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Community Participation in the Management, Protection, and Conservation of Watersheds: The Case of Davao City

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Abstract: ***Watershed management is putting land use and water management practices in place to safeguard and enhance the integrity of water and other natural resources within a watershed. This is done by regulating the use of those land and water resources in a comprehensive approach [3]. Due to these concerns, watershed management often meets scientific problems and issues in public policy. The watershed areas of Davao City are critical as they are sources of essential services that support the city's economy, environment, and people's quality of life, such as clean drinking water and healthy fisheries. Watershed management in Davao City also faces challenges relative to the city's developments, including the threats brought by increasing population, culture, climate change, and resource overuse. In this study, the researchers evaluated the multi-sectoral participation in crafting policies, guidelines, and strategies toward ensuring the health and sustainability of the watershed areas. The study uses a qualitative research design that involves sending out structured questionnaires. This design can assess the multi-sector participation in the management, protection, and conservation of the eight watersheds in Davao City.***
The study provides information on the stakeholders' community participation in managing the Davao City watershed. The community is highly aware of the need to participate in managing, protecting, and conserving watersheds. This was exemplified by the organization of the Davao City Watershed Management Council members as a group with legal and moral duties to protect the watershed and sustainably utilize it.
Keywords: **Community participation, Watershed, Davao City, Watershed Management Council, Environmental Science**

I. INTRODUCTION

Watershed areas are topographically defined tracts of land where precipitation drains as surface run-offs from a particular river or stream system to a common point like a dam, an irrigation system, or a municipal water supply take-off point. For this study, a watershed is a region where rainwater from higher ground runs into a river or stream before eventually reaching the Davao Gulf [5].
Recently, there has been a focus on headwater streams and their role in a watershed. There is an increased need for scientific information to support regulatory determinations and to inform future policies and legislation. Meyer et al. (2007) [5] studied the diversity of organisms dependent on headwaters, discussed how downstream biota depend on headwater ecosystems and concluded that the cumulative impact of degraded headwaters contributes to the loss of ecological integrity downstream. Watershed biological, physical, and chemical activities offer essential ecosystem services supporting plants, animals, humans, and ecosystem functions [2]. The stabilization of the ecosystem on a local and global scale depends on the function of watersheds in the cycling of nutrients [1]. Because of this benefit, anyone who lives close to a river will experience less flooding [8]. Ecological benefits and services may be diminished or lost when watersheds are polluted. Watershed issues are multifaceted and persistent. Watersheds give their residents the livelihoods they need to survive, but their natural resources are limited, frequently under stress, and in danger of being damaged. The main issue is typically degradation brought on by the unsustainable exploitation of natural resources. It causes social unrest, food insecurity, and poverty [7]. Watershed degradation is the gradual loss of value, including the loss of the land's and water's capacity for production, along with significant modifications to the river system's hydrological behavior that led to poorer water flow in quantity, quality, and timing. It results from the interaction of physiographic characteristics, climate, unsustainable land use, and other human activities [4]. The establishment, management, upkeep, and extension of a reliable and economically viable water supply for the Philippines' urban centers are covered by Presidential Decree No. 198 of 1973, popularly known as the "Provincial Water Utilities Act of 1973.
" Given the expanding population, the necessity for such initiatives cannot be overstated. In order to fulfill this demand, the government determined that creating locally administered water districts is the most practical approach.

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Upon recognizing the importance of a healthy and ecologically sound watershed area to achieve the mission of the decree, local government units acted on their own volition to further expound their scope of responsibilities. The degradation of watershed areas may be prevented with proper and applied maintenance of the water sources. Identifying the different kinds of pollutants in the watershed and how those are elated and recommending ways to reduce or eliminate those pollution sources, properly managing watersheds may help if implemented thoroughly. Thus, the support of national and local governments is vastly needed.

