PROPOSED TOPIC PAPER FOR THEME 4, TOPIC 4.2 (#13)

Theme	**4. GOVERNANCE AND MANAGEMENT**
Topic	**4.2 OR 13 IMPROVING PERFORMANCE THROUGH REGULATORY APPROACHES**
Main Question	*Water is a life support means or resource and is, therefore, essential. The 3rd WWW in 2003 had noted that 'a global withdrawal of 600-700 km3/a (cubic kilometres per year) makes ground water the world's most extracted raw material. It is a cornerstone of the Asian Green Agricultural Revolution, provides about 70% of piped water supply in the European Union and supports rural communities across large areas of Sub-Saharan Africa'. The fast rate of urbanization, resulting in rapid increase in demand, makes it scarce day by day. A growing number of Urban Cities and Towns are facing serious problems due to water scarcity. Whereas the water demand on one hand is increasing manifolds, on the other hand state assured water supply is quite inelastic. These need to be addressed through mobilizing the people as well as enacting legislations that promote water harvesting on one hand, and regulate water extraction on the other.* *Groundwater poses an extremely difficult legal problem. Unlike the case of surface water, it is often difficult to determine the source and rates of recharge, the extent and variation of quality in storage, and the direction of water movement. Three basic rules cover the use of groundwater. The first, or English, rule is one of absolute ownership. It allows the overlying landowner to take groundwater from the land at any time and in any quantity, regardless of the effect on the water table of a neighbour's land. Under this rule it would be possible for a landowner to exhaust the total groundwater supply of an area by heavy pumping. This rule has been qualified in some areas to limit the malicious and wasteful use of the water. The American rule, or rule of reasonable use, recognizes that the landowner has rights to the water under the land but that these rights may be limited. The rights to water are limited to its reasonable use in relationship to the overlying land. The third rule covering groundwater is the appropriation principle, whereby the water is allocated for specific uses. The growing intensity of water scarcity, however, calls for certain legislative, administrative and fiscal measures. Legislation is a source as well as an instrument of public policy.* *In USA the English doctrine is followed in some eastern and western states. The American principle of reasonable use is followed by many states. In several of the western states, the appropriative principle has been applied by statute, court decision, or both to the use of ground water.*
Overview of Related sub-questions	*<u>Question 1</u>: Through which types of measures could groundwater withdrawals be best controlled by users to reduce groundwater mining? At what costs and for which efficiency?* *<u>Question 2</u>: Through which types of measures could non-point source pollution of surface and groundwater be reduced?* *<u>Question 3</u>: What strategies can be adopted to deal with storm water volume and pollution in the face of more extreme weather events and increased urbanization? Are there changes to infrastructure design (roadways, gutters, culverts) or to engineering of pollution sources (cars and trucks, petrol and oil formulations) that would mitigate damage to natural systems?* *<u>Question 4:</u> What policies should govern groundwater recharge measures to ensure water quality safety and stabilize the water table?*

