International Journal of Social Science Research and Review

http://ijssrr.com
editor@ijssrr.com
Volume 6, Issue 5
May, 2023
Pages: 384-400

Persistent Poverty Amid Rural Infrastructure Development in Timor Island, Indonesia: Enhancing Livelihood Analysis on Rural Development

Yulius Yasinto[1]; Daniel D. Kameo[2]; Robert M. Lawang[3]

[1]Student at Satya Wacana Christian University, Salatiga, Central Java, Indonesia

[2]Professor of Economics at Satya Wacana Christian University, Salatiga, Central Java, Indonesia

[3]Researcher at University of Indonesia, Jakarta, Indonesia

E-mail: yulyasinto@gmail.com

http://dx.doi.org/10.47814/ijssrr.v6i5.1224

Abstract

This paper examines the impacts of rural infrastructure development on the livelihood of peasant communities in the Bena Irrigation Area in South Amanuban District, Timor, East Nusa Tenggara, Indonesia. Statistic data indicated that despite significant agricultural infrastructure developments, the local people's welfare remains less developed, and poverty persists. Based on the Pentagon assets of livelihood approach, this paper analyses how politics and power, the broader structure of the society and globalization, and dynamics of livelihood change and shift in the future have shaped the livelihood of the people of Bena. This research found that the development of natural, social, and human assets has yet to be sufficiently supported by political structure and power relation to having maximum advantages, is still vulnerable to impacts of globalization, and lacks clear pathways to anticipate future shifts in rural livelihood. This paper argues that rural livelihood analysis in Timor should involve notions of politics and power, impacts of globalization and anticipation of future shifts and changes in rural livelihood.

Keywords: *Rural Development; Sustainable Livelihood; Pentagon Assets; Persistent Poverty; Rural Infrastructure; Dynamics; Politics; Power; Globalization*

Introduction

The debate on rural development approaches remains relevant and challenging. Reality shows that the welfare condition of rural communities remains poor. Many rural development programs exist, especially in developing countries of Asia and Africa, including Indonesia. Even after three decades of economic growth approaches, the welfare of rural communities has not changed much (Griffin & Khan,

1978; Streeten, 1984; Chambers, 1995). On the contrary, this approach has raised many problems in development and the environment. There is no sustainable impact of the economy-based policies on the livelihoods of the rural poor and their environment (Agarwal & Narain, 1985). Three justifications for economic growth strategies for the welfare of rural communities, glorified by proponents of the economic growth approach, are not proven (Streeten, 1979).

The phenomenon of rural community lagging in East Nusa Tenggara Province of Indonesia (NTT) is an irony amid quite intense rural infrastructure development. The poverty rate of NTT rural communities is still very high, at 25.08%, ranking 32nd out of 34 provinces in Indonesia in 2019 (BPS, 2020). The stunting rate in NTT was also the highest in Indonesia (34.5%) in 2018, although it dropped to 23.5% in 2020. NTT's Gross Regional Domestic Product (GDP) per capita based on current prices (ADHB) is only IDR 20.58 million annually in 2021. NTT's GDP per capita is equivalent to 7.5% of the income of Jakarta Province residents, which reaches IDR 274.71 million per year.

Various rural development approaches and practices have emerged in the rural development debate in recent decades. After the economic growth approach, the Sustainable Development approach has emerged since the 1980s. This approach criticizes the dominance of the economic growth approach known as the "growth-with-modernization" era over the previous two decades (Mitchell, Ingco & Duncan, 1997). Robert Chambers and his colleagues introduced the 'Sustainable Livelihood Approach' (SLA). This approach emphasizes the diversity of activities and livelihood resources. In addition, the development strategy must be people-centred. Development priority proposals are made from the bottom up based on the needs felt necessary by the community itself on a sustainable basis (Chambers, 1995; 1997). That is, driven development must withstand the pressures and shocks of the present. In addition, development must preserve capabilities and assets and prepare sustainable livelihood opportunities for future generations (Chambers & Conway, 1992). According to this approach, five main livelihood assets are known as Pentagon assets. These include natural, financial, physical, social, and human assets.

Studies using the sustainable livelihood framework to analyze the phenomenon of rural community underdevelopment have been carried out before, especially on the island of Timor, NTT (Kameo, 2003, 2013; Bele, 2011; Jocom, 2016; Ratumakin, 2016; Neonbasu, 2016; Tjoe, 2017). The findings of several studies show that human and social assets need to be utilized more to maximize the impact of rich natural assets. Social and human assets have also been unable to design other physical assets, such as infrastructure, that impact people's financial capabilities more. However, these studies do not adequately explain the influence of politics and governance, globalization and dynamics on changes in people's livelihood patterns. Scoones (1998, 2009) asserts that studies and livelihood strategies to date have been limited to analyzing five assets. Meanwhile, the role of power relations and politics, macro context analysis of the impact of globalization, and the dynamics of changes in the livelihoods of rural communities in the future have yet to be adequately included or analyzed.

This article enriches Chamber and Scoones' analysis by focusing on the development of physical assets (agricultural irrigation infrastructure) in the context of politics and governance, globalization and dynamic changes of livelihood. Departing from the Bena irrigation case study, the author reviews changes in livelihood patterns based on various contexts around the community. The reality shows that the development of agricultural infrastructure has little impact on the level of people's welfare. The same is the case with the impact of agricultural infrastructure on several other irrigated areas in NTT, such as Lembor, Mbai, and Malacca. The question to be answered in this study is: What is the impact of infrastructure development on the livelihoods of the surrounding community? Furthermore, why has it not been able to encourage significant improvement in the welfare of rural communities? This study aims to analyze the impact of agricultural infrastructure development and the factors contributing to changes in people's livelihoods and welfare levels.

Through the framework of Ian Scoones (2009), the study contributes to enriching the Pentagon analysis of assets in the political dynamics and globalisation of various rural development narratives. This study will complement the existing livelihood analyses of NTT rural communities (Scoones, 2009).

