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From Community Capital to Sustainable Rural Livelihood: Exploring Green Development Program in Masoso, Indonesia

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ABSTRACT

Community capital has approached to formulate a sustainable rural livelihood. As an agreement in the world development challenges, it has been designed in Sustainable Development Goals (SDGs) framework that the United Nations supported as a global effort to attain 169 targets, such as natural resources management for sustainable rural development. This article aims to analyze community empowerment on green growth to strengthen energy self-sufficient villages based on the community capital. The qualitative research method is used to obtain a comprehensive understanding of all phenomena that existed in the study of Masoso village, Indonesia. The discussion found that the implementation of green development through micro-hydropower plants supported by the village fund has contributed to local community prosperity. This study concludes that the community's adherence to traditional institutions and local wisdom is needed to preserve as the basis of community collectivity to conserve natural resources. Therefore, novel opportunities for local economic activities on integrated agriculture could promote socio-economic development in the modern era by strengthening farmer groups and community development.

Introduction

Fundamentally, the village development policies implemented by the Indonesian government have formed participatory rural

communities. This policy encourages rural communities to independently determine their lives' goals (Gai, Poerwati, Maghfirah, & Sir, 2020; Sidik, 2015; Tarlani & Sirajuddin, 2020)each village must manage its own village funds. This significantly impacts the spatial and a-spatial aspects of rural development, either creating opportunities in rural areas or even creating new problems. Currently, many villages carry out development without prudently considering spatial aspects. Villages as the main suppliers of various staple foods are unable to achieve self-sufficiency as part of sustainable development. Therefore, it is important to discuss governance aspects. This paper explains rural issues and problems and relates these to the development management framework. The paper uses a literature review and secondary data to identify issues and problems in villages. The paper found that each village can formulate strategic solutions by planning to increase information and public communication, organizing to strengthen systems and internal supervision, actuating to optimize the role of Village-Owned Enterprises (BUMDes. Since the enactment of the Village Law no. 6 of 2014, in addition to allocating village funds—IDR 20.8 trillion in 2015, IDR 46.9 trillion (2016), IDR 60 trillion in 2017 and 2018, 2019 amount IDR 70 trillion, and IDR 72 trillion in 2020 (Ministry of Finance of the Republic of Indonesia, 2020)—the government also classifies village status into five clusters: very underdeveloped villages, underdeveloped villages, developing villages, developed villages, and independent villages (Islahuddin, 2020). In fact, despite a large number of village funds, the status of underdeveloped villages is still relatively high, around 2.9% or 2,424 out of a total of 83,820 villages that do not have access to electricity from the state (Harmadi, Suchaini, & Adji, 2020). The status of this village, in the report, shows that not only geographical conditions are challenging to reach the area but also drastic changes in problem identification mechanisms, community bonding, and low social participation levels (Dai, 2016).

Scholars—both Indonesian and International—claim continuously that the status of disadvantaged villages is due to declining community bonding so that many villagers are affected by the urbanization process (Lee, 2020; Menahem, 2011; Norris, 2004). This condition has caused residents not to have the capacity to develop the potential and wealth of natural resources owned by the village (Koch, Faust, & Barkmann, 2008; Purnomo, Rahayu, Riani, Suminah, & Udin, 2020; Wilonoyudho, Rijanta, Keban, & Setiawan, 2017). Apart from these conditions supported by sustainable development policies, one of the many underdeveloped villages, namely Masoso Village, Mamasa Regency, West Sulawesi, has developed local power to carry out green development construction of turbines under micro-hydropower plants program. This program is one of the steps taken by the village community to meet energy needs, such as household lights, televisions, schools, and village offices (Bracken, Bulkeley, & Maynard, 2014; Moresová, Sedliaciková, Schmidtová, & Hajdúchová, 2020).

Despite urbanization existing, declining community ties, and residents' weak capacity, Masoso Village people have formed new social solidarity to build turbines with green development concept (Firman, Kombaitan, & Pradono, 2007; Zajadło, 2016). As long as the government has issued village funds, strong social solidarity, and respect for local wisdom can generate sustainable village development (Badaruddin, Kariono, Ermansyah, & Sudarwati, 2020; Gayatri, Latrini, & Widhiyani, 2017; Ramly, Wahyuddin, Mursida, & Mawardi, 2018). However, Masoso Village has to face the fact that the turbine operation is not running optimally even though village funds have been allocated to assist the green development program. It happens because the funding assistance is insufficient for turbine maintenance, while the need for energy is relatively high. Therefore, the people of Masoso Village must accept this fact.

