



Economic and Social Commission for Asia and the Pacific In collaboration with United Nations Human Settlement Programme

Regional Policy Workshop of Stakeholders on Decentralized Waste Water Treatment Systems (DEWATS) in Southeast Asia (SEA) 19 – 21 March, 2014, UNCC, Bangkok, Thailand

Key Conclusions for the Way Forward on Enabling DEWATS in the SEA Region

Participants of the Regional Policy Workshop of Stakeholders on DEWATS in SEA, considering the current status of DEWATS in the pilot countries, reviewing good practices in the region, and bearing in mind policy, institutional, technological and financial frameworks to enable wastewater treatment and sanitation systems, arrived to the following key conclusions (ref: Chapter III):

- The national vision of DEWATS in each of the pilot countries should be developed through a participatory and interactive series of discussions, with implementation strategies, integrated in national planning, to be agreed upon at the national workshops in Cambodia, Lao PDR, Viet Nam;
- The endeavor to encourage technology and knowledge transfer among SEA countries, national and regional networks, while three national sanitation consortia will be developed to ensure the sustainable implementation of DEWATS programs through continued institutional strengthening; and
- The Regional Centre on DEWATS will be identified by ESCAP in consultation with partners to serve as a "Centre of Excellence," to provide policy and planning advices to the National Governments, to function as a referral hub on technical, environmental, financial, social and operational aspects of DEWATS, and to support capacity building.

I. WORKSHOP BACKGROUND AND SUMMARY

By 2011 the population of the Asia-Pacific region without access to safe and drinking water was halved from 1990 levels, but the sanitation-related component of the target is still far from being achieved.¹ According to a WHO-UNICEF report of 2010: 10.3 million people in Cambodia, 2.9 million in Lao PDR and nearly 21.8 million people in Viet Nam did not have access to improved sanitation.² The lack of sanitation and wastewater treatment leads to fecal contamination of fresh water sources, endangering the health of the population at large.

The 2nd Asia-Pacific Water Summit on "Water Security: Leadership and Commitment, with special focus on water disaster challenges" (Chiang Mai, 2013), focused on regional solutions and policy frameworks, has highlighted that universal access to water supply and to sustainable sanitation in the region by 2025 requires regional commitment, leadership, legal frameworks and training system³. Strengthening further

¹ ESCAP, 2013, Statistical Yearbook

² WHO-UNICEF Joint Monitoring Report: Progress on Sanitation and Drinking Water 2010 update in 2008

³ 2nd Asia Pacific Water Summit, Chiang Mai, Thailand, 19 May, 2013. Summary of the Focus Area Sessions (<u>http://apws2013.files.wordpress.com/2013/05/fas-summaries_260713.pdf</u>)

commitments to the wastewater revolution⁴ in the Asia-Pacific region also requires putting greater emphasis on resource recovery as part of wastewater management, as well as the adoption of appropriate centralized and decentralized management systems in urban and rural settlements.

Transforming wastewater treatment into a platform for socio-economic growth and community empowerment opens the door for non-traditional investors in wastewater technology and greater involvement from the non-governmental organization community – key partners for growing initiatives within the local communities. In this context, DEWATS present an opportunity to expand fruitful partnerships with additional stakeholders and international agencies and UN, such as the Food and Agriculture Organization, United Nations Secretary-General's Advisory Board on Water and Sanitation (UNSGAB), and the Asian Development Bank, all working towards a common goal of improving sanitation in SEA.

To address the issues above, ESCAP and UN-Habitat are implementing a joint project to regionally address the fast-growing problem of untreated wastewater while simultaneously encouraging sustainable socioeconomic growth through the promotion of DEWATS in SEA and related capacity building activities for policy makers, with a focus on three target countries of Cambodia, Lao PDR and Viet Nam. As part of this initiative, the Attapeu province in Lao PDR, with support from UN-Habitat, is finalizing the implementation of a pilot project, aiming to improve existing sanitation facilities for the residents of two villages, Phousay, Mixay and Sanxay towns. Through the construction of DEWATS with capacity for 1,000 people (36m³), particularly for the poor, this project intends to improve at least 60 households latrines and also includes the construction of one biogas facility in 2014.