Literature Review

The Evolution of Rural Development Approach

Up to the 1980-s development perspectives and strategies have been dominated by economic growth approaches (Lewis, W.A., 1955; Kuznet, 1955; Mitchell, Ingco & Duncan, 1997). These approaches – known as "growth-with-modernisation" (Mitchell, Ingco & Duncan, 1997) - use indicators, such as per capita income, poverty rate, maternal and child mortality rate, and human quality of life index s the main measure of development. Poverty is understood as a decrease in food production per capita. Poverty alleviation has focused on how to increase rural households' income by transforming traditional and subsistence agriculture into large scale modern agriculture (Johnston & Mellor 1961; Mellor 1966), or how to change rural peoples' behaviour to become more rational in the use of their resources (Lee & Goodland 1986).

Challenges to economic growth approaches have emerged since 1970s. The first example was basic needs approach (Streeten, 1979). According to basic needs approach, development strategies are designed to improve, firstly, opportunities for poor people to earn income; secondly, public services which are accessible by all; thirdly, flows of goods and services to address the needs of households; and lastly, participation of poor people in diverse ways to decide how they respond to their needs. These four pillars should have sustainable characteristics.

Streeten (1979: 29) asserts that the three justifications of economic growth approaches have been unproven. The first justification is that economic growth results will automatically "trickle down" to the poor and the benefits spread out through market forces, increase job opportunities, increase poor people's productivity and income, and lower the prices. Secondly, that the governments are democratic and concern with the poor and will extend economic growth benefits through programs like progressive taxation and social services and grants. Thirdly, in the early stages of development, the people need to save money to make funds available for capital and economic infrastructure development. In time, the development results will also improve the welfare of the poor. The poor only need to go through the belt-tighten process at the certain period, until economic growth gains (infrastructure, capital accumulation, increase productivity of economy) pay back to the poor for their welfare. Most of these claims did not happen as expected. Gaps between the rich and the poor have been widened, the market has served the interests of the ones who hold capital, many governments have failed to reduce rural poverty and collaborated with the market for the benefit of the rich, and the accumulation of capital and infrastructure development failed to improve rural people's welfare.

Escobar (1995) criticises the language of development discourse which put economic development as the basic structure of modernity. The basic problem, according to him, lies not on how the developing countries should develop to modernity, but on the gap between development concepts and actual condition at rural level, where people view the change as a process based on an interpretation to their history and tradition. Seavoy (2000) indicates the failure of development economists to recognise subsistence working norms conserved by farmers. Kottak (1985) warns development projects that are socially insensitive and do not fit into the context of society. Development is measured solely by economic objectives and ignores the actual needs of local communities.

The Sustainable Development approach is a correction to the economic growth approach (Webster, 1984). The Brundtland Report (WCED, 1987) defines sustainable development as development

that can meet the needs of today without compromising the ability of future generations to meet their needs. This definition contains two critical concepts. First, the concept of needs emphasises that the world must prioritise the needs of the poor. Second, the concept of limitations reminds the world to use the resources available in the natural environment with responsible technology and social organisation. The goal is that the results of development are enjoyed by those who are less fortunate today and future generations at the same time. Munasinghe (1993) and Rogers, et al. (1997) provide operational limitations in the sustainable development approach through linkages between three main aspects. The three aspects include the economic, social, and environmental approaches called the triple bottom line for sustainable development.

The idea of sustainable livelihood entered the centre of thinking about rural development in the 1980s as part of the Sustainable Rural Development approach (Chambers, 1983; Chambers & Conway, 1992). This approach is from now on, known as the "Sustainable Livelihood Approach" (SLA). According to Chambers & Conway (1992), livelihood includes capabilities, assets, material and social resources, and all activities to sustain life. Livelihood is sustainable if it can face and recover from pressures and shocks. In addition, it can also maintain or improve capabilities and assets without weakening the natural resource base. There are three basic terms in the concept of livelihood. First, capability refers to the ability to perform basic functions. This includes the capacity to utilize both tangible (resources and supplies) and intangible (claims and access) assets, and be able to withstand shocks (Sen 1984, 1987; Dréze & Sen, 1989). Second, equity to end discrimination and provide a decent livelihood for all. Third, sustainability in the use of resources to ensure future generations can still enjoy and utilize livelihood assets. DFID (1999) formulated the Sustainable Livelihoods Framework (Sustainable Livelihoods Framework) includes five core assets called "Pentagon assets." These assets are natural assets (water, land, rivers, forests and minerals), financial assets (savings, income, pensions, credit, and state transfers), physical assets (shelter, transportation, water, sanitation, and energy), social assets (social networks, affiliation, reciprocity, trust, and mutual exchange), and human assets (education, skills, health).

Sharpening the Sustainable Livelihood Approaches

The livelihood approach is open to deficiency and criticism. One repeated criticism of livelihood approaches is that they ignore politics and power. Scoones (2009) notes that since SLF was popularized, the focus of the livelihood approach tends to be limited to these five assets. Meanwhile, the role of power relations and politics should be included and analyzed. In fact, power and politics form various social differences in society. Another note was conveyed by Ellis & Biggs (2001), who stated that the livelihood approach is difficult to accommodate in rural area policy if it is still understood only from an economic point of view. While Ellis (1999) asserts that agriculture alone will not be able to improve the ability of rural communities to live. Therefore, livelihood diversification is needed. Poverty alleviation policies in rural areas must focus on developing community access to critical assets. These assets include education and health, infrastructure, financial resources, small businesses, and support for social assistance programs. Davies (1996) and Scherr (1999) suggest that not all livelihood approaches using local knowledge successfully adapt to environmental changes and natural and social shocks.

