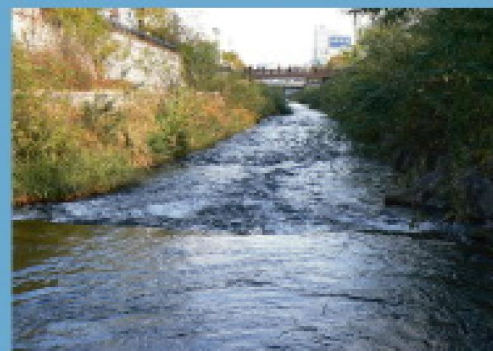
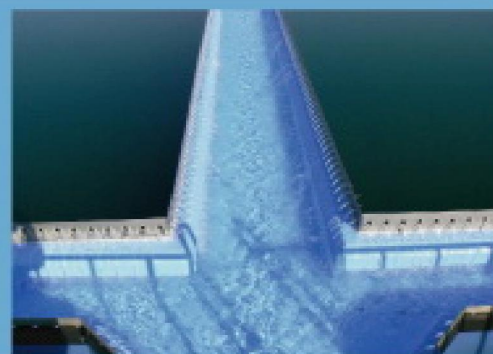


Development of Eco-Efficient Water Infrastructure for  
Socio-Economic Development in Asia and the Pacific Region

# Strategy of Eco-efficient Water Infrastructure Development for Mongolia Water Programme and Water Law



June 2011



**Strategy of Eco-efficient Water  
Infrastructure Development for  
Mongolia Water Programme  
and Water Law**

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# CONTENTS

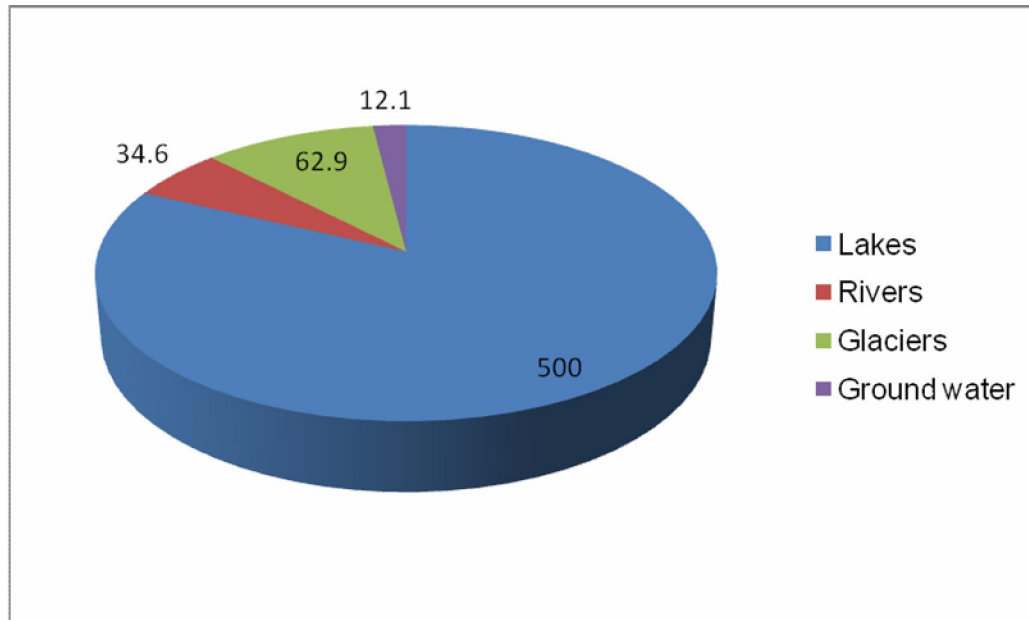
<b>1.0 Introduction</b>	3
1.1 Challenges in Mongolia	3
1.2 Objectives of the strategy	4
<b>2.0 Eco efficient Water Infrastructure</b>	4
2.1 Overview of Green Growth and Eco efficiency	4
2.2 Concept of Eco efficiency	6
2.3 Key Policy Guide for Eco-efficient Water Infrastructure Development	7
2.4 Expected benefits of eco efficient approach	10
<b>3.0 Existing Institutional and Legal Framework of Water Resource Management</b>	11
3.1 Existing institutional framework in Mongolia	11
3.2 Key actors and responsibilities	14
3.3 Water law/policy	16
4.0 Strategy for Eco-efficient Water Infrastructure Development in Mongolia	17
4.1 Overview	17
4.2 Framework and Process	17
4.3 Suggested Priority programmes (Brief description)	18
<b>5.0 Process of Integration of Eco efficiency into Water Infrastructure Development</b>	19
5.1 Role of key actors and agencies	19
<b>6.0 Policy Guide and recommendations</b>	20

# 1. INTRODUCTION

## 1.1 Challenges in Mongolia

- Mongolia is vulnerable to multiple crises; 1) external economic and financial shocks, 2) resource crisis symbolized by the oil price volatility and 3) ecological crisis heralded by negative impacts of climate impacts as well as the negative impacts from unsustainable rapid urbanization.
- Mongolia is arid and semi-arid country with annual average precipitation of 251 mm ranging from 400 mm in the north to less than 100 mm in the southern Gobi region.
- 20% of Mongolian water consumption is originated from surface water sources and 82% is originated from groundwater sources. Groundwater is currently the main source of supply for household and drinking use, watering points for pastures, and industrial consumption.
- Groundwater table is decreasing in arid regions, and degradation and desertification of land cover due to shortage of water and precipitation have been intensifying. The region's groundwater source are also under serious threat of pollution from the discharge of untreated and raw sewage; leachate from the current practice of solid waste management; and downstream effects of agricultural practices that result in soil siltation.
- 220 million m<sup>3</sup> of water is utilized for industries; mostly mining utilization has increased in the last few years. 40% of used water is purified and remaining flows into surface bodies. Above mentioned data shows that sustainable development of Mongolia depends on appropriate utilization of water resources.
- Key challenges
  - ✓ Worsening water shortage for drinking & sanitation freshwater,
  - ✓ Decreasing and polluting groundwater table, Water pollution is particularly a significant problem in Mongolia because the water supply is so limited. The country has only 34.8 cubic kilometers of renewable water resources, 53% of which are used for farming. Water quality has been decreasing with increasing pollution from a variety of sources such as, outdated and irresponsible mining technologies, chemicals from leather processing and agricultural practices
  - ✓ Drying and reducing water sources, and
  - ✓ Conservation / protection of watershed
  - ✓ Population growth in the Ulaanbaatar area of Mongolia has been rapid, and demand for potable water will continue to rise.
- Water challenges including water scarcity make negative impacts on Mongolia economic growth and quality of life

**Graph 1: Total water resource of Mongolia is estimated to be 609.5 cubic km**



## 1.2 Objectives of the Strategy Paper

- Contributing to the development of the action plan based on for implementation of Mongolia Water National Programme and Water Law
- Contributing to sustainable urban infrastructure of Mongolia by improving the green growth approaches and eco-efficiency through national development planning process

## 2. Eco efficient Water Infrastructure

### 2.1 Overview of Green Growth and Eco-efficiency

Three crises hit the Asian-Pacific region in the last couple of years. The “Triple Fs”- food-fuel-financial-compounded by climate change adversely affect countries of the region, inflicting a heavy human cost. But the consequence of these crises has also brought along an opportunity to take a fresh look at the development paradigm of the region. These concurrent crises have exposed the limits of current economic growth patterns.

