



Economic and Social Commission for Western Asia (ESCWA)**REPORT****INTERGOVERNMENTAL CONSULTATIVE MEETING ON THE WATER
AND ENERGY NEXUS IN THE ESCWA REGION
BEIRUT, 27-28 JUNE 2012****Summary**

The Economic and Social Commission for Western Asia (ESCWA) hosted the intergovernmental consultative meeting on the water and energy nexus in the ESCWA region. The meeting aimed to initiate reflection on issues related to the interrelation between water and energy sectors and to identify priorities for further research and interest from ESCWA member countries on that subject matter. The goal of the meeting was also to examine the possible mechanisms and institutional arrangements to organize coordination and harmonization of water and energy sector policies.

Participants focused on ways to enhance the concept of the water and energy nexus through the establishment of institutional and technical mechanisms to better approach the Nexus topic. They made a number of recommendations and set priority issues for the actions of the Committee on Energy and the Committee on Water Resources at ESCWA.

Two separate meetings were also held by each of the two ESCWA committees.

This report contains a brief account of the discussions held at the meeting and the recommendations that were issued by the participants.

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Introduction

1. The issues of energy and water are strongly interrelated: on the one hand, energy is used to extract underground water and to power desalination processes, to run water treatment and pumping plants and to insure appropriate transportation and distribution of water. Energy is also used to collect wastewater and operate its treatment stations. On the other hand, water is essential for fossil fuel production and processing and for energy production, (in conventional thermal power plants, in hydropower plants and in renewable energy applications). Water also provides the heat transfer medium for cooling or heating in a number of industrial operations and has other various uses.
2. Arab countries face mounting challenges in the water and energy sectors because of population pressure but also environmental pressure such as lack of water, desertification, pollution, global warming and climate change. Therefore, there is a need for a new, comprehensive and systematic methodology to approach the water and energy nexus in a sustainable way.
3. Understanding the dynamics of the water-energy nexus is essential to develop appropriate strategies for the interrelated use of these two resources in a comprehensive and sustainable manner throughout the region.

I. RECOMMENDATIONS

A. ON THE QUESTIONNAIRE ABOUT THE WATER-ENERGY NEXUS AND ON PRIORITIZING ACTION IN THE FIELD

4. The meeting discussions led to the following recommendations:
 - (a) Participants should assign ranks to the seven priorities for future activities in the water-energy nexus field, which were agreed upon during the meeting. They should discuss their priority ranking with stakeholders in their countries, with a view to reflecting the official national position. Priority ranking forms should be submitted to the Economic and Social Commission for Western Asia (ESCWA) within a week of their reception;
 - (b) Members of the Committee on Energy and the Committee on Water Resources should revise the information previously provided in the first and second part of the questionnaire on the water-energy nexus, namely “Institutional and organizational aspects” and “Statistical data”;
 - (c) Participants should then complete the questionnaire in its final version and submit it to ESCWA by 31 August 2012. They can rely on ESCWA for any clarifications when needed.

B. ON THE JOINT ACTION OF THE COMMITTEE ON ENERGY AND THE COMMITTEE ON WATER RESOURCES

5. The meeting discussions led to the following recommendations:
 - (a) The two committees should hold joint biennial meetings, outside the timings of their respective regular sessions;
 - (b) The two committees should reconsider the details of implementation of their joint action programme during their regular sessions, in the light of the new priority ranking that would be adopted after the consultative meeting;
 - (c) The two committees should establish joint work groups for each of the priority topics of future activities.

II. TOPICS OF DISCUSSION

A. OVERVIEW OF THE WATER AND ENERGY NEXUS IN THE REGION

6. Mr. Abdullah Ali Abdullah, Chief, Water Conservation Section, Electricity and Water Authority, Bahrain, opened and moderated the first session, in which three topics were discussed as follows:

(a) Ms. Roula Majdalani, Director of the Sustainable Development and Productivity Division (SDPD) – ESCWA presented the “Results of the United Nations Conference on Sustainable Development (Rio+20) regarding the Water-Energy-Food Nexus.” She first made an overview of the Rio+20 Conference and summarized the main items of its outcome document, “The future we want”, in which participants addressed the subject of the green economy as one of the available paths for achieving sustainable development. She then highlighted some of the Rio+20 recommendations in the sectors of food, water and energy, namely: revitalization of the agricultural and rural development sectors; enhancement of the access of agricultural producers to appropriate and affordable technologies for irrigation, reuse of treated wastewater and water harvesting and storage; and provision of universal access to water and sanitation services and sustainable energy. She underlined the fact that the Arab participation at the conference was coordinated and coherent concerning all discussed issues;

