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**Research Article**

# Multiplier Effect of Dam Development in Indonesia (A Study on Dam Development during the Leadership of President Joko Widodo)

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## Abstract:

This paper is a literature study entitled Multiplier Effect of Dam Development Policies in Indonesia with a focus on dam development policies under the leadership of the President of the Republic of Indonesia, Ir. H. Joko Widodo. Library research is part of the type of qualitative research, therefore the characteristics of qualitative research are transformed into the context of library research by moving the field setting to the library room, including changing interview and observation activities into text analysis and discourse. The results of this study indicate that Indonesia's dam construction policy is not limited to the purpose of increasing food security. However, the construction of dams has a multiplier effect, such as; as a power generator, flood control, overcoming drought, development of freshwater fish farming, and development of the tourism sector. The multiplier effect caused by the construction of dams has proven to be able to open new economic opportunities that stem from increasing the welfare of the community.

**Keywords: Multiplier Effect, Policy, Development, Dam, Indonesia.**

## Introduction

Water is a compound needed by all living things. Without water, there would be no life on this earth; one of the basic daily needs of living things in this world that cannot be separated. Water is not only important for humans, but water is an essential part of life. It is important for living things both animals and plants [4]. In the use of water, there is often carelessness in its use and utilization, so efforts are needed to maintain a balance between water availability and demand through development, preservation, improvement, and protection [23]. In the last few decades, the world has been faced with conditions of rapid population growth and urbanization that have an impact on improving infrastructure in accessing water, resulting in water pollution, in addition to increasing water needs, including increasing food needs [10]. In harmony, Ambarwati [4] mentions that currently in various parts of the world there is a water scarcity phenomenon, in 1998 as many as 208 countries experienced water difficulties or scarcity, and it is estimated that 56 countries will increase by 2025. Human needs for water always increase from time to time, not only because of the increasing number of people who need this water, but also because of the increasing intensity and variety of the need for water [5].

Referring to Kunu,[21] mentioned that with the increasing population, increasing economic development, intensified use of water, and water pollution by human behavior and industry over the last few decades as well as global climate change, there has been an imbalance between water supply and demand. This imbalance has triggered a water crisis that has occurred in almost all corners of the world. This is reinforced by studies by Ambarwati, [4] which state that the phenomenon of water scarcity has now become a global issue that is a common problem, in Indonesia, is also experiencing the problem with water scarcity. One of the government's policies in supporting water security is carried out through the policy of building dams in several regions in Indonesia. The implementation of the policy until 2019 was realized through various development programs carried out by the Ministry of Public Works and Public Housing (PUPR) in the field of water resources, including the construction of 65 (sixty-five) dams, including 16 (sixteen) advanced dams and 49 (forty-nine) new dams, construction of 1 million hectares of new irrigation areas, rehabilitation of 3 million ha of irrigation areas, provision of raw water [10].

The policy of dam construction as a solution to the problem of water scarcity is closely related to food security. Quoting Yulianingsani & Putro, it is stated that agricultural production is affected by water supply, drought and floods are a continuous threat to the agricultural sector due to climate anomalies and uncertainties as well as widespread land degradation. Seeing that, the availability of water is one of the keys to the realization of food security [33]. As it is known that Indonesia has the potential to be

able to contribute to overcoming the world's food problems, among others through the construction of food barns in various regions, including border areas [33]. The policy of dam construction in Indonesia is not only directed at meeting water needs to achieve food security, but the construction of these dams has a multiplier impact in other sectors. This then attracted the author's attention, to study further the other impacts of dam development policies in Indonesia, this paper then entitled "Multiplier Effects of Dam Development Policies in Indonesia" which focused on dam development policies under the leadership of the President of the Republic of Indonesia, Ir. H. Joko Widodo.

