

Water Management and Education

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Abstract:

The lack of proper water supply and sanitation services turns the surroundings into polluted, unhealthy and undignified places to live in and degrades water quality in lakes, rivers and seas. The poor suffer most as they often depend directly on these water bodies for their needs. The provision of water supply and sanitation services is a vital part of building communities that can take control of their lives and make real strides on the path to Sustainable Development (SD).

The need to improve these services is now recognized as a critical component of poverty reduction, as well as being necessary for progress in health, education, and environmental sustainability. Wastewater treatment, water conservation and hygiene play a vital role in providing healthy living conditions for all in a sustainable way.

The discharge of untreated wastewater is a growing environmental concern. The expansion of water supplies without simultaneous wastewater collection and treatment facilities can lead to environmental and public health problems. The sequencing of improvement requires careful planning, beginning with sewerage systems for urban areas that have reached higher levels of water usage and sewage treatment plants. Municipal wastewater treatment cannot be implemented in isolation from broader actions at the river basin. Municipal wastewater treatment can only bring marginal environmental benefits as on-site wastewater disposal and non-point source pollution can account for a large share of pollution at a regional scale.

Water conservation is an increased concern for countries with growing urban populations. Although agriculture is the largest user of water, water withdrawals for human consumption are substantial at basin level in arid regions. Water conservation can be promoted by setting prices that reflect the scarcity of the resource, increasing delivery efficiency, installing water-saving technologies at the household level, and by educating consumers.

Sanitation coverage continues to lag far behind water supply. Compared with water supply, sanitation and hygiene require distinct approaches for three main reasons. First, the benefits of improved sanitation and hygiene depend largely on investment decisions at the household level. Second, the demand and willingness to pay for sanitation and wastewater treatment lag behind those for water. Third, sanitation and hygiene require a change in behavior. The energies of all parties need to be harnessed to promote and support changes in household behavior. Sanitation specialists need to team up with social marketing, and health and Environmental Education (EE) specialists.

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Water supply and sanitation turns their surroundings into a polluted, unhealthy and undignified place to live and degrades water quality in rivers, lakes, seas. The poor suffer most as they often depend directly on these water bodies for their needs. The provision of water supply and sanitation services is a vital part of building communities that can take control of their lives and make real strides on the path to sustainable development.

Improving the water supply and sanitation services are now recognized as a critical component of poverty reduction, as well as making progress in health, education, and environmental sustainability. Water and sanitation is area needed to improve the lives of the humans while protecting the environment. In the water supply and healthy environment sector, the wastewater treatment, water conservation and hygiene play the vital role in improving healthy living conditions for all in a sustainable development.

The discharge of untreated wastewater is a growing environmental concern. Expansion of water supplies without simultaneous waste water collection and treatment facilities can lead to environmental and public health problems. Sequencing of improvement requires careful planning, beginning with solutions, sewerage systems for urban areas that have reached higher levels of water usage and sewage treatment plants. Municipal wastewater treatment cannot be implemented in isolation from broader actions at the river basin. The municipal wastewater treatment can only bring marginal environmental benefits as on-site wastewater disposal and non-point source pollution can account for a large share of pollution loads at a regional scale.

During the consideration of water supply and hygiene, it's too important to consider the Transboundary Water Management. In the world, a lot of countries are the area of Transboundary River Basins, which plays a vital role in the politic of countries, in the protection of environment, and stabilization of ecological situation of environment and etc.

Water conservation is an increased concern for countries with growing urban populations. Although agriculture is the largest user of water, water withdrawals for human consumption are substantial at a basin level at arid region. River Basin Management system based upon the integration of land owners, farmers, who should be actively involved in all aspects of water management, river restoration, diffuse pollution, flood and agricultural land use practices, to reduce erosion, run-offs and etc. Water conservation can be promoted by setting prices that reflect the scarcity of the resource, by increasing delivery efficiency, by installing water-saving technologies at the household level, and by educating consumers.

Water Management Education System:

Education System in kindergartens, schools and universities

This kind of education system should be divided in some specific groups. It will be better if we will begin development of water management education from the group of people, who are still involve in the kindergartens, schools, institutes and universities. This is such kind of peoples level, who don't know what does it mean "Water Management" and who after the taking of knowledge will be treat more carefully and will take into account that main points of water supply and sanitation that will be taught

during the lessons within their education program. This program will include not only general aspects of water supply, but also the main and specific objects of water management.

There are many methods of putting this subject in the school or universities programs. This can be used by the creating of new subject or connecting to exist one, by the arranging of training courses and publishing of booklets, bulletins, producing CD-disks and computer programs, which will be about the water supply, sanitation and water management and which will be done in the way of interest's of environmental protection and will be interesting for this level of consumers, will be educative and later beneficial for the nature and environment. Also it will be much more beneficial of improving knowledge by seeing the places which are "Hot Spots", show them examples of rectification of water resources. This and other kinds of activities will fulfill and accomplish that theoretical side of teaching of protection natural resources, at this moment water resources, that will be beginning of establishing of good water management system.