How do the people of Masoso Village solve this problem? At this place, villagers value local wisdom as their source of livelihood. The community utilizes the potential of abundant natural resources. A wide river with a large water discharge capacity makes people believe in providing electric lighting. Although local people support turbine construction, they have to cover the management budget via each family contribution. They form a social gathering of labour with the cultivation system. In turn, the community makes up for the lack of funds for turbine management. This condition implements the community capital concept to develop its potential (Ahmad, 2016). Social participation and respect for local wisdom are presented in the discussion of this study. Using fieldwork data collected under the snowball sampling process, this article aims to explain community capital in green development programs. Implementing community capital-based programs in underdeveloped villages has contributed to the scientific understanding of Indonesia's community empowerment and sustainable development.

Community Capital: A Theoretical Framework

Many rural communities are maintaining natural resources to manage life sustainably. However, in many cases, the poverty conditions of local communities reinforce people's belief to spend costs for their needs and also require strengthening their natural resources (Gai et al., 2020; Kelman & Mather, 2008). This strengthening has encouraged the community to increase natural potential as a step to reduce poverty. For this reason, the concept of sustainable development emerged as an alternative offer to reduce the number of rural poverty since the 1980s and as a critical reflection to establish the rural economic system. When the concept of sustainable development respects the strength of local potential, environmental conservation becomes the main initiative and focus

in increasing economic growth in the village (Gutierrez-Montes, Emery, & Fernandez-Baca, 2009).

The evolution and development of sustainable development concepts have shown the main focus in reconstructing society's daily activities (Robert Chambers, 1992). For example, the rural appraisal approach is a sustainable development concept to change the mindset of rural communities (Robert Chambers, 1994; Olofson, 1985). This concept is also an integral part of the sustainable rural livelihood approach, which became the next trend in the 1980s (Saragih, Lassa, & Ramli, 2007). From a policy perspective, sustainable development correlates with three terms, 'sustainable,' 'rural,' and 'livelihood' as a new development term—sustainable refers to sustainability, rural refers to village status. Livelihood refers to local people living independently (Scoones, 2009). At the same time, sustainable rural livelihoods need alternatives to build public awareness.

An alternative approach to understanding natural resource management systems has raised more applicability in participatory-based development strategies. Referring to the concept offered by Cornelia and Flora, community groups must develop alternative methods as implications for reducing poverty in rural areas. Based on field data in the USA and Latin America, they define the fundamental aspects of resources or capital: natural, human, cultural, social, financial, development, and political. The results show that community capital can be used in various cases of village development (Flora, Flora, & Fey, 2004).

Capital is defined as community resources or social groups, and its development outcomes create different programs. This concept can empower the community because its implementation begins with basic community needs. Community capital emphasizes the importance of shifting from the idea of "aspect" to "resources" or "capital" to provide a more applicable view regarding the conceptual

framework of community empowerment. Every community already has resources, but it is necessary to consider people included in the vulnerable group. This condition can negotiate between the capital owned by the community and individual welfare. To that end, community capital has three different types: natural capital, financial capital, and built capital (Gutierrez-Montes et al., 2009)—these three types are material forms. Meanwhile, community capital can be divided into two main objectives that can essentially create sustainable community development: human and material factors.

Table 1. Community Capital Sources

Human:	Material:
• Social Capital	• Natural Capital
• Human Capital	• Financial Capital
• Cultural Capital	• Built Capital
• Political Capital	

Sources: Adaption from Emery & Flora, 2006.

The table above shows that the success of village development can achieve program output if capital sources are utilized optimally. First, natural capital shows the assets in the village, including weather, geographical conditions, natural resources, and natural scenery. Natural capital can also influence local culture. Second, human capital is understood as the community's ability to develop their community or, by other names, human resources to improve identity and access community development data. Third, cultural capital reflects the way people act and maintain their traditions. Cultural capital also affects innovation creativity and the influence of cultural hegemony as the dominant group capital.