## Materials and Methods

A study conducted, it is important the method used. Departing from this, this research utilizes a library approach. Data collection is done by utilizing literature sources, such as books, articles, online platforms, and various other literary sources that are considered relevant to the research topic. As delivered by Hadi, [13] that the type of library research is comprehensive, holistic, complete, and comprehensive. Data analysis was carried out from the beginning of data collection, which was based on 3 (three) main stages; namely data reduction, presentation, and verification. The final conclusion will only be drawn after no more information is found regarding the case under study. Miles & Huberman; then the conclusions that have been drawn will be verified both as a form of research framework and with existing data until consensus is reached at the optimal level for researchers with information sources and with the research team in order to obtain validity and accuracy [14]. Furthermore, a cross check was carried out to test the validity of the data. Referring to Hamzah in Ohoiwutun and Ilham, it is stated that library research is part of the type of qualitative research, because this type of research has strong postpositivism philosophical roots. Therefore, the characteristics of qualitative research must then be transformed into the context of library research by moving the field setting to the library room, including changing interview and observation activities into text and discourse analysis [23].

## Results

### Multiplier Effect

The concept of multiplier effect is a concept that examines the impact of both social and economic on development that are interrelated with one another [18]. Multiplier effect is a concept that examines an impact [10]. Furthermore Derire [8], multiplier effect is a widespread influence, caused by one activity, and will subsequently affect other activities. The term multiplier effect is known in the world of economics, referring to: Entrepreneur Journal, [18] the multiplier effect is a multiplier in the economic calculation, so that changes in social income can be calculated. Another opinion, Lestari, in Sarjanti et al., said that the multiplier effect is a direct and indirect link which then encourages development activities caused by activities in certain fields, both positive and negative, that drive activities in other fields [27]. Talking about the policy of dam construction in Indonesia, in its implementation it is certainly expected to be able to provide a multiplier effect on other sectors for the purpose of improving the economy which stems from the welfare of the people. As it is known that development activities are carried out identically with the promotion of people's welfare.

### Development Policy

Public policy is an action taken by the government, parties, policy makers for the benefit of the community, the stages starting from agenda preparation, policy formulation, policy adoption, policy implementation and finally policy evaluation [12]. Referring to Ilham et al, [15] public policy is a series of decisions taken in an effort to answer public needs, the process is carried out systematically through in-depth analysis in order to answer certain problems. In the field of development, development policies can be interpreted as guidelines that form the basis for implementing activities in the field of development with certain targets for the realization of changes for the better [7].

Development is always synonymous with community welfare, basically the main purpose of doing a development is to improve the welfare of the community so that through development it is expected to provide the community with a better quality of life and improvement of the community's economy as well as the expansion of employment opportunities so as to reduce the poverty level of an area [18]. Tjokrowinoto, in Kartono & Nurcholis; In general, the meaning of development is every effort to realize a better life as defined by a country "an increasing attainment of one's own cultural values" [20]. Development in relation to public welfare has been mandated in the 1945 Constitution of the Republic of Indonesia, namely "protecting the entire nation and the entire homeland of Indonesia, promoting general welfare, educating the nation's life, and implementing world order based on independence, eternal peace and state social justice".

### Dam Construction in Indonesia

The Minister of Public Works and Public Housing of the Republic of Indonesia, Djoko Kirmanto said that China had been able to build dams of more than 22 thousand (twenty two thousand) large dams, far more than Indonesia which had only reached 120 dams. is the fifth country in the world that has the largest amount of surface water but not optimally so that the impact in the rainy season is so abundant that it causes floods, while in the dry season water becomes very scarce, therefore the Indonesian government will continue to build large dams [17]. In the era of the leadership of the President of the Republic of Indonesia, Ir. H

Joko Widodo has built as many as 65 (sixty-five) dams, of which some have been inaugurated [25]. Throughout 2021, as many as 13 (thirteen) dams were inaugurated by President Joko Widodo (Jokowi).

