

11. The Palestinian Water Authority presentation introduced the Water-Energy-Gender Nexus seed project in Palestine which aims to better understand the gender dimension of the water-energy-food nexus. A gender approach helps to recognise the specific needs of women and ensures these are taken into consideration within the nexus. Activities conducted under the project generated analysis addressing the role of gender empowerment in enhancing the sustainable use of water and energy resources.

12. Participants' discussions emphasized the shortage in data, specifically disaggregated data, and lack of data accessibility in addition to the absence of a unified regional database. Deliberations recognized the importance of building regional capacities to support water, food and energy demand projections which take into consideration the impact of climate change.

13. It was clarified that the implementation of the "AgroVoltaics" projects remains at the pilot stage in identified locations. Challenges facing the replication of the project at a larger scale were linked to the interrelated variables that have to be examined and analyzed in the context of each specific case. Examples of these variables include crop tolerance to shade and angles at which PV panels are positioned. Participants also emphasized the role of women as the main consumers of water and energy and hence the need to integrate gender considerations in addressing the water-energy nexus. There were extensive deliberations on the definition of gender, the role of men and women and its implication on water-energy nexus decision making.

B. NATIONAL AND INTERNATIONAL EXPERIENCES IN APPLYING THE NEXUS

14. The session opened with an overview by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on the nexus dialogue in Germany and Europe. The role of regulatory and economic instruments, institutional structures and cooperation mechanisms put in place to advance cross-sectoral decision-making processes was demonstrated through case studies focusing on ground water management. Voluntary cooperation was highlighted as essential for nexus cooperation.

15. Ensuing discussions focused on the possibility to build on lessons learned from the German experience to inform water-energy nexus applications in the context of the Arab region. Deliberations analysed the role of the German central government as a mediator between ministries serving as local authorities and the possible conflicts that might arise from this type of arrangement in the region.

16. The representative of the Ministry of Water and Irrigation in Jordan presented the national strategic plan to improve water and energy use efficiency. Accordingly, the National Water Strategy (2016-2025) aims to reduce energy used in water utilities by 15 percent through increasing the share of renewable energy sources to 10 percent in the total energy mix consumed in the water sector. The energy efficiency policy relies on three main pillars focusing on: increased water systems efficiency, alternative energy sources and improved cost recovery.

17. The representative of the Ministry of Energy and Water in Lebanon focused on the potential of hydropower from non-river sources in the country. Under the National Renewable Energy Action Plan (2016-2020), the share of renewable energy technologies in the total energy mix is set to reach 12 percent by 2020. In that context, a study was undertaken to assess non-river sources for hydro-power generation. The possible options included: irrigation channels and conveyors, wastewater treatment plants, electric power plants outfall channels and municipal water distribution channels. The estimated combined potential of these resources approximates 5 MW. The preliminary assessment results demonstrated the potential of non-river resources in contributing to the renewable energy mix in Lebanon, with thermal power plants outfalls found to be the best suited to the national context.

18. Ensuing discussions addressed the implementation of the Jordanian plan to improve water and energy efficiency and the use of various tools to aid in its implementation. It was explained that implementation started with awareness raising to gain public support and supporting sectors with various initiatives to offset increased costs to lost income. Technology was also used to monitor sources of water and even detect illegal use of water. It was also elaborated that the projected decrease in renewable energy costs should further assist the implementation of this plan which depends in part on the use of renewable energy.

C. RESOURCE EFFICIENCY WITHIN THE CONTEXT OF THE WATER-ENERGY NEXUS

19. This session opened with a presentation by ESCWA on the Water-Energy Nexus Resource Efficiency Operational Toolkit. The rapid increase in energy consumption across the Arab region with current rates reaching twice as 1990 levels was highlighted. It was also clarified that the energy sector is the second largest consumer of water after agriculture. In that respect, a nexus approach can increase the understanding of the interconnectedness of the water and energy sectors and hence improve coordination between these sectors. The main objectives of the Water-Energy Nexus Resource Efficiency Operational Toolkit were emphasized and the technological means available for more efficient water and energy production and consumption were elaborated upon in detail.