(b) Mr. Walid al-Deghaili, Chief of the Energy Section, SDPD, ESCWA, presented an “Overview of the Water and Energy Nexus in the ESCWA region”. He reviewed the uses of water for energy-related purposes; the uses of energy for water-related purposes; the characteristics of the water and energy sectors in ESCWA countries and how they were affected by climate change; and ESCWA subprogramme 1: integrated management of natural resources for sustainable development. He discussed regional trends in the water and energy sectors and the related alternative options. He highlighted the need for considering social, environmental and economic aspects when identifying possible options, and emphasized the importance of regional cooperation and of partnership between private and public actors to achieve water and energy security. He also pointed out the benefits of using renewable energy to treat and produce drinking water and the need to consider productivity and integration as priorities in managing the water and energy sectors;

(c) Mr. Walid al-Zubari, Head of the Scientific Committee of the Water Science and Technology Association (WSTA), presented the “Outcomes of the tenth Gulf Water Conference on Water-Energy-Food Nexus”. He highlighted one of the main challenges that countries of the Arab Gulf are faced with: providing water, energy and food sustainably in the context of economic growth and population increase. Moreover, he underlined the need for adopting integrated planning and management policies for the food, energy and water sectors. He also showed the need for scientific research to fill the gaps of knowledge regarding the water-energy nexus and said that universities and research institutes should be encouraged in adopting research programmes to improve understanding on that topic. In further discussions, Mr. al-Zubari pointed out the importance of renewable energy sources in water desalination, with a view to reduce its costs. He also clarified that what was meant by energy was not only electricity but the broader concept including all kinds of energy from all possible sources.

7. General discussions of the first session focused on the importance of finding water sources that would require less energy consumption for its extraction. Participants also stressed the need for an atlas of available energies in Arab countries and an atlas of water that could be produced at a lower cost.

B. REGIONAL MAPPING OF WATER –ENERGY LINKAGES

8. Mr. Jamal Othman Abu Bekr Suleiman, Director General of the Ministry of Petroleum, Sudanese Petroleum Corporation, the Sudan, opened and moderated the session, in which Mr. Monji Bida, First Economic Affairs Officer of the Energy Section, ESCWA, presented the “Results of Part I(A) of the questionnaire on the Water and Energy Nexus - Institutional and organizational aspect.” He reviewed non-statistical general information on the reality of the water and energy nexus, particularly on the following

subjects: production and treatment of fresh water in public supply networks; private water supply systems; water supply transmission and distribution systems; wastewater drainage and treatment systems; private wastewater treatment systems; information on the consumption of fresh or recycled water; hydroelectric power generation; and mechanisms of local coordination of energy and electricity resources.

9. During discussions, participants highlighted the importance of the questionnaire as it treated valuable information. Countries should be given a second chance to check the accuracy of information provided in the light of a guiding booklet to be annexed to the questionnaire. The institutional status of the specialized bodies in charge of completing the questionnaire was also discussed along with the need for coordination between authorities to provide accurate and updated information. One of the participants also suggested the establishment of a database for the information sought in the questionnaire. The moderator of the session underlined the benefits of modifying the questionnaire analysis to further highlight successful experiences of countries dealing with the nexus and thus promote exchange of experience between countries. Mr. Walid al-Deghaili finally concluded with underlining the consensus that has been reached: the questionnaire should be returned to participants for final revision, developed and annexed with a guiding booklet to clarify needed information. He noted that, since the information was more likely to be provided by experts than by official authorities, it should therefore mainly be used to provide ideas and future trends.

C. BRAINSTORMING ON KEY NATIONAL AND REGIONAL ISSUES RELATED TO THE INTERRELATION BETWEEN WATER AND ENERGY IN THE REGION

10. Mr. Walid al-Zubari, Head of the Scientific Committee of WSTA, opened and moderated the session which tackled the following issues:

(a) The most important national and regional stakes of the water and energy nexus in the ESCWA region and member countries;

(b) The institutional structure of the water and energy sectors in ESCWA member countries, in a presentation given by Mr. Walid al-Deghaili, Chief of the Energy Section, SDPD, ESCWA;

(c) The institutional mechanisms for dealing with the water-energy nexus stakes in the ESCWA region and member countries: existing structures and gaps.