**Table 1: Inauguration of Indonesian Dams Throughout 2021.**

| Dam | Construction Site | Capacity million /m3 |
|---|---|---|
| Tukul Dam | Pacitan Regency, East Java | 8.7 |
| Tapin Dam | Tapin Regency, South Kalimantan | 56.7 |
| Napun Gete Dam | Sikka Regency, East Nusa Tenggara | 11.2 |
| Sindangheula Dam | Serang Regency, Banten | 9.3 |
| Kuningan Dam | Kuningan Regency, West Java | 25.9 |
| Way Sekampung Dam | Pringsewu Regency, Lampung | 68 |
| Bendo Dam | Ponorogo Regency, East Java | 43 |
| Paselloreng Dam | Wajo Regency, South Sulawesi | 138 |
| Karalloe Dam | Gowa Regency, South Sulawesi | 40.5 |
| Tugu Dam | Trenggalek Regency, East Java | 12.1 |
| Gongseng Dam | Bojonegoro Regency, East Java | 22.4 |
| Ladongi Dam | East Kolaka Regency, Southeast Sulawesi | 45.9 |
| Pidekso Dam. | Wonogiri Regency, Central Java | 25 |

**Source: Processed (2022)**

**Tukul Dam**, The construction of the dam will provide enormous benefits. This dam was built to develop the agricultural sector which can irrigate 600 hectares of rice fields, to other benefits, it serves to reduce flooding by 42.21 m3/second and has the potential as a source of 2x132 KW Micro-hydro Power Plant, conservation of natural resources, water resources, as well as in the tourism sector [16].

**Tapin Dam**, this dam is located in Pipitak Village, Piani District, is the second dam inaugurated by President Jokowi in 2021. The Tapin Dam has enormous potential, apart from being a disaster control agent in South Kalimantan Province, this dam will also strengthen food security as an irrigation supply. covering an area of 5,472 hectares, providing raw water for the Rantau area as the capital of Tapin Regency and its surroundings of 500 liters/second, water conservation, and for hydropower of 3.30 MW, including the existence of a dam of the Inti Tegak Zonal Stone Pile, which has the potential as a new tourist destination in Indonesia. East Kalimantan. Tapin Dam is equipped with access roads and dam ring roads, management offices, official residences, places of worship, toilets, viewing posts, and generator houses [32].

**Napun Gete Dam,** This dam is designed to be multifunctional, besides being able to irrigate an irrigation area of 300 hectares of rice fields, it also functions as a provider of raw water as much as 214 liters per second, flood control as much as 219 m3/second, has the potential as a power plant of 0.1 MW, and other potentials are: in the tourism sector which is expected to help improve the welfare of the local community [16].

**Sindangheula Dam** will irrigate an area of 1,280 hectares of rice fields in the Serang and surrounding areas, other benefits as a provider of raw water for developing industrial areas, such as; Serang City, Serang Regency, and Cilegon City are 0.80 m3/second, besides that the dam is useful for reducing flooding to 50 m3/second, while other potentials as power plants are 0.40 MW, and can support the community's economy. in the tourism sector [16].

**Kuningan Dam**, the construction of this dam is intended for development in the agricultural sector, besides the presence of this Kuningan dam has the potential to be developed in the tourism sector. Referring to Fatimah, [11] it is stated that the Kuningan dam can help water security in the surrounding area as well as flood control, besides that the dam is a provider of raw water with a discharge of 0.30 cubic meters/second so that it is able to produce electricity with hydropower of 0.5 megawatts.

**Way Sekampung Dam, T**his dam is projected to be able to strengthen water and food security in the Lampung region, as a supply of raw water this dam also functions as a source of power generation of 5.4 megawatts, including flood control [16]. The presence of the Way Sekampung Dam also has the potential to be developed as a new tourist attraction, because the scenery presented is quite beautiful when you are above, visitors will be presented with a stretch of a puddle with a capacity of 68 million m3 and an inundation area of 800 hectares [2].

**Bendo Dam**, the dam can provide irrigation to irrigate an area of 7800 hectares of rice fields, as a supplier of raw water with a capacity of 370 liters/second, including being able to function to reduce flooding in Ponorogo City by 31% or 117.4 m3/second, from 375,4 m3/sec to 258 m3/sec [16]. In addition, this dam has the potential to be developed as a new tourist destination, because it has such an amazing natural panorama.

**Paselloreng Dam,** Paselloreng dam is located in Bumi Cakkuridie, Gilireng. The construction of this dam functions as a water supply for Gilireng Weir which can irrigate an area of 8,500 hectares of rice fields. As a water supplier, the presence of this dam can certainly make South Sulawesi a food barn. In addition, this area is also known for its natural wealth in the form of natural gas, cultural treasures such as the *mattompang* tradition (laundering heirlooms), the red bridge as a symbol of the people's struggle against the colonialists in the past, and the natural panorama of the waterfall. The presence of the Paselloreng dam further completes the potential of Gilireng as a tourist destination in Wajo Regency.

