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FUNDAMENTAL OF WATER RESOURCES PRETECTION

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Abstract

Water resource protection plays the main role in sustainable water supply management for human well-being and ecological ecosystem prosperity. Water resource protection plays a critical role in policy practices aimed at mitigating water resource problems and mitigating social well-being. Such practices are critical to sustainable water management for human well-being and ecological ecosystem prosperity. Proper implementation and monitoring of water conservation practices is high on the international agenda. Approaches such as results-based policy monitoring are seen as suitable methodologies for monitoring policy implementation practices to assess their impact.

Key words: water protection, losses, preventing, environmental policies, water resources, sustainability, groundwater, ecological ecosystems, climate change, personal qualities, water conservation.

Water protection is described as activities that involve protecting resources and habitats, such as securing resource and stream rights. It involves the gradual reduction of discharges, emissions and losses of pollutants to ensure long-term protection of existing water resources and aquatic ecosystems. Although in practice water conservation and water management are often used interchangeably, water protection focuses on measures taken, such as preventing and controlling water pollution. Water resource management, on the other hand, emphasizes enabling environmental policies and regulations, institutional roles and responsibilities, and management instruments as prerequisites for using water resources to support social and economic development while ensuring the sustainability of the resource. Around the world, surface and groundwater resources are considered among the most important material resources necessary for the survival and development of humanity. Moreover, these resources are considered key to the sustainability of the natural environment and the evolution of the ecological ecosystem. It is noted that the state of water resources in one place can determine the local ecological environment. The role of ecological ecosystems in social well-being, such as the

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provision of goods and services, is well documented. It is in this regard that water conservation is considered central to socio-economic development and environmental sustainability of ecosystems.

This argument is supported by those who noted that water resources are currently facing variable and unpredictable challenges throughout the world, which are mainly manifested in different aspects. It is recognized that water resources are an indispensable element of the ecological ecosystem and natural environment, which requires protection for sustainable use. In the case of groundwater, protection requires understanding the hydrologic characteristics of groundwater systems, such as scale, hydraulic conductivity, and effective porosity, to predict contaminant transport. Sustainable use of groundwater resources requires an understanding of how much groundwater is available in the system, and in such practices, aquifer recharge becomes a critical hydrological parameter to consider. As noted, understanding groundwater recharge helps conceptualize aquifers for effective management and sustainable water abstraction. In addition, the sustainability and availability of groundwater resources requires an understanding of aquifer properties associated with groundwater contamination. Such understanding is critical to the development of feasible methods that can be used to predict and track the movement of chemical concentrations along saturated and unsaturated zones at local, regional and national levels. For example, it has been shown that nitrate levels in groundwater levels can be predicted at a regional scale, which is critical for groundwater resource management. Likewise, understanding the hydrological dynamics of groundwater is critical for the sustainability and protection of the ecological ecosystem. For example, changes in nitrate concentrations in groundwater and nitrate loading from intensive agricultural activities can cause serious problems in aquatic ecosystems when groundwater is discharged into surface water. The vulnerability of both surface water and groundwater resources to pollution and over exploitation warrants adoption of water resources management approaches that seek to balance between their protection and sustainable utilization. It has been argued that such approaches should consider river basins as ‘‘natural’’ units and logical units for water management. Water vulnerability to climate change has dire consequences on socio-economic development. For instance, when water resources vulnerability was assessed in Nigeria, climate change was identified as one of the factors having a negative impact on water resources, giving a compromise in terms of meeting future demand. In South Africa, influence of climate change on water resources has been reported to cause constraints of water resources availability, and a negative impact

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on economic development, livelihoods, and progress towards attainment of SDGs. Such challenges require strategies and tools for mitigating potential negative impacts imposed by climate change, and it is encouraging that relevant tools are made available for measuring water resource vulnerability due to environmental and anthropogenic factors. Furthermore, tools for assessing the vulnerability of water resources in China have been developed. For example, [18] developed a Vulnerability Scoping Diagram (VSD) framework and System Dynamics (SDs) model as a tool for water resource vulnerability in the Pearl River Delta network in the city of Zhongshan.

Policy relevant approaches have been considered as critical in water resources protection. For example, a research study conducted in the United States of America (Florida) investigated forest conservation for ecosystem service provision as an effective strategy for protecting water resources and increasing public welfare. Using a web-based choice experiment survey, the study found that forest/water protection programs provide an annual average of USD 154–230 million in clean water benefits, and a significant portion of that value was associated with the policy process. The findings suggests that policy interventions provide relevant solutions for water resource protection.

Conclusion

Although policies for water resources protection are critical in mitigating water resource challenges, but if such policies are not appropriately implemented or if the implementation processed are delayed, their intended purpose are likely to be compromised. For example, development of policies that regulate the environmental quality of the waters in in the world have advanced significantly; however, it has taken the country about 22 years to implement such policies and thus, at present, water quality problems and challenges remain a major challenge in the country. It has been argued that several advances and reforms of World's institutional and legal framework for water management have fallen short of what is needed to address the issues that the world faces in its current phase of development. Hence the adoption of an integrated water resources management approach has been recommended as a priority so that the world can face its current and future water management .

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