11. During the first discussion, participants tackled the topic of the most important national and regional stakes of the water and energy nexus in the ESCWA region and member countries and mentioned various issues including:

(a) The need for annual balance sheets for water and energy, which could be issued with help from ESCWA through the preparation of special legislations for that matter;

(b) The need to focus on water culture in countries and to familiarize citizens with water sources and the amount of water available, leading to a community response to the directives on rationalization of water consumption and improvement of energy and water efficiency;

(c) The need for an approach that links water sustainability with energy sustainability, considering the scarcity of both water resources and agricultural lands versus the abundance of fossil fuels and solar energy in the ESCWA region;

(d) The need to improve the efficiency of energy consumption in various water systems;

(e) The need to concentrate on renewable energy sources;

(f) The need to support the right of ESCWA member countries to their water resources;

(g) The need to apply international legislations on transboundary water;

(h) The need to benefit from studies prepared by ESCWA on water and energy issues as data and information bases;

(i) The need to follow governments' and water institutions' recommendations by reducing water losses in networks, considering that wasting water equals wasting energy;

(j) The need for governments to specify the cost of water production and of energy production as a first step towards integrated planning for water and energy;

(k) The need to give climate change the required attention, as it has a direct impact on water scarcity;

(l) The lack of efficiency of electricity systems and the increase in demand on water and electricity.

12. On the topic of the cost of water production, Mr. Walid al-Zubari considered that it was already known for Arab Gulf countries and amounted to US\$1.50 per cubic meter, while Mr. Walid al-Deghaili stressed that studies of costs needed to be more transparent and based on the measurement of all technical details involved, with a view to reaching the accurate cost of production of desalinated water.

13. Mr. Walid al-Deghaili presented the institutional structure of the water and energy sectors in ESCWA member countries and specified their characteristics as follows:

(a) The institutional structures established in the water and energy sectors are generally of governmental nature, but there are exceptions;

(b) Some countries combine energy and water activities, others separate the oil sector;

(c) The water and electricity sectors are combined at the level of ministries or companies and public institutions;

(d) Countries tend to privatize their water and electricity production sectors.

14. A discussion followed on the institutional mechanisms that should be established to deal with the issues of the water and energy nexus in the ESCWA region and member countries. All participants consented to the necessity of coordination and joint planning between all institutions and ministries that deal with water and energy issues. Other topics were also tackled, such as the privatization of production and distribution sectors, a process in which citizens should become first partners of their governments.

D. MAPPING THE INFORMATION GAP AND APPROACHES TO ADDRESS THIS ISSUE

15. Mr. Said Ben Ali al-Duair, Director General of the Water Resources Development Department, Ministry of Water and Electricity, Saudi Arabia, opened and moderated the fourth session in which participants examined gaps and obstacles in information availability and the means to overcome them. The session included:

(a) A presentation of the results of the questionnaire –part (B): questionnaire on the Water and Energy Nexus - statistical data, given by Mr. Ali Karnib, an expert affiliated with the cooperation project between ESCWA and the Federal Institute for Geosciences and Natural Resources (BGR);

(b) A review of barriers that impede a better dealing with water and energy nexus issues in the region.

16. Mr. Ali Karnib's presentation included the following:
- (a) An overview on water resources;
 - (b) A study of the interrelationship between water and energy in the following issues:
 - (i) Water production and purification;
 - (ii) Water transmission and distribution;
 - (iii) Sanitation;
 - (iv) Water consumption.
17. The presentation led to the following conclusions:
- (a) *On water production and purification*
 - (i) The rate of energy consumption in surface water applications was not available;
 - (ii) The rate of energy consumption for producing water using desalination processes was 3.5 kWh per m³;
 - (iii) The rate of energy consumption for producing water using underground extraction processes was not available, noting that the best practice rate would be 0.5 kWh per m³ for a depth of 100 m;
 - (iv) Future trends in ensuring the required amount of water would rely on sea water desalination, one of the highest energy-consuming sources;
 - (v) Future trends in operations of water production and purification would rely on the private sector.
 - (b) *On water transmission and distribution*
 - (i) Materials used for pipes of freshwater distribution networks were mostly metal and plastic;
 - (ii) Future trends would be to reduce the amount of concrete pipes, which would help reduce water loss and improve the efficiency of transmission and distribution networks;
 - (iii) Current estimated ratios of water leaks in transmission and distribution networks were higher than best practice ratios, but future trends would be to reduce those ratios, which would necessarily lead to the reduction of the rate of energy consumption;
 - (iv) The current rate of energy consumption in water transmission and distribution networks varied in member countries from 0.5 to 2 kWh per m³. These rates were to increase in the future, varying between 1 and 5 kWh per m³;
 - (v) The questionnaire showed the need to monitor and organize the energy consumption linked to water transmission and distribution, with a view to reducing its costs to a minimum.
 - (c) *On sanitation*
 - (i) The rate of energy consumption in sewerage networks was higher than the best practice figures;
 - (ii) Wastewater treatment plants mostly used aerobic technologies, whereas the climate in the region encouraged the use of anaerobic technologies;