In view of the decreasing carrying capacity of resources including water resources, it is clear that Asia and the Pacific cannot follow the conventional development path of “grow first, clean

up later”. Countries need to improve Green Growth development paradigm through new thinking and change the ways they pursue economic development.

Pursuing green growth means more than just integrating environmental sustainability in current development patterns. It means fundamental transformation of our economic structure from the current development paradigm of “quantity of growth” to a new development paradigm of “quality of growth” by integrating ecological costs in market prices, investing in sustainable infrastructure, promoting green business and technology, pursuing sustainable lifestyles, by developing climate resilient societies and by strengthening the regional cooperation. The transformation represents an opportunity for new green economic growth with creation of employment in water sector, which is a basis for inclusive social development.

Greening our future requires three main things:

- Changing people’s mindset so as to value systems and there is also the need to change preferences to support sustainable lifestyles and decouple economic growth from current unsustainable consumption patterns.
- Invisible infrastructures (non-physical infrastructures) such as pricing system, regulations and institutions and visible infrastructure (physical infrastructure) such as dam and pipes are key determinants that lock societies into production and consumption patterns. Therefore, there is a need to integrate ecological price in the market system, and invest in sustainable infrastructure.
- Green/eco efficient water business and technology are enabling tools for countries to turn the crisis into an opportunity for economic advancement and to increase industrial competitiveness.

Green Growth also requires 3 Ps: Public, Private and People. The Public sector needs to lead the transition, bridging the gap between short-term investment costs in water infrastructure and its long term benefits from investment. The Private sector has to promote business opportunities that green growth can bring. Such a leadership by the public sector has also to be politically supported by the people, responding with positive acceptance, adopting more sustainable lifestyles, and focusing more on quality of life, rather than on quantity of consumption. Investing in water infrastructure, clean water and ecological efficiency represents new opportunities for new economic growth and creation of employment which is beneficial towards poverty reduction (MDG 1) and environmental protection (MDG 7) simultaneously.

Developing countries of Asia and the Pacific are faced with a number of challenges, but are also in a position to adopt and move quickly on implementing innovative low carbon green growth policies as compared to industrialized countries which have less flexibility due to the lock-in effect. Furthermore, experience shows that early introduction of such strategies can create opportunities for countries to enhance competitiveness and robustness of the economy in the long run. Adopting such strategies in support of development plans can push the Asia-Pacific region as the new global centre of gravity for innovation, sustainability and prosperity.

## **2.2 Concept of Eco efficiency**

- Eco-efficiency aims to improve the efficiency in the context of eco-system
- The term ‘eco’ in this strategy means improving both economical efficiency and ecological efficiency at the same time
- Eco-efficiency based on green growth development paradigm is the policy option to achieve MGD 1 (poverty reduction) and MDG 7 (environment protection) at the same time and in a harmonious manner
- The key concepts which are composing the eco efficiency are integration, decentralization, life cycle management, sustainable production and consumption pattern, and 3Rs (Reduce, Reuse, and Recycle).

## **2.3 Key Policy Guide for Eco-efficient Water Infrastructure Development**

### **a) Water Pricing Reforms including Tax and Budget**

Current market prices do not reflect real social and ecological costs such as pollution from the use of energy and water. Such conventional pricing structures expedite wasteful use of natural resources and prevent the appearance of new eco-efficient technologies and business. Governments made efforts to correct these market failures through a mix of economic and fiscal instruments. The consensus on the need to establish pricing reforms including tax and budget reforms was recognized a long time ago. However, experience over the past two decades indicates that the implementation of water pricing reforms is a complex process that often challenges long standing institutional, legal and cultural values. Nonetheless, actual implementation of this consensus on the ground has been, at best, mediocre.

Therefore, new different thought processes are required. Key concept is price/tax neutrality and incremental (progressive) pricing/tax system. Government can create so-called ecological tax reform, which means applying green taxes on pollution or inefficient use of resources such as energy and water, to encourage reducing pollution and economizing the use of resources. At the same time, government needs to reduce the traditional income-based pricing and tax, based to balance taxation levels so as to maintain revenue neutrality and progressiveness. This is an urgent need to take steps to protect the most vulnerable people and to enhance long term investment benefits including creation of new markets and jobs. It means shifting the burden of the pricing/taxes from the “good” to the ‘bad’.

Efficient and effective water pricing systems provide incentives for efficient water use and for water quality protection. They also generate funds for necessary infrastructure development and expansion for poor people, and provide a good basis for ensuring that water services can be provided to all citizens at an affordable price. The well designed pricing and tax system will cast new incentives for enterprises to develop eco-efficient technologies and systems, which again create new jobs and economic growth. In this connection, eco-efficient water infrastructure

suggests the following policy guides as practical approaches in the context of Green Growth development paradigm.

- Change of water pricing structure: Traditional water pricing system is based on income and volume-based water supply. In order to improve the eco efficiency, the structure of pricing should transform from income and water supply based to pollution and wastewater volume based
- While guaranteeing the basic water supply at the lowest level, the incremental (progressive) pricing/tax system should be applied to above certain threshold of water consumption (for example 70L/per person/per day)
- Water pricing/tax reform is required to foster surroundings to assure the sustainable water production and consumption patterns, and to bring up infant water industry.
- Water pricing reform should be led by the government because it features short term pains and long-term benefits
- Increased revenues obtained from increased price should be reinvested in the eco-efficient water infrastructure development

#### b) Reduce Distance and Decentralized Approach

Water management in the region has been dominated by the centralized and separate management of water supply, sanitation and stormwater discharges since the mid 1800s and early 1900s. The centralized paradigm has served countries well over the last one hundred years. However, the reliance on centralized sources of water has proven to be inadequate for population growth, droughts, climate change and protection of important ecosystems.