Fourth, political capital affects access to power, organization, the network of resources, and the ability to organize the community's capabilities to achieve self-independent. Fifth, social capital reflects the relationship between the community and social organizations bound to build community bonds and social solidarity. Sixth, financial capital refers to financial resources available to be invested in community capacity-building activities, business development to encourage people to become entrepreneurs and collect income for sustainable living in the future. Seventh, built capital is an infrastructure supporting community activities (Aldrich & Meyer, 2015; Gasteyer & Araj, 2009; Kline, McGehee, & Delconte, 2019; Menahem, 2011; Utami & Cramer, 2020).

The definition highlights that community capital can be a concept to encourage sustainable rural development. A village as a source of livelihood, utilizing community capital owned by local residents, is the leading indicator related to the success of a sustainable development project. For this reason, the community capital indicators above are a reference for defining, articulating, and adapting factual conditions to people's experiences in Masoso Village. Thus, this study refers to the theoretical approach and literature on community capital as a reference to see the success of community empowerment in the research location.

Methods

Administratively speaking, Masoso is a village located in the Mamasa Regency, West Sulawesi Province, Indonesia. This village is included in the category of an underdeveloped village with a Development Village Index of 0.43% (Ministry of Village of the Republic of Indonesia, 2020) with the respective values of social, economic and ecological resilience around 0.69, 0.27, and 0.33. Furthermore, Masoso is also a forest area divided into two categories:

protected forest and limited production forest. The majority of the population is working as farmers in protected forest areas. They work as farmers because they have no other choice to make a living. However, abundant natural resources can be the potential to increase the economic productivity of the community, but they have to face the challenge of the limited community toward resource access. Meanwhile, the action carried out by the government is still merely focused on developing village infrastructure.

Masoso Village has several natural potentials that can support sustainable life for the community. The possibility of water resources is one of the visiting attractions. The community uses this water resource to build village lighting because they do not have access to install electricity lines from the State Electricity Company or *Perusahaan Listrik Negara* (PLN), thus the presence of electricity is important to fulfill their livelihood (Statistics of Mamasa Regency, 2020; Statistics of Merangin Regency, 2020). The community utilizes potential, social capital, and local wisdom to build turbines and its benefit of water for electricity. Therefore, researchers decided Masoso Village to be the research location as a case study to understand changes in meaning, community bonding mechanisms, and community organizing (Yin, 2014).

Researchers started in August 2020 when the lockdown policy was implemented to suppress the spread of the coronavirus (Covid-19) in Indonesia. After the researchers got access through a private network with the Mamasa Regency government, the researchers began to build communication with the Masoso Village community. A qualitative research design was used in this project for eight weeks (August – October 2020) field data collection in 2020 in the village. The methods used 5 (five) approaches, i.e. local wisdom identification, local economy activity, social mapping, identification of economic opportunities for livelihood, and the case

of micro-hydropower plants programs that affect the community. This study is conducted by a case study due to it involves an intensive and detailed analysis (Bryman, 2008: 52). To that end, the research team collected data in three ways.

First, the research team, together with local research assistants, lived in Masoso Village. Furthermore, we were collecting data using the participant observation method. An observational and interaction phenomenological approach is used in research as the primary method of the data collection process (Creswell, 2007; Gill, Stewart, Treasure, & Chadwick, 2008; Saunders et al., 2018). Second, conducting in-depth and unstructured interviews with village communities, village officials, traditional leaders, and local officials. The researcher used interview data collection with a snowball sampling technique (Walter, 2010, p. 52), starting with primary informants and asking the interviewees to provide research references to other community members so they could be interviewed. In total, the researcher conducted interviews with ten interviews. In this process, the researcher asks the informants to provide feedback about real-life conditions and guides the researcher to share their new experiences in the community. Several fieldworks from interview data were also used to complement the participant observations when study was carried out. Finally, data were collected through documentation in local archives, policy documents, village records, and minutes of village government meetings. This archive data allows researchers to describe and understand the local context of the community. In addition, archival data also helps researchers to show some social interactions that can complement field data.

After finishing the field investigation, field notes and interviews were transcribed combined with relevant local documents and archives for analysis. Following this case study, research is expanded to understand social phenomena by conceptualizing concrete

empirical cases (Maxwell & Reybold, 2015). This activity aims to expand the theoretical studies used by researchers via data coding to produce consistent themes (Miles & Huberman, 1994), such as the meaning of community, social participation, green development programs, electricity payment fees, and sustainable rural livelihoods. The theme's content is then dialogued with the literature presented to expand community empowerment studies in underdeveloped villages. However, the presented themes can strengthen the data to identify and analyze the theoretical community development process.