Davao City has eight watershed areas straddled by its significant rivers, aside from the biggest of them, the Davao River. These are: Sibulan River, Lipadas River, Talomo River, Tamugan River, Cugan River, Suawawan River, Matina River, and Bunawan River. The Tamugan-Lipadas and Tamugan-Panigan are of prime importance because these have been identified as Davao's primary water sources and comprise the city government's first phase of watershed delineation.

To achieve the ecological balance where human beings, other living beings, and nature may thrive harmoniously, Ordinance No. 0310-07 or otherwise known as the Watershed Protection, Conservation, and Management Ordinance (Watershed Code) was enacted, and the Implementing Rules and Regulations of the watershed code was approved to prescribe the procedures and guidelines for the implementation of the Watershed Code. With the mission to protect, conserve and manage the city aquifers, the Watershed Code also aspires to maintain the sustainability of a livable city through a participative, empowered, and environmentally conscious community. With the need for collective ingenuity to attain such goals, a collaborative action between different government bodies was implemented through the creation of the Watershed Management Council (WMC), Barangay Watershed Management Council, and the Watershed Multi-partite Monitoring Team. With tasks ranging from issuing policies and guidelines to a more detail-oriented job of ensuring the efficient, effective, and consistent implementation of the Watershed Code and full compliance with this code's provisions, each was hierarchically fashioned to maintain a more specific task.

With all the initiatives of trying to maintain an ecologically healthy and practical source of water supply, such efforts will be rendered futile if made invalid by the negligence of the government, its bodies, and its officials and, most importantly, by the ignorance of people whose blithe actions may unpredictably impact the general health of such water sources.

The watershed areas of Davao City are critical as they are sources of essential services that support the city's economy, environment, and people's quality of life, such as clean drinking water and healthy fisheries. Watershed management in Davao City also faces challenges relative to the city's developments, including the threats brought by increasing population, culture, climate change, and resource overuse. Thus, this study needs to be conducted to assess further how the community can help strengthen watershed protection. In this study, the researchers evaluated the multi-sectoral participation in the management, protection, and conservation of the Davao City Conservation Watershed Areas. The community participation consisted of crafting policies, guidelines, and strategies toward ensuring the health and sustainability of the watershed areas. The researchers have also assessed the collaborations of the different sectors if they were effective, efficient, and consistent. The study also investigated the issues and threats the watershed areas face and whether the government bodies have plans to resolve them.

II. METHODOLOGY

The study was conducted in Davao City, Philippines, as it best suited the research objectives. The City Government of Davao also has a Watershed Code, which is implemented and monitored by the city's Watershed Management Council. The researchers prepared a set of questionnaires for the council's different actors, including the Watershed Management Council and the Watershed Multipartite Monitoring Team. Page Layout

A. Research Design

The study used a qualitative research design that involved sending out structured questionnaires. This design can assess the multi-sector participation in the management, protection, and conservation of the eight watersheds in Davao City.

B. Source of Data

The study used primary data based on the responses of the selected members of the Davao City Water Management Council and the Watershed Multipartite Monitoring Teams through subjective sampling.

C. Scope and Limitation

The study focused only on community participation in managing, protecting, and conserving watershed areas in Davao City. The research respondents were members of the Davao City Watershed Management Council and the Watershed Multipartite Monitoring Team.

III. RESULTS AND DISCUSSION

Watershed development projects worldwide have performed poorly because they needed to consider local people's needs, constraints, and practices. Participatory watershed management, in which users help to define problems, set priorities, select technologies and policies, and monitor and evaluate impacts, is expected to improve performance. Therefore, community participation is an essential aspect of the success of any watershed project. As explained by Arnstein (2007) [9], community participation involves theory and practice related to the direct involvement of citizens or citizen groups potentially affected by or interested in a decision or action.