20. This was followed by a presentation on the use of Reed Beds for Wastewater Treatment in Oman by the Petroleum Development Oman. It was mentioned that 10 barrels of water are consumed for the production of each barrel of oil in the GCC. Traditionally, produced water (by-product of oil extraction activities) is injected in deep groundwater aquifers laying below pumped reservoirs through an energy intensive process. In that respect, a biological treatment methodology is being tested in Oman which relies on allowing water flow by gravity over reed beds to facilitate uptake and immobilization of contaminants by indigenous plants. The project outcomes demonstrated the benefits of using reed plants through the reduction of hazardous contaminants by 99 percent, decrease in energy consumption, in addition to carbon assimilation by indigenous plants. Also, the constructed wetlands in the project area provided favourable environmental conditions for new species of birds and fish and resulted in an enhanced local ecosystem.

21. Ensuing discussions with regards to the environmental impact of oil uptake by reed beds have clarified that soil samples in the project area demonstrated that oil residue contamination was within acceptable ranges. It was also mentioned that the reed plants have a high soil tolerance that can accommodate the super saline water of constructed wetlands.

D. RENEWABLE ENERGY WITHIN THE CONTEXT OF THE WATER-ENERGY NEXUS

22. The session was opened by an ESCWA presentation on the Water-Energy Nexus Renewable Energy Operational Toolkit. The importance of renewable energy (RE) to strengthen the water-energy nexus in addressing energy needs by water-related activities such as water distribution and wastewater treatment was highlighted. RE technologies provide an alternative, less water intensive energy resource, hence reducing the dependence on fossil fuels and contributing to the reduction of greenhouse gas emissions. These benefits are of high relevance to the Arab countries in pursuing their growing demand for water and energy resources and supporting them in devising national sustainable development plans.

23. This was followed by a presentation on the water and renewable energy nexus in the Gulf Cooperation Council countries' context by the MASDAR institute. The current water desalination methodologies are based on multistage flash (MSF) technologies which are energy intensive compared to reverse osmosis (RO). In supporting the shift to desalination in the UAE, the Renewable Energy Water Desalination Program coordinated by MASDAR aims to identify the most efficient RO desalination scheme that can utilize renewable energy sources. Results have demonstrated the cost effectiveness of applying RO powered by renewable energy sources. However, the use of renewable energy is still a challenge in large scale RO desalination due to its intermittency.

24. Participants' deliberations recognized that many countries in the Arab region have achieved innovative technological advancements suited to their respective local and national contexts. Arab countries are encouraged to build on regional success stories and lessons learned to inform the applicability of these technological advancements to their national contexts. For that purpose, it was recommended to develop a fact sheet on regional best practices in the field of water-energy nexus. It was also highlighted that fossil fuels will not be phased out completely to renewable energy in the near future and will hence have continuing significance, especially in the transport sector. Efforts should also focus on optimizing fossil fuel usage. Nuclear energy for electricity generation is being examined in Egypt but faces a major challenge in relation to the highly water intensive process.

25. Following the discussion, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) presented in relation to the nexus case study from Germany and Europe on pumped-storage hydropower plants. The presentation provided a generic framework for integrating policies and strategies in the water, energy and food sectors to support moving from a sectoral to a holistic approach. The key elements of the generic framework include strengthening horizontal coordination; harmonising public policies to minimise cross-sectoral conflicts and maximise synergies; facilitation of nexus-smart investment and technologies; and strengthening institutional capacity for understanding interlinkages and involving all stakeholders from the early stages of any project.

E. TECHNOLOGY TRANSFER WITHIN THE CONTEXT OF THE WATER-ENERGY NEXUS

26. A presentation by ESCWA on the Technology Transfer Water-Energy Nexus Operational Toolkit highlighted the role of technology transfer (TT) in advancing innovation for economic development. The key considerations for successful TT include: individual country needs, consistency with sectoral strategies, ability to mobilize private investment, effective governance structure, potential for sustainability and replication, cost-effectiveness, ease of implementation, and existing indigenous technology options. The importance to monitor, report and verify newly adopted technology was also mentioned. Furthermore, it was emphasized that local governments have a pivotal role in achieving a successful technology transfer. The presentation discussed the TT means and avenues that are most suitable in the Arab region context.