Moreover, the dominant centralized management paradigm has proven to be inflexible and resistant to the necessary changes required for sustainable water management. Asian cities have experienced water shortages whilst discharging more rainwater, stormwater and wastewater, unused, than the total water demand of those cities. The centralized paradigm has limited the use of abundant decentralized water sources. It is now recognized that multiple sources of water from centralized and decentralized locations in combination with a diverse range of water conservation strategies can increase the resilience of a city's water supply.

In recent times, concerns about the limitations of the centralized paradigm have resulted in the creation of the promotion of eco-efficient water infrastructure for Green Growth including Water Sensitive Urban Design (WSUD) approaches in Australia and Integrated Storm Water Management approaches in Asia. Although eco-efficient water infrastructure approaches are relatively new, they have wide adoption in legislation, policies and water resource management throughout Asia including Indonesia and Philippines.

This decentralized approach should be designed based on local water cycle from rainwater to river and groundwater to evaporation; as well as storage and distribution; treatment, recycling and disposal; protection, conservation and exploitation of water resources at their origin. Such decentralized approaches are further expected to empower local communities to decide action plans based on their priorities to improve access to safe water and hygienic living conditions, to

create more sustainable livelihoods per unit of water, and to better conserve the quantity and quality of freshwater and terrestrial ecosystems that provide services to humans and all living things.

The virtue of decentralization in the water sector lies in the fact that the devolution of the managerial, administrative, and financial power to local areas can promote developmental policies and strategies appropriate for local social, economic and environmental conditions. Decentralization can accelerate streamlining of the governmental bureaus at the center and redefine the roles and functions of diverse bureaus related to water management. The success of decentralization depends upon a clarification of the roles of local, regional, and national level institutions and the setup of efficient local level institutions for planning and decision-making.

#### c) Development of New Water Sources

As fresh water resources from river and ground waters are reaching its limits, development of alternative water sources are important to reduce water stress and competition and meet the ever-increasing demand for water. These alternatives include the active use of rainwater and urban storm water, the recycled use of wastewater (e.g. treated sewage effluent) and exploiting fresh water bodies that are available underneath the sea. Harvesting rainwater and reclaimed grey water holds the potential for fresh water conservation, wastewater and storm water discharge reduction, and should also be considered in terms of its contribution to integrated water management system.

The reasons that these alternative water resources have not been developed are relatively high cost and complicated process of management. However due to technology and design development such as portable membrane and smart design, these water sources are becoming much easier to develop along with decentralized approaches. However, at the beginning stage to develop new water sources, government regulation and commitment are required to promote the fledging water sources development and to open new market and industry. For example, since 2009 the law in Korea requires new public buildings including school to install certain level of rainwater facilities with incentive measures together. Such measures are promoting new technologies and innovative ideas such as green filter and eco-energy devices and also promote new markets of small-medium business such as membrane development.

These public policies that are aimed at improving access to new water resources, contribute to environmental protection and promotion of better practices for wise use of water through recycled waste water and enhanced adaptive capacity, and by recharging groundwater aquifers and augmenting surface water reservoirs.

#### d) Educate People: Sustainable Water Consumption Patterns and People's Support

As countries develop economies which are based more on exchange of knowledge and information, they tend to become more eco-efficient. However, these gains can be more than offset by rising consumption as more people adopt energy and material-intensive lifestyles.

Moreover, increasing the quantity of consumption does not necessarily mean increasingly meeting consumer's needs and enhancing the quality of people's life. Furthermore, people need to be aware of how consumption of goods and services contribute to the environmental degradation. Governments will therefore want to focus on the quality of life and to foster sustainable lifestyles –through policy mixes that encourage eco-efficient consumption patterns including, for example, energy efficiency or mass-transit systems.

Furthermore, people's support and participation is one of key elements for success to improve the eco-efficiency and greening our future. Greening our future requires 3 Ps: Public, Private and People. The Public sector will need to lead the transition. Governments need to bridge the gap between short-term costs of green growth and its long term benefits. The Private sector has also an important role to play, and seize business opportunities that green growth can bring. Due to the time gap between short-term costs and long-term benefits, it is the Government that has to jump-start the green growth process. Such a leadership by the public sector has to be politically supported by the people. The People will need to support the paradigm shift by responding with positive public acceptance, adopting more sustainable lifestyles, focusing more on quality of life, rather than quantity of consumption.

#### e) Development of Local Water Industry and Business

Environmental sustainability need not to be a trade-off. Investing in natural capital, clean energy and ecological efficiency represents a new opportunity for economic growth that is green and can create employment opportunities which is a basis for inclusive social development. Businesses already have much to gain from integrating environmental considerations into the production processes – higher productivity, for example, saving energy and materials, improving their public images, and profiting from new demands for environmentally preferable goods and services. However, in the future, business should have stronger incentives for adopting environmentally sustainable practices. Governments need to create a favorable environment to promote green business and technology by, for example, improving regulations and standards, providing tax breaks, subsidies and R&D incentives, adopting green procurement practices, or promoting Corporate Social Responsibility (CSR).

In the meantime, promoted water industry includes new foundations for innovated ideas, new technologies and design as well as integrated planning of water infrastructure and other infrastructures to develop new water sources and eco efficient use and management of water resources. In case of Singapore, over the last four decades, strong partnerships of public and private sector have built a sizeable and innovative environmental industry. They have also established a diversified and sustainable water supply from four different sources known as the Four National Taps - water from local catchment areas, imported water, reclaimed water (NEWater) and desalinated water. With a growing global emphasis on water and the environment, Singapore is well positioned to take the lead in this industry as an R&D base and provider of water solutions. Over the next decade, Singapore aims to supply technology and products to three per cent of the global water market.

Therefore, to bring up local infant water industry, we need key policy measures to secure water supply such as to promote new technologies and design, to create new employment through new

water market, and to ensure eco efficient use and management. In order to promote the fledging water industry, the strong protection measure such as incentives and subsidies are recommended to grow to some extent.

#### f) Integrated Planning with Other Sector Infrastructures

Our infrastructure is a system of sub-systems involving diverse sub-infrastructures and social organizations. This implicates that we need a fundamental reconsideration of how we look at infrastructure design, away from traditional solitary planning toward a multi-domain, multi-disciplinary effort.

Although our academic and industrial organizations have great expertise in system components, we lack experiences in the planning and design of the “systems of systems” that constitute our infrastructures at the city level and national level. Recently the emerging issues have the tendency to show cross-sectoral features such as nexus of water and energy. It is advised to make interdisciplinary planning beyond one sector in order to increase eco-efficiency.