- (iii) Energy recovered from wastewater treatment plants was almost inexistent, whereas the best practice rate was around 0.1 kWh per m³;
- (iv) The rate of energy consumption in wastewater treatment plants was low relatively to best practice rates.

18. Mr. Ali Karnib had indicated that data available were based on experts' opinions, meant to stimulate debate and highlighted the current situation and could not be considered accurate and official statistical data.

19. During interventions, participants focused on the need for countries to calculate energy consumption rates related to different water systems and on the potential contribution of ESCWA in that regard. They also underlined the need for determining wastewater treatment techniques that would be most appropriate and feasible, considering the climatic conditions that characterize the region and knowing that the study conducted in Lebanon demonstrated the feasibility of using anaerobic technology. Some participants asked for a comparative study on aerobic and anaerobic wastewater treatment technologies, to be conducted prior to any decision on plants and to identify new technologies to save energy in water systems. Mr. Walid al-Zubari also suggested that ESCWA should further examine aspects of the water and energy nexus in the region and establish a database, helping to fill gaps of knowledge on that topic.

E. PRIORITIES OF ACTION PLANS IN THE NEXUS FIELD

20. Ms. Carol Chouchani Cherfane, Chief of the Water Resources Section, SDPD, ESCWA, opened and moderated the fifth session which focused on modalities for identifying priorities for the joint work programme of the Committees on Water Resources and Energy. Participants discussed issuing a list of water and energy issues to be dealt with and a list of criteria to set priorities, with a view to preparing the joint programme of work of the Committee on Energy and the Committee on Water Resources. Their list of criteria included the following:

- (a) Raising awareness and disseminating knowledge;
- (b) Improving harmonization of public policies;
- (c) Examining the link between water security and energy security;
- (d) Improving efficiency;
- (e) Increasing knowledge of technological choices;
- (f) Promoting renewable energy;
- (g) Integrating climate change and natural disasters factors in decision making.

F. PRIORITY RANKING AND FUTURE STEPS

21. Ms. Carol Chouchani Cherfane, opened and moderated this session in which participants examined the future steps that should be undertaken. They agreed to address their list of priorities to the members of the Committee on Energy and the Committee on Water Resources, who should assign ranks of importance to those priority issues : three would be assigned to an issue of great importance; two to an issue of average importance and one to an issue of limited importance.

22. Fourteen answers were submitted and results were as follows:

Priority issues for ESCWA stakeholder committees	Ranking			Total
	Of great importance (3)	Of average importance (2)	Of limited importance (1)	
Increasing knowledge and awareness raising	12 x 3	2 x 2	-	40
Increase policy coherence	11 x 3	2 x 2	1	38
Examining water-energy security nexus	10 x 3	4 x 2	-	38
Improving efficiency	12 x 3	2 x 2	-	40
Increasing knowledge of technological choices	10 x 3	4 x 2	-	38
Promoting renewable energy	10 x 3	3 x 2	1	37
Climate change and natural disasters	6 x 3	8 x 3	-	34

23. Therefore, the order of criteria according to priority levels becomes the following:

Priority	Criteria	Total
1	Increasing knowledge and awareness raising	40
1	Improving efficiency	40
2	Increase policy coherence	38
2	Examining water-energy security nexus	38
2	Increasing knowledge of technological choices	38
3	Promoting renewable energy	37
4	Climate change and natural disasters	34

III. ORGANIZATION OF WORK

A. VENUE AND DATE OF THE MEETING

24. The “Intergovernmental consultative meeting on the water and energy nexus in the ESCWA region” was held at ESCWA, in the United Nations House in Beirut, on 27 and 28 June 2012.