Result

The field data shows that Masoso Village residents do not have access to electricity services from the State Electricity Company. In contrast, electricity service has become a crucial issue to people's needs and lives. With existing local strengths, the community collectively builds electricity turbines to meet lighting needs. Turbine construction aims to ensure that local communities can receive electricity service similar as provided by the state. Interestingly, this program is carried out by empowering the community. Empowerment has started from the time of the operational development of the electricity service (Ariyanto, Setiono, Sasmoko, & Pamungkas, 2018) SerangPanjang Sub-District, Subang Province, West Java Province, utilizes Ciasem River water, processed so that it has high water fall 17,61 m, water discharge design 1,100 l / s, hydraulic potential of 160 KW, turbine efficiency of 0.73, efficiency of generator 0.89, out put generator 120 KW, loses 4 KW and total electrical energy generated 116 KW. The purpose of development, to help people who were not reached PLN electricity, to empower the community.Empowerment begun from the time of development, where citizens are involved, which then able to become operators. The result of energy from PLTMH is sold to PLN, then the result is reduced for operational

costing, maintenance cost, import cost / electricity payment used, depreciation cost of equipment taken from 10% of transactions, divided by two (50% for PT HidropirantiIntiBaktiSadaya, as shareholder. With the existence of independent electricity services, all residents understand the benefits of water to build turbines.

> "With collective awareness, we built a Turbine construction program to provide lighting in this village. Of course, we did various activities, especially taking advantage of the potential of the water resources here. Meanwhile, the community also has awareness for environmental sustainability." (Male, Interview, 19 August 2020)

Based on this explanation, micro-hydropower plants (Turbine) development in Masoso Village has become a potential for sustainable ecological development. It positively impacts people because the turbine has produced 50 kW, and only 30 kW is used for housing lighting and family entertainment like televisions. After the turbine is established, the community must pay or contribute IDR 15,000 per 20 W for one lamp, and IDR 20,000 per 60 W or three lamps. Meanwhile, new families who want to install these electrical services must build electrical installations. As a result, turbine management in Masoso Village requires community participation support in the form of electricity payment fees because great electricity needs to illuminate one area, so the village government has allocated funds to support this management.

Table 2. The Institutional Pattern of Turbine Management in Masoso Village

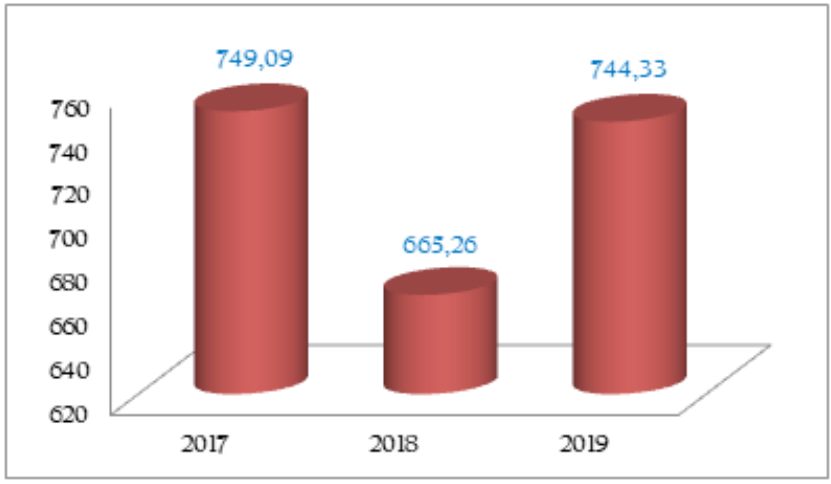
No	Institution	Masoso Village
1	Establishment	Since 2009 managed by Turbine Organization
2	Management	Chairman, Secretary, Treasurer

No	Institution	Masoso Village
3	Program	PNPM Green 2009
4	Water sources	*Masoso* River (Turbine)
5	Services	Turbine 30 kW, Start from 3 PM – 7 AM, and Sunday 24 hours
6	Control over forest and water management	Based on local knowledge and leadership
7	Development Micro-Hydropower Plants	Ecologically very potential to be developed as it is still supported by a sustainable forest resources

Source: Fieldwork, 2020.

