NEAT Working Group on
Water Resource Management

Singapore
29-30 June 2010

I Background

1 Water-related challenges such as water shortages, flooding, contaminated water, poor sanitation and inaccessibility to safe drinking water affect in a varying degree, both developed and developing countries around the world. According to the World Health Organization (WHO), water scarcity affects one in three people on every continent of the globe. Almost one fifth of the world's population (about 1.2 billion people) lives in areas where water is physically scarce. One quarter of the global population also lives in developing countries that face water shortages.[1]

2 Water-related challenges are also becoming more acute. For one, global warming and climate change are already causing unpredictable and extreme weather conditions of either too little or too much rainfall in certain parts of the world. Many countries regularly suffer droughts, floods, hurricanes and other disasters that destroy lives, drain economies and hinder growth. Water scarcity has even occurred in areas where there is abundance of rainfall or freshwater.

3 Most significantly, the demand for water has increased along with rapid population growth, urbanization, industrialization and growing affluence. Today, 50 percent of the world's population already lives in urban areas and, with changing demographics characterized by massive migration into cities, this percentage is projected to rise to 60 percent by 2025.

4 Simultaneously, the rapid rate of urbanization and industrial growth have generated large amount of wastes and toxic substances that pollute existing water sources, rendering them unsuitable for human consumption. It is estimated that over 2.5 billion people globally live without adequate sanitation of which 1.8 billion live in Asia.[2] Ensuring sufficient quantity of quality water is a big challenge. This is especially so in developing countries where urban water and wastewater management are either lacking or not fully developed.

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[1] See World Health Organization website at http://www.who.int/features/factfiles/water/en/index.html dated March 2009.

[2] See "World Water Day 2010 brochure" by UNWater at http://www.unwater.org/worldwaterday/downloads/WWD2010_LOWRES_BROCHURE_EN.pdf.

5 The growing global demand for food and bio-energy has correspondingly led to increase demand for water from the agriculture and energy sectors. According to a 2009 study by the International Water Management Institute (IWMI) and the Food and Agricultural Organization (FAO), the demand for food and livestock fodder in Asia will double during the next 50 years. To meet this demand, farmers will need to divert between 10% and 57% more water to agriculture in South Asia by 2050 and between 16% and 70% in East Asia.[3] Thus, the demand for already scarce water resources is expected to surge further. It is necessary that efforts to increase food production be undertaken with less water, especially as climate change puts our water resources under even greater stress.[4]

6 Dealing with the competing demands on water posed by the multifarious challenges of population growth, urbanization, industrialization, food production, energy needs and environmental degradation would require a holistic and coordinated approach to water allocation, management and development - an integrated approach. This usually involves proper economic pricing policies, effective institutional and regulatory framework, and better access to relevant technical, technological and financial resources.

7 Already, more and more countries recognize the importance of improving water resource management and are collaborating regionally and internationally to make it a reality. In this connection, the NEAT Working Group (WG) on Water Resource Management held its inaugural meeting in Singapore from 29-30 June 2010. It discussed challenges faced by each ASEAN plus Three (APT) country on water resource management, and more importantly, made recommendations to promote regional collaboration in this area. This WG further builds on the APT Cooperation Work Plan (2007-2017) approved by the APT Leaders in 2007 that identified sustainable water resource management (including groundwater) as an area for closer cooperation.

II Water Resource Management in East Asia[5]

8 East Asia's strong economic growth, coupled with its rapid pace of urbanization, industrialization and growing affluence, will exert even more demands on available scare water resources in the years ahead. Already, over a 15-year period from 1992 to 2007, there has been a spike in per capita consumption of renewable water due to increases in population density, GDP per capita and urbanization in the APT countries.[6]

[3] The joint report by the IWMI and FAO is titled "Revitalizing Asia's Irrigation: To Sustainably Meet Tomorrow's Food Needs". It was released at the World Water Week held in Stockholm in August 2009. The project is funded by the Asian Development Bank.

[4] "Global Water Partnership (GWP) in action: 2009 Annual Report", page 7 at http://www.gwpforum.org/gwp/library/GWP_Annual_Report_2009.pdf.

[5] East Asia here generally refers to the APT countries.

[6] Renewable water refers to the water that is continuously renewed within reasonable time spans by the hydrological cycle, such as that in streams, reservoirs or aquifers that refill from precipitation, runoff or

This has caused a corresponding decline in total renewable water per capita over the same period (see Table 1).