Furthermore, application of eco efficiency into water infrastructure development needs to integrate both dimensions of physical infrastructure aspects and non-physical or institutional aspects such as laws, regulations, regulatory programs, government bureaus, and civil society groups like environmental NGOs. The eco-efficient water infrastructure includes institutional arrangements and policy measures including relevant legal, economic and regulatory instruments to manage water resources in a sustainable manner.

### **2.4 Expected Benefits of Eco efficient Approach**

- As economies grow and population increases rapidly in Asia and Pacific region over last decades, many developing countries face increasing demand of water resources, increasing acute water scarcity and serious socio economic impact of water related disasters, thereby threatening the sustainability of socio economic development efforts.
- In addition, climate change which is the biggest threat the planet faces, is making serious impacts on water system including water infrastructure, especially to the poorest and the most vulnerable among us.
- Most of the developing countries in the region have very limited capitals and resources to invest in the construction of new water infrastructures as well as in replacement of aging water infrastructure. Moreover, the continuous constructions of new water supply facilities could not be eco-efficient in the long run and face strong confrontation from environmentalists and civil society.
- Under these circumstances, one of the best solutions to tackle these issues is to increase ecological efficiency (eco-efficiency) in water infrastructure in countries, which can play a central role in pursuing sustainable development. This eco-efficiency approach for water infrastructure could be supplementary to the traditional approach, mainly focusing on water supply management (e.g. construction of physical water infrastructure like dams, reservoir, hydropower plants, water distribution networks, and other water facilities).

- ESCAP, in close collaboration with countries, research institutes, regional organizations and civil societies, aims to contribute to developing countries to identify best practices that have helped countries to address a variety of challenges including the rising wave of infrastructure replacement needs and Climate Change impacts on water system, and further to achieve the sustainable development through the promotion of eco efficient approach for water infrastructure. In this connection, ESCAP establishes the regional knowledge hub with the purposes to facilitate flows of information including research papers, country reports, good practices and activities, etc and to strengthen the partnership and networks as well as participations in Asia and the Pacific region.

### 3. Existing Institutional and Legal Framework of Water Resource Management

#### 3.1. Existing institutional framework in Mongolia

- Until 1987, the Ministry of Water resources was implementing water sector policy in its entirety.
- Since 1990s, various line ministries have been given responsibilities with regard to water.
- At present
  - Water conservation is the responsibility of the Water section under the Agency for Water, within the Ministry Environment and Tourism (MET),
  - Water use and licensing are the responsibility of the Ministry of Food, Agriculture and Light Industry (MFALI),
  - Ministry of Road, Transportation, Construction and Urban Development (MRTCUD), and others: agriculture, pasture land water supply, urban drinking water or industry and mining.
  - The Ministry of Health (MoH) is responsible for water quality, ecological and environmental sanitation and hygiene.
  - Water related research and monitoring functions are dealt by the Mongolian Academy of Science, and the National Institute of Meteorology and Hydrology, Agency for Meteorology, Hydrology and the Environment Monitoring.

**Figure1: WATER GOVERNANCE INDICATORS & SCORES**

Water Governance Indicator	Comment	Score (1 - 5)	Priority needs
Policy & Legislation	1. A variety of policies concerning aspects of the sector exist, but they are not harmonized and there are significant policy gaps in key areas or for key functions of the sector. 2. A range of legislation exists but does not allow for integrated implementation of the various policies. More than 20 organizations have some responsibility for aspects of the water sector under existing legislation.	1	Preparation of an integrated and comprehensive water sector policy (water resources, water supply, sanitation, agricultural water) that fully-reflects stakeholder needs and preparation of the necessary enabling legislation. Repeal if all existing sector policy and legislation
Regulation	1. Existing standards are quite comprehensive, but enforcement remains difficult due to the large number of	2	Establishment of an autonomous and independent agency for sector

	<p>organizations involved and poor coordination among organizations.</p> <p>2. Capacity constraints significantly affect the effectiveness of regulation in rural/remote areas.</p> <p>3. Tariff setting and regulation is an opaque process and urban services are not being provided on a financially-viable basis at this time for various reasons.</p> <p>4. Urban piped services such as Ulaanbaatar appear well-regulated.</p>		<p>regulation, with sufficient resources and capacity to effectively regulate sector development and management (eventually) throughout the country.</p>
Decentralization	<p>1. Mongolia is still essentially centralized and while some responsibilities have been devolved (or delegated) to Aimag levels, the resources required to implement decisions at the Aimag level are very limited.</p> <p>2. Very significant capacity constraints have generally prevented further decentralization from the Aimag to the Soum and lower levels.</p> <p>3. A coherent and comprehensive decentralization and/or local government policy does not exist, and existing water policies do not address decentralization.</p> <p>4. Aimag PUSOs/USAGs have been relatively successful in managing technical and administrative aspects of WSS service provision in Aimag Centres, but with significant external support, and not on a full-cost recovery basis.</p>	2	<p>Pilot-testing then refinement, replication and scaling up of local WSS service delivery for as many rural/peri-urban areas as possible. Articulation of a local government/decentralization strategy.</p>
Alternative Service Providers	<p>1. ASPs are vital particularly for water supply in Ger areas, but are not being brought into the formal sector and are unregulated.</p> <p>2. ASPs for household sanitation facility promotion &amp; construction are generally absent.</p> <p>3. Social marketing for sanitation improvement is largely an unknown concept in Mongolia, but holds significant potential for Ger areas.</p> <p>4. Privatization of PUSO/USAG services in Aimag Centres is proceeding but general lack of private sector capacity in many provinces constrains competition.</p>	2	<p>Initiate pending (then replication/scale-up) of proven sanitation promotion methodologies such as social marketing and CLTS in peri-urban areas.</p>
Sector Financial Management	<p>1. Sector budgets are not linked to policies' objectives, but are guided at the current time by MDG targets and the Water Action Plan (2009-2012).</p> <p>2. Sector budgets do not appear to reflect broader national objectives for rural economic development and poverty reduction.</p> <p>3. Budgets for sanitation development are far short of health and social needs and are skewed towards piped urban sewerage.</p> <p>4. Budget allocations to lower levels of government for sector development are inadequate.</p>	2	<p>Increase sector budget allocations to sanitation and to local government levels, making them needs-based and pro-poor.</p>
Monitoring & Evaluation	<p>1. Water sector data collection is fragmented among numerous organizations and a coordinating mechanism (i.e. integrated database) does not exist.</p> <p>2. Data concerning field conditions particularly regarding WSS service coverage and performance is lacking.</p> <p>3. Financial data regarding sector development and service costs is not well-integrated into sector planning.</p>	2	<p>Coordinate existing databases in various sector entities within one agency, and then improve the consolidated database. Develop and implement a sector communications strategy.</p>
Water Resources Management	<p>1. Progress towards developing a national IWRM plan is promising, and a specific project in the NWA is starting.</p> <p>2. Meteorological, hydrological and hydro geological data has been collected for the long term, but the organizations responsible are suffering significant capacity and resource constraints.</p> <p>3. Basin organizations and water user groups do not exist, but are planned on a pilot scale.</p> <p>4. Transboundary water management (Russia, China) is centered in the Ministry of Foreign Affairs, rather than in bilateral/multilateral basin institutions.</p> <p>5. While awareness among sector organizations of the potential impacts of climate change is quite high, adaptation/mitigation initiatives do not appear to have been integrated into water resources planning yet.</p>	3	<p>Improve data collection capacity to supplement movement towards preparing a national IWRM plan, and establish Basin(stakeholder) Organizations.</p>
Transparency & Accountability	<p>1. Sector planning and budgeting is not transparent and is not participatory.</p> <p>2. Dissemination of information to the public on sector</p>	2	<p>Encourage the establishment of a water sector umbrella and watchdog NGO.</p>