Education system for main consumers and pollutants of water resources

Another kind of group of people, with whom the water management education system should be worked are main consumers of water resources. These are farmers (agriculture sector), manufacturer (industry sector) and households. These groups of people are the main pollutant of river basins and main users of water resources. From them to work out the water management education program is too important and significant for further protection of water resources and sanitation, which are the main points of water management. This education system includes TV programs, telephone and radio conversations, meetings, seminars, training course, workshops and internet conferences. Access to internet is one of the main points of education system. Development of internet network in rural sector is significant fact for improving and encouraging the education system. Because the main user and pollutant, agriculture, is located in rural sector, where the access to internet isn't well developed (depends on the region of country, mountain region and etc.). The water users can: deal with their problems, exchange with information and give each others advices or recommendations during the meetings and face to face conversations.

Education system for improving skills and qualifications for experts, Specialists, researchers, trainers

Another kind of group contains people, who are involved in the water law legislation system-experts, environmental managers, who are supervisors and trainers in this system, who are working in the labs, doing researches and observation in water supply, sanitation and water resources management, need everyday preparation, they should be obtained with everyday news. It's important to mention that Georgia don't have an education program in Universities, which are connecting to Environmental Management and therefore Water Management or Natural Resources Management. Because of that our experts and other specialists, who are involved in the Water Management programs need to take qualifications. Of course some of them took training courses abroad, where they had a chance (who know the foreign languages) to develop their knowledge in this field, but still Georgia suffers from a lack of

specialists in the field of Water Management and wholly in Environmental Management.

With new skills, renewed knowledge and qualification, they will find the best or better solutions for fulfilling and improving the water law legislation system, which is too important for managing of water resources. The country, like Georgia, needs good and suitable law legislation in water resources management, because, it is a place of Transboundary Rivers Basins. The biggest Transboundary River in South Caucasus is Kura-Araks that flow within five countries: Turkey, Georgia, Armenia, Azerbaijan and Iran and flows into Caspian Sea. Transboundary Rivers have political impacts. Because of that there is needed a strong, fulfilled and precise Water Law Legislation. For improving and fulfilling Water Law Legislation system, there are needed good qualified experts and specialists, who will use their obtained knowledge and skills. For implementing well of Environmental Policies in our country, we need really well educated experts and specialists with a high level of skills and qualifications.

New techniques and technologies will give possibility to researchers for making the accurate research and give precise deductions and conclusion, which will be used for developing of water supply and sanitation.

Experts, specialists, researchers, supervisors and trainers should be have opportunities to develop their knowledge by participating in an appropriate workshops and high level training courses, which will give them opportunities to exchange with information, study new methods and skills and develop their activities in their jobs.

Conclusions and Recommendations:

The country, like Georgia, which is in the middle of transition period have lots of problem, especially in environmental protection, environmental management and education system. The education system, which runs now in the schools and universities are coming from the Soviet Union system. At the moment Ministry of Education tries to make reforms in the system of education. But only Ministry of Education will not be able to make changes and/or reforms in education programs of Universities, if their will not be encouragement from the side of Universities to establish departments of Environmental Sciences and Policy and/or Environmental Management and Policy and the needs of specialists in this field from the Ministry of Environmental Protection and Natural Resources.

At this stage it's too important to develop the educational level of water management, sustainable use of water resources.

For good management of water resources and implementing of policies it's very significant to develop and fulfill Water Law Legislation System and Water-quality Standards for drinking water, recreational water and agriculture, as well as for wastewater effluents, are essential policy components for the protection of human health. By this, it's very important to:

- ✓ Make reforms and create new educational programs and projects in the schools and universities;
- ✓ Arrange training courses and meetings for consumers (agriculture, industry, households and etc.) for sharing and exchanging with information of water resources;

- ✓ Arranging training courses, workshops, seminars, conferences for environmental managers, experts, specialists, researchers for exchanging with information, for fulfilling and improving their skills and qualification for the good management of natural resources, especially water resources and implementing policies.

Policies are required that not only support capacity building in water quality, but also empower qualified individuals and organizations to implement appropriate action. Raising public awareness and participation are important elements of policies and actions for water quality and human health protection and management. Land-use and other policies (for example biotechnology and the release of genetically engineered organisms) need to consider the implications for water quality and human health. An important objective for help is to prevent narrow approaches to resolving water and health issues. These are cross-cutting issues, to be approached from several directions concurrently and in partnership.

The water environment capacity (WEC) is important for determining the limit for pollutant control. Knowing the WEC for different contaminants in varying environments will help managers prioritize source controls and determine appropriate best-management practices.¹

References

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¹ Water Environment Capacity, Internet, 2003, World Bank.