27. A case study on a regional TT case study was then presented by MEDRC Water Research in Oman. The presentation highlighted the importance of considering the flow of experience and know-how from the early stages of project design, planning and development. Three case studies of TT were presented from Morocco, Tunisia and Jordan. The role of Private Public Partnership in TT was highlighted through a case study of As-Samra wastewater treatment plant in Jordan. The plant achieved 78-90 per cent energy self-sufficiency through the use of renewable energy sources covering hydraulic and biogas sources. It was recognized that engaging staff in charge through proper training and education enhanced the adequate transfer of technical know-how contributed to the success of the project.

28. Participants engaged in an elaborate discussion on TT within the context of water and energy nexus in the region. It was highlighted that most countries of the region are chiefly consumers of new technology and have missed out on the opportunity to localize technical knowledge and expertise. In addition, the importance of linking technology transfer to job creation, a priority concern to the region, was emphasized. The importance of sharing and disseminating obstacles faced in implementing TT in the Arab region was underscored. The lessons learned can give an idea of the challenges facing the application of similar technologies in different countries of the region.

29. Participants were informed of a global model being formulated to estimate desalination costs which can provide an important assessment tool to support donors and countries in decision making and policy formulation. It was agreed that the development and deployment of water and energy technologies should be based on an integrated approach involving private, public sectors, research institutions as well as recipient communities.

F. WATER-ENERGY NEXUS PROJECT PILOT INITIATIVES

30. The following section provides an overview of the presentations of the technical and financial feasibility assessment outcomes for three water energy nexus pilot initiatives implemented in the Syrian Arab Republic, Tunisia and Egypt with advisory and technical support provided by ESCWA within the framework of the UNDA project implementation.

Pilot Initiative I:

Renewable Energy Use for Groundwater Pumping in Suwayda, Syrian Arab Republic

31. A background on the pilot project was presented by the Ministry of Electricity in the Syrian Arab Republic listing the pressures resulting from the current armed conflict and possible climate change effects which reduced the amount of snowfall and thus groundwater recharge resulting in lowering of the water table.

The pilot initiative is for the Suwayda area which extends over 5,500 km² in the southeast of the Syrian Arab Republic. The area is currently facing severe water shortages from decreased precipitation and increased demand from incoming population who are fleeing armed conflicts in other parts of the country. Concerned authorities have thus resorted to pumping 250 deep water wells reaching in some cases up to 800 meters in depth. These pumping schemes have also put additional pressure on the already limited energy resources. In that context, ESCWA provided support to the Ministry of Electricity in Syria and Ministry of Water Resources for a technical and financial feasibility study on the use of photovoltaic solar systems for groundwater pumping in a number of wells in Suwayda area. The assessment outcomes suggest the suitability and feasibility of PV solar systems to pump water from deep water wells using existing pumping equipment, particularly in the summer.

32. Discussions linked the main obstacle in implementing PV solar panels for water pumping in the Suwayda area to the lack of available financial resources. Engaging the private sector is an option but may result in increased water tariffs which cannot be considered under the current situation in the Syrian Arab Republic. Isolated initiatives with limited impact were recognized such as the contribution of a community group to fund a number of PV solar panels for water pumping in the study area.

33. The experience of the Public Authority for Electricity and Water in Oman in using renewable energy for water pumping in Wadi Sinai was shared. The project consisted of 40 PV panels that supply a total 10 KWh and is considered as a pioneering project paving the way for larger scale projects.

Pilot Initiative II:

Improving Energy Consumption of the Chrichira Hydraulic System in Tunisia

34. A background on the pilot project was presented by the Société Nationale d'Exploitation et de Distribution des Eaux (SONEDE). SONEDE is the National Water Distribution Utility responsible for supplying the country with potable water and is the largest energy consumer in the country. In that context, a pilot initiative was devised to improve energy consumption in hydraulic systems through the installation of a hydroelectric microturbine in municipal water distribution systems to generate electricity. The assessment proposed modification to the initially identified micro-hydro system location and suggested a pump as turbine (PaT) for its simplicity and affordability in addition to SONEDE's extensive experience in handling pumps. Assistance was also provided to support the preparation of technical specifications for project implementation. The proposed micro-hydro system was found financially feasible with a reduction in electrical energy purchased, and a return on investment for the envisaged project achieved in less than 3 years.