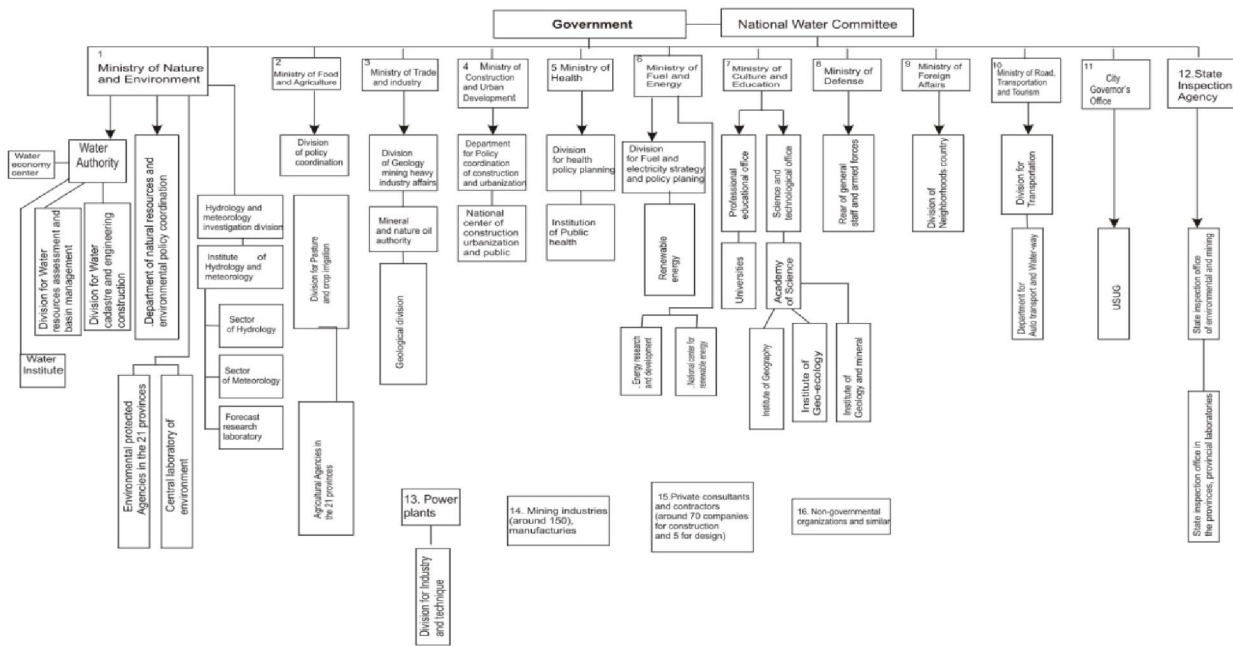
	<p>projects, expenditures, services is poor, but in Ulaanbaatar consideration is being given to establishing a customer relations capability.</p> <p>3. Water sector advocacy organizations such as 'watchdog' NGOs are not present.</p>		
Civil Society Participation	<p>1. Generally, water users are not involved in service development or management.</p> <p>2. Planning is not participatory, even at the local levels where it is usually easier to undertake, and users are passive recipients.</p> <p>3 A relatively small number of NGOs exist but few are dedicated to the sector, but one notable NGO in UB has developed strong capacity for civil society participation in urban services development in Ger areas.</p> <p>4. Local level CBOs tend to focus on livelihoods and occupations but could be strengthened to address community WSS issues.</p> <p>5. Attention to water issues in the media is quite high, but the impact of this cannot be readily ascertained.</p>	2	Incorporate takeholder/service user participation in ALL sector planning activities.
Equitable Service Delivery	<p>1. There is a strong bias towards piped water and sewerage service in urban areas (UB and other cities and Aimag centres) with little attention towards Soum Centres and lower-level communities.</p> <p>2. The issue of financial viability of services in relation to affordability by poorer segments of society is not systematically addressed. The need for subsidization of services to the poor is not being adequately considered. Water consumption rates per capita in poor areas are among the lowest in the world, while in urban areas they are among the highest, although steps are being taken to reduce this rate.</p>	2	Re-direct resources and attention from urban service expansion to peri-urban and Soum Centre service provision to improve equity.

Total Score 20/50 = 40%

Mean Score = 2

The current structure of the water sector in Mongolia (as of late 2008) is presented in Figure 2 prepared by the Strengthening IWRM Project in the NWA.

**Figure 2. CURRENT STRUCTURE OF THE WATER SECTOR /2008/**



Source: Integrated Water Resource Management Project, Mongolia.

### 3.2. Key actors and responsibilities

- Thirteen GOM institutions (mostly Ministries) are involved in the water sector with key sector functions of policy, regulation and implementation scattered among them.
- Figure 3 based on information received from the National Water Committee (NWC) shows that there are indeed 29 different 'stakeholders' who have legal obligations to fulfill under current sector legislation. Some of these 'stakeholders' are within the 13 GOM institutions mentioned above as comprising the water sector, but some are not, and for one set of set obligations it is 'unknown' who is responsible.

