

Social Innovation of Tubanan Agrocycleforestry: Community-Based Empowerment Practices for Sustainable Agriculture

Wahyu Mahaputra ¹, Ahmad Ilham ², A. Khoirul Anam ^{3*}, Miftah Arifin ⁴

^{1,2}PT PLN UIK Tanjung Jati B, Indonesia

^{3,4}Nahdlatul Ulama Islamic University Jepara, Indonesia

E-mail: kenaroknakal@gmail.com¹, amatilham21@gmail.com², anam@unisnu.ac.id³, miftah@unisnu.ac.id⁴

Abstract Social innovation is often considered to have great potential to encourage sustainable development and transformation towards more sustainable economic practices. Many companies are preparing community empowerment programs with an orientation that is simply considered good at the start, even just to meet the interests of certain parties, but do not plan what benefits are targeted so that they quickly become obsolete. In order not to be left behind, companies must form a business model, embrace many parties, create sustainable programs from year to year, and prepare an exit strategy carefully. This article discusses social innovation practices in the PT PLN UIK Tanjung Jati B TJSL program based on the social innovation process model and empirical practice. This article contributes to improving the concept of social innovation, how social innovation succeeds and what factors encourage its emergence and growth.

Keywords: Social Innovation, Community Empowerment, Sustainable Agriculture

INTRODUCTION

Sustainable agricultural practices are very important because they improve the welfare of farmers and surrounding communities by building strong and sustainable rural farming communities, maintaining environmental balance and the impacts of climate change. Efforts to realize sustainable agriculture face various challenges including overcoming dependence on chemical fertilizers, farmers' lack of knowledge about sustainable agricultural technology, and shifts in people's consumption patterns. Thus, educating the public regarding sustainable agriculture is the key to increasing agricultural sustainability and supporting these practices.

A strategic approach to sustainable agricultural practices in society can be carried out through social innovation programs. Social innovation is a community empowerment activity that can solve social problems/needs (more effectively than current solutions) and encourage social capabilities and relationships as well as better utilization of assets and resources (LHK Ministerial Regulation No. 1 of 2021, 2021). Social innovation is intended to empower society, and encourage change in the sense of leading to social change that results in sustainable social inclusion (Fougère et al., 2017).

There are still many companies that use conventional empowerment concepts that are only considered good at the start (even just to fulfill the interests/desires of certain parties), but do not plan what benefits are targeted so they quickly become obsolete. In order not to become obsolete, companies must form a business model, embrace many parties, create sustainable programs from year to year, and prepare an exit strategy carefully. Social innovation is expected

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* A. Khoirul Anam, anam@unisnu.ac.id

to empower people more efficiently, because this innovation is based on social relationships and their experiences(Moulaert et al., 2013).

This article aims to systematically describe the heterogeneous field of social innovation for sustainable agriculture and develop a typology based on theoretical knowledge and empirical practice. So far, the term social innovation has been defined variously in theory and practice(Klein et al., 2013). This gap regarding the definition and practice of social innovation opens up an interesting study on how social innovation is implemented in community empowerment programs. This article discusses social innovation practices by presenting discussions and examples of the implementation of social innovation carried out by companies in sustainable agricultural practices.

This article contributes to improving the concept of social innovation, how social innovation succeeds and what factors encourage its emergence and growth. This study is also expected to enable the formulation of more systematic support measures for various types of social innovation for sustainable agriculture by policy makers as well as local governments, foundations, NGOs and companies.

LITERATURE REVIEW

There are many definitions of social innovation, but there is almost no consensus in the academic field(Amanatidou et al., 2018; Edwards-Schachter & Wallace, 2017; Howaldt et al., 2014; Howaldt & Hochgerner, 2018; Van der Have & Rubalcaba, 2016). A widely cited definition of social innovation is a new solution to a social problem that is more effective, efficient, sustainable, or fairer than existing solutions and that adds value primarily to society as a whole rather than to individuals.(Phills et al., 2008). This definition emphasizes the need for innovation to be implemented to support the inclusion of socially weaker groups. In our view, successful innovation must be one that is implemented, and also includes social inclusion of marginalized target groups. Therefore, we suggest a definition of social innovation: the discovery, development, and application of new ideas to solve social problems faced by individuals, groups, or communities. This definition views the implementation of innovation as an indicator of successful resolution of social problems. Social problems are all situations that prevent individuals, groups or communities from being involved in society as understood in inclusiveness and participation, or vice versa, any individual, group or community that is socially excluded from social welfare. Social inclusion is the process by which society combats poverty and social exclusion(Atkinson & Marlier, 2010).