The importance of village government is needed to encourage turbine management. For this reason, village funds have been allocated by the government for IDR 2.1 billion in the period 2017–2019 (see Figure 2). Furthermore, Masoso Village people have high expectations of electricity services for household activities and public facilities to be more productive in accommodating small-scale businesses. However, this still faces challenges in Turbine management, such as damaged turbines and dynamos that have a significant impact on the additional cost to repair them. Finally, the village government must make a reparation plan to solve the turbine's technical problem. Therefore, the local community and the Masoso Village government must allocate more funds for Turbine maintenance.

Figure 1. Village Fund Allocation in Masoso Village
(in IDR millions)



Sources: Fieldwork, 2020.

The budget for these funds is in accordance with village fund regulations managed for sustainable development by utilizing village resources (INFID, 2021). Consequently, the construction of the turbine has contributed to sustainable livelihoods. This means that turbines in Masoso villages was appropriate with the needs of the community due to it can solve electricity problems adequately. Their turbine does not damage environments, but it can be easily utilized and maintained by the community, and produces added value from economic and environmental aspects. Therefore, the encouragement of the village government and local leaders in allocating Village Fund for turbine management is a concrete action to preserve energy resilience in sustainable rural development.

There, the allocation of funds prioritizes the sustainability of water sources. In this manner, the community commits to protect the forests, hills, and rivers. Also, Masoso understands local wisdom to protect their resources with the term "*Tak Malo Mulelleng Kayu*

and Tondok Kediari Pariane" (to participate in conserving wood and planting rice). This term indicates that all forest woods are prohibited from cutting down the rice harvest season because by growing rice, the need for water increases. This term also respects and practices the local strength of the Masoso community views (Interview, R2, 11 September 2020).

The community develops turbines to preserve the environment, social and economy based on a Green Development approach. Accordingly, natural resource management and protecting water resources should be a top priority in the context of the program. Furthermore, with the socio-cultural uniqueness possessed by local people, they can contribute to ecological management and the sustainability of water resources to build local communities. On the other hand, the ecosystem owned impacts the energy management system in the village. However, these efforts require local leaders supports and village governments to link economic interests and social development.

> "We have been negotiating with local communities to implement the Green Development program. All elements are involved in running this program, especially the people who really need electricity for lighting." (Male, Interview, 19 September 2020)

Furthermore, the benefits of village funds in Masoso have been rearranged to the local community's needs. Based on Law No. 6/2014 and Ministerial Regulation 14/2020 concerning Priority for Village Funds, natural resources in villages can use appropriate technology, such as micro-hydropower plants (Turbines). Furthermore, the construction of the turbine is following the community's needs because it can overcome electricity problems. Moreover, Turbine development does not damage the environment but utilizes and maintains local wisdom in adding value from economic and environmental sustainability. Therefore, the encouragement of the village government and community leaders in allocating village funds

for turbine management is a real action to maintain energy security in sustainable rural development.

In this case, the village government has a commitment to build infrastructure, including micro-hydropower plants. Thus, the village funding scheme is expected to help build and manage power plants for villages that need energy independently. Maintenance is one of the contributions of village funds for the development of turbines in Masoso Village. It can be directed to the construction of micro-hydropower plants. However, financial support for micro-hydropower plants is not only from village funds but also from community self-help funding, including monthly contribution for electricity. Therefore, the key to successfully managing the turbine power plant in Masoso village is the partnership between the local community and the village government. Community participation is always related to and involved in green development programs.

The construction of this micro-hydropower plant aims to increase the community's commitment to protecting natural resources site. Traditional values are systems embedded in society to preserve social relations values at various levels, social structures and relationships with natural resources. This will affect various levels of organizations in their efforts to protect the environment's sustainability, currently local government agencies, universities, and non-governmental organizations (NGOs) have initiated cooperation through the green development program in Mamasa. In addition, Local communities have strengthened local wisdom to conserve their natural resources by complying with customary law. For example, in Mamasa, it is forbidden to cut down trees in the protected forest. Still, there is a permit from the forestry service that local people can grow coffee in the protected forest but not burn it, and the necessary protective trees such as Lamtoro (Leucaena leucocephala), Dadap (Erythrina variegata), and Gamal (Gliricidia sepium).