The literature on the development of rural communities on the island of Timor, NTT, related to the livelihood perspective, is quite large (Ormeling, 1957; Schulte, 1971; McWilliam, 2002). They provide a clear picture of the agricultural culture, religiosity, organizational structure, livelihood, and history of the Atoni people on the island of Timor. Local contexts in the past influenced agricultural patterns, socio-political structures, and the religiosity of these communities in the present. Written works with an anthropological approach, such as Neonbasu (2016); Foni (2004); Bele (2011), or the study of ecology and the people of Atoni, Timor (Ataupah, 2020) emphasise the availability of resources/natural assets and social assets of rural communities on the island of Timor that are abundant but not optimally

utilised. As a farming society, the Atoni people have traditional mechanisms that regulate their behaviour so that their agricultural activities provide maximum results.

Kameo (2003) offers four pillars of development of rural communities in NTT, especially the island of Timor. Four pillars are offered: household-based economic development, human resource development through education and health, and institutional development as supporting infrastructure. Using a socio-cultural approach, Kameo (2013) emphasized the need for inclusive and sustainable development of NTT rural communities. Tjoe's (2017) study on three different rural communities in TTS and Kupang found that sustainable livelihoods in dryland communities on the island of Timor are the result of subsistence culture. Subsistence culture comforts its members to face difficulties in life in their village. The study also finds the implications of modern education and market systems in smoothing the path for community members, especially women, to achieve social status—education as a correction of ascribed status in the family and society. Subsistence culture promotes more sustainable forms of development in dryland areas. To support subsistence communities in sustaining livelihoods on the island of Timor, we need to foster awareness, equality and respect for subsistence cultural values.

Ratumakin et al. (2016) from *Perkumpulan PIKUL* examined local knowledge of the sustainability of water management in the dry land region of Timor. They found that some communities/villages on the island of Timor succeeded in building and managing water resources based on local knowledge and wisdom. Jocom (2016) examined the phenomenon of water scarcity in the coastal area of South Timor and concluded several things. First, the problem of water scarcity in South Timor is not caused by environmental conditions but rather the problem of lack of community access to water resources. Second, communities have diverse ways of overcoming water scarcity based on local wisdom and the social agreements of community members.

Scoones (2009) criticizes the use of a livelihood approach that only focuses on the five Pentagon assets. Scoones calls it a simplification of the application of this perspective in its realm of practice. Furthermore, he explained four failures or weaknesses that often arise in the livelihood approach. First, it is less involved with the processes of economic globalization. The livelihood approach sees "context" as paramount. The livelihood approach could be more assertive in the face of significant shifts in the global market and political conditions. Second, there needs to be more attention to power and politics. The livelihood perspective does not link livelihood with power relations and governance dynamics in development debates. Third, it does not look at the issue of long-term changes in environmental conditions. In livelihood discourse, sustainability refers only to the ability to deal with local shocks. Fourth, there needs to be more attention to long-term shifts in rural economies and broader questions of agrarian change. According to Scoones, giving new energy to the livelihood perspective is needed now. This may be done by adding new focus and priorities to answer new challenges.

Scoones (2009) sharpened SLF analysis by adding four aspects: knowledge, politics and power, scales and dynamics. First, knowledge to create a solid political framework of livelihoods knowledge-making discourse. Thus, it can compete with other dominant development discourses, such as economic growth discourses. Second, politics and power must be a central part of the livelihood perspective for rural development. Politics is not just a "context" but a focus of analysis. Nor is it just adding other "capital" to the five main livelihood assets (pentagon assets) (Baumann, 2000). Attention to how livelihoods are shaped by relations of class, caste, gender, ethnicity, religion and cultural identity is central. Third, as global transformation continues rapidly, attention to scale issues must be central in refreshing livelihood perspectives. The challenge ahead is to develop livelihood analysis that can examine cross-scale networks, linkages, connections, streams and chains while remaining firmly rooted in place and context. Fourth, enable a livelihood perspective to deal with long-term change issues. Without attention to the variables of long-term change, analysis can fall into finding short-term solutions and ignoring slow transformations for long-term good.

Scoones asserts that the livelihood perspective offers a critical lens through which to address complex rural development questions. However, to remain relevant and applicable, the livelihood perspective must examine the questions surrounding knowledge, politics and power, scale and dynamics more deeply and concretely. The livelihood perspective needs to be given new energy, as quoted below (Scoones, 2009: p. 191):

"A re-energised livelihoods perspective thus requires, first, a basic recognition of cross-scale dynamic change and, second, a more central place for considerations of knowledge, power, values and political change. The themes of knowledge, scale, politics and dynamics, I argue, offer an exciting and challenging agenda of research and practice to enrich livelihood perspectives for rural development into the future."

Research Methods

This research uses a qualitative approach with a case study method. According to Nisbet & Watt in Wilardjo (1994: 4-5), a case study systematically investigates a particular event. Case studies can be used to examine a situation, group, local community (community), institutions or individuals. Case studies examine a specific problem that is a common symptom of other problems to produce general postulates. This research uses a case study of a single location, the Bena Irrigation Area. This study in no way intends to generalize the livelihood of the Bena Irrigation community to describe the condition of all areas with irrigation projects in NTT let alone in Indonesia. However, with consistent and well-structured data collection procedures, the data and analysis can be used to examine similar phenomena elsewhere.

Data collection is carried out in 3 ways: participatory observation, in-depth interviews and document studies. Direct observations were carried out during weekend visits to Bena during the period of 2019 and continued after the Covid-19 pandemic in 2021-2022. Interviews were conducted with selected resources from various circles who were considered to represent all segments of Bena society. The interview forms are open-ended and semi-structured—open interviews in the form of discussions or brainstorming with individual and group resources. Semi-structured interviews are used to guide questions that are successfully formulated from initial findings, both to broaden information and perspectives and to confirm data/information. Meanwhile, document studies include government documents containing relevant statistical data.

The data analysis uses a stepwise coding method. The first stage is the classification of themes/issues in general and random. The second stage is carried out by selecting issues based on the five categories of asset livelihood. The materials from this second issue selection stage are analyzed to prove the main argument and answer the research question.