Social innovation is not only an abstract concept because its social elements are difficult to explain, but the term 'innovation' in relation to 'social' is also a complicated thing. Innovation is primarily understood in the context of tangible goods or services. According to Westley et al. (2014), social innovators need different skills to move from scaling out to scaling up, where the former is limited to involving more people and covering a wider geographic area, while the latter aims to involve more people and covering a wider geographic area. On the social and institutional changes of the system itself. Herrera's findings show that in social innovation, process variables play an important role in its success (Westley et al., 2014).

One of the difficulties in defining social innovation stems from its potential to meet pressing social needs and social innovation's use of new social processes to produce products and services. In other words, social innovation can refer to the means and ends of an action. Thus, social innovation can refer to new products and services that address social needs, that is, products and services that help build a more sustainable, cohesive and inclusive society. We call this type of innovation goal-oriented social innovation.

The Young Foundation understands social innovation as new ideas that successfully achieve social goals (Caulier-Grice et al., 2018). Phills et al., (2008) defines social innovation in the same way as a new solution to a social problem that is more effective, efficient, sustainable, or equitable than existing solutions and for which the value created accrues primarily to society as a whole rather than to individuals. However, social innovation can also mean new processes that utilize social relationships to produce products and services in a more efficient way. Mumford (2002) defines social innovation as the implementation of new ideas about how people should organize interpersonal activities or social interactions to achieve one or more shared goals. Schwarz (2010) argues the same thing and argues that social innovation is a new combination and/or new configuration of social practices with the aim of satisfying or answering needs and problems better than is possible based on existing practices. From this perspective, social innovation occurs at the level of operational practices and plays an important role in the way things are done. Social innovation thus defined is essentially a means to an end and not the anticipated outcome of a particular process. This type of social innovation is categorized as process-oriented social innovation. Some commonly used definitions of social innovation combine goal-oriented and process-oriented innovation.

The term social innovation has also been widely accepted among socio-economic experts (Pol & Ville, 2009). In organizational studies, social innovation can refer to social capital as a source of creativity, learning and skills, knowledge exchange and capacity

development to make organizations resilient to rapid changes in the external environment. The concept of social innovation is also used to research management structures and explore new forms of relationships between actors (Bakhshi & Throsby, 2010) and development of new business models (cooperative and joint) (Ridley-Duff & Bull, 2015).

RESEARCH METHODS

Social innovation is relevant for business research. Business people understand that they do not operate in a societal vacuum. Future profits depend on the impact of a business on its social environment. Technology is clearly not the only driving force for business model innovation, companies need to utilize their human resources and social environment to remain successful (Schwarz, 2010). More and more companies understand that their sustainability depends on understanding how to convince customers that their products or services are made for people, planet and profit (3P). For example, many companies see the importance of social entrepreneurship, which emphasizes the creation of social value and the generation of profits. Rebuilding companies to support social innovation will increase the social and economic participation of larger groups.

Elements of social innovation include: (1) Novelty, there are ways of fulfilling needs that are different from traditional methods; (2) Developing an idea until its implementation; (3) Fulfilling community needs, namely needs that have not been met or are fulfilled because existing methods are inefficient, unfair, or in vain do not produce results; (4) Effectiveness, encouraging the empowerment of various types of actors, especially those excluded from society; and (5) Increasing society's capacity to act, producing transformation in society through structural changes, creating new relationships, allowing the entry of new actors into social dynamics and the participation of more actors. These five elements then become an analytical framework to prove that the community empowerment program being implemented falls into the social innovation category.

RESULTS AND DISCUSSION

To provide an overview of social innovation practices, below is an example of Tubanan Agrocycleforestry social innovation. The Tubanan Agrocycleforestry Program is a CSR program run by PT PLN UIK Tanjung Jati B, Indonesia. The Tubanan Agrocycleforestry social innovation was implemented in Tubanan Village, Kembang District, Jepara Regency, Indonesia, with the beneficiaries being the community in Tubanan Village who are members

of two groups, namely the Farmers Group (KT)Mantra 1 and the Forest Village Community Institution (LMDH) Tunas Agung, Tubanan Village.