The study provides information on the multi-sectoral participation in managing the Davao City Conservation Watershed Areas. The community is highly aware of the need to participate in the management, protection, and conservation of watersheds. This was exemplified by the organization of the Davao City Watershed Management Council members as a group with legal and moral obligations, duties, and responsibilities to protect the watershed and sustainably utilize the same not only for the present but also for future generations. The respondents are bound by the shared vision of ensuring the protection, conservation, and management of watershed areas, they ensure the implementation of the sustaining activities for the watershed areas through collaboration in gathering, processing, and evaluating information, pushing for the prioritization of projects concerning the watershed area, and most importantly, attending and actively participating in discussions during meetings.

The Watershed Management Council members also regularly update the Watershed Protection, Conservation, and Management Framework and Plan. The framework and plan are part of an overall strategy for protecting, conserving, and managing all the city watershed areas. They conduct Information, Education, and Communication Campaigns to gather insights from the community to further the protection of the watersheds and to be considered in crafting new and additional policies, guidelines, and strategies to ensure the health and sustainability of the watershed areas.

A. Community Participation in the Management of Watershed

The Watershed Management Council members have played imperative roles in the management of watershed areas of Davao City. All the relative inputs and interventions were included in the crafting of the Comprehensive Development Plan (CDP) that has a shared vision of ensuring proper management of watershed areas. The said council listed and considered all possible interventions according to their urgency. Implementation and prioritization of the different interventions are easy to identify because of the readily available data.

Reforestation was one of the initiatives introduced in the watershed by the City Environment and Natural Resource Office (CENRO) with regular monitoring and inspection congruent with the watershed code of the City of Davao. Programs pertaining to the management of watersheds are well implemented due to close collaboration and partnerships with different barangay, private sector, civil societies, and national government offices including indigenous peoples and other stakeholders. Stakeholders were involved in Information Education Campaign (IEC) drive in the community including quad media such as Socmed, TV, radio, and newspaper.

Problems encountered in managing Davao City Watershed include informal settler families living and cutting trees surrounding the watershed, the Kaingin system, and financial difficulties in mobilizing set initiatives.

B. Community Participation in the Protection of Watersheds

The watershed management council's initiatives to inform the public or community on how they can participate in the protection of protected areas is through the installation of signages and delineation of the critical watershed areas with consultations to its legal bases like the Davao City watershed code.

To ensure proper participation of the stakeholders, intensified coordination of the council to the stakeholders and strict policy implementation are being put in place. Legal and other constitutional matters are discussed to further the implementation of programs relating to protecting watershed areas, like amendments to the watershed code and watershed tributaries that need protection.

C. Community Participation in the Conservation of Watersheds

The water management council has guidelines on how the stakeholders can participate in the conservation of watersheds and community participation by making every locational clearance application within the conservation areas appropriately deliberated by the council for assessment and approval.

The council also conducts technical assistance to the Barangay Watershed Management Council (BWMC) to efficiently monitor the different prohibited activities within the conservation areas.

Insufficient financial capacity and illegal structures within the declared conservation areas are some of the problems that hinder the WMC from implementing initiatives on how the community can participate in the conservation efforts.

IV. CONCLUSIONS

This study concludes that the participatory approach in management was one of the effective strategies of Davao City in managing the watershed areas considering social, economic, and environmental factors. This approach is not new to Davao City as it has been implemented since through their Watershed Management Council and their Barangay Watershed Management Council. The community's involvement in watershed management provided opportunities for raising new issues for needs-based watershed research, including designing effective systems for coordinated community actions.

With the challenges identified by the council, it is concluded that participatory planning for watershed management shall be open to more than just the local communities. It shall entail collaborations with various interest groups at the micro and macro level, including the involvement of higher-level councils, political entities, bureaucrats, and other key groups. On the micro level, the challenge will be in identifying strategies to source out and assure interaction between local communities and the key organizations, groups, or individuals to support the management process and provide the necessary interventions.