Findings

The location of this study is three villages located in the Bena Irrigation Area, namely Linamnutu village, Polo village and Bena village. Administratively, the three villages are part of South Amanuban District, South Central Timor Regency (TTS), East Nusa Tenggara Province. Data on the area and demographics of the three villages are as follows:

Table 1. Area and Demographic Data of Pollo, Bena and Linamnutu Villages

No	Village Name	Size (km2)	Number of Hamlets	Population	Number of Household	Average Household Members
1	Pollo	18,03	4	4.414	1.093	4
2	Bena	56,52	4	3.290	796	4
3	Linamnutu	41,52	4	2.293	671	4

Source: BPS TTS. South Amanuban District in Numbers, 2020

Linamnutu village consists of 4 hamlets: Linamnutu hamlet (located near the trans-Timor road south lane), Oetaman hamlet (the earliest place for people to paddy fields), Pakupanan hamlet (central weir place) and Binel hamlet. This village is relatively remote compared to the villages of Polo and Bena. The main road access to this village must be through a river without a bridge, so it is difficult to pass in the rainy / flooding season. However, there is vehicle access that connects the four hamlets, as well as surrounding the entire rice field area. Transportation access facilitates the movement of agricultural equipment/machinery (alsintan) and crops.

Meanwhile, the villages of Polo and Bena are along the national road that connects the trans-Timor road through the South route to the Malacca regency area. Polo Village is the capital of South *Amanuban* District and therefore has better infrastructure than the other two villages. Previously Bena village was part of Polo village, and when the expansion of Polo village occurred, Bena became a separate village. Pollo Village was established in 1959, at the initiative of the local community together with local traditional leaders. Pollo Village is also the first village in the South *Amanuban* sub-district.

Natural Assets in Bena Irrigation Area

Ataupah (2020: 53) illustrates that the mainland of West Timor can be categorized into three alluvial sediments, namely river sediments (auf kuni), ocean ampuhan sediments (mnelan) and old terrace sediments (nonof). River sediments form on river banks and are generally fertile. Linamnutu village belongs to this category. Ocean sediments form around river mouths. The area has also traditionally been disused as a place to earn a living due to standing water, mosquitoes, and safety reasons. However, since the beginning of the 20th century, the area around the estuary began to be inhabited. The villages of Polo and Bena can be included in this category.

Rice paddy is not the native/traditional livelihood of the Atoni people, who make up the majority of the population of the Bena Irrigation area. According to Schulte (1971), the main livelihood of the Atoni people is farming and raising livestock. Farming is generally run in the highlands. While lowlands such as Bena are used for raising cattle, especially raising cows, and deer hunting grounds. When precisely the settlers from these villages began to move to the Bena lowlands, there was no definite/uniform information. The transfer process is suspected to occur in line with the start of rice field activities on the plain. Information about the start of paddy activities on the Bena plain also varies.

In the early days, rice field water was obtained from a small river on the Polo plain, namely the Panite river. In the rainy season, floods bring much humus, called *sarpete* or *cloflite*, from mountainous areas, making the soil naturally fertile. *Kloflite* means fine mud brought from the highlands. The system works by stepping on grass and burying it in the ground, making the soil fertile / fertilized naturally. Urea fertilizer, which at that time was provided by the government (through the *Nusa Makmur* Program), was not widely used. The river, in its history, has been rerouted twice. As a result, the small river can no longer irrigate rice fields in Polo and Bena because the flow path of water from the mountains has moved. Thus, the natural fertilisers carried by this river also no longer exist, and farmers use chemical fertilizers.

The total area of the potential Bena Irrigation Area for rice fields is around 17,000 Ha. The expanse often becomes wider if it includes plains that reach two neighbouring districts to the south coast, Kualin and Kolbano. The area that has been reached by Bena water irrigation is 3,500 Ha. The government carries out the process of printing additional paddy fields through the Agriculture Department.

The area of agricultural potential compared to a relatively small population is sufficient. However, problems arise when the control of land and agricultural land is only to a few people. In general, the land is controlled by the Nabuasa clan, the region's traditional rulers (McWilliams, 2002). The majority of the people obtained the land on grants from the Nabuasa clan. Land ownership appears uneven. In addition to the Nabuasa clan, local and district state apparatuses, as well as provinces, traders/financiers, the Church (Protestant and Catholic) controlled large tracts of land. The number of landless members of local communities tends to increase.

The climate in the three villages where the study was conducted is similar to the general climate of the western island of Timor. The rainy season is short between November and March, while the dry season is long. In connection with these climatic conditions, there are two Growing Seasons (MT) in one year. However, optimal utilization of MT is only carried out on MT I which ranges from December – May / June. Meanwhile, MT II, in June – November, is underutilized by farmers because, according to them, there is limited water discharge. At this time, many cattle entered the rice field area to find food from rice husks left by farmers in the fields. In addition, MT II is considered less efficient to be utilized because of the high evaporation (evaporation) due to the hot sun. In MT II, the community generally did other work, including gardening and horticultural cultivation.

Physical Assets in Bena Irrigation Area

By the late 1950s, the government had begun to pay attention to the potential of the Bena plain. The government began to initiate irrigation development, in line with the start of pioneering rice field activities by Rotenese settlers in 1954. However, simple irrigation work was only started in 1958 at the initiative of fetor Nabuasa with the people of Pakupanaf (Linamnutu village now). Irrigation was carried out at two points, namely in the eastern part (Pakupanaf) and the southern part (Toekola). The initial work was excavated manually with traditional techniques. Rice paddy activities began to become increasingly crowded in the 1980s. The working technique still used traditional treatment systems and relied on rainwater. During the leadership of Regent Willem Nope, dams were made to collect water and have been used until now. In the 1990s, the Bugis people, who began to be numerous in the region, began introducing modern farming methods/rice using tractors. Nevertheless, all the Bugis left the region until today due to social unrest.

