



**REGIONAL CONSULTATION  
ON  
INNOVATION STRATEGIES FOR SUSTAINABLE DEVELOPMENT  
THROUGH WATER-ENERGY-FOOD NEXUS**

28-29 June 2017

Conference Room 3 (CR-3), United Nations Conference Centre (UNCC), Bangkok, Thailand

*Organized by*  
Asian and Pacific Centre for Transfer of Technology (APCTT)  
of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP),  
New Delhi, India

*In cooperation with and hosted by*  
Thailand Institute of Scientific and Technological Research (TISTR), Ministry of Science,  
Technology and Innovation (MOST), Thailand

**Background**

Over the past two decades, rapid economic growth has lifted more than 660 million people out of poverty, and the Asia-Pacific region in particular has experienced the fastest economic growth in history. However, this growth has come at a price: environmental degradation, economic uncertainty, and widening gaps between rich and poor, urban and rural areas<sup>1</sup>. Globally there has been an increased interest on the concept of Sustainable development and its application in regional and national contexts. Sustainable development recognizes that the economic growth must be inclusive and based on an environmentally sound strategy to reduce poverty without compromising the ability to meet the needs of future generations. It is based on a new development paradigm that harmonizes economic, social and environmental priorities for generating shared and sustained prosperities.

Of all natural resources, water, food and energy are the most critical ones for sustaining life on the planet. These three resources share many common features: there are billions of people without access to them; they have a rapidly growing global demand; all face resource

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<sup>1</sup> Source" <http://www.unescap.org/sustainable-development>

constraints; all three are “global goods” involving international trade with global implications; each has different regional availabilities and variations in supply and demand; and all operate in heavily regulated markets<sup>2</sup>. Moreover, global water cycles, carbon energy cycle, food production and climate change are intrinsically linked. Because of these reasons, they present severe challenges for human security as they are fundamental to the functioning of society<sup>3</sup>.

Water, food and energy resources are highly interconnected even from a policy perspective. Agriculture sector is the largest consumer of water globally. To ensure adequate food production to meet the increasing needs of a rapidly growing world population, there is a need for more water and energy. On the other hand, producing energy requires water to cool power plants and produce biofuel, while making water accessible and clean for human consumption demands energy. According to UN estimates, by 2030 we will need 30% more water, 45% more energy and 60% more food. Understanding the complex relationship between water, energy and food systems has become critically important to the development of a sustainable and secure future for all nations and regions<sup>4</sup>. The nexus perspective focuses on the interdependence of water, food and energy by understanding the challenges and finding opportunities. The nexus approach recognizes the inter-connectedness of water-energy-food across space and time. Its objectives are to: improve energy, water and food security; address externality across sectors and decision-making at the nexus; and support transition to sustainability. Towards addressing these challenges, the sustainable development agenda adopted by the United Nations in September 2015 have set a specific Sustainable Development Goals (SDGs) focused on food security (SDG 2), water security (SDG6) and energy security (SDG 7). Apart from these specific goals, there are several other interconnected SDGs that cannot be achieved without a sound strategy to sustainably manage the water-energy-food resources.

This regional consultation organized in partnership with the Thailand Institute of Scientific and Technological Research (TISTR) and the Ministry of Science and Technology of the Royal Thai Government is part of the ongoing activities of APCTT to strengthen the capacities of countries in the Asia-Pacific region to meet the developmental challenges related to water, energy and food security. In particular, this meeting will focus on innovative policy mechanisms for managing these resources effectively to promote growth in developing countries in a way that is both socially inclusive and environmentally sustainable. It is envisaged that APCTT would facilitate sharing of experiences, best practices as well as lessons from unsuccessful initiatives towards addressing the key challenges involved in effective management of water-energy-food resources. The Consultative Meeting would discuss and recommend relevant action plans and strategies for achieving the above objectives. These recommendations will also be presented at the UNDESA-ESCAP Symposium on “Progress on SDG 7 and its Interlinkages with other SDGs in support of First Review of SDG7 during the 2018 High-Level Political Forum” scheduled to be held during 28-30 June 2017 in Bangkok, Thailand.