The programs implemented are based on the potential and problems faced by the community. Tubanan Village has a lot of economic potential that can be developed. Based on data from the Village profile, the majority of Tubanan Village residents are engaged in the agricultural sector, reaching 2,194 families. Tubanan Village has forest potential managed by Perhutani covering an area of 777.8 ha, while rice fields cover around 316.9 ha. The people of Tubanan Village have the habit of farming and raising livestock as their main income.

There are several locations/plots of forestry land that often experience crop failure for years, the area has been dry and barren, based on the latest regulations, Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 8 of 2021 concerning Forest Governance and Preparation of Forest Management Plans, as well as Forest Utilization in Protected Forests and Production Forests, communities can manage forests with a profit sharing system through the Agroforestry cooperation system. This has the potential to educate the public about the importance of preserving forests and also developing the economic potential of forests while still complying with applicable regulations.

The agriculture sector and other land uses, based on FAO data in 2019, the agriculture sector contributed at least 16.5 billion tons (green house gas emissions). As much as 4% of this figure comes from agricultural waste residues. Methane and nitrous oxide emissions from crop and livestock activities accounted for 5.3 billion tons of CO₂eq in 2018, a 14 percent growth since 2000. Livestock production processes such as enteric fermentation and manure deposition on pastures dominate agricultural emissions, together generating 3 billion tons of CO₂eq in 2018. Therefore, it is necessary to solve problems that also have a positive contribution to the environment.

Other societal challenges include limited access to the economy and resources. These existing problems and challenges require solutions in the form of environmentally friendly and generative agricultural management programs, as well as optimizing forest functions using Agroforestry collaboration methods. This is an enthusiasm to develop programs that have social, economic and environmental value.

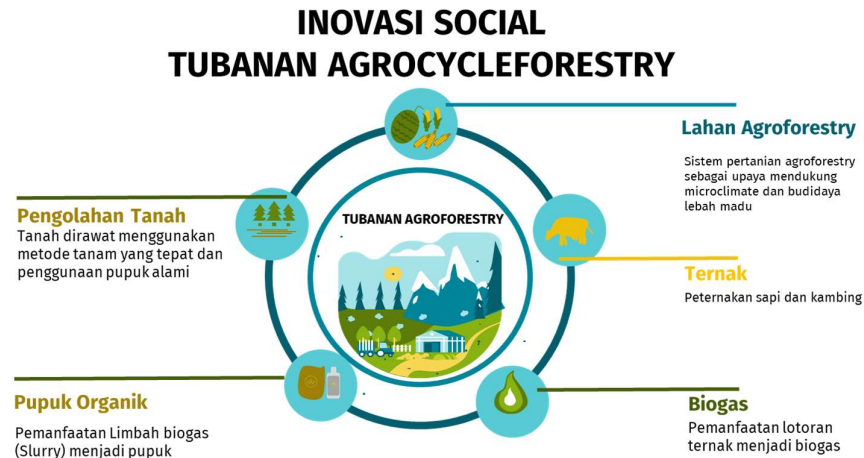


Figure 1. Tubanan Agrocycleforestry Social Innovation

Tubanan Agrocycleforestry's social innovation uses a circular economic concept in the field of agroforestry with a regenerative agriculture approach implemented in Tubanan Village. The Tubanan Agrocycleforestry Program includes: (1) Agroforestry land management, agroforestry farming systems as an effort to support microclimate and honey bee cultivation; (2) Livestock, cattle and goat farming, (3) Biogas, use of livestock manure into biogas; (4) Organic fertilizer, utilization of biogas waste (slurry) into fertilizer; (5) Land processing, the land is treated using appropriate planting methods and the use of natural fertilizers. By implementing this innovation, it is hoped that it will have positive impacts such as environmental and social quality and improving community welfare. The following is an explanation of the Tubanan Agrocycleforestry Innovation.

1) *No Till/Minimizing Tillage*

No tillage/minimizing tillage is an agricultural technique for growing plants without disturbing the soil through tillage. No-till farming reduces the amount of soil erosion caused by tillage on certain soils, especially on sandy, dry soils on sloping terrain. Other possible benefits include increasing the amount of water that soaks into the soil, soil retention of organic matter, and nutrient cycling. This method can increase the amount and diversity of life in and on the soil. While conventional no-till systems use herbicides to control weeds, organic systems use a combination of strategies, such as planting cover crops as mulch to suppress weeds.