Sub-Questions	*Question 1: Through which types of measures could groundwater withdrawals be best controlled by users to reduce groundwater mining? At what costs and for which efficiency? (23%)* *Ground water is a strategic ecological resource. Managing that resource to meet human and environmental needs is one of the great water security challenges of the early 21st century. Ground water tables are falling in many countries. Countries like Jordan have embarked on a regulatory offensive in groundwater. On the supply side It is using the system of permits and on the demand side installation of revenue meters and increased prices.* *Ground water extraction costs depend on the capital cost of pumps and the recurrent costs of electricity. Once a pump is installed, the only constraint on pumping is the price of electricity. In many cases electricity for agricultural users has been free or subsidised, removing incentives to conserve water. These subsidies thus have created disincentives for water conservation and incentives for inappropriate cropping patterns. If water is sensibly priced and regulated, cropping pattern for many water-intensive crops will change. Right use of pricing policies both for water and electricity will not only promote efficiency and environmental sustainability. WWW-5 should debate on the implications of perverse subsidies which are visible in many water-stressed environments. Governments often justify current subsidies for water on equity grounds. Producer subsidies for water-intensive produce such as oilseeds, sugar, wheat and beef create incentives for investment, patterns that lead to overexploitation of underground water. The under-pricing of irrigation water creates disincentives for conservation. WWW in Istanbul should discuss the challenge of electricity subsidies which maintain artificially high demand for water. Withdrawal of subsidies will force agricultural sector using more efficient irrigation practices giving an incentive for farmers to produce crops less intensive in water use. The overall water savings will be enough for additional urban water consumption.* *Question 2: Through which types of measures could non-point source pollution of surface and groundwater be reduced?* *Many pollutants can be carried long distances by surface and groundwater threatening the health, longevity, livelihood, recreation, cleanliness and happiness of people who have no direct involvement in their production but cannot escape their influence. Two types of measures have generally been recommended. First through the establishment of Water-quality standards which establish a designated use for a specified section of a water body, which is then balanced with the maximum amount of waste the water body can assimilate. Technology-based standards, the second type of measures, are effluent limitations based on the levels of pollutant removal that can be achieved by modern wastewater treatment technology.* *Water-quality-based approach adopted in US in 1960s had faced lot of difficulties of enforcement and the limited availability of data for use in water-quality models. The arguments in favour of a technology-based approach are as follows:* 1. *Technology-based standards are easy to enforce. This is important from an institutional perspective.* 2. *These standards are the first step toward the ultimate goal of zero discharge of pollutants to natural waters, as opposed to merely cleaning of waters to suit specified objectives (the basis of water quality standards).* 3. *There is insufficient knowledge and resources to set water-quality standards for all pollutants and locations. Technology-based standards are an interim approach to avoid pollution.* 4. *Countrywide uniformity in treatment standards minimises economic*

dislocations.

5. *The approach promotes equity among dischargers. No one should have the right to discharge more into the environment simply because of geographic location.*

Given below are various advantages to adopt water-quality standards approach for reducing source pollution of water:

1. *Water-quality standards and the process by which they are adopted inherently encourage an assessment of costs and benefits, which is absent in the adoption and application of technology-based standards.*
2. *They foster scientific debate, which accelerates the advancement of the state of the art in predicting the fate and effect of pollutants.*
3. *The debate takes place in a local-state arena and heightens awareness of local government, policymakers and the public of the importance of water pollution control in their communities.*
4. *The assertion of the primary right and responsibility of states to regulate pollutants is essential to establishing the appropriate balance of power between the national governments and state/local governments.*
5. *Water-quality-based decisions can avoid requirements of treatment for the sake of treatment, which can result from application of technology-based standards.*

WWF-5 in Istanbul may have to debate about the approaches that may be followed to reduce non-point source pollution of water based on the ability and sophistication of the authorities to regulate discharged pollutants under water-quality standards.

<u>Question 3</u>: What strategies can be adopted to deal with storm water volume and pollution in the face of more extreme weather events and increased urbanization? Are there changes to infrastructure design (roadways, gutters, culverts) or to engineering of pollution sources (cars and trucks, petrol and oil formulations) that would mitigate damage to natural systems?

Rapid and effective removal of storm runoff in a modern city is considered an essential service. Urban drainage facilities have progressed from crude ditches and stepping stones to the present intricate coordinated systems of curbs, gutters, inlets and underground conveyances. Handling surface runoff in urban drainage areas is a complex and costly undertaking with several primary difficulties —notably quantity and variability. Volumes of surface runoff can be exceedingly large during intense storms, yet such storms may occur only on a very infrequent basis. This poses the problem of building drainage works that perhaps are used for only a short time.

Storm water inlet capacity has received little emphasis in the design of storm drainage systems for highways and streets. It is nevertheless of great importance, because regardless of the adequacy of the underground drainage system, proper drainage cannot result unless storm water is quickly and efficiently collected and introduced into the system.

A reliable knowledge of the behaviour of storm water has broad implications: over-design and inefficient use of the drainage system due to inadequate inlets can be avoided, debris and leaf stoppage of inlets can be reduced and traffic interferences on the streets and highways can be minimised. Four major types of inlet can be built: curb inlets, gutter inlets, combination inlets and multiple inlets. However, no specific inlet type can be considered best for all conditions of use. Street grade, cross slope and depression geometry affect the hydraulic efficiency. Eliminating stoppages or minimising traffic interferences often take precedence over hydraulic considerations in design.

Increasing the streets cross slope will increase the depth of flow of the gutter, gutter depressions will concentrate flows at the inlet, and curb and gutter openings can be combined. These and other modifications provide increased capacities, although some of them are not compatible with high-volume traffic.