Figure3 : **STAKEHOLDERS INVOLVED IN THE WATER SECTOR**

No	Stakeholders	Obligations specified in Legislation
1	Parliament	6
2	Government	9
3	Ministry of Nature and Environment MNE	25
4	Ministry of Construction and Urban Development (MCUD)	8
5	Ministry of Food and Agriculture (MFA )	4
6	Ministry of Road, Transport and Tourism ( MRTT)	6
7	Ministry of Industry and Trade (MIT )	3

8	Ministry of Health (MH )	4
9	Ministry of Education, Culture and Science (MECS )	1
10	Ministry of Defense (MD )	1
11	Ministry of Finance ( MF)	1
12	Ministry of Fuel and Energy ( MFE)	3
13	Water Authority (WA )	23
14	State Inspection Agency ( SIA)	3
15	State Emergency Authority (SEA )	1
16	Institute of Meteorology and Hydrology ( IMH)	10
18	Civil Representative Khural of Capital and Province (CRK of CP )	8
19	Governors of Capital and Province	12
20	Local Nature and Environment Department ( LNED)	9
21	Governors of Soum and District	12
22	Civil Representative Khural of Soum and District (CRK of SD )	3
23	Governors of Bag and Khoroo	5
24	Civil Representative Khural of Bag and Khoroo	2
25	Rangers (Ra )	2
26	Laboratories ( L)	4
27	River Basin Committee (RBC )	8
28	Professional Organization (PO)	20
29	Unknown	16

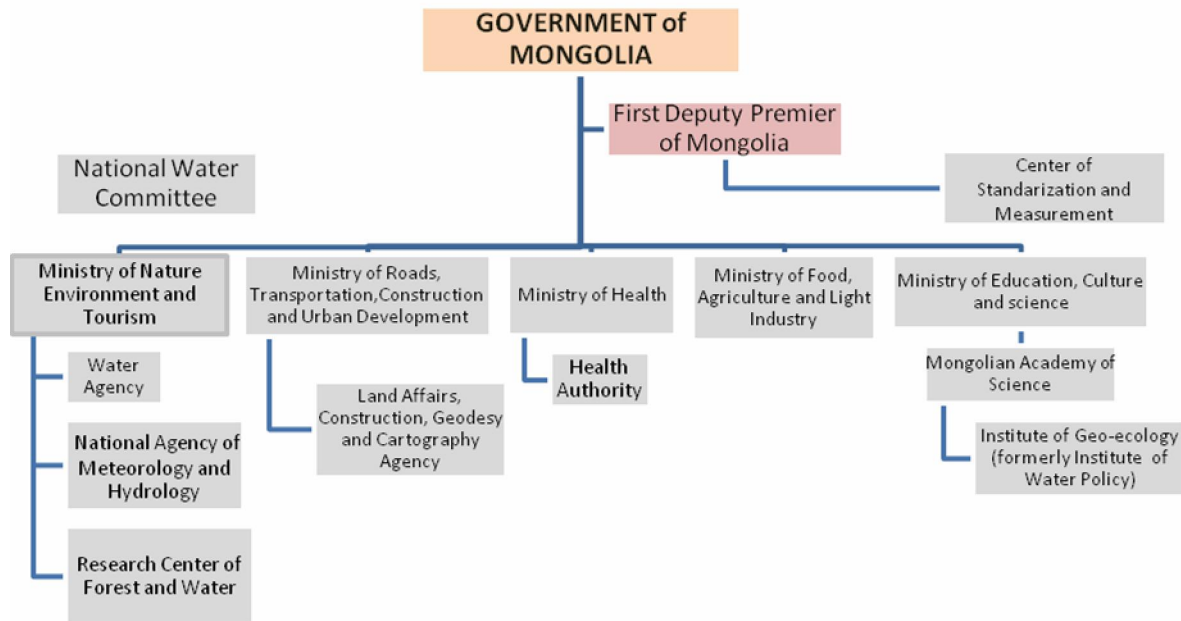
Source: Dorjsuren.D and Baysaikhan.G, Present Water Sector Legislation and Analysis: Results and Challenges, 2007.

As an example of this complicated situation, water conservation is the responsibility of the Water Section of the NWA within the MNET, water use and licensing is the responsibility of the MFALI, or MRTAUD, or others depending upon the water use (irrigation, livestock watering, urban drinking water, or industry/mining, etc.). The MOH is responsible for water quality, sanitation and hygiene. Water-related research and monitoring is dealt with by the Mongolian Academy of Science and the National Institute of Meteorology and Hydrology, Agency for Meteorology, Hydrology and Environmental Monitoring.

Sector coordinating entities or umbrella organizations have been tried. The NWA (formerly the Water Authority of the Government Implementing Agency) was established with this general mandate but is located under the Ministry of Nature, Environment and Tourism, so has tended to concentrate its efforts within that Ministry, which has the largest number of water sector sub-entities within it and the highest number of legal obligations to fulfill. But as a truly sectoral coordinating mechanism, the NWA has not yet been able to reach this goal.

In 2009 Government of Mongolia was implementing a significant revision to water sector organization, which is presented in Figure 4.

Figure4. **REVISED STRUCTURE OF THE WATER SECTOR (2009)**



It appears that the number of line Ministries designated as being in the water sector has been reduced to five (1. Nature, Environment and Tourism. 2. Roads, Transportation, Construction and Urban Development. 3. Health. 4. Food, Agriculture and Light Industry. 5. Education, Culture and Science.). What is to happen regarding the other Ministries and institutions which have legal obligations in the water sector is not clear as before, except now the number of these has increased. The NWA remains as the de-facto coordinating body but is still under its Ministry. An Agency (formerly a Centre) for Standardization and Measurement has been reformulated, reporting to higher levels of GOM. The NWC remains but its connection to the other entities is not known at this time.

### 3.3. Water Law/policy

The basis of the current structure and organizational arrangement of Mongolia's water sector is based on the Law on Water that was endorsed in 2004 (MG, 2004). This law is consistent with the Constitution of Mongolia as well as the other laws. It recognises the public role and responsibilities related to the protection of water resources and its restoration. As seen from the articles of these laws, the task to 'develop state policy on water and extent of water resource use' wrests with the State Great *Khural*. The Parliament operates on a permanent basis, makes decisions related to the water sector, the administrative and organizational arrangement, the extent of its utilisation, water charges and penalties. The policies that are approved by the Parliament are implemented with the assistance of budgetary grants of the central government that determine the development and management of water resources.

Mongolia has a wide range of legislation, enactments and standards in force in the public utilities sector of Mongolia, including:

- Law of Mongolia on Water
- Law on Water Supply and Sewage in Cities and Settlements
- Law on Water Resource Use Fees
- Law on Hygiene

- Standard on Industrial Wastewater Discharge into the Sewage System (1997)
- Standard on Pit Latrines and Soak Pits (1980)
- Standard on General Requirements for Selecting a Site for Wastewater Treatment Plants and Treatment Technologies MNS 4288-96-5
- Standard on Water Quality: Guidelines for Taking Water Samples and Samples from Sludge in Wastewater Treatment Plants MNS(ISO)566-1300
- Standard on Water Quality, Wastewater and General Technical Requirements MNS494300

However, the extent to which these codes are enforced is unclear. Also, many codes and standards do not reflect current needs or financing capability, and it is recommended that these are revised, incorporating them into a single updated sector strategy.