The Regional Policy Workshop of Stakeholders on DEWATS in SEA was convened from 19 to 21 March 2014 at UNCC in Bangkok, Thailand. Forty-four experts participated from research institutions, civil society organizations, the private sector, power utilities, intergovernmental bodies and financing institutions in Asia (List of Participants is enclosed). The workshop⁵ reviewed the current state of water management practices and DEWATS implementation in the focal region, including a review of best practices and challenges experienced by those in the target countries and beyond. Policy and stakeholder frameworks, as well as technical solutions, were discussed for DEWATS implementation in SEA. The Workshop participants also commemorated World Water Day 2014 with an event organized by ESCAP in partnership with UNESCO and the Thai government. This year's theme of Energy and Water complements the DEWATS synergistic benefits for resource recovery, energy, and water quality improvements. In addition, ESCAP hosted a luncheon, where participants discussed the potential to maximize urban nexus opportunities, interlinking critical and scare resources like water, food and energy of the region.

II. THE WORKSHOP PROCEEDINGS

Opening Session

The DEWATS workshop opened with remarks from Mr. Rae Kwon Chung, Director of the Environment and Development Division of ESCAP, who questioned on why sanitation in Southeast Asia is not improving as quickly as other areas of the world. Mr. Chung pointed out that sanitation is an issue that is

⁴ 2nd Asia Pacific Water Summit, Chiang Mai, Thailand, 19 May, 2013. Summary of the Focus Area Sessions: <u>http://apws2013.files.wordpress.com/2013/05/fas-summaries_260713.pdf</u>

⁵ Policy Workshop materials are available at: <u>http://www.unescap.org/events/regional-policy-workshop-stakeholders-</u> decentralized-waste-water-treatment-systems-dewats

often funded by the government, but there is actually great potential for local people to be the driver for sanitation upgrades in their areas, with support from the greater community. Such Pro-Poor Public Private Partnerships for Sustainable Sanitation Services (or 5P for 3S) create a practical solution for governments to reach long-term sanitation goals through streamlined policies that encourage the development of these partnerships. Through this approach, the poor become a central focus of sanitation development as equal partners in the venture, creating wealth and social entrepreneurship within communities.

Ms. Mariko Sato, Chief of UN-Habitat in Bangkok, in her welcoming statement, followed Mr. Chung's comments by sharing examples of how some Korean and Japanese villages have banded together to complete small-scale projects through local investment, not requiring funding from, for example, the World Bank. However, these projects are not frequently replicated on a wider scale. Ms. Sato also encouraged the government representatives to accelerate the achievement of Millennium Development Goals by 2015, and to participate in negotiations for the next round of goals. She noted that, while the government agrees to the goals, in actuality it is the people who have to implement them. The DEWATS programme is a promising step in this direction, and those present in this meeting are already advanced compared with other ministries.

Session 1 Overview and the current state of DEWATS in the region

Mr. Avi Sarkar of UN-Habitat moderated this session, facilitated questions and answers from the participants. Mr. Hongpeng Liu, Chief of the Energy Security & Water Resources Section (ESWRS) for the Environment and Development Division (EDD) of ESCAP, began the session by providing an overview of the workshop objectives, expected outcomes and impacts of the workshop and the whole project for 2014-2015 implementation period, sharing the complementary role of UN-Habitat and ESCAP for the project. ESCAP will be identifying the Regional Centre on DEWATS, which would support regional networking, providing a platform for dialogue, knowledge delivery, collection of the technological innovation, as well as to facilitate continuous learning. The Centre should be able to serve beyond the scope of this project.