Furthermore, Masoso community builds a cultivating system by developing *Arisan Tenaga Kerja* or *Social Gathering Workers*. This *Kelompok Kerja Masyarakat* or *Community Working Group* (Pokmas) plans rice planting by looking at proper seasons and relies on the figure of *Dukun Padi* or *Sharman of Rice Field* who gives instructions to plan it. However, the community still carries out this tradition to this day. People also use traditional knives—called *Ani-Ani*—to harvest rice, so that they have limitations in harvesting rice on a large scale. It is due to the traditional system like *Ani-Ani*, and this is part of the community's obedience to respect local traditions. The community still carries out this tradition system to maintain social relations at various levels, social structures, and natural resource relationships.

This traditional value is embedded in the social system of society to protect social relations at various levels, social structures, and relationships with human resources. It will have an impact on all levels of people's lives. Local knowledge in Masoso can be understood as a system that introduces traditional practices as part of resource management and human life. Although this village is categorized as an underdeveloped village area, it still maintains the power of local wisdom. It is an appreciation for the cultural values owned by the community. Local knowledge in Masoso has also been transformed into institutions or social capital based on community development. This social capital has become the impetus for the community to establish and manage turbines for electricity services for the residents of Masoso Village.

Table 3. Changes in Community Capital as a result of green development

Human	• The population is increasing every year • Population migration is not very significant
Social	• Community awareness to develop Masoso village area • Community ties and social participation are increasing to carry out green development programs
Political	• Full support from local government (Mamasa Disctrict) • Conducive village governance conditions • None Prolonged conflict
Financial	• Annual change in village funds increased by more than 2% • Awareness of community fees voluntarily for turbine maintenance • Increasing the number of participants using electricity services
Natural	• Protected forest areas have become the government's concern for developing rural communities • Water resources with high discharge • Village institutions have supported the green development program
Cultural	• Residents appreciate the advice of traditional leaders • The emergence of a common awareness to appreciate local potential • The strengthening of the power of local wisdom
Built	• Construction of turbines with a green development program • Local people build irrigation water • Fixing lighting and electricity installations per family

Sources: Fieldwork, 2020.

Table 3 showing the Masoso village community has faced various collaboration patterns with stakeholders in supporting the green development program. Local stakeholders consist of individuals and institutional groups residing in the village, such as the village government and turbine managers. The collaboration of the community and stakeholders is essential to support the development of socio-economic activities, such as public facilities and the productivity of small industries. However, in Masoso Village, the benefits of the turbine are limited to household activities, and there is no electricity at the clinic, school, mosque, hall, and village office. For this reason, if the community is to improve turbine development and natural resource management, it is imperative to build cooperation with various parties, including 1) the government plays a role in encouraging service access through community participation-based rural development programs; 2) Village-Owned Enterprises as a forum for increasing regional economic development through various cooperative institutions and various parties; 3) Regional stakeholders are local government agencies, universities, and non-governmental organizations (NGOs); and 4) National stakeholders are the Ministry of Villages, Development of Disadvantaged Regions and Transmigration, Ministry of Home Affairs, Ministry of National Development Planning or National Development Planning Agency.

Discussion

Rural social change has drastically shifted in the contemporary era of Indonesia. The lives of rural people have to face challenges, disturbances, reinterpretation, and reorganization. Various dimensions and aspects of community meaning have been revealed in this study. Interestingly, social participation by respecting local power is still attached to the residents of Masoso Village. The disadvantaged village category still has social ties and protection

by maintaining local traditions such as an agricultural management system by the advice of their traditional leaders.

On the other hand, in general, when government programs enter the countryside, tend to experience conflict and rejection, the Masoso community consciously accepts green development programs while maintaining their local wisdom. The construction of turbines is acceptable to the community, and local residents also experience the program. Villagers receive assistance directly from the government by channeling village funds, and collectively, they actively participate with contributions to pay electricity bills. Thus, the social structure mechanism in Masoso Village has experienced flexibility to accept something new outside their living conditions (Koch et al., 2008).

The multi-dimensional understanding of the relations of social life in Masoso Village has aroused scientific attention to the context of sustainable livelihood change. The status of disadvantaged villages is one reason for understanding differences in community bonds in terms of social change (Malik, 2018; Utami & Cramer, 2020). Community bonding can serve as a buffer zone to shape social life positively (Dai, 2016). Although political, policy and economic changes still occur at the central level, local wisdom is still the important point for making changes in underdeveloped rural areas (Simanihuruk & Sihombing, 2019).