Table 1 Water Resources and Domestic Uses in the APT Countries

	Population Density (per person per sq km)		GDP Per Capita (in PPP$)		Urbanization (percentage of urban population)		Total Renewable Water Per Capita (cubic meters per year)	
	1992	2007	1992	2007	1992	2007	1992	2007
China	122	138	1,328	5,378	28.94	42.24	2,691	2,130
Japan	334	343	26,955	33,573	63.75	66.27	3,457	3,361
Republic of Korea	441	486	11,818	26,523	75.82	81.25	1,594	1,451
ASEAN								
Brunei Darussalam	46	68	16,349	49,160	67.08	74.39	31,261	22,254
Cambodia	50	79	1,126	1,784	13.19	20.92	45,834	33,537
Indonesia	98	121	2,338	3,716	32.52	50.44	15,035	12,400
Lao PDR	18	24	1,012	2,244	16.13	29.7	77,126	57,914
Malaysia	58	82	5,783	13,167	51.81	69.56	30,387	22,211
Myanmar	63	85	-	-	25.3	31.92	25,269	21,613
Philippines	207 (1)	295	3,303	3,409	50.88	64.24	7,469	5,553
Singapore	4,050	6,489	14,564	49,714	100	100	189	137
Thailand	112	129	4,697	7,901	29.76	32.9	7,374	6,462
Viet Nam	208	257	1,140	2,639	21	27.34	12,893	10,338

Source: *ESCAP Yearbook for Asia and the Pacific 2009; ASEAN Statistical Yearbook 2008 & 2003; and, ASEAN In Figures 2003.*

(1) Figure for 1992 not available, thus the 1990 figure as in *ASEAN in Figures 2003* is used instead.

NOTE: The Population Density and GDP per Capital (in PPP$) data for ASEAN countries are derived from ASEAN Statistical Yearbook 2008 & 2003, and *ASEAN In Figures 2003*. Data for China, Japan and Republic Korea, and data on Urbanization and Total Renewable Water Per Capita for all ASEAN + 3 are derived from ESCAP.

In the *Fourth ASEAN State of the Environment Report 2009*, the data for 'Per capita Water Resource Availability' is only for the year 2007. There are no corresponding figures in other ASEAN reports for 1992. For the purpose of comparing figures across time, the 'Total Renewable Water Per Capita' from *ESCAP Yearbook for Asia and the Pacific 2009* is used instead.

9 For the majority of APT countries, the percentage of total renewable water per capita in 2007 (compared to 1992) has witnessed double digits decline (see Table 2). In other words, the demand for water has increased without any corresponding increase in available supply. It is imperative that a more sustainable way be found to ensure sufficient and quality water for future human, industrial, agricultural and even environmental needs.

groundwater recharge. See http://www.aaas.org/international/ehn/waterpop/gloss.htm. The renewable water supply is the sum of precipitation and imports of water, minus the water not available for use through natural evapotranspiration and exports and is a simplified upper limit to the amount of water consumption that could occur in a region on a sustained basis.

Table 2 Total Renewable Water Per Capita in ASEAN + 3 countries

Total Renewable Water Per Capita

	Cubic meters per year				% change
	1992	1997	2002	2007	since 1992
China	2,691	2,286	2,184	2,130	-20.8%
Japan	3,457	3,409	3,373	3,361	-2.8%
Republic of Korea	1,594	1,522	1,474	1,451	-9.0%
ASEAN					
Brunei Darussalam	31,261	27,395	24,324	22,254	-28.8%
Cambodia	45,834	39,712	35,909	33,537	-26.8%
Indonesia	15,035	13,972	13,050	12,400	-17.5%
Lao PDR	77,126	67,812	61,741	57,914	-24.9%
Malaysia	30,387	26,768	23,909	22,211	-26.9%
Myanmar	25,269	23,609	22,357	21,613	-14.5%
Philippines	7,469	6,692	6,026	5,553	-25.7%
Singapore	189	162	144	137	-27.5%
Thailand	7,374	6,968	6,647	6,462	-12.4%
Viet Nam	12,893	11,767	10,943	10,338	-19.8%

Source: *ESCAP Statistical Yearbook for Asia and the Pacific 2009* at http://www.unescap.org/stat/data/syb2009/

10 Most governments in East Asia recognize the importance and urgency of instituting an integrated approach to water resource management as highlighted by the representatives from the APT countries and the ASEAN Secretariat at this workshop. However, the extent of such an approach varies among the APT countries. In addition, the APT countries have very different physical characteristics and are at very different stages in their economic and social development. Such diversity and complexity imply that there is a need for approaches to be tailored to the individual circumstances of country and local communities.