Mr. Gabriel Regallet, a Consultant of ESWRS/EDD ESCAP, overviewed the outlines of the upcoming Background Policy Study and the DEWATS Guidelines Manual, to be developed alongside project participants to reflect the needs of the forthcoming implementation strategy in the three target countries. The policy study provides an overview of the current status of wastewater policy within the countries in an effort to identify gaps in policy and opportunities to support of DEWATS system's adoption with policy interventions. Early findings, including the need for sustainable financing of sanitation, the potential for that to come from local value chains were highlighted: there is a need to foster local demand for sustainable sanitation, to encourage DEWATS growth, to trigger positive hygiene & sanitation behavior changes.

The draft criteria for selection of the Regional Centre was shared and includes technical and institutional know-how on DEWATS in the three countries, expertise on funding and financial viability, networking experience, and potential for long-term sustainability of the Centre. ESCAP will collect inputs from the project partners, and then circulate a call for applications to select a partner for implementation of the work.

<u>Session 2</u> Taking a stock on wastewater management and sanitation practices in Cambodia, Lao PDR and Viet Nam: challenges, barriers, policies and solutions for DEWATS

Mr. Liu facilitated sessions 2 and 3, guiding discussions on good regional practices. Three country presentations were delivered with follow-up question and answer session on opportunities on how to enable DEWATS in Lao PDR, Cambodia, and Viet Nam, and to discover further the capacity building needs of

policy makers and planners, for better wastewater management and, to identify the priorities and focus areas of the regional and national level policy studies and workshops within the current intervention.

Cambodia: Mr. Long Chivina, Deputy Office Chief of Planning and Technique for the Department of Sub-National Public Infrastructure and Engineering, began the session with a presentation on the state of wastewater management in Cambodia. Mr. Chivina said that the sewer and sanitation systems in Cambodia are very poor due to lack of financial resources and local technology capacity. In many areas, sewage drains untreated to a retention pond or wetland for "self-purification" then flows onward to the nearest waterbody. There are only four formal wastewater treatments plants in Cambodia, which were constructed during France's colonization of the country, and are thus quite outdated, especially because they were not maintained during the country's Civil War and the Khmer Rouge regime. Stormwater management systems are also outdated, resulting in habitual flooding particularly in lowland areas. While there is no master plan to improve situation, policies are being prepared by a technical team in the Department of Subnational Infrastructure and Engineering. Wastewater treatment is a new process for the Cambodian people, thus the technical knowledge of wastewater management needs to be developed. Japan is assisting Cambodia by sharing their experiences and knowledge.

Lao PDR: Mr. Virachith Douangchanh, Chief Urban Environment Unit, Ministry of Public Works & Transport, Department of Housing and Urban planning, Government Focal Point for BORDA Projects, represented Lao PDR. Mr. Douangchanh stated that, while there is no master plan in place, overall drinking water supply and wastewater treatment access has increased in both urban and rural areas. Still, many areas, especially in rural regions, do not have connection to wastewater treatment and, thus, discharge the wastes directly to roadside drains or public areas.

The government's urban sanitation development strategy from 2015 to 2030 will focus on DEWATS, alongside centralized systems, as a key method for urban and rural wastewater treatment. Depending on the characteristics of an area, wastewater solutions could be only DEWATS, or a mix of DEWATS and a centralized system. To date, two DEWATS have been built as demonstration projects, and eight capacity building activities will be completed throughout the country before the end of 2015. The government agency DHUP has entered into a partnership with BORDA to build capacity and technology know-how on DEWATS throughout Cambodia in 2015.

Viet Nam: Dr. Duong Thanh An, Director of the Department of Policy and Legal Affairs for the Viet Nam Environment Administration (VEA) and Ministry of Natural Resources and Environment (MoNRE), presented the status of Viet Nam's initiative. Viet Nam has had policies in place since 1998 that have improved development of wastewater treatment in urban settings, a rapidly growing section of Viet Nam's population. Policies support private sector participation urban and environmental activities, and established fees for urban and industrial sectors address key constraints. Effluent standards are followed, but there is not yet an effective sludge management standard in the country.