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<sup>2</sup> Source: Bazillian, M., and others. 2012. Considering the energy, water and food nexus: towards an integrated modeling approach. *Energy Policy*, vol. 39, pp. 7896-7906

<sup>3</sup> Source: <http://www.unescap.org/sites/default/files/Water-Food-Nexus%20Report.pdf>

<sup>4</sup> Source: <https://iep.berkeley.edu/node/9735>

## **Objectives**

- To facilitate knowledge sharing within the region on innovative policy mechanisms for meeting challenges for sustainable management of water-energy-food resources
- To broaden the understanding on international and regional dimensions of water-energy-food nexus for aligning national developmental priorities
- To brainstorm on effective policy interventions that could leverage the interconnectedness of water-energy-food related SDGs for accelerating the progress in achieving them
- To learn about latest technology advances and technological trends for driving water-energy-food efficiencies
- To gather regional perspectives as well as to receive recommendations as inputs to the First Review of SDG7 during the 2018 High-Level Political Forum

## **Expected Outputs**

- Presentations on national as well as regional scenarios and best practices in policy formulation for addressing challenges related to water-energy-food
- A policy brief on innovative strategies and policy mechanisms for achieving the SDGs related to water-energy-food at the regional level
- Recommendations with relevant action plans and strategies for fostering regional cooperation as well as for overcoming barriers to water-energy-food efficiency initiatives

## **Expected Outcomes**

- Improved understanding of the current scenario related to policy formulation for addressing challenges related to water-energy-food at the national and regional levels
- Increased awareness and knowledge of key issues, major challenges, lessons learnt and leading practices in the effective management of challenges related to water-energy-food resources
- Enhanced knowledge on various policy options available for meeting sustainable development challenges related to water-energy-food at the national as well as regional levels
- Awareness on latest technology advances for driving water-energy-food efficiencies
- Formation of a collaborative network to enable further discussions and knowledge sharing within the region going forward

## **Organizers**

- This Conference is organized by the Asian and Pacific Centre for Transfer of Technology (APCTT) of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in partnership with the Thailand Institute of Scientific and Technological Research (TISTR) and the Ministry of Science and Technology of the Royal Thai Government

## Participants

- Senior experts involved in water-energy-food sectors in ESCAP Member States
- Government officials and representatives from academia, public institutions, development organizations and the private sector in Thailand
- Representatives from the United Nations and other international organizations based in Thailand working on water-energy-food nexus related issues

## **Tentative Programme**

<b>Regional Consultation on Innovation Strategies for Sustainable Development through Water-Energy-Food Nexus</b>		
<b>28 June 2017 (Wednesday)</b>		
08:15-09:00	Registration	
<b>OPENING SESSION:</b>		
09:00-09:30	Welcome Remarks	Ms. Michiko Enomoto, Head, APCTT-ESCAP
	Welcome Remarks	Dr. Luxsamee Plangsangmas, Governor, Thailand Institute of Scientific and Technological Research (TISTR)
	Opening Address	Mr. Hongjoo Hahm, Deputy Executive Secretary for Programmes, United Nations ESCAP, Bangkok, Thailand
	Inaugural Address	H.E. Dr. Atchaka Sibunruang, Minister of Science and Technology, Thailand
	<b>Group Photo</b>	
09:30-10:00	<b>Tea / Coffee</b>	
<p><b>SESSION I: Sustainable Development through Water-Energy-Food Nexus – Global and Regional Perspectives</b></p> <p>Water, food and energy are strategic resources sharing many comparable attributes. The current understanding on the interconnectedness of water-energy-food related challenges and their regional implications for achieving sustainable development goals is limited. This session elaborates on the complex and pervasive connections between water, food and energy security issues and their linkages with SDGs. This session also deliberates on possible policy interventions for accelerating progress in achieving SDGs related to water-energy-food at the regional level.</p> <p><b>Moderator:</b> Mr. Arunabha Ghosh, Chief Executive Officer, Council on Energy,</p>		

