

Thailand's Water Security situation in the context of the world and ASEAN

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INTRODUCTION

During the RIO+20 meeting, the sustainable green economy for protecting environmental health via income increase and poor eradication was discussed. The countries with a successful, sustainable green economy depend on efficient integrated water management and provision of water supply and sanitary services. The water security index was another issue proposed to monitor national socio-economic development, and took account of domestic water, urban water, economic water (including irrigation water), river health and resilience. The study proposed the Water Security definition and assessed the water security status of Thailand by using water use status and correlated with gross domestic product per capita in various countries of the world, Asia and ASEAN (Association of South East Asian Nations), which helped understanding of the competitiveness and the strength, weakness and potential of water development in Thailand compared with the rest of the world and ASEAN countries.

METHODOLOGIES

This study determined the water security status from five dimensions, i.e. WS1: basic water (renewable, supply, hygiene); WS2: sufficient water (water supply, consumption, agricultural; water), WS3: development water (irrigation area, industrial water use, water for energy, water for aquaculture); WS4: water disaster (loss from floods and drought); and WS5: water for future (population growth, urban population growth, water footprint). The index status was analysed and correlated with water use unit (cubic metre per capita) and water productivity (US \$ per cubic metre of water use) and grouped into four groups of country classified by income per capita of the country. Based on the available data from various sources worldwide (Black and King 2009, World Bank 2014), the index of each country was determined comparatively by weighting equally from each dimensions and ranked by the marking equally (1–5 points) of each element from the average and standard deviation values.

WATER SECURITY STATUS AT THE WORLD SCALE

From the analysis, the average water use unit, water productivity, grows with the GDP per capita growth though the agricultural water use in the high income group decreased due to the change of water use structure. In general, more water productivity induced better Water Security status. The water security index increased from the less income group countries to the lower middle income group and became stable in the upper middle and high income group due to the reduction of water disaster (which may reflect the data availability). The water productivity, measured by the income per capita and per water use unit, was assessed and compared with the water security index obtained and showed that more water productivity induced better water security status.

THAILAND AND ASEAN

The water security status of Thailand, compared with the world, Asia and the ASEAN regions were investigated with the ranking in each dimension as shown in Table 1. Within ASEAN

Table 1 The average world, Asia and ASEAN water use status and the ranking of Thailand.

Items	Elements	World		Asia		ASEAN		Thailand	
		average	ranking	average	ranking	average	ranking		
Basic water	1. fresh water renewable (m ³ /capita)	22,167	79	10,854	15	19,205	8	6,382	
	2. water supply (m ³ /capita)	84	46	84	9	85	3	98	
	3. sanitation water (m ³ /capita)	67	15	70	6	71	2	96	
Sufficient water	1. water use per capita (m ³ /capita)	511	12	842	9	531	7	1,391	
	2. households (m ³ /capita)	84	46	84	9	85	3	98	
	3. agricultural water (m ³ /capita)	354	159	712	7	424	1	1,322	
Water for development	1. irrigation area (%)	19	49	41	30	18	3	25	
	2. industrial water (m ³ /capita)	97	68	60	18	49	4	34	
	3. water for energy (%)	31	89	20	23	14	6	4	
	4. water for fresh water aquaculture (m ³ /capita)	346,734	4	1,241,323	4	582,458	2	1,385,801	
Water disaster	1. flood damage (US\$)	3,543,108	3	8,670,092	2	6,002,888	1	41,051,592	
	2. drought damage (US\$)	1,261,531	22	1,896,770	5	239,512	2	424,300	
Water for future	1. population growth (%)	1.3	137	1.43	38	1.31	10	0.43	
	2. urban population growth (%)	63	147	59	30	59	7	42	
	3. water footprint (m ³ /capita)	1,338	7	1,304	2	1,697	2	2,223	
Water productivity	1. GDP (10 ⁶ US\$)	343,530	29	445,799	7	151,224	2	318,907	
	2. productivity(US\$ / m ³ water)	81	132	41.3	132	117.3	6	3.6	
	3. agricultural productivity (US\$/m ³ water)	392	124	33.8	18	162.5	7	0.32	
	4. industrial productivity(US\$/m ³ water)	169.1	63	69.5	8	121.6	4	51.2	

countries, the water use, water productivity and water security status of each country *versus* country GDP per capita were assessed comparatively and it showed that Thailand has the highest water use unit, moderate lower water productivity and a moderate water security ranking.

CONCLUSIONS

This study showed the status of water security of Thailand compared with the rest of the world. Thailand has strengths of clean water and sanitation water accessibility arising from the development investment in the past. However, the water use status regarding renewable freshwater and the agricultural sector, i.e. low efficiency, high water footprint, low productivity, seemed to be a weakness compared with other countries. There are potential demands for industrial water and water for energy, thus, the restructuring of the present water use structure is needed to cope with future water demand increase.

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