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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : Improvement of Waste Management Through Community Awareness of Plastic Controlling in Garang Watershed, Semarang City, Indonesia

Jumlah Penulis : 3 orang (Wahyu Setyaningsih, Hadiyanto Hadiyanto, **Thomas Triadi Putranto**)

Status Pengusul : penulis ke-3

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Reviewer 1



Prof. Dr. Ir. Lily Montarchi Limantara, M.Sc.
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Malang, 24 Juni 2022

Reviewer 1



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NIP. 196209171987012001

Unit Kerja : Teknik Pengairan FT

Universitas Brawijaya

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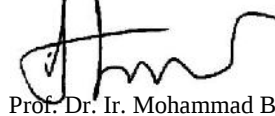
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Improvement of Waste Management Through Community Awareness of Plastic Controlling in Garang Watershed, Semarang City, Indonesia

Setyaningsih, Wahyu^{a, b} ; [Hadiyanto, Hadiyanto^c](#); [Putranto, Thomas Triadi^d](#)

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^a Environmental Science Department, School of Postgraduate Studies, Universitas Diponegoro, Semarang, 50275, Indonesia

^b Geography Department, Faculty of Social Science, Universitas Negeri Semarang, Semarang, 50229, Indonesia

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Improvement of Waste Management Through Community Awareness of Plastic Controlling in Garang Watershed, Semarang City, Indonesia



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ABSTRACT

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This study aims to analyze the condition and awareness of community plastic waste management in the Garang watershed to increase institutional capacity in reducing plastic pollution. This study was a sequential exploratory mixed-method research involving 175 respondents from Garang rivers community. Data was collected using observation, open-questionnaire and in-depth interview about community understanding and waste management organization. The respondent answer then converted into number and analyzed statistically using Kruskal-Wallis test. The institutional aspect was identified by interview and scored for AHP analysis. This research predicts more than 66 ton of plastic waste was produced by the communities around Garang watershed that managed, inappropriately. Only less than 40% of the Garang watershed community sells their plastic waste to the waste bank, and the rest were burned or abandoned in vacant land or rivers. Regarding to the waste-management organization aspect, the financial support and community participation aspect should be improved in upstream watershed area to enhance waste management communally. In contrast, internal institutions, community participation, and operational institutions are the main aspects that might be enhanced in the downstream areas. A future research needs to be conducted to identify community requirements as a foundation for establishing an appropriate waste management institution.

1. INTRODUCTION

The Garang River is the main major river that flows from the Ungaran mountains and passes through two administrative areas. The Garang River provides the primary raw water source with a total installed capacity of 1,130 L/sec and an average discharge of 915.79 L/sec [1]. Garang watershed is formed from four sub-watersheds that span an area of 21,277.36 Ha, which includes the Kreo, Kripik, Garang Hulu, and Garang Hilir watersheds [2]. However, the watershed area has decreased due to the increase in population in Semarang City.

Semarang City is an urban area with a population growth rate of 3.05% in 2015-2017 and reached 1.79 million people in 2019 [Department of Population and Civil Registration of Semarang City [3]. Increased population causes land clearing in the Garang watershed for residential and agricultural areas [4]. Over ten years (2005-2015), at least there has been a reduction in the Garang watershed area by up to 22.00% [5]. At least 21.28% of settlements in Semarang City are located on the riverbanks [Statistic Board of Semarang City [6]. The increase in population and residential area in the Garang watershed has implications for increasing anthropogenic activity in waste production, especially plastic. Furthermore, approximately 67% of Semarang City's waste comes from settlements or households [6] and 16% of them are plastic

waste. The Garang river watershed area, which has a water catchment area on a densely populated highland, is a source of waste, especially plastic.

The government's waste management in Semarang City only covers about 80% of the total 1229 tons/day of waste production [7]. In addition, handling only includes collection from the source and transportation to the Jatibarang landfill. In other words, about 20% of the total waste generated cannot be handled properly [8]. The systems of community waste management both independently and communally that have not been maximized can result in the release of waste, especially plastic, into the Garang watershed. The Statistical Board of Semarang City [9] survey shows that 0.56% of the population frequently throws their garbage in rivers and waterways.

Plastic waste is difficult to degrade, so it accumulates in the Garang watershed both in the soil and in the water. Plastic waste stored in the soil or in waters is easy to undergo physical changes as a result of physical environmental factors such as temperature, mechanical friction or due to exposure to UV light which results in the formation of microplastics. In other words, the existence of residential areas located in high topography and around the watershed area will be one of the sources of microplastics that enter through the run-off.

Increasing community and neighborhood capacity in waste management institutions needs to be carried out holistically

The Institutional Role Model: A System-Dynamic Approach to Reduce Complexity



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ABSTRACT

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The paper's primary objective is to make a scientific contribution by presenting an innovative, system-dynamic method for organisational change in the context of today's market complexity which is the institutional role model (IRM). It also aims to show why classical organisational theories no longer have the necessary degree of complexity to successfully tackle current challenges. The research process contains several steps. Firstly, it provides a literature-based analysis on why dynamic processes are needed to fully grasp today's complexity as well as the ground theory related to the IRM. Secondly, governmental projects that have been conducted by the authors are analysed to provide concrete cases in which the IRM was used and proved to be the superior method to organize complex systems. The aim is to examine these case studies and make a general methodological contribution to how institutions can be structured using the institutional role model and they can effectively and successfully work together. The primary aim of the model is to ensure that tasks, responsibilities and roles are systematically assigned to the most appropriate institution over time through democratic and anonymous qualitative and quantitative processes. The dynamic approach of the IRM fully considers the technicalities of today's technologies and is making sure that a high level of interoperability is guaranteed. This is one of the main assets of the IRM and making it more holistic and therefore better than previous working models. Through the anonymous and democratic questioning process the allocation of resources is optimized, since a great number of Institutions are filling out the IRM matrix and providing an assessment which institution is best suited to take over a specific role. This ensures that the organisation's resources are used effectively and efficiently.