In achieving sustainable development according to the 2015 international agreement, one common approach adopted by governments around the world is to shift social protection to grassroots organizations and communities (R. Chambers & Conway, 1992; Israr, Humayun, Dawood, & Nafees, 2014; Scoones, 2009). Masoso Village has demonstrated local strengths as a vital instrument for building communities through strong community ties and social participation (Lestari, Kartono, Demartoto, & Setiyawan, 2019).

However, this study has revealed that the government's budget still does not cover the green development program. Thus, it is a challenge for the sustainability of the program. This discussion is complicated to apply to the context of disadvantaged villages. Moreover, the allocation of village funds has not fully covered the community's interests under existing social facts. One analytical instrument to discuss the distribution of village funds still exists some nepotism kindship rampant in several villages in Indonesia (Handayani & Badrudin, 2019; Simanihuruk & Sihombing, 2019).

Social participation is one of the assets that can be developed in Masoso Village to suppress kindship nepotism issues. It can be an important instrument for educating village cadres to maximize their potential and skills in developing their territory. The main priority in this participation is to build political stability that prioritizes using the proper budget (Akagawa, 2019; Roseland, 2000). On the other hand, participation can also be an important instrument in encouraging common interests to voice the government in building electrical installations in the Masoso Village area immediately. Based on mutual awareness and involvement of all parties, the fulfillment of village lighting through the State Electricity Company (PLN) can be a solution to develop villages in a sustainable manner.

As explained in this study, community capital is only part of the instrument in building grassroots awareness. The underdeveloped status in Masoso Village must take the initiative to remove it from the disadvantaged zone. Improving the human, natural, social, political, financial, cultural, and built resources that Masoso Village has excellent potential to make it "take off": from being left behind to becoming an independent village. It requires the courage of the local population to take collective action in proposing a more open geographical isolation. Electric lighting is an essential element to realize a sustainable rural livelihood. This electricity

service fulfills the rights of citizens and becomes the main element to increase economic and social activities. Therefore, future research needs to consider aspects of community-centered welfare on green development and critically include multi-dimensional and relational values in community empowerment projects to achieve social justice and welfare goals.

Conclusion

Communities in Masoso have conducted green development through micro-hydropower plants as the development efforts through participatory approaches. The importance of village funds to support green development is needed to be a breakthrough to be self-sufficient energy villages. Although the village is categorized as an underdeveloped rural area, local communities have the initiative and creativity to develop turbines to obtain electricity. The presence of turbines in Masoso village has encouraged local economic development, although still limited due to several challenges, such as low turbine capacity. Therefore, the innovation of appropriate technology on turbines is the main agenda to resolve various socio-economic challenges at study sites.

The implementation of green development through micro-hydropower plants is supported by funding cooperation, namely community dues and the village fund for turbine maintenance. This funding scheme could help communities build and manage electricity power plants allocated for financial support to maintain generators and electricity distribution networks. This pattern is an effort to become a self-sufficient energy village. Furthermore, local communities have strengthened the commitment to preserving natural resources to protect water continuity as the priority source in the development of micro-hydropower plants. By the presence of electricity, local communities in the Masoso village can increase

various socio-economic opportunities. Electricity has become an essential aspect for local communities to do multiple activities at their home. Students can learn from home, work in production activities, public health services, and household duties for women's groups because they often have more prominent domestic roles.

Nevertheless, this study has two limitations: firstly, it only examines underdeveloped rural areas located in Masoso Village, Mamasa Regency, the West Sulawesi, thereby can not be implemented in the other places and, secondly, it excludes the surrounding community of the villages. Thus, it is expected that further research will consider examining some green development programs located in different areas, especially rural development areas, which become the cluster of the underdeveloped. This way is projected to generate a more reliable picture as an approach to formulate the sustainable livelihood of the rural areas.

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Author's Declaration

Authors' contributions and responsibilities

We are Muhammad Syafar (Author 1/A1) and Helmy Faizi Bahrul Ulumi (Author 2/A2) confirm for our contribution to the paper as follows:

A1 contributed to study conception, research design, and developed the theoretical framework. A1 and A2 conducted data collection in the study site. A1 carried out the processing data, performing data analysis and interpretation of research results. A1 wrote of the draft manuscript preparation, A1 and A2 wrote the final manuscript with input from us. A1 and A2 discussed and reviewed the results and approved the final version of the manuscript.

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Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

Additional information

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