Modern irrigation on the Bena plain began in 2004, referred to as Bena 1 Irrigation Project, resulting from cooperation between the Indonesian and Japanese governments. This means of irrigation then suffered severe damage. In 2012, this irrigation was reworked and named Bena 2 Irrigation Project. This project is included in the Decentralized Irrigation System Improvement Project (DISIMP) scheme, whose funds are sourced from two balanced sources (partnership basis), the State Budget and JICA. The area of rice fields to be irrigated (part of which has been utilized) is approximately 3500 hectares. The development of irrigation infrastructure is also complemented by the clearing of rice fields by the Agriculture Department. Along with infrastructure development, the number of farmers working in rice fields has also increased, especially in three villages that are reachable by irrigation development water: Linamnutu, Polo, and Bena. Not only Bena's growing number of indigenous farmers work in the fields, but also civil servants and other people from outside Bena who are interested in buying paddy fields.

Table 2. Bena Irrigation Physical Building Data

1	Area of Irrigation Building (ha)	3.514
2	Weir	
	a. Fixed	2
	b. Mud bag	2
3	Building	
	a. Divide	18
	b. Divide Tapping	34
	c. Tapping	22
	d. Complementary	97
4	Sluice Gate	
	a. Weir Gate	8
	b. Divide Buiding Gate	54
	c. Tapping Building Gate	66
	d. Divide Tapping Building Gate	102
	e. Complementary Building Gate	13
5	Carrier Canal	
	a. Primary	1
	b. Secondary	23

Source: NTT PUPR Office Data 2020

From observations, it was found that water distribution to the secondary channel is in good condition. However, tertiary channels that still use earthen foundations are in poor condition. The discharge of water that seeps into the soil is relatively high. Irrigation water management, on paper, seems quite reasonable. Water management has been mutually agreed upon by members of Unions of Water Users Farmers according to irrigation gates (Perkumpulan Petani Pemakai Air). However, there is often friction because the agreed schedule needs to be adhered to. Even rice field owners with political and social power forced changes in the water distribution schedule in their favour. An interview with the Head of Water Resources of the General Work Office of NTT Province admitted that problems often arise in managing Bena irrigation water. Water discharge begins to decline in the dry season, tertiary channels are unavailable, or conditions must be maintained. Conflicts over water sharing and cross-sectoral coordination must be fixed and sometimes contradictory.

In addition to the construction of irrigation assets, there has also been an improvement in the condition of highway infrastructure. This improvement in road facilities opened up the region's isolation. It connected it more quickly to economic centres such as Batuputih, Soe, Camplong and Kupang, and even the Malacca district to the east. On the other hand, this fact has attracted the attention of many large investors to start controlling large amounts of land.

Financial Assets in Bena Irrigation Area

The primary source of financial assets is the sale of agricultural products and livestock. In emergencies or when basic needs arise that require high costs, selling land to get fresh funds is commonplace. Generally, there is no investment in business capital working on rice fields or other productive businesses. Most of the rice fields are used for household consumption. An informant, the Treasurer of Farmers Working Group, said that soft loans provided in the form of revolving funds for business capital are often borrowed for consumptive purposes.

The cost of cultivating rice fields is high, and often needs to get profitable returns. The overall yield of NTT farmers is still below 100%, including in Bena. That is, the costs incurred for the production

process are still higher than the production itself. Many farmers are trapped in debt to money owners who leave their money to rice mill owners. The capital is lent to farmers with the yield of rice crops, the price of which is set far below the market price. The main reason for farmers borrowing money is because of the ease of getting money without complicated requirements is the main reason.

Most community members in the Bena Irrigation Area have the characteristics of subsistence communities (Goldsmith, 1998). They have little interaction with the market because their production is mainly for consumption. Their economies are not controlled by profit and competition but rather by the fortune of individuals, families and communities. Money did not become the primary medium of exchange because they were already satisfied with the practice of mutual exchange and redistribution. In meeting their needs, they follow the cycle of seasons and depend on the products available in a particular season. They combine farming, livestock, gardening, and other activities that can produce food, clothing, shelter, and others (Kuokkanen, 2011).

Social Assets in Bena Irrigation Area

The general name for the majority tribe inhabiting the three villages of the Bena Region and the Amanuban Area as a whole is *Orang Atoni*. The name Atoni people comes from *Atoni Meto* or *Atoin Meto*, meaning people who dwell in dry places. According to Schulte (1971), the basis of social organisation and kinship of the Atoni Meto people is *ume* (household). Some *ume* form *kanaf* (= clan) consisting of all who (claim) to be descended from a common ancestor and therefore use the same (last) name (e.g., Nabuasa, Asbanu, Nope, Banunaek). They also live or have the same *kuan* (=kampung/hamlet), the "sacred stone or sacral source" of their *kanaf*. In later developments, many clan members spread to places other than the original Kuan because *ume* and *kanaf* are exogamic. In the context of Amanuban, a number of *ume* can form a unit and then establish a *lopo* (house of origin/custom). Several *lopo* can form one *kuan* (village). In the process of reorganising village government in modern Indonesia, the concept of *kuan* was then transformed into government units such as hamlets, villages and sub-districts.

Family and community are the mainstay and support for the people around Bena Irrigation. The interviewees informed that the majority of the workforce in their rice fields was kinship-based. However, it is also recognised that this kinship-based mutual aid system has begun to fade and be replaced by a wage system. Tariffs in the fixed-wage system are mutually agreed upon to ensure income fairness among existing groups of wage workers.

The government of Indonesia introduced organization system for farmers around irrigation area in Bena. The first organization is peasants' group or association (*Kelompok Tani*). Several groups form *Gabungan Kelompok Tani* (unions umbrella organisation). The main aim is to channel government supports such as machines, tools and loans, and to organize trainings and field technical accompaniment. The membership of these groups is based mainly on kinship or friendship affinities. The second organization is related to water distribution and management. It is called Union of Water Supply User Farmers (*Perkumpulan Petani Pemakai Air - P3A*). The membership is based on location of irrigation gates. Any decision about water management and distribution is made through democratic agreement process in these unions. However, several resource persons informed that the ones with power have very often determined or pushed the decisions for their own favor.