1. INTRODUCTION

One of the major theoretical contributions of liberal economic theory after Adam Smith is the division of labour, which has ensured substantial increases in productivity throughout the centuries. The most important aspect of the division of labour process is that the different actors must be efficiently and effectively interlinked, which is achieved through cooperative structures. Only then can the division of labour improve the efficiency of business processes. However, not only is efficiency essential: the effectiveness of the measures is also of central relevance, which leads to the question of whether the right person is doing the right thing at the right time. Especially in a highly competitive environment, the efficiency and effectivity of actions is getting more and more important. Innovation within organisations, for example, is of utmost importance for the survival of organisations. This requires enormous organisational adaptability to the current environment. The use of dynamic capabilities also includes aspects such as adaptability and change to ensure corporate competitive advantage. Thus, the main question most researchers try to answer is how this high level of complexity within organisations can be managed efficiently and effectively. However, until now, researchers have been unable to understand the microfoundation of organisational performance in a dynamic environment. Microfoundation is understood as the individual-level and group-level actions in

an organisation that shape strategy and lead to superior organisational performance. In every organization the primary tension is the balance between efficiency and flexibility. As organizations get older, they tend towards more rigid structure with a strong focus on efficiency. This results in a lack of flexibility and adaptability to its current environment. One of the primary duties of a leader is to actively encourage its organization towards flexibility to ensure that there is a balance between flexibility and efficiency. When considering these two dimensions we automatically deal with the environment in which the organization is operating in. It is important to mention that the environment is a much more complicated object of analysis and why it is difficult to use the stable versus dynamic dichotomy. The environment includes dimensions such as ambiguity or lack of predictability [1]. In this paper, the authors deliver a specific framework that can be used by every organisation to master their microfoundation, hence provide a clear structure on how organisations must be organized to achieve the organizational goal and provide a necessary tool to reinforce the organizational flexibility that is needed to navigate through the world's complexity.

One of the scientific contributions made in this regard is that self-regulating collaborative partnerships have significant advantages over traditional hierarchically structured organisations. However, this contribution also emphasises that the complexity of this cooperation is often underestimated, especially when considering the temporal dimension of the

Technical Closure of the Humberto Molina Astudillo Hospital and Its Implications for Sustainability, Zaruma-Ecuador



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ABSTRACT

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Zaruma, a heritage city of Ecuador with a rich geological mining history, it suffers from technical problems of stability. The Humberto Molina Hospital and its surroundings have been affected by different geodynamic events, causing damage to buildings. The aim of this study is to analyze the technical components that led to the Hospital's closure through engineering considerations of studies carried out and a matrix that includes the implications of the inhabitants' perception of the closure for the proposal of remediation measures. The methodology considers: a) Surveys and analysis of citizen perception; b) Analysis of the technical studies and its components; and c) Remediation proposal for the rehabilitation and sustainability of the Hospital. Citizen perception is aware of the imperative need for a hospital for a city recognized as a "magic town" (2019) by the Ecuadorian Ministry of Tourism. The stability analysis shows that the steep slopes decrease the safety factor. The study area has low susceptibility to landslide, also are present extreme precipitation conditions and fill areas. The design of berms and the construction of rainwater collection channels are recommended, so that they do not infiltrate, and do not saturate the saprolite in the area (generating instability on slopes).

1. INTRODUCTION

Anthropic activities related to underground mining have caused severe environmental problems around the world. The hydrogeological changes, surface subsidence, and deformations related to the slopes significantly impact the landscape [1, 2]. Mining subsidence occurs due to the deformations induced in the ground by mineral deposits near the earth's surface [3]. It can occur years after mining ends, affecting soils, rocky massifs, and slopes [4]. The subsidence of the soil product of mining is one of the most critical environmental and social problems in developing of cities [1], which represents a significant risk to buildings, canals, communication routes, and all kinds of constructions settled on the ground that is deformed. In Illinois, most subsidence is the result of underground mining used to extract coal [5]. In Latin America, in the mining town of Chima-Bolivia, in 2003, an avalanche buried approximately 2,000 people. This situation generated uncertainty in the population seeking a sustainable development solution by analyzing technical and social issues for the evaluation of this disaster [6]. Another case occurred in the Cerro Rico de Potosí-Bolivia, considered a cultural heritage of humanity and one of the essential mining

deposits in the world. In recent decades, instability has been detected in the hill due to mining activity carried out without specialized techniques [7], where it was imperative to carry out a technical-social analysis for its respective evaluation in order to safeguard the lives of the inhabitants.

The inclusion of the population in a project ensures its success, making them participate in the work carried out and strengthening their commitment to guarantee the sustainability of the initiatives [8]. At local level, participatory techniques such as participation-action (PAR), interviews, surveys, direct observation, collective discussions and dialogues have been used for territorial sustainability [9, 10]. Such is the case applied in Mongolia, where the Sustainable Minerals Institute (SMI) of the University of Queensland have used the PAR methodology to deepen their understanding (data collection and analysis) and examine the health and safety risks faced by the Artisanal and Small-Scale Mining (ASM) sector [11].

Another problem that occurs in mining cities is related to damage to buildings by seismic movements. Earthquakes are considered the most catastrophic natural disasters that have devastated various civilizations throughout history [12]. Building failures are the leading cause of death and economic loss due to earthquakes [13]. Essential facilities (schools,