However, an emphasis on high cost, government-controlled wastewater systems has slowed progress such that only 10% of wastewater and 4% of sludge is formally treated. Cost recovery of the wastewater systems is low, and user fees don't yet cover the operational costs. To provide sanitation services to the urban populations estimated in 2025, investment of USD \$8.3 billion will be needed. DEWATS are increasing in number in smaller towns, some initiated by the community and funded by donors, though Viet Nam has had a mixed experience to date in their application. Technical guidelines for decentralized solutions are now being compiled by the government.

<u>Session 3</u> Good practices and lessons learned on DEWATS from the regional level in Southeast Asia and South Asia

In this session 3, facilitated by Mr. Liu, ESCAP, each presentation was followed by five minutes of question and answers. On a high level, the follow-up discussions focused on the commitment and coordinated vision of project partners to the Pro-Poor Public Private Partnership on Sustainable Sanitation Services, as called for during the 2nd Asia-Pacific Water Summit, though additional discussion points are integrated into the summary below.

Mr. Ti Le-Huu, Adjunct Professor on Water Security Danang University and Concurrently Director of Water Security Centre, Water Resources University, began this session informing participants on the outcomes of the 2nd Asia Pacific Water Summit, which had recalled for leadership and commitment towards wastewater revolution. The rapid economic growth in the region creates an opportunity for governments to partner with key stakeholders and local communities to move forward strategically and sustainably in ways that benefit the environment, economy as well as public health. There is a need to do costing of socio-economic impacts of inaction and socio-economic impacts of sanitation in place. This was highlighted during discussions throughout workshop.

Next, Mr. Alex Campbell, Mekong Countries Coordinator for the Bremen Overseas Research and Development Association (BORDA), shared experience in DEWATS implementation; they have already implemented 2000 structures globally. Mr. Campbell highlighted the importance of encouraging community adoption by training a local and regional network who can act as champions for further dissemination, though funding remains an issue particularly in Mekong countries. Furthermore, there is a need to establish management and monitoring systems following construction. BORDA found that the most successful projects included a DEWATS service package for operation, management and support, as well as had a comanagement role for the local authority to be sure appropriate practices are being used.

Mr. Changda Cai, Executive Director of the Association of Circular Economy and Vice Chairman of the Biomass Energy Industry Technology Innovation Strategic Alliance, discussed the progress of wastewater treatment and biogas utilization in China. Biogas plants have been successfully constructed around livestock and agricultural operations, as well as for municipal waste. China discussed the benefits from selling bio-gas to the grid and for the transport fuel.

Then, Ms. Ho Yoke Ping, Senior Executive from Planning and Engineering Department for Indah Water Consortium in Malaysia, provided an overview on Malaysia's efforts to standardize their wastewater treatment infrastructure to encourage widespread adoption of beneficial measures and increase local technical capacity. Malaysia found that growth in the wastewater sector is driven by the private industry and that standardization of projects to minimize variation can facilitate the policy development.

Ms. Angelina Victoria M. Ferrer, Unit Head of the Baguio Sewage Treatment Plant (BSTP) in the highly urbanized city of Baguio, Philippines, presented their municipal wastewater treatment plant which the city is seeking to upgrade. Beyond the central business district (CBD) area covered by the BSTP, peri-urban areas in Baguio have no sewer systems but instead, individual or communal septic tanks are used. The city is currently studying how to better manage wastewater in the CBD and all peri-urban areas of the city in order to improve and protect conditions of inland waterways. The Philippines discussed their comprehensive planning around municipal sanitation and wastewater management within a decentralized-centralized link, along with the issues of land availability for wastewater treatment expansion.

Mr. Wahanudin, Directorate of Settlements and Housing and the National Development Planning Agency in Indonesia, discussed their efforts to improve sanitation via policy, at least partly through DEWATS. They found DEWATS to be effective in improving health and cleanliness, particularly in densely packed areas, though some had issues related to operations and maintenance. He discussed how, for Indonesia, DEWATS are considered as an intermediate option between on-site and centralized systems, as well as shortcomings of collective facilities and cost recovery issues for investors. He introduced BAPPENAS as a good example of national leadership and coordination for sanitation in Indonesia.