35. Participants' deliberations recognized the relevance of recovering energy through hydroelectric microturbines in water transmission systems in many countries of the region as a promising energy resource, which demonstrates the benefits of considering water-energy linkages. It was agreed that the importance of building on human capacity knowledge base and technical know-how is fundamental to enhance ownership of the project by local staff. The feasibility of using pumps as turbines for water desalination was discussed and it was agreed that it depends mainly on the cost of energy resources in each country. Participants agreed that planning for projects from the start is easier and more efficient than retrofitting. Furthermore, optimality depends on local context and matching and building on the local human capacity base is very important for adopting new technologies.

Pilot Initiative III:

Renewable Energy Use for Groundwater Pumping for Irrigation in Egypt

36. The Pilot Initiative was presented by Ministry of Electricity and Renewable Energy in Egypt with an intervention from the Ministry of Water and Irrigation. The aim was to evaluate the technical and economic feasibility of using renewable energy to pump groundwater for irrigation in the one and a half million fadan project in the Moghra Area, Egypt. The assessment outcomes provided the most suitable PV systems with efficient and suitable technology for the studied site. This takes into account the impact of local conditions such as sand abrasion, extreme heat, large diurnal temperature variations, high levels of irradiation, dust, and similar conditions on the performance of equipment. Furthermore, the analysis of the expected balance of benefits and costs compares the proposed project scenario with the existing conditions and attempts to reveal

the positive and negative consequences of PV water pumping in the Moghra site, including social and environmental benefits and net cost and rate of investment returns.

37. The need to rationalize groundwater water use for irrigation purposes was emphasized in light of the deepening groundwater levels recorded across many parts of the Arab region. The importance of regulating water use to ensure sustainability of groundwater abstractions was also emphasized. Increasing the availability of accurate data from official sources on irrigated agriculture, costs of energy resources and water availability was recognized as a crucial step to the success of water-energy nexus projects. Furthermore, participants emphasized the need to address the socio-economic impact of such projects on local communities.

G. PURSUING THE NEXUS IN THE ARAB REGION: THE WAY FORWARD

38. ESCWA invited participants to discuss and deliberate on means for advancing the nexus paradigm in the Arab region. Discussions were organized along three main axes focusing on: (1) Legal and institutional strengthening and creating linkages across sector; (2) Information and assessment tools for enhancing nexus governance including data sharing, monitoring and modelling; (3) Finance, technology transfer and capacity building as means of implementation. Discussions were organized through the formation of three working groups each addressing one of the identified themes.

39. Group 1: Legal and institutional strengthening and creating linkages across sectors.

The group members emphasized the importance of appropriate institutional structures to support interlinkages within the water-energy nexus. The existing institutional arrangements for water and energy resources management in various Arab countries were presented and analysed. Assignment of a focal point in each line ministry was suggested as an effective means to enhance collaboration on water and energy interlinkages across ministries. The role of education and capacity building training programs in concerned ministries as well as awareness raising with regards to water-energy nexus issues was emphasized. Group members highlighted the instrumental role of the media in ensuring general acceptability and successful implementation.

40. Group 2: Information and assessment tools for enhancing nexus governance including data sharing, monitoring and modelling.

The group discussed information and assessment tools for enhancing nexus governance. There was consensus on the limited data availability and accessibility in most countries of the Arab region. Furthermore, interruptions in data collection is common in the Arab region as many countries are going through periods of political instability and unrest. Institutional arrangements for data governance vary from highly centralized data collection systems, dedicated ministries, to more decentralized options where steering committees within each line ministry are in charge of data collection and sharing. The link between official national data availability and accessibility and the relevance of research programs to government priorities was highlighted.

41. Suggestions to improve information and assessment tools for enhancing nexus governance included putting in place regional platforms for sharing data and information, standardization of data collection methodologies over the Arab region, assignment of national focal points for the collection and dissemination of water-energy nexus data. The existing data collection mechanism in many countries of the region for the collection of SDG indicators could be expanded and built upon to collect water-energy nexus relevant data.