2) *Diverse Crop/Crop Rotation*

Diverse crop plant diversity is the diversity of plants. Plants used in agriculture, including their genetic and phenotypic characteristics. It is part of and a specific element of agricultural biodiversity. The loss of plant diversity threatens global food security, as the world's human population relies on a decreasing number of varieties from a decreasing number

of plant species. Crops are increasingly grown in monoculture, which means that one disease overcomes varietal resistance, it can destroy the entire crop, it can lead to the commercial extinction of the entire variety. The main purpose of crop rotation in this case is to anticipate plant pest problems.

Implementation of diverse crops on Tubanan Agroforestry land in the form of planting Balsa, Watermelon, Peanuts. The community manages agroforestry land by planting 10 thousand Balsa tree seedlings through an agroforestry cooperation system. Utilization of a 23.5 ha forest area for watermelon cultivation by 23 members of LMDH Tunas Agung. Watermelon cultivation produces 4-5 million per farmer. The average agricultural income from watermelon commodities in the agroforestry location plot 79A-1 reaches 2 tonnes/ha per season. Meanwhile, the area of agroforestry land planted with watermelon commodities reaches 13.5 ha.

3) *Cover Cropping*

Cover cropping or cover crops are plants used primarily to slow erosion, improve soil health, increase water availability, cover weeds, help control pests and diseases, increase biodiversity and bring a number of other benefits to agriculture. Cover crops have also been shown to increase crop yields, add organic matter to the soil, increase plant diversity on a farm and attract pollinators. There is increasing evidence that planting cover crops increases resilience in the face of erratic and increasingly intense rainfall, as well as under drought conditions. Ground cover plants help when it doesn't rain, help when it rains, and help when it rains. The application of cover crops on agroforestry land is carried out by planting grass and cassava plants.

4) *Apiculture*

Apiculture or beekeeping is the maintenance of bee colonies, generally in artificial hives, by humans. The type of bee kept is *Apis mellifera*. Bees have an ecological function as pollinators or helping pollinate plants. Therefore, the presence of bees in forest and agricultural areas is very important.

Bee cultivation in the Tubanan Agroforestry program is carried out by LMDH Tunas Agung. Cultivating honey bees is LMDH's strategy to continuously monitor forest conditions and make bees an indicator of environmental balance. The main production produced is honey MSMEs. Bees are widely used as pollinators and are an integral part of the intensive cultivation of horticultural crops. Bees have an important function as assisting animals in pollinating plants, especially plants that cannot pollinate themselves. Bees help the cross-pollination process so that the productivity of cultivated plants increases. This potential

can be exploited by placing bee colonies in areas of cultivated plants that have low pollen capacity.

The social innovation implemented has had an economic impact on LMDH Tunas Agung Tubanan. In one year the LMDH Tunas Agung Tubanan group can only harvest honey for 6-7 months, namely April-October. In November-March the group must provide additional food in the form of liquid sugar to keep the colony at home in the stub and not change their residence. This is because there are not many flowers and pollen found in that month. In April-October the harvesting process is carried out every 14-17 days. In certain seasons the harvest can produce 1.2 quintals of honey per harvest. However, the average harvest income from the group reached 90 kg. In one year the group can harvest up to 15 harvests.

5) *Animal Farm*

Animal farms or animal husbandry has a big role for the people of Tubanan Village. Breeding is an investment strategy. This livestock has a positive function to utilize the abundance of greenery in the village environment and can utilize agricultural waste as feed. The existence of these farms supports the agricultural sector.

The KT Mantra 1 communal pen has 7 cows, the value of livestock assets in the form of cows reaches Rp. 116,000,000,- if calculated using market standards (Jepara Regency Food Security and Agriculture Service, 2022). Apart from developing meat goats, KT Mantra 1 independently developed milk-producing goats, namely the Saanen type, which was inbred with PE goats. At least now he has 4 broodstock and 3 males and 9 cubs.

6) *Organic fertilizer*

The use of livestock waste in one communal pen is 10,200 kg/month. The use of livestock manure waste is then processed into biogas, and helps reduce wasted methane production by 6,003 kg/month or 72,036 kg/year in one cage. The use of livestock biogas waste (slurry) into solid fertilizer reaches 12,000 kg per month or 144,000 kg per year. The potential for utilizing goat and cow urine waste into liquid fertilizer reaches 50,000 liters per month or 600,000 liters of liquid fertilizer per year. The current capacity produces 250 liters of urine per month or 3,000 liters per year.