The cost of social life is relatively high. Nevertheless, people look at it from two sides, first, as a social investment. At different times they may donate but also receive material/monetary donations. Even giving to family parties and ceremonies is prestige for them. Secondly, on the other hand, they recognize that the proceeds from selling their agricultural products cannot be saved. They use their earnings for high social expenses and children's education.

Human Assets in Bena Irrigation Area

The livelihood of the majority of the people of the three villages in the Bena Irrigation Area is currently farming rice fields, fields and raising livestock. This fact was acknowledged by all interviewees. This can also be seen for example in the statistical data of Pollo and Linamnutu villages in the following table:

Table 3. Classification of Population by Type of Livelihood in Linamnutu and Polo Villages

No	Livelihood		
		Linamnutu	Polo
1	Farmer	662	2.970
2	Breeder	491	763
3	Civil Servant	18	51
4	Others	10	9

Source: Processed from Pollo, Bena and Linamnutu Village Profile 2020

Basic infrastructure in health and education, as well as electricity, still needs to be improved.

Table 4. Conditions of Social Facilities in Linamnutu, Polo and Bena Villages

No	Facility	Village/Number			Total
		Linamnutu	Polo	Bena	
1	Kindergarten	-	2	1	3
2	Primary School	2	4	3	9
3	Junior High School	1	1	1	3
4	Senior High School	-	1	-	1
5	Vocational School	-	-	-	0
6	Health Center	-	-	1	1
7	Hospital	-	-	-	0
8	Doctor	-	1	-	1
9	Nurse, Midwife, Pharmacist	2	2	7	11
10	Households that have not received electricity	460 (671)	133 (1.093)	245 (796)	838

Source: Processed from BPS TTS – South Amanuban in 2020 Figures

The data in Table 4 above shows the condition of the people of Bena Irrigation Area in terms of education and health. Basic education and health facilities are still limited, which affects the enrollment rate of secondary education, which is still very low, let alone tertiary education.

Discussion

What is the impact of Bena irrigation development on the livelihood of the Bena community? First, the development of irrigation infrastructure significantly increases natural assets in the form of additional potential land for rice fields and water availability. This is also supported by programs such as fertiliser and seed subsidies, technical assistance, and even small business capital. The assumption is that with less than 3000 households, while irrigated land is more than 3500 hectares and can still be added, each household can manage at least more than 1 hectare of paddy fields. From interviews with two successful farmers, if done well, just 1 hectare of land can generate high returns.

Why has the addition of agricultural infrastructure and other supporting interventions not been able to improve the welfare of farmers significantly? Two factors are found in this study, seen from the side of politics and power. The *first* factor is uneven land ownership. Power relations in the Bena Irrigation community caused the land to be controlled by those with social, economic and political power. *Fetor* Nabuasa and his descendants, who were the traditional rulers of the Bena region, controlled large amounts of land. Other groups that control land are local government officials, the TTS district and the NTT province, whether they are from the region or not. Protestant and Catholic Church Institutions (GMIT Klasis Amanuban Selatan, Panite Parish, and CMF Congregation) also control a large land area. In addition, large areas of land are also controlled by local investors, such as mill owners, transportation equipment agents, and kiosk traders/shops owners from Sabu and Rote.

The phenomenon of poverty, as in Bena, is not only associated with subsistence shortage (Townsend, 1979; 1993) but also with inequality of access to resources (Sen, 2000; Silver, 1995; Dharmawan, 2007; Syahra, 2010; Lawang, 2014). Social relations in rural social networking systems are not neutral but asymmetrical (benefiting one party). Small farmers are often trapped in the shackles of the hegemony of small groups who control capital, land and natural resources. One form of persistent hegemony trap is the *ijon* system. The interviewees admitted that they easily gained capital with the *ijon* system. These financiers included rice mill owners and wholesalers who entrusted money to rice mill owners. The financiers are considered their "emergency breath" in times of economic crisis. There was a strong and traditional relationship of trust between them and the rice mill owners.

The second factor relates to policy and governance capacity. The construction of irrigation depends only on the availability of funds, and no comprehensive package covers all important aspects of rural development. Because of this, there are often cross-sectoral coordination bottlenecks and even conflicts. Local government tools are not creative in using the opportunities of the presence of agricultural infrastructure for community development. Local governments are already satisfied when they successfully implement central and provincial government programs. No significant initiatives and innovations exist at the sub-district and village government levels.

Second, the development of irrigation infrastructure and supporting transportation in the Bena Region has increased globalization's influence. The area, previously only a spread from the traditional villages of the Atoni people, has become an open area that many notice. Especially Pollo and Bena villages, located in the Kupang - Kolbano - Malacca national road area, developed into "urban villages" as described by Salman (2012). The proximity to the city makes villages like this the fastest to recognize the great urban tradition. They intensively influenced urban lifestyles by exchanging natural materials, people, food, money, and knowledge with cities.

Urban influences led to a process of commodification of production and incorporation of small farmers in the Bena Region into the market system. There is a change from household/domestic production to the capitalist system of production in various forms that change the social structure of the society concerned (Harris, 1992). In an era of economic globalization, farmers work to fit into the

network of market economies. They produce to meet additional needs demanded by modern life, such as children's education, entertainment facilities, transportation and communication facilities.

The impact of integration into the wider world also includes the breakdown of traditional social structures. Tribal solidarity and its supporting systems began to fade due to changing economic needs and the introduction of market economic institutions (Polanyi, 1957). Strathdee (2005) suggests that global capitalism has disrupted long-standing patterns of labour relations. Capitalism also interferes with an individual's sense of identity in relation to his work. Furthermore, it disrupts traditional social relations and traditional social institutions, both family and education.

Third, irrigation development conveys the wrong message that rice production will be the mainstay of the livelihood of the Bena people in the future. Therefore, diversification of products other than rice is understood only as a support or substitution during a food crisis. The community feels it is shifting from traditional livelihoods such as maise, tubers, livestock, gardens and horticultural to livelihoods based on rice production. A survey conducted by Palekehu et al. (2012) describes the consumption structure of the Linamnutu Village community. About 71 per cent of households surveyed admitted to consuming rice and corn as their main meals. Most sources are self-grown, showing a significant dependence on rice consumption.