11 Nevertheless, there are certain common principles/strategies/policies related to sound water resource management which the APT countries are considering implementing or have implemented. These principles/strategies/policies involve incremental, yet innovative and sustainable ways and means of managing the water problem from both the demand side (to manage water demand) and supply side (to ensure sustainable water supply). The onus is on each APT country to find the right balance within and between these two sides.

12 Tackling problems on the demand side among the APT countries include but are not limited to the following: (i) proper pricing of water to reflect its true economic cost; (ii) promoting water conservation as a way of life through lifestyle changes and public education; (iii) introducing better agricultural and industrial technology or techniques for more efficient uses of water; (iv) encourage other stakeholders' participation instead of relying solely on government efforts; and, (v) instituting better monitoring and regulatory framework, information management and dissemination on water usage. Ultimately, these efforts are geared towards reducing unnecessary or wasteful water consumption, resulting in more usable water.

13 Addressing problems on the supply side among the APT countries also include but are not confined to the following: (i) improving the water mix by diversifying into new sources of water; (ii) upgrading or improving water infrastructure to reduce water leakage or increase access to drinking water; (iii) reallocating water from surplus areas to shortfall areas; (iv) managing and reducing water pollution, hence increasing the supply of usable water; (v) promoting the recycling of used water; and (v) devising more cost efficient ways of desalinating sea water or capturing rainwater.

III Challenges Faced

14 In most APT countries, there are already existing laws, agencies, strategies and even programs in place that are aimed at promoting sound water resource management or even geared towards an integrated approach to water resource management. It was found that the water-related challenges the APT countries face mainly cover the areas of governance (including implementation and coordination issues), pricing, capacity building, stakeholders' participation, financing, technology, cross-border and other emerging issues such as climate change.

15 The list of key challenges includes:

- Improper integration of water resource management into mainstream national and local development objectives and plans
- Multiplicity of institutions overlooking water resource management, leading to overlapping functions, unclear responsibilities and poor coordination in planning, implementing and monitoring
- Limited technological capabilities, low technical qualifications of manpower and weak infrastructure
- Poor or inconsistent monitoring, information management and dissemination mechanism on water usage
- Insufficient stakeholder engagement (including public-private partnership and civil society) from planning to implementation
- Lack of financial resources and inadequate budget allocation
- Inequitable distribution of water resources among different economic sectors, users and regions
- Complexities of cross-border water issues such as water resource management of the Mekong River
- Impact of climate change

IV Recommendations for APT Regional Cooperation

16 The availability of sufficient water quantity of acceptable quality is essential to achieving sustainable development and the Millennium Development Goals. Properly managing water resources will not only contribute to sustainable economic growth but will also help to attain other objectives such as social equity and social progress (e.g. poverty reduction), environmental protection, effective disaster management and prevention, and ultimately, political stability. In this important endeavor, the APT countries can complement their national efforts to meet water-related challenges by working together in the region. And regional cooperation will not only facilitate exchanges of information, technology and country experiences, but also spur positive action to better utilize our water resources in a sustainable manner.

17 Below are some key recommendations to promote cooperation in water resource management among the APT countries:

(a) Adopt a relevant set of water indicators and ensure consistent monitoring and reporting based on these indicators in order to help formulate better policies or programs

(b) Devise a suitable and up-to-date regional database based on the relevant set of indicators in (a) so as to facilitate information and data sharing

(c) Identify feasible water resource management projects at local levels in the APT countries (involving at least two APT countries and other interested partners) to be carried out over a reasonable time frame

(d) Develop a long-term regional framework of water resource management encompassing and integrating all water sub-sectors

(e) Allow voluntary peer review of existing action plans in order to assess progress and identify problems

(f) Publish information on best practices as well as challenges in implementing water resource management projects in the APT countries

(g) Include in school curriculums topics on environmental studies to enhance awareness among youths of the importance of water resource management

(h) Look into climate change impact on water resources for appropriate adaptation measures

(i) Adopt appropriate economic pricing policies to promote water conservation and more efficient allocation of this scare resource for different uses

(j) Involve relevant stakeholders beyond water professionals to ensure broad-based support for water resource management initiatives

(k) Strengthen linkages and promote regular interactions among APT countries to better address water-related disaster risks management such as flooding and droughts

(l) Build closer cooperation and coordination among the countries in the Mekong River Basin and other regional interested parties to better meet the challenges of water resource management

(m) Establish a regional water fund to support water resource management activities and exchange of information, experience and knowledge as well as capacity building

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(in alphabetical order by country)

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