Environment and Water (CEEW), India		
10:00-10:30	Key Challenges for Developing Countries in Policy formulation and Implementation	Mr. Arunabha Ghosh, Chief Executive Officer, Council on Energy, Environment and Water (CEEW), India
10:30-11:00	WEF Experiences and Best Practices from ASEAN and East Asia	Mr. Anbumozhi Venkatachalam, Senior Economist, Economic Research Institute for ASEAN and East Asia (ERIA)
11:00-11:30	Challenges Related to Water-Energy-Food Nexus by Regions	Ms. Aiko Endo, Associate Professor, Research Institute for Humanity and Nature (RIHN), Kyoto, Japan
11:30-12:00	Examples of Nexus Approach from Different Regions of the World	Prof. Abdul Salam, Energy Field of Study, School of Environment, Resources & Development, Asian Institute of Technology (AIT), Thailand
12:00-12:30	<b>Q &amp; A</b>	
12:30-13:30	<b>Lunch</b>	
<p><b>SESSION II: Application of Science, Technology and Innovation for Sustainable Management of Water-Energy-Food Resources</b></p> <p>The nexus approach acknowledges the close relationships between water, energy and food and also the fact that the use and management of one of these systems can affect the others. Science, Technology and Innovation (STI) play a vital role in helping us to understand how these three systems are interconnected to ensure water, energy and food security and sustainability for the future. A nuanced understanding of the nexus between these three critical elements is at the core of policymaking and implementation of strategies to ensure sustainability. When the nexus becomes unbalanced, there are direct consequences for human security, economy and the environment. This session deliberates on various STI strategies and initiatives for understanding the interrelationships between water, food and energy and to promote regional cooperation.</p> <p><b>Moderator:</b> Ms. Susan F. Stone, Director, Trade, Investment and Innovation Division (TIID), ESCAP</p>		
13:30-13:50	Technology Transfer Platforms and Mechanisms for Achieving SDGs 2, 6 & 7	Mr. Krishnan Srinivasaraghavan, Coordinator, Technology Transfer, APCTT-ESCAP
13:50-14:20	Policy, Science, Technology Interface for Water-Food-Energy Governance	Prof. Abdul Salam, Energy Field of Study, School of Environment, Resources & Development, Asian Institute of Technology (AIT), Thailand

14:20-14:50	Human-Environmental Security in Asia-Pacific Ring of Fire - Water-Energy-Food Nexus	Ms. Aiko Endo, Associate Professor, Research Institute for Humanity and Nature (RIHN), Kyoto, Japan
14:50-15:20	Q & A	
15:20-15:50	<b>Tea / Coffee</b>	
<p><b>SESSION III:Water-Energy-Food Nexus: Opportunities and Challenges for Policy Formulation from ASEAN+3</b></p> <p>Effective governance of the WEF nexus is based on the integration of the complex interlinkages between these resources. Policy coherence is critically important for effective integration between the W-E-F sectors. This session critically examines experiences, best practices and failure cases for enhanced understanding on the challenges and opportunities for policy formulation and how does policy coherence affect resource governance under the W-E-F nexus. This session also deliberates on experiences and best practices from India, China, Republic of Korea and ASEAN countries related to policy formulation and national governance framework related to WEF</p> <p><b>Moderator:</b> Ms. Aiko Endo, Associate Professor, Research Institute for Humanity and Nature (RIHN), Kyoto, Japan</p>		
15:50-16:05	Policies and Programmes related to WEF in China	Prof. Junguo Liu, Southern University of Science and Technology, Guangdong, China
16:05-16:30	WEF Policy Formulation in India	Mr. Arunabha Ghosh, Chief Executive Officer, Council on Energy, Environment and Water, India
16:30-17:00	Water Food Energy Nexus: Changing Scenarios in Recent Decades (Via VC)	Prof. Subimal Ghosh, Department of Civil Engineering, Indian Institute of Technology Bombay, India
17:00-17:15	National Policy Framework related to WEF	Dr. Sarjiya Antonius, Senior Researcher, Center for Biology, Indonesian Institute of Sciences (LIPI)
<b>29 June 2017 (Thursday)</b>		
<b>SESSION III:Water-Energy-Food Nexus: Opportunities and Challenges for Policy Formulation from ASEAN+3 (Contd.)</b>		
09:00-09:20	Water-Energy-Food Nexus: Policy Perspectives from the Asia Pacific Region : Keynote Presentation	Mr. Hongpeng Liu, Director, Energy Division, ESCAP
09:20-09:35	WEF Nexus Approach in Malaysia	Mr. Yun Shiang Ho, Principal Assistant Secretary, Foresight Division, Ministry of Science, Technology and Innovation