As reminded by Scoones (2009), the anticipation of changes or shifts in livelihood patterns in the future needs to be done. The NTT provincial government, in recent decades, has anticipated populist diversification programs. They include *Provinsi Jagung (Maise), Ternak (Livestock), and Sandalwood Programs*, Moringa Widespread Planting and Production Program, Agro-Tourism Programs. However, the results and impact have yet to be seen on the livelihood patterns of rural communities, including in Bena. These programs are also vulnerable to discontinuation because of the change of provincial or district leadership.

Conclusion

This article has analyzed the impact of irrigation infrastructure development on the welfare of rural communities in the Bena Irrigation Area, Timor, Indonesia. The development of irrigation infrastructure has increased the potential of natural assets of the Bena community in the form of the expansion of rice fields and increased water availability. It also opens up the region to the effects of globalization and changes people's understanding of the basic sources of their livelihoods. However, the infrastructure development has not been able to encourage the improvement of the welfare of the Bena community. They continue to experience poverty. The causes are inequality in land, capital and physical resources access, poor coordination and low capacity of local government to create new opportunities for livelihood, lack of anticipatory steps against the influence of globalization and shifts in livelihood patterns in the future. Measures such as agrarian reform for equal access to land, capacity building of local governments, improving the quality of human resources through education, vocational skills training and opening up broad access to digital information are necessary. Agricultural and off-farm diversification programs must be designed comprehensively through government policies to provide long-term livelihood security.

Recommendation

Policy steps need to be taken to address access inequality through agrarian reform. Providing more straightforward and affordable access to capital in the Bena Irrigation Area is also necessary. It is also urgent to improve the quality of human resources through education, vocational education and trainings, providing access to information and digital literacy, in order to respond to challenges of

globalization. Long term-based programs to develop food and livelihood diversification are also needed to create food security, resilience and independence.

Acknowledgement

The authors would like to thank faculty members of the Faculty of Interdisciplinary Studies, Satya Wacana Christian University, Salatiga, and colleagues at the Faculty of Social and Political Sciences, Widya Mandira Catholic University Kupang, for their support in the completion of this paper.

References

Agarwal, A & Narain, S. 1985. The State of India's Environment 1984-1985: A Second Citizens' Report. New Delhi, India: Centre for Science and Environment.

Ataupah, Hendrik. 2020. *Ekologi dan Masyarakat: Kajian dan Refleksi Atoin Meto di Timor Barat, NTT*. Surabaya: CV Sejahtera Mandiri Teknik Indonesia.

Baumann, P. 2000. Sustainable Livelihoods and Political Capital: Arguments and Evidence from Decentralisation and Natural Resource Management in India. ODI working paper, 136. London: ODI.

Bele, A. 2011. Nurani Orang Buna: Spiritual Capital dalam Pembangunan. Salatiga: Penerbit UKSW.

Chambers, R. 1983. *Rural Development: Putting the Last First*. Harlow Essex: Pearson Education Longman Ltd.

Chambers, R.1995. 'Poverty and Livelihoods: Whose Reality Counts?' Environment and Urbanisation, Vol. 7, No. 1, pp. 173–204. 244.

Chambers, R. 1997 'Editorial: Responsible Well-Being - A Personal Agenda for Development', World Development, Vol. 25, No. 11, pp. 1743–1754.

Chambers, R & Conway, G. 1992. 'Sustainable Rural Livelihoods: Practical Concepts for the 21st Century', Discussion Paper 296, Institute of Development Studies, University of Sussex, Brighton, UK.

Davies, S 1996, Adaptable Livelihoods: Coping with Food Security in the Malian Sahel, Macmillan Press, New York.

Dharmawan, A.H. 2007. "Sistem Penghidupan dan Nafkah Pedesaan: Pandangan Sosiologi Nafkah (Livelihood Sociology) Mazhab Barat dan Mazhab Bogor", dalam *Soladity: Jurnal Transdisiplin Sosiologi, Komunikasi dan Ekologi Manusia*, Edisi Agustus 2007, hal. 169-192.

Dréze, J, & Sen, A 1989, 'Public action for social security: foundations and strategy', DEP No. 20, The Development Economics Research Programme, London School of Economics, London.

Escobar, A. 1995. Encountering Development: The Making and Unmaking of the Third World. New Jersey: Princeton University Press.

Ellis, F 1999, 'Rural Livelihoods Diversity in Developing Countries: Evidence and Policy Implications', Overseas Development Institute, Natural Resource Perspectives, No. 40.

Ellis, F & Biggs, S 2001, 'Evolving Themes in Rural Development 1950s – 2000s', Development Policy Review, 19 (4), pp. 437–448.

Foni, W. 2003. *Budaya Bertani Atoni Pah Meto: Siklus Ritus Bertani Lahan Kering Atoni Pah Meto Tunbaba Timor Nusa Tenggara Timur.* Salatiga: Program Pascasarjana Studi Pembangunan Universitas Kristen Satya Wacana.

Goldsmith, E. 1998. The Way: An Ecological World-View (Revised and Enlarged Edition). Athens, Georgia: University of Georgia Press.

Griffin, K & Khan, AR 1978, 'Poverty in the Third World: Ugly Facts and Fancy Models', World Development, Vol. 6, No. 3, pp. 295–304.

Harris, J. 1992. Rural Development: Theories of Peasant Economy and Agrarian Change. London & New York: Routledge.

Jocom, H. 2016. Kelangkaan Air Coping Dalam Harmoni: Pengalaman Masyarakat di Pesisir Timor Tengah Selatan. Salatiga : Satya Wacana University Press.

Johnston, BF & Mellor, J .1961. '*The Role of Agriculture in Economic Development',* American Economic Review, 51 (4), pp. 566-593.