In May of 2010 National Parliament of Mongolia adopted “Water” programme from 2011-2021 For implementation this “Water” programme State Government developed action for phase one from 2011-2016, which eco efficient has been implemented.

#### **OBJECTIVE AND STRATEGIC GOALS OF “WATER” NATIONAL PROGRAMME OF MONGOLIA:**

The objective of this programme is the protection of water resources from deterioration and pollution, proper use of available resources, the implementation government policy creating conditions for Mongolian people to live in a healthy and secure environment as a key element in development of the country.

The programme objective shall be implemented through the following strategic goals:

- Protect the water resources of Mongolia, provide all means possible to support their formation, maintain their purity and natural replenishment;
- Establish water resource quality-monitoring network covering all territory that is constant and with sustained operation; and adopting new technology in order to provide efficient information and management;
- Create conditions for the accumulation of water resources, provide potable water meeting the requirements of health standards, and improve water supply for industry and agriculture to support sustainable development;
- Take comprehensive measures towards proper use of water resources and water conservation; adopt and implement advanced technology for reuse and treatment of wastewater; prevention from flood disaster; and support activities and initiatives within the legislative framework;
- Improve water resource use and management, and develop the legislative environment and institutional development for coordinating multiple requirements for water use, and capacity building; Promote community participation and public information, advanced technology enriching with customs and tradition on the protection of water resources and proper use to young people and citizens.

## **4. Strategy for Eco-efficient Water Infrastructure Development in Mongolia**

### **4.1. Overview**

The strategy aims to contributing to the Water National Programme resolute by the Mongolia Parliament dated 20<sup>th</sup> May 2010 and to promoting the eco efficiency dimensions into Mongolia national development policies and plans for Green Growth in Mongolia.

The strategy aims to providing the guiding principles for the development of the action plans to implement the Mongolia Water National Programme.

#### **4.2. Framework and Process**

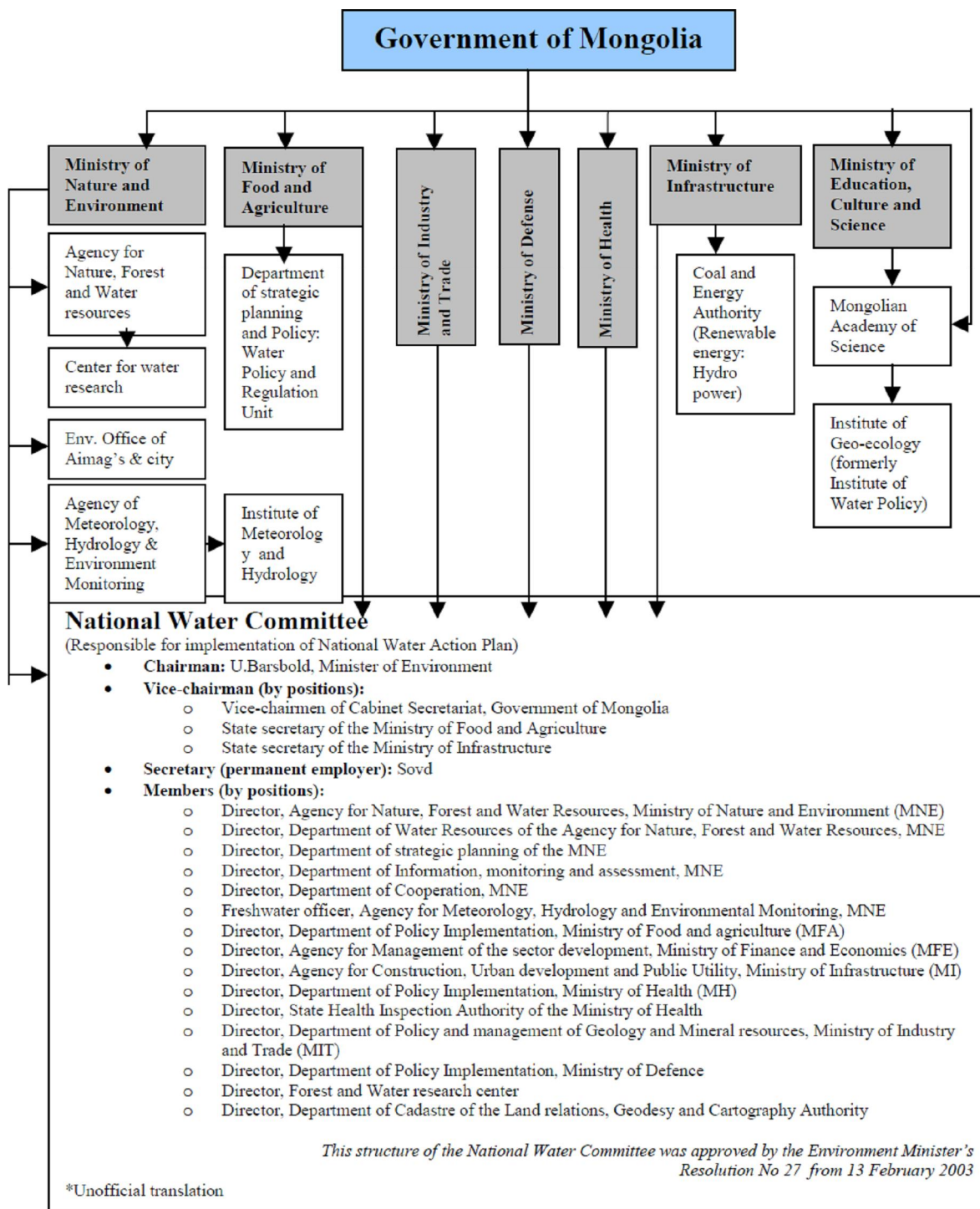
- Organize the expert group meeting with participation of experts from international organizations
  - ✓ Make the priority list
  - ✓ Establish a project team to provide technical guide, to develop guidelines and to arrange the next meetings (need to secure the budget to support the project team)
- Project team will implement followings
  - ✓ Draft the paper on the current situation and needs assessment which include conditions that require action be taken and the factors that facilitate or constrain them.
  - ✓ Collect good practices in Mongolia
  - ✓ Develop Mongolian models and design for eco efficient water infrastructure development