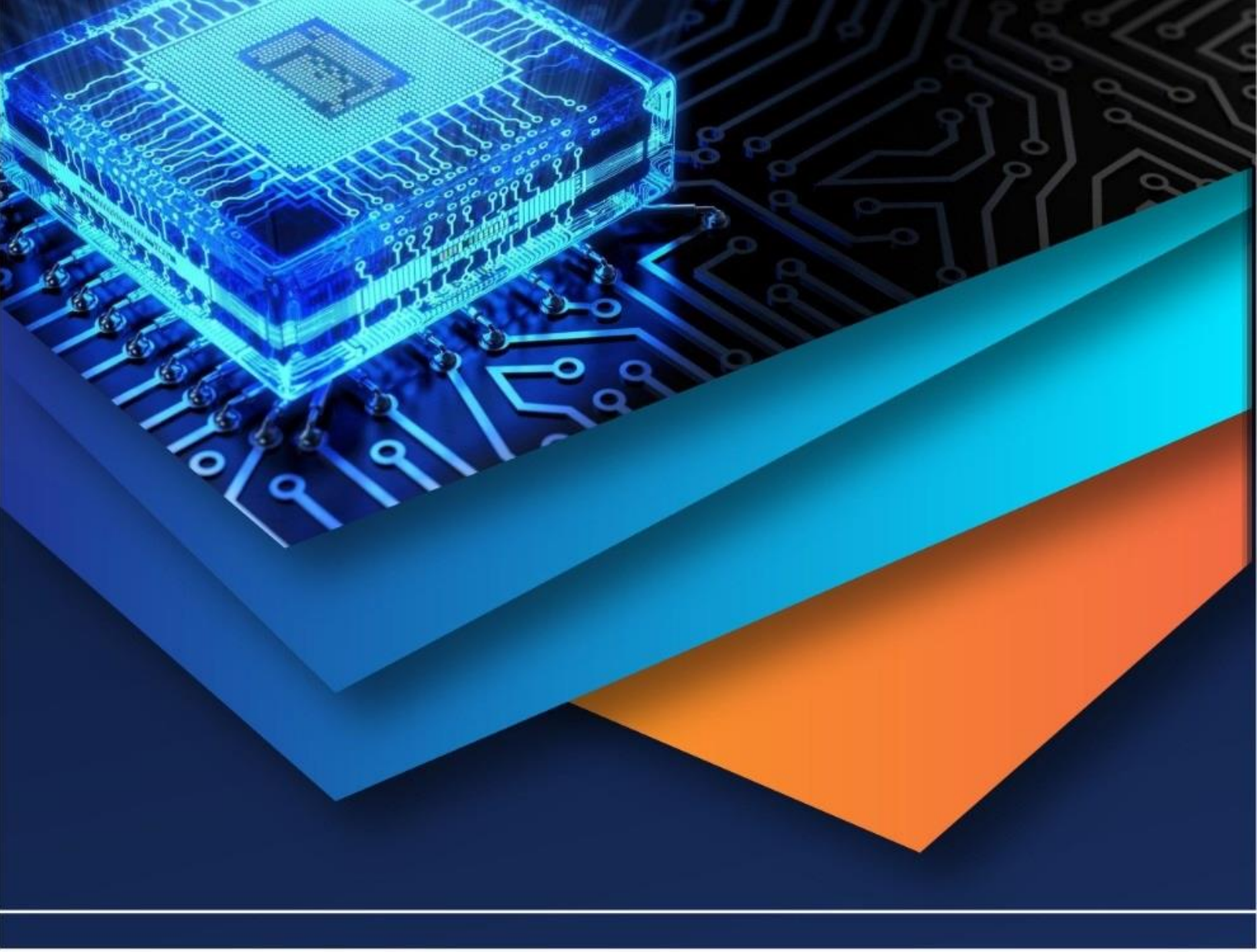
This study also concludes that the integration of the protection of watershed areas in the city government's planning processes is a successful indicator of the community's participation. This included incorporating necessary interventions like programs, projects, activities, and policies in the city's Comprehensive Development Plan to improve the management process and resolve the fundamental problems the watershed areas are facing.

V. ACKNOWLEDGMENT

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