Utilization Of Hydro Vortex Energy In Watershed Conservation Efforts And Increasing Community Nutrition Through The Fisheries Sector And Educational Tourism In Songgon

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Abstract.

The residents of Songgon District, who are generally farmers, make rice fields and plantations dominant in the community's economy. Once a year durian trees can be harvested and once a rice harvest, this makes agriculture and plantations the backbone of the source of life for Songgon District, which results in the villagers' income being only annual. So that the economic sector that is able to generate income for villagers both on a monthly and daily basis, such as in the fisheries and tourism sectors, needs special attention for the development of the rural economy, given the huge potential possessed by Songgon District. Garbage is a major problem in this place, for example on the banks of the Binau river which is located in Songgon Village/District, opposite the Songgon District Office to be exact, which used to be full of piles of garbage. Residents around are reluctant to pass or do activities around the watershed (DAS). Therefore we are here with Pertamina Muda present in the development of the river fisheries sector such as controlled fish stocking (pioneered by Mr. Wibi Untoro) in the Binau river flow path and by utilizing Hydro Vortex Energy is a solution that can be implemented because it is proven to improve the community's economy and public awareness of the environment.

Keywords: *Tourism, economy, energy, and hydro vortex.*

I. INTRODUCTION

Songgon District where residents work in agriculture, trade, services, transportation, industry and other sectors. This village which is under the foot of Mount Raung has 9,595 people who occupy the area with the majority of the workforce in the agricultural sector. (Badan Pusat Statistik, 2021). Geographically, Songgon District is a fertile area because there is almost no difference between the rainy and dry seasons because its location is located at the foot of Mount Raung. While the land can be planted with anything, including durian trees.The residents of Songgon District, who are generally farmers, make rice fields and plantations dominant in the community's economy. Once a year durian trees can be harvested and once a rice harvest, this makes agriculture and plantations the backbone of the source of life for Songgon District, which results in the villagers' income being only annual.

So that the economic sector that is able to generate income for villagers both on a monthly and daily basis, such as in the fisheries and tourism sectors, needs special attention for the development of the rural economy, given the huge potential possessed by Songgon District.In 2019, the residents of Songgon District together with the Banyuwangi State Polytechnic managed to take advantage of one of the natural potentials in this village as a source of renewable energy that villagers can utilize to this day. About 1 Km of village roads have been illuminated with Hydro Vortex Energy by utilizing rivers that never experience drought even though it's the dry season. The existence of this micro-hydro energy generator is of course one of the great potentials that can be utilized as a whole for villagers to develop the community's economy. To be able to take advantage of the full potential of this power plant, it is necessary to have the support of all levels of society to keep the river environment clean and away from household waste.

Fig 1. Hydro Vortex Energy in Songgon District

Development of the river fisheries sector such as controlled stocking of fish (pioneered by Mr. Wibi Untoro) in the Hydro Vortex Energy flow path is a feasible solution because it is proven to be able to increase the community's economy and people's awareness of the environment. This controlled stocking of fish can have an impact on environmental cleanliness and water sources are maintained because residents are reluctant to throw garbage in the river. The development of the fisheries sector will be able to create economic turnover and improve community nutrition through processed fish-based foods and tourism.Seeing the need for economic development in the fisheries and tourism sectors, and seeing the enthusiasm of the villagers in developing new technologies for economic independence, we "Friends of the Environment" together with the residents of Sragi village agreed to develop the people's economy through the Pertamina Foundation, to move forward in carrying out watershed conservation. rivers and improving community nutrition in the fisheries sector and educational tourism.

II. METHODS

The method used is to observe locations and community groups in an informal or formal way to carry out activities that will be carried out by the FPYouth social project activities. The implementation phase of the activity program is as follows:

1. Related parties

In carrying out the FPmuda social project activities, it consisted of several parties including the campus from the ship manufacturing engineering study program, the village government, the Banyuwangi fisheries service, and the Sragi regional community group.

2. Official survey

Through informal interviews with the village and the community as well as conducting a site survey, this effort aims to find out more about the utilization of the potential of the river to be used for the utilization of hydro vortex energy in efforts to conserve watersheds and improve community nutrition through the fisheries sector and educational tourism. Some of them asked the following questions: (1) how is the influence of the hydro vortex energy generator and the discharge of water flow from the power plant can support the controlled fish stocking movement in Sragi village, (2) the effect of controlled fish stocking in the watershed conservation movement, and (3) the effect of controlled fish stocking in the movement to improve community nutrition in the fisheries and educational tourism sectors.

3. FPmuda activities

To overcome the problems asked by the community, this activity was carried out by providing a tool in the form of a hydro fortex turbine to generate electricity from hydropower at the location of controlled fish empowerment and stocking. As well as empowering the community about caring for the environment and utilizing energy from nature.

4. The role of partners

In the FPyouth social project activities, partners are directly involved in the activities of this social project.

5. Monitoring and assessment

In order for the FPyouth social project activities to be useful and run as expected, this monitoring activity is carried out to monitor activities as well as provide solutions going forward.

III. RESULT AND DISCUSSION

3.1 Result

3.1.1 Environmental Development

On September 21 2022, a comprehensive socialization of activities was carried out, both from the concept of conservation and the provision of other capacities, such as power generator turbines and fish pond facilities.

Fig 2. FPmuda Social Project Activities Socialization

From the socialization results of the FPmuda social project, POKMASWAS was created as a reference or legal umbrella for groups to carry out monitoring activities in watershed areas. In accordance with the stipulation of the Pokmaswas decision letter number 188.48/63/KEP/429.509.01/2022 concerning the Establishment and Determination of Community Monitoring Groups (POKMASWAS) "Bina Lestari"

Fig 3. POKMASWAS Songgon District