These and other related issues of engineering of pollution sources (cars and trucks, petrol and oil formulations) that would mitigate damage to natural systems need to be discussed during WWF-5 to improve urban planning for making the cities more liveable.

<u>Question 4:</u> What policies should govern groundwater recharge measures to ensure water quality safety and stabilize the water table?

There is a basic lack of control over exploitation of the ground water sources. Groundwater over-abstraction represents a special situation as the visual evidence is typically less obvious and the effects are more difficult to recognize and react to. Increased pumping from aquifers has increased globally. While this has produced a number of important benefits, some have been sustainable over only relatively short periods and have had significant side effects. For example, an initially impressive benefit was experienced in India where shallow groundwater development allowed irrigated land area to be doubled, thereby dramatically increasing food production. However, it also caused momentous changes to local water regimes that resulted in a variety of impacts, including lowered water tables and entirely depleted groundwater resources in some areas. Similar cases from all climatic regions of the world illustrate that over-abstracting groundwater is relatively common. The results of groundwater over-abstraction can be seen in: reduced spring yields; rivers drying up and having poorer water quality because of lowered base-flow contributions; intrusion of saline waters or other poor quality water into the fresh water zones of aquifers; lowered or abandoned productivity as water levels decline in wells; higher production costs from wells or the need to extend underground aqueducts as inflow rates decrease; and diminished groundwater-dependent ecosystems, including wetlands, as they become stressed or lose resilience from inadequate water sources. Subsidence is another particularly widespread impact that occurs from excessive over-pumping, with notable examples in a number of major cities in China, Japan, Mexico and the US. However, this type of impact can be stopped when the over-pumping of the aquifer is discontinued, although the effects are not usually reversible.

Tracking groundwater use as compared to recharge volumes at national and sub-national levels-and particularly for individual aquifers – should be practiced and implemented to identify and take corrective action as needed to maintain groundwater development sustainability. Unfortunately Ground water assessment, monitoring and data management activities are for the most part minimal or ineffective in many developing countries and are being downsized and reduced in many developed countries. Lack of data and institutional capacity is endemic, making adequate ground water development and management difficult. There is, therefore, a primary need to upgrade monitoring and networks for groundwater regulation and protection.

Regulatory instruments are essential both for determining equitable allocations and water use limits. There is a need for a paradigm shift from supply driven to demand driven policies so as to encourage the process of using water more efficiently and fairly, improving the balance between present supplies and demand and reducing excessive use through demand management. The policy framework, however, should respect people's right to free and easy access to water. The policy should also respect the right of people to clean and unpolluted water and a healthy environment. Further, the policy should also incorporate the principle of equity and distributive justice in the utilisation of water and to do so drinking water should get top priority followed by other domestic uses. The policy needs a law and for a possible law, a policy framework is a guideline. There is a need to evolve a decentralized legal regime which empowers people and makes them real managers of resources.

For integrated development, it is necessary that the National and sub-national governments should recognize and accept the need to rationalize planning and administration under a unified authority which should have representatives from the civil society, members of rural and urban institutions, and officials from relevant ministries, such as those dealing with planning, urban development, rural development, health and environment. This authority should function under the head of the government at various levels of Govt. The purpose of these authorities should not only be to regulate abstraction of ground water and promote water harvesting in

	different ecological regions of the country but also to promote efforts to protect existing water harvesting structures.
(Types of) Organizations to be involved in topic consultations	• International Agencies: UNDP, UN-Habitat, UNESCO, WHO, WSSCC, FAO, (WASH), UNECE, World bank, Regional Banks, IFPRI, ILO • National Governments: India, China, USA, Mexico, Brazil, EU Countries • Local Authorities: Mayors, Presidents, Chairpersons • International organisations: IWA, AquaFed, ISW • Professional Associations: IWA, AquaFed, juristes francophones IDEF • Research Institutions: COHRE, University of Dundee, University of Lausanne • Donors: GTZ, SIDA, CIDA • Business and operators: Suez, Manila Water, Veolia • Related national organisations, NGOs and Local civil society: • World Water Council • ALMAE • Académie de l'Eau (France) • WECF • Nueva Cultura del Agua • Business & Human Rights • UCLG & Human Rights in Cities • James Dorsey - EWP • Slum-dweller organisations • R. Petrella • Green Cross International