The construction of the **Karalloe Dam** is not only for the purpose of development in the agricultural sector with the hope of making South Sulawesi one of the national food barns. This dam also functions to reduce flooding in Jeneponto and Gowa Regencies which is integrated with a flood control infrastructure system from upstream to downstream, has the potential to supply raw water as much as 440 liters/second, 4.5 MW micro hydro power plant [32], including the potential for development in the tourism sector.

**Figure 1: President of the Republic of Indonesia Ir. H. Joko Widodo accompanied by the Minister of Public Works and Public Housing, Dr. (HC) Ir. H. Mochamad Basoeki Hadimoeljono, M.Sc., Ph.D. while monitoring the construction of the Paselloreng Dam, Gilireng District, Wajo Regency, South Sulawesi.** (**Source: Personal Documents, 2018**)

**Tugu and Gongseng Dam,** The construction of two multifunctional dams in East Java, namely the Tugu Dam in Trenggalek Regency, can meet the needs of an irrigation area of 1,250 hectares, supply raw water of 12 liters per second, and reduce flooding. Meanwhile, Gongseng Dam serves to meet irrigation needs that are capable of irrigating an area of 6.191 hectares of rice fields, as a raw water supply of 300 liters/second, tourism conservation, and flood reduction [16].

**Ladongi Dam** construction has the main function to irrigate an irrigation area of 3,604 hectares located in 4 (four) Regencies, namely; East Kolaka, Konawe, South Konawe, and Kolaka regencies. In addition, the Ladongi dam is a provider of raw water of as much as 120 liters/second, reduction, and electricity potential of 1.3 megawatts, another potential is as a tourist destination, especially water tourism [31].

**Pidekso Dam** is located in the upper reaches of the Bengawan Solo River, the construction of this dam is designed with a construction that is able to survive despite being shaken by an earthquake measuring up to 8 on the Richter Scale. In addition to functioning to irrigate an agricultural area of 1,500 hectares, other benefits of this dam are flood control, reduce sedimentation, and have the potential as a tourist destination, with the availability of raw water of 300 liters/second can reach Giriwoyo and Baturetno sub-districts [3].

**Multiplier Effect Dam Development Policy**

The policy of dam construction is carried out for the purpose of regulating the availability of water, when in the rainy season there is a flood disaster, on the other hand, during the dry season, drought strikes. This phenomenon is often found in Indonesia. Floods and droughts both have the potential to trigger crop failures for farming communities, and hamper other economic activities. Seeing that, the construction of dams in several parts of Indonesia is one of the steps taken by the government in responding to these problems. The construction of dams for the purpose of food security actually has a multiplier effect that stems in the order community's economy. In the agricultural sector, the construction of dams can certainly regulate water availability, with the fulfillment of water needs can increase community production, both rice, *palawija* (crops planted as 2d crops in the dry season), and so on. Increased production of agricultural products will also have an impact on increasing economic growth which is

ultimately expected to create community welfare. In line with development goals, namely the promotion of people's welfare. Referring to Todaro, in Adni and Setyono, [1] it is said that development is actually a multidimensional process, which includes various fundamental changes in people's attitudes, social structures, national institutions, as well as continuing to pursue economic growth acceleration, overcoming economic inequality, as well as poverty alleviation.

The construction of the dam has the potential to be used as a hydroelectric power plant. The flow of water produced by the dam is used to drive a turbine so that it can generate electricity. The development of this hydropower plant, apart from being able to absorb labor from the construction stage to operation, will also revive Micro, Small, and Medium Enterprises (MSMEs) around the hydropower area [6]. In line with the results of the study Sibagariang, revealed that the construction of a hydropower plant on the socio-economic life of the Purba Bersatu village community, Pakkat District, Humbang Hasundutan Regency had a positive impact on increasing community income [6].