Kameo, D.D. 2003. Rekonstruksi Pembangunan Wilayah Berdasarkan Pendekatan Empirik: Pengalaman Daerah Nusa Tenggara Timur. Salatiga: FE UKSW.

Kameo, D.D. 2013. *Pembangunan NTT yang Inklusif dan Berbasis Ekonomi Rumah Tangga.* Dalam Neonbasu, G: Prospektif Pembangunan Strategi (Teropong Strategi dan Pola). Jakarta: JP II Publishing House.

Kottak, CP 1985, 'When People Don't Come First: Some Sociological Lessons from Completed Projects', in Putting People First: Sociological Variables in Rural Development, ed MM Cernea, Oxford University Press for the World Bank, New York, NY, USA.

Kuokkanen, R 2011, 'Indigenous Economies, Theories of Subsistence, and Women: Exploring the Social Economy Model for Indigenous Governance', American Indian Quarterly, Vol. 35, No. 2, pp.215-241.

Kuznets, S. 1955. "Economic Growth and Income Inequality," American Economic Review (March 1955).

Lawang, Robert M.Z. 2014. Beberapa Hipotesis Tentang Eksklusi Sosial di Indonesia. Jurnal Il1mu Sosial Mamangan, Nomor 2. Volume I. Tahun 2014.

Lee, JA & Goodland, R 1986, '*Economic Development and the Environment',* Finance and Development, 23 (4), pp. 36–39.

Lewis, W.A. 1955. The Theory of Economic Growth (London: Allen & Unwin).

McWilliam, A. 2002. Paths of Origin, Gates of Life: A Study of Place and Precendence in Southwest Timor. Leiden: KITLV Press.

Mellor, JW. 1966. The Economics of Agricultural Development. New York: Cornell University Press.

Mitchell, DO, Ingco, MD & Duncan, RC. 1997. The World Food Outlook. Cambridge, UK: Cambridge University Press.

Munangsihe, M. 1993. Environmental Economics and Sustainable Development.Washington DC: World Bank.

Neonbasu, G. 2016. Citra Manusia Berbudaya: Sebuah Monografi tentang Timor dalam Perspektif Melanesia. Jakarta: Perum LKBN Antara.

Ormeling, F.J. 1957. The Timor Problem: A Geographical Interpretation of An Underdeveloped Island. The Hague: J.B. Wolters, Groningen and Martinus Nijhoff.

Palekahelu, Dharma et. al. 2012. Sumber Makanan dan Air di Desa Linamnutu: Sebuah Penelitian Awal. (ms).

Polanyi, K 1957, The Great Transformation. Beacon Press, Boston.

Ratumakin, A., et al. 2016. Pengetahuan Lokal dalam Keberlanjutan Pengelolaan Air. Kupang: Perkumpulan PIKUL.

Rogers, Peter, P, Kazie F. Jalal, and John A. Boyd (2007). An Introduction to Sustainable Development. London: Earthscan.

Salman, D. 2012. Sosiologi Desa: Revolusi Senyap dan Tarian Kompleksitas. Makasar: Penerbit Inninawa.

Scherr, S. J. 1999. '*Does soil degradation threaten developing-country food security in 2020?'* Food, Agriculture, and Environment Discussion Paper No. 27, Washington, DC.

Schulte, Nordholt, H.G. 1971. The Political System of the Atoni of Timor. The Hague: Martinus Nijhoff.

Schultz, TW. 1964, Transforming Traditional Agriculture, Yale University Press, New Haven, CT.

Scherr, SJ 1999, 'Does soil degradation threaten developing-country food security in 2020?' Food, Agriculture, and Environment Discussion Paper No. 27, Washington, D.C.

Scoones, I. 1998. 'Sustainable Rural Livelihoods: A framework for analysis', Institute of Development Studies (IDS) Working Paper 72. Brighton, UK: Institute of Development Studies, Brighton.

Scoones, I. 2009. Livelihoods perspectives and rural development, The Journal of Peasant Studies, 36:1, 171-196.

Sen, A.1984. Resources, Values and Development. Oxford: Basil Blackwell.

Sen, A. 1987. The Standard of Living. Cambridge: Cambridge University Press.

Sen, A. 2000. Social Eksclusion: Concept, Application and Scrutiny. Manila: Asian Develompent Bank.

Seavoy, RE 2000, Subsistence and Economic Development, Greenwood Publishing Group, Westport, CT, USA.

Sheperd, Andrew. 1998. Sustainable Rural Development. London: Macmillan Press Ltd.

Silver, H. 1995. "Reconceptualizing Social Disadvantage: Three Paradigms of Social Exclusion", dalam Gerry Rodgers, Charles Gore dan Jose Figueiredo (eds), Social Exclusion: Rhetoric, Reality, Responses. Geneve: International Labour Organisation.

Strathdee, R. 2005. Social Exclusion and the Remaking of Social Networks. Review oleh Lloyd, Paulette dalam Contemporary Sociology*;* Jul 2006; 35, 4.

Streeten, P. 1979. 'From Growth to Basic Needs". Finance and development, p. 28-31.

Streeten, P. 1984. 'Basic Needs: Some Unsettled Questions'. World Development, Vol. 12, No. 9, pp. 973–978.

Syahra, R. 2010. Eksklusi Sosial: Perspektif Baru untuk Memahami Deprivasi dan Kemiskinan. Jurnal Masyarakat dan Budaya. Edisi Khusus, Tahun 2010.

Tjoe, Y (2017). Sustaining Livelihoods: An Analysis of Dryland Communities in West Timor, Indonesia. Brisbane: Griffith University.

Townsend, P. 1979. Poverty in the United Kingdom, London: Allen Lane and Penguin.

Townsend, P. 1993. The International Analysis of Poverty. London: Harvester.

Webster, A. 1984. *Introduction to the Sociology of Development*. London: The Macmillan Press Ltd.

Wilardjo, L (Peny.) 1994. Studi Kasus: Sebuah Panduan Praktis. Jakarta: Penerbit PT Grasindo dan Salatiga: Satya Wacana University Press.