		(MOSTI), Malaysia
09:35-09:50	Policy Formulation and Governance related to WEF in Philippines	Mr. Norberto G Ambagan, Chief Science Research Specialist, Food Processing Division, Industrial Technology Development Institute(ITDI), Republic of Philippines
09:50-10:05	Thailand National Policy Framework on WEF	Mr. Surachai Sathitkunarut, Senior Director, STI Information and Foresight Centre, National Science Technology and Innovation Policy Office (STI), Thailand
10:05-10:20	Policies and Programmes related to WEF in Viet Nam	Mr. Van Chinh Le, Department of Social and Natural Sciences, the Ministry of Science and Technology of Viet Nam
10:20-10:35	Q & A	
10:35-10:45	<b>Tea / Coffee</b>	
<p><b>SESSION IV: Promoting Partnerships among Key Stakeholders for WEF Nexus</b></p> <p>There is increasing competition for resources among WEF, combined with a growing population, changing climate and land use. Technical and policy solutions that just address the challenges in one sector can have minimal impact or even be detrimental, as disruption and change in one part of the system can destabilize another part.. The water-energy-food nexus provides an opportunity to overcome sectoral “silos”, and to strive for interdisciplinary solutions when developing projects and initiatives that can have cross-sectoral benefits while being socially, economically and environmentally sustainable. Nonetheless, gaining continuous and stable momentum for cross-sectoral cooperation needs long-term commitment and adaptive and practical national, regional and global policies. This session deliberates on how innovative partnerships could transform the WEF scenario and help in achieving SDGs.</p> <p><b>Moderator:</b> Mr. Anbumozhi Venkatachalam, Senior Economist, Economic Research Institute for ASEAN and East Asia (ERIA)</p>		
10:45-11:15	Intergovernmental Networks for Collaboration in WEF	Mr. Anbumozhi Venkatachalam, Senior Economist, Economic Research Institute for ASEAN and East Asia (ERIA)
11:15-11:45	Perspectives from Academic Institutions and R&D Organizations	Ms. Aparat Mahakhant, Deputy Governor R&D for Sustainable Development, TISTR
11:45-12:15	Perspectives from Private Sector	Mr. Pornsil Patchrintanakul, President, Thai Feed Mill Association
12:15-12:30	Role of Knowledge Networks in	Mr. Satyabrata Sahu,

	Promoting Partnerships in WEF	Coordinator, Technology Intelligence, APCTT-ESCAP
12:30-13:00	Q & A	
13:00-14:00	<b>Lunch</b>	
<b>SESSION V: Policy Recommendations and Preparation of a Roadmap for Fostering Regional Cooperation on WEF</b>		
<b>Moderators:</b> Mr. Arunabha Ghosh, CEEW and Ms. Michiko Enomoto, APCTT-ESCAP		
14:00-15:00	Panel discussion	All experts
15:00-15:30	Summary and Recommendations	
15:30-15:45	Closing Remarks	APCTT-ESCAP TISTR/MOST Thailand
15:45-16:00	Tea/Coffee	