#### **4.3. Suggested Priority programmes (Brief description)**

- Water Pricing and Tax Reform
  - ✓ Research programme on water pricing, tax and subsidy reforms
- Development the action plans to implement the Mongolian Water National Programme
- Development of educational and training model for eco-efficient water infrastructure development
- Establish the long-term research plan and programme
- Development of programme for eco efficient technologies and design
  - ✓ Develop the Water Smart Urban Design (Water Sensitive Urban Design)
- Develop 4R educational campaign program, targeting reducing water leakage 20%, increase water energy 20%, save electricity 20%, saving water 20%
- Education material for monitoring underground water
- Development of laws and regulations to promote the rainwater use and management system in new public buildings
- Establish a water database and keep water records on water use, prevention of water disasters and provide management for activities on mitigating damage caused by water disasters

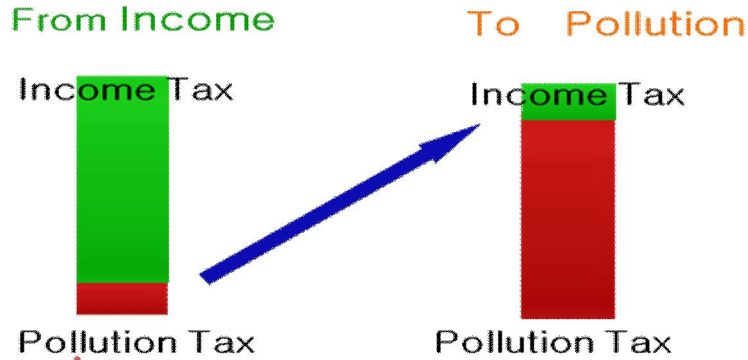
## 5.0 Process of Integration of Eco efficiency into Water Infrastructure Development

### 5.1. Role of key actors and agencies



## 6. Policy Guide and Recommendations

### a. Pricing, Tax and Budget Reforms

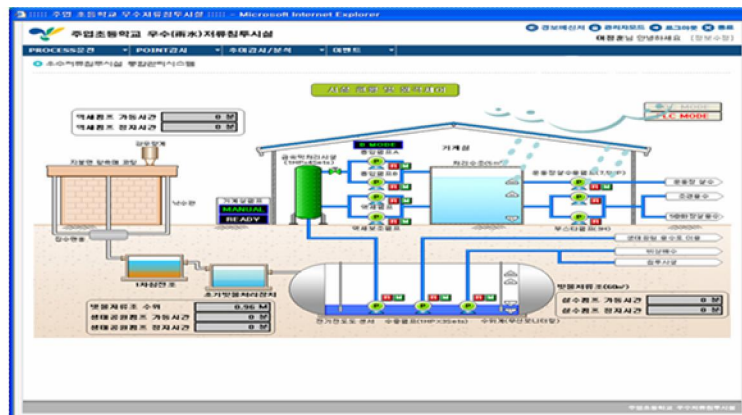


### b. Proactive government intervention to fill the time gap and price gap

- Build the system to fill two gaps
  - ✓ between short-term investment and long-term profits
  - ✓ between market price and ecological price
- Pricing, tax and subsidy for new innovators in the local business
- Government intervention for infant industries

### c. Reduce the distance and Decentralized approaches

- To achieve and to reduce the distance, the decentralized approaches is key element
- To enable the decentralized approaches successful, remote monitoring and controlling system should be equipped
  - ✓ Software is already developed
  - ✓ Need to modify to accommodate country's condition



d. Development of new water source

- Wastewater and Rainwater as new water source
- Develop local technology-based industries
- Decentralized small size water supply / treatment facilities
- Get right wastewater price
- Develop standard / cost effective household waste treatment device
- Enact by-laws that install approved high performance wastewater treatment in new buildings or renovations requiring a permit.
- Enact by-laws requiring home water audits and retrofits with every house resale

e. Educate the people for sustainable consumption pattern

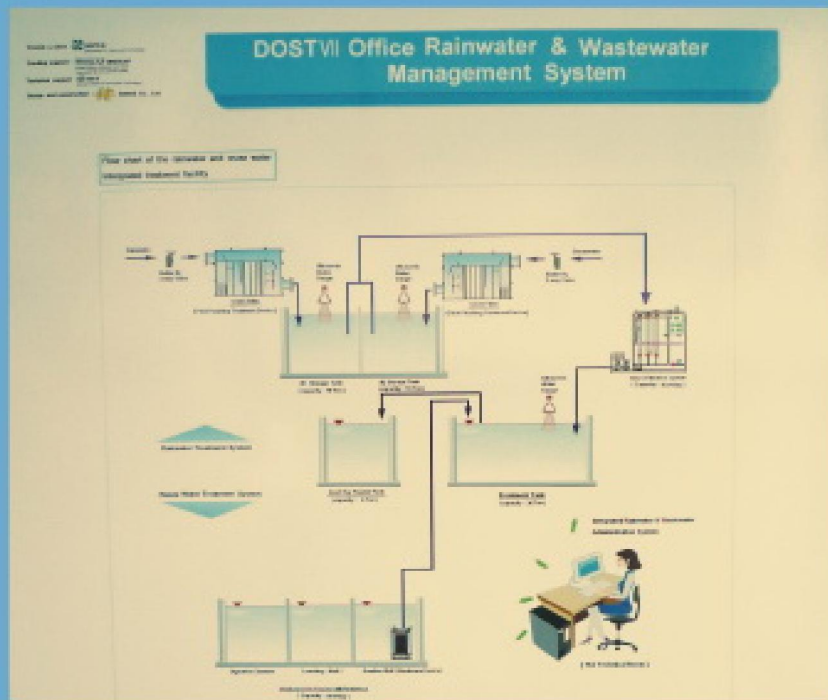
- Any additional water demand from new development is off-set by reducing water use in existing buildings.
- Enact by-laws for dual plumbing in new developments
- DSM requires staff with right skills and expertise based on social sciences to handle water demands
- Create permanent DSM staff positions in utility operations, finance and planning departments, and strategic decision making
- Managing demand as daily water management
- Educate people in collaboration with Media based on social compacts
- Enact by-laws that require high performance water-saving device in new buildings

f. Foster new infant water industry and business

- Government intervention required
- Establish state-owned enterprises
- Protect infant water industry for new technology and capacity build-up
- Local government purchasing: 'Buy local' campaigns
- Short-term subsidies to stimulate the local market
- Government can provide a ground rule where LC GG innovators can prosper by
  - ✓ Improving regulations
  - ✓ Providing R&D incentives
  - ✓ Adopting green procurement practices
  - ✓ Promoting CSR

g. Integrated planning with other infrastructures

Mandatory regulation and process to promote integrated planning with other infrastructure in energy, transportation, solid waste, disaster and land infrastructures



## Discussion Paper



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