7) *Biofuel/Biogas*

The use of livestock manure into biofuel such as biogas has a positive value in people's lives. Utilizing livestock manure into biogas can extend the life cycle of goods and is a strategy to reduce the environmental impact of livestock. Dirt that is not utilized usually becomes waste and becomes a problem for water quality and health quality in the community.

Biogas production has been used in 12 residents' kitchens, and can save costs of IDR 792,000/month or IDR 9,504,000/year, by rationalizing the average household gas requirement of 9 kg (3 gas cylinders). 3 kg/canister of melon gas), at a price of IDR 22,000/3 kg/canister.

8) *Compost/Manure Production/Application*

Utilization of manure and compost into fertilizer is carried out to utilize agricultural waste and also biogas waste from animal waste. The activity carried out is in the form of making fertilizer by KT Mantra 1. This group has been utilizing livestock manure into fertilizer since 2018. KT Mantra 1 has also succeeded in developing its production into a planting medium for nursery needs for watermelons and other trees.

9) *Agroforestry Land*

Agroforestry is a farming system that combines agricultural crops and forestry crops to increase profits and provide added value. Agroforestry is a form of effort to deliberately grow and manage trees together with other agricultural plants in a system that pays attention to ecological, social and economic sustainability. In simple terms, agroforestry is planting trees in an agricultural system. In one forest area there are trees, both homogeneous and heterogeneous, combined with one or more types of agricultural plants.

The advantage that can be obtained in this way is that people can get results from forest land without having to wait long for forest plants to be harvested because they can get results from agricultural plants monthly or annually depending on the type of agricultural plant. In addition, forestry plant productivity increases due to the supply of nutrients and fertilizer from agricultural plant processing and recycling of plant residues. This is clearly very beneficial for farmers because they can get double benefits from agricultural crops and forestry products.

One of the efforts to develop agroforestry patterns in the community is carried out through the construction of agroforestry demonstration plots. In Tubanan Village, agroforestry is implemented in Plot 76A which is managed directly by LMDH Tunas Agung with members of 150 pesanggem (farmers). This group has an important role in preserving forests in the Tubanan Village area. In Plot 76A, as a demonstration plot, which has an area of 23.5 ha, balsa and secondary crops (corn, watermelon, peanuts, cassava beans, etc.) are planted. Plot 76A was originally land managed directly by Perum Perhutani but the harvest failed for years, leaving the area dry and barren. The location of plot 76A is close to a river which is a Sub-Watershed (River Watershed) in Tubanan Village. To date, LMDH Tunas Agung has planted agricultural crops under stands for at least three seasons.

The agroforestry land management program provides economic benefits for LMDH Tunas Agung, in the form of agricultural income. (1) Corn Commodity, the average agricultural yield of corn in one hectare in agroforestry locations reaches 5.2 tons/ha per season. The land planted with corn is 23.5 ha; (2) Watermelon commodity, the average agricultural income from watermelon commodities in the agroforestry plot 79A location reaches 12 tonnes/ha per season. Meanwhile, the area of Agroforestry land planted with watermelon commodities reaches 23.5 ha.

CLOSING

Based on the results of theoretical studies and empirical practice, Tubanan Agrocycleforestry Innovation shows that it has fulfilled the basic elements of social innovation. The Tubanan Agrocycleforestry program creates ways of agricultural management that are different from traditional methods through regenerative agricultural management. Tubanan Agrocycleforestry is a model of social innovation for sustainable agriculture. This social innovation has also succeeded in empowering communities through more efficient agricultural and livestock practices. The social innovation carried out is also based on social relationships and existing potential/resources, and is able to increase society's capacity to act.

The benefits achieved through the Tubanan Agrocycleforestry Innovation are increasing or restoring soil health and fertility. As an effort to conserve river watersheds. Increased biodiversity. Maintaining microclimate in the Tubanan Village environment, as well as increasing the livelihood and wellbeing of the Tubanan Village community.

Challenges faced in the practice of social innovation, namely linking social innovation programs with the company's core business, linking social innovation programs with life cycle assessment (LCA) as a method for analyzing potential environmental impacts in the production process, and challenges in realizing harmony with the company's grand design for business/economic, social and environmental sustainability within the framework of the company's value system.

Learn from existing social innovation practices, where social innovation can help company business innovation (Davies, 2014; Newey & Zahra, 2009), so that practitioners and researchers in business need to learn from social innovation, how social innovation succeeds and what factors drive its emergence and growth.

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