B. OPENING

25. At the opening session, Mr. Nadim Khouri, Deputy Executive-Secretary of ESCWA, delivered a speech in which he highlighted the importance of the Water and Energy Nexus in ESCWA countries. He noted the paradoxical situation of ESCWA member countries which hold 52.9 per cent of the world’s proven oil reserves, 25.3 per cent of the declared reserves of gas and are also a mine of renewable energy, but are nevertheless the poorest in freshwater resources. There lies the importance of taking the water-energy nexus into consideration for building strategies on water, energy and the environment. Mr. Khouri also underlined the goals of the meeting: setting priorities for the joint work programme of the Committees on Energy and Water Resources and coordinating efforts between member countries in energy and water sectors.

26. Mr. Adel Yahya al-Haddad, Chairman of the ninth session of the ESCWA Committee on Water Resources and Deputy Minister for Water Affairs, Ministry of Water and Environment, Yemen, then gave a speech in which he praised the efforts, concern and support of ESCWA and its close follow-up of issues raised by member countries. He highlighted the importance of setting priorities, examining mechanisms and institutional arrangements and organizing coordination regarding policy harmonization in the water and energy sectors.

27. Mr. Mustafa Ibrahim Khamis, Vice-Chair of the eighth session of the ESCWA Committee on Energy and Deputy Minister for Authorities Follow-up, Ministry of Electricity and Energy, Egypt, delivered a speech in which he presented the Egyptian experience in water desalination using solar energy and wind power. He also pointed out the feasibility studies prepared to evaluate the use of nuclear power in sea water desalination and electricity generation. He informed the participants that methane gas, used to generate energy, was being extracted from a wastewater treatment plant.

28. Ms. Carol Chouchani Cherfane concluded the opening session by reviewing the agenda and focus of the intergovernmental consultative meeting.

C. PARTICIPANTS

29. Members of the Committees on Energy and Water Resources, ESCWA, participated in the meeting along with designated experts from ESCWA member countries.

D. OBJECTIVES

30. The meeting aimed to initiate reflection on issues related to the water and energy nexus and to set priorities for the action of ESCWA member countries in that field. Participants also examined possible mechanisms and institutional arrangements to organize coordination and policy harmonization efforts in the sectors of water and energy.

E. AGENDA

31. The agenda of the meeting included the following items:

“Welcoming and opening statements;

Session 1. Overview of the water and energy nexus in the region:

- Outcomes of the United Nations Conference on Sustainable Development (Rio+20) on the water-energy-food security nexus;
- Overview of the water-energy nexus in the region;
- Outcomes of the tenth Gulf Water Conference on Water-Energy-Food Nexus.

Session 2. Regional mapping of water-energy linkages:

- Findings of the questionnaire, part I: “Water-Energy Nexus: Organizational and Institutional Aspects”.

Session 3. Brainstorming on key national and regional issues related to the interrelation between water and energy in the region:

- Important national and regional issues related to the interrelation between water and energy in the region;
- Institutional structure of water and energy sectors in ESCWA member countries;
- Institutional mechanisms to address water-energy nexus issues in ESCWA member countries: existing structures and gaps.

Session 4. Mapping the information gap and approaches to address this issue:

- Findings of the questionnaire, part II: “Water-Energy Nexus: Statistical Findings”.

Session 5. Priorities of action plans in the nexus field:

- Formulating a list of water and energy issues for further study;

- Identifying criteria to set priorities in preparing the joint IGM work programme.

Session 6. Priority ranking and future steps:

- Identifying priorities for the joint intergovernmental work programme of the Committees on Water Resources and Energy (based on the criteria identified in session 5);
- Recommendations and next steps.”

IV. EVALUATION

32. An evaluation form was filled out by participants and submitted to ESCWA for analysis. The following was concluded: (a) the goals of the meeting were reached to a great extent (100 per cent); 95 per cent of the participants agreed that the organizational arrangements before and during the meeting were good and very good; (b) 89 per cent of the participants considered that the presentations were clear and very clear; (c) 84 per cent of the participants said that the meeting was a good and very good opportunity to exchange information, 89.5 per cent of them said that the meeting helped in making good and useful contacts and 79 per cent of the participants thought that the meeting was good and very good regarding future benefits of its outcomes; (d) all of the participants (100 per cent) asked for meeting follow-up activities.

Annex*

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