The construction of the dam also has the potential to be used as the development of freshwater fish farming. Freshwater cultivation is an activity to increase the productivity of waters such as freshwater fish, starting from the maintenance stage to reproduction, growth, and improving the quality of aquatic biota so that profits can be obtained [28]. Freshwater fish farming, either in reservoirs or dams can be done by applying the concept of developing recreative freshwater fish farming as offered by Setiyawan, this concept is planned and designed in an integrated manner by combining cultivation, fishing, culinary, and educational activities into one superior tourism that offers jobs to the community. Through this concept, an increase in income, economy, and community welfare can be realized [28].

The construction of the dam also opens up new tourist destinations. Considering that tourism development is one of the priority sectors of the Indonesian government, besides that tourism is a leading sector, it is considered capable of moving the world economy [26]. The potential for dam tourism development can actually be managed by the community around the dam, as stated in Law Number 10 of 2009 concerning Tourism that: "the community has the same and widest opportunity to participate in the implementation of tourism" [29]. Referring to Sugiharto, who conducted a study on the impact of the development of the Karangkates Dam tourist destination area for the community, the results showed that the presence of the dam as a tourist destination has opened new livelihoods for the surrounding community, where previously the community's economy only depended on the agricultural sector, now it has become diverse with the presence of new tourist destinations [30]. Study Permadani and Mistriani, [24], at the Logung Kudus Dam, Central Java, shows that the presence of dam tourism has been able to improve the welfare of the community, open new business opportunities for the surrounding community where the Logung Dam destination can be used as an alternative choice as a tourist destination because it is presented with the beauty around the dam that can make tourists relax to enjoy nature which is amazing. Therefore, it can be concluded that the construction of dams in Indonesia for the purpose of food security has a multiplier effect on other sectors. As is the case in the tourism sector, dam tourism destinations open up new job opportunities for the surrounding community, such as; culinary business, lodging, souvenirs, photography, and so on. However, referring to Permadani and Mistriani, the development of a tourist destination will bring many benefits to the community both economically, socially, and culturally if managed properly, on the contrary it will create new problems and harm the community if its development is not well prepared [24]. Similarly, Ilham et al., [14] said that one of the great potentials that can improve the local community's economy is development in the tourism sector, even if it can be managed professionally, effectively, and efficiently.

## Conclusions

Indonesia's dam construction policy is not limited to food security purposes. However, the construction of dams has a multiplier effect, such; as power plants, flood control, overcoming drought, developing of freshwater fish farming, and developing of the tourism sector. Where the multiplier effect caused by the presence of this dam has been able to open new economic opportunities that can prosper the community.

The construction of dams in Indonesia is directed to meet the availability of water when the dry season hits, on the contrary, it functions as flood control during the rainy season. Floods and droughts pose a threat to people who depend on the agricultural sector for their livelihood. The phenomenon of floods and droughts is often found in the territory of Indonesia, therefore the construction of dams is one of the efforts made by the government in overcoming these two problems. With floods and droughts overcome, of course, the hope then is that national food security is fulfilled as a solution for people's welfare.

The construction of the dam has the potential to be used as a Hydroelectric Power Plant. Utilizing the flow of water from the dam to generate electricity, has had a positive impact on improving the welfare of the surrounding community. The potential for freshwater fish farming can be developed with the presence of dam construction, this business opportunity can be done by applying the concept of developing recreational freshwater fish farming designed and planned in an integrated manner by combining fish farming, fishing, culinary, and educational activities into a leading tourism offering employment opportunities to improve the community's economy.

Equally important, the presence of the dam as a tourist destination has opened new livelihoods for the surrounding community. Through dam tourism, it is expected to be able to improve the welfare of the community by opening up new business opportunities for the surrounding community. Dam tourism destinations can be used as a choice tourist destination because it is

presented the natural beauty around the dam which is so amazing. However, the development of a tourist destination, such as dam tourism, will bring many benefits to the community both economically, socially, and culturally if managed properly, on the contrary it will create new problems and harm the surrounding community if its development is not well prepared. Therefore, dam tourism is great potential that can improve the local community's economy if it can be managed professionally, effectively, and efficiently.

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