42. Group 3: Finance, technology transfer and capacity building as means of implementation.

The group emphasized the lack of financial and institutional infrastructure in the Arab countries to support an effective technology transfer. There is an absence of vision, strategies and policies to guide technology transfer for energy and water production and development. Traditional financial arrangements are still prevalent with little options for innovative financing tools and mechanisms. Most of the Arab countries are characterized by poor exchange and communication among the private and public sector, research and academia as well as NGOs. The importance of the social and economic impacts of new technologies was highlighted, specifically that most technological transfers in the region are controlled by the private sector which commonly overlook the impact on recipient communities.

43. Recommendations of the working group focus on the need to consolidate and enhance infrastructure for technology transfer. The implementation of efficient novel technologies should consider the suitability to the national context, social and economic impacts on recipient communities as well as sustainability issues. Regional efforts should focus on strengthening research and development programs, regulating the involvement of the private sector, capacity building of locals for better know-how and expertise, put in place monitoring and evaluation framework for the applied technology. Facilitating access to finance is a key element to the success of technology transfer, mainly through the support to Private Public Partnerships, privatization schemes, liberalization of the energy and water markets and the protection of intellectual property among others.

H. CLOSING SESSION

44. The workshop sessions were closed by Ms. Carol Chouchani Cherfane, Chief of the Water Resources Section, and Ms. Radia Sedaoui, Chief of the Energy Section, Sustainable Development Policies Division, from the Sustainable Development Policies Division at UN-ESCWA. The closing statements emphasized the final workshop as the culmination of activities and efforts undertaken under the UNDA project on developing the capacity of ESCWA member countries to address the water and energy nexus for achieving sustainable development goals. Follow-up activities will focus on putting into practice the water energy nexus concepts developed through the exchange of experiences, lessons learned and enhanced knowledge of the water and energy interlinkages throughout the project duration.

IV. ORGANIZATION OF WORK

A. VENUE AND DATE

45. The Final Regional Policy Workshop on the Water-Energy Nexus was organized from 11 to 12 December 2017 in Beirut, Lebanon.

B. OPENING

46. The meeting was formally opened by Ms. Carol Chouchani Cherfane, Chief of the Water Resources Section, Sustainable Development Policies Division, UN-ESCWA and Ms. Radia Sedaoui, Chief of the Energy Section, Sustainable Development Policies Division, UN-ESCWA.

C. PARTICIPANTS

47. The workshop was attended by around 50 participants including members of the ESCWA Committee on Energy and ESCWA Committee on Water Resources or their delegated representatives. Furthermore, associated stakeholders representing water and energy ministries as well as representatives from specialized Arab and international organizations contributed to the deliberations and enriched discussion and exchange of ideas.

D. AGENDA

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

- a) Opening statements
- b) Water and Energy Nexus Regional Initiatives
- c) National and International Experiences in Applying the Nexus
- d) Resource Efficiency within the Context of the Water-Energy Nexus
- e) Renewable Energy within the Context of the Water-Energy Nexus
- f) Technology Transfer within the Context of the Water-Energy Nexus
- g) Water-Energy Nexus Project Pilot Initiatives
- h) Pursuing the Nexus in the Arab Region: The Way Forward
- i) Closing Statements.

E. EVALUATION

49. An evaluation questionnaire was distributed to participants to assess the relevance, effectiveness and impact of the meeting. The feedback received was positive with all participants rating the overall quality of the meeting as good to excellent. The majority of the participants found that the meeting achieved its objectives and all agreed that their expectations were met.

50. The preparation of the workshop in terms of clarity of objectives was rated as good to excellent. Participants also considered their expertise as well as that of the other experts was well suited to the workshop subject. Almost all submitted questionnaires indicated that the meeting represented a good to excellent forum for exchange of information with other experts and provided input for future work. The quality of the written materials circulated by ESCWA and the clarity of presentations delivered during the workshop were evaluated as good to excellent by almost all participants. Two thirds of the participants thought that the meeting duration was appropriate whereas almost a quarter considered that a longer workshop duration would allow better coverage of the relevant subjects. Participants unanimously were in favor of follow-up action on the workshop. The most cited areas of interest for follow-up activities included continuous information sharing with regards to the progress in implementing pilot projects as well as field visits to learn more about details of project implementation in order to facilitate replication to other countries of the region. In addition, additional capacity building workshop on the various aspects of the water-energy nexus were mentioned.

ANNEX

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