Next, Professor Lawrence Surendra, Chairman of the Sustainability Platform, conveyed India's positive experiences in creating local wastewater solutions that provide sustainable sources of fertilizer for communities, as well as the need for countries to band together to learn best practices and spread knowledge. He stressed ecological sanitation as a triple win for hygiene, environment and agriculture, with the potential to create wealth through reducing water pollution.

Finally, Mr. Guilberto Borongan, Senior Programme Officer of the Regional Resource Center for Asia and the Pacific (RRCAP) at the Asian Institute of Technology (AIT), discussed their work, supported by UNEP IETC to improve national and city waste management strategies through capacity building programs and demonstration projects, sharing the experience in strategic planning on waste management through the National SD Strategies, National 3R Strategy Project and Community demonstration projects such as the capacity building energy-biogas program.

<u>Session 4</u> Group discussions Part I: policy and institutional frameworks to enable DEWATS in SEA target countries- Cambodia, Lao PDR and Viet Nam

Group discussions for each focal country were led by Mr. Avi Sarkar, of UN-Habitat, Ms. Aida Karazhanova, of EDD/ESCAP and Mr. Regallet, consultant for ESCAP. The discussions focused around two main objectives. Firstly, the group worked to identify the elements that need improvement within existing policies, regulations, and standards in order to successfully enable wastewater management services and DEWATS in urban and peri-urban areas. Secondly, the group discussed what measures could be taken to enhance the capacity of the existing governmental and institutional frameworks on wastewater management and DEWATS. In particular, improved urban planning and DEWATS integration were considered, along with the potential for up-scaling and long-term program sustainability based on experiences to date and potential involvement of broader public-private partnerships. The outcomes of the discussions for each of the three target countries were presented during Session 6.

To that end, Mr. Regallet discussed the draft Guidance Manual for DEWATS implementation which will address site-appropriate technologies and the development of supporting policy guidelines and standards in the target countries. The Manual also aims to support robust decision-making as DEWATS are rolled out, strengthening sustainable supply chains as well as system choice, design, construction and long-term maintenance. Next Mr. Regallet identified some common barriers for sustainable sanitation services in the targeted three countries, including lack of vision in the urban planning context, low demand from citizens, priority focus on sewerage and wastewater treatment plants, fragmenting of the public and private sectors, as well as low priority in national budget and finance plans. However, there are strong incentives for improvement of sanitation services in each country, such as improved public health, environment, local economy, and quality of life in general, as well as effective implementation of regulations and access to DEWATS technology and water and energy efficient infrastructure.

Session 5 Stakeholder frameworks and technical solutions for DEWATS in the SEA region

This session followed the format of presentations as per the agenda and was moderated by Ms. Aida Karazhanova, ESCAP. Mr. Ti Le-Huu of Viet Nam started the session, stressing the importance of building regional, national and local networks that can lead the promotion and diffusion of clean wastewater technologies, thereby driving local socio-economic growth. The regional vision on sustainable sanitation for all could only be achieved by the continuous commitments to wastewater revolution, driven by ADB and UNSGAB and further highlighted by the 2nd APWS. This was an important theme within discussions throughout the session and the workshop -- to find the practical ways of system driven implementation, enabled by respective efficient policies, integrated into national strategies, supported by sustainable funding mechanisms, and raised through national and regional networking.

Mr. Yuttakan Makphan, Director of the Institute of Renewable Energy Development of Asia-Pacific Foundation and Vice-Director of the Agriculture and Energy Centre for Thailand, presented on the ability for renewable energy technology to be applied to waste in order to reduce global emissions and dependence on fossil fuels. The resort is self-sufficient: electricity and gas has been produced from the mini-biogas stations at the resort. The local entrepreneurship helps people to attain wealth via the social and financial benefits of DEWATS.

Next, Professor Chettayappan Visvanathan, Dean of the School of Environment, Resources and Development at AIT, discussed the status of DEWATS in Europe, where only 66% of wastewater is treated to a secondary level. To reach EU wastewater directives, decentralized systems like membrane bioreactors show potential for wider adoption in both rural centers as well as standalone buildings like sports stadiums. His presentation provided analysis of urbanization trends between Europe and Asia Pacific and shared different technological solutions for DEWATS, including the usage of membranes.

<u>Session 6</u> Group discussions Part II: technical, financial frameworks and solutions to enable DEWATS in SEA: target countries-Cambodia, Lao PDR and Viet Nam

This session had the objective to discuss the following items in three breakout groups: what enables technical and economic decision-making processes to plan investments; design, implementation, operation and monitoring of DEWATS facilities including modular systems, improving reliability and up-scaling potential; the capacity to pay for technical service delivery packages for DEWATS; experiences with effective national and local investment strategies and plans; cost recovery options for Operation Expenditures (OPEX) and Capital Expenditures (CAPEX); and measures to reach the poorest households for sanitation service delivery. Participants were asked to list successful measures to increase demand and supply of DEWATS, such as the measures to assess then increase willingness and capacity of households to pay, community and women's involvement, affordability and household (HH) preference assessment. They also considered measures to improve and better coordinate the supply chain for enhanced DEWATS goods and services delivery from importers, wholesalers to retailers and local vendors and builders. The highlights of the three country presentations merging outcomes of discussions of sessions 2 and 6 are included below.

Cambodia: Knowledge and understanding of wastewater treatment as a component of community infrastructure is limited within the government and technical community. Awareness building through frequent trainings and demonstrations for policymakers, national and local governments, academia, and community venues will help encourage participation in and adoption of wastewater treatment. There is also a limitation of land space in Cambodia; often roads are de facto drainage systems and lakes or ponds are

used as reservoirs for passive wastewater treatment before draining to rivers. Solutions discussed include the potential for Cambodia to adopt DEWATS to different contexts, such as "module" options for different conditions (e.g., anaerobic and anaerobic systems). Because funding is limited, options for financing upgrades include a subsidy, connection fee, and tariff (e.g., inclusion in the water or electricity bill); however, fees and subsidies should consider low-income citizens. Donors will be encouraged to participate in the program to supporting development of activities alongside the government.

Lao PDR: The discussion highlighted existing barriers to implementation, such as lack of local skills, unplanned structure development, lack of funding, limited community awareness and policy maker understanding of wastewater issues. Potential solutions include technology training and knowledge sharing, encouraging donations from multiple sources like NGOs, international and third-party funders, as well as continued cooperation with BORDA. Furthermore, the idea of DEWATS must be demonstrated frequently to stakeholders in government, NGO and academia in order to raise awareness and promote further adoption. The discussion centered around integrating DEWATS into urban planning, law and housing development – and the potential for inclusion in master planning at district or provincial levels.

Viet Nam: During the discussion, it was noted that improvements could be made at both the national and local levels. Nationally, there is a need to develop policies to improve sanitation financing, reform the utility sector, improve pro-poor public-private partnerships, as well as to modify wastewater discharge quality levels to accommodate DEWATS. Overall, the mindset of planners and decision-makers can be expanded to include DEWATS as a sustainable sanitation option. Big cities have centralized master plans; smaller towns do not, but ADB is studying opportunities for DEWATS as a wastewater system option. Decree 88 can be amended to expand DEWATS in peri-urban decentralized systems and the overlap on tariff and fee (Decrees 88 and 27) can be settled.

Locally, strategic planning can be implemented to ensure selection of the optimal sanitation solutions for the local situation. Improving return on investment, technical capacity, and public awareness for local stakeholders and policy makers is also important. The establishment of a technical working group could help move this and other issues forward. Additional research and development in technology to develop affordable and modular structures is a need, along with the coordination and cooperation of core organizations. There is no established controlling system or registration of providers and suppliers of DEWATS in Viet Nam, though they fall under broad environmental regulations.

Recognizing the rapidly growing population in Southeast Asia, the Regional Policy Workshop noted the growing sanitation demands in urban and peri-urban settings. However, there are several regional key issues that emerged as hurdles to widespread adoption pf DEWATS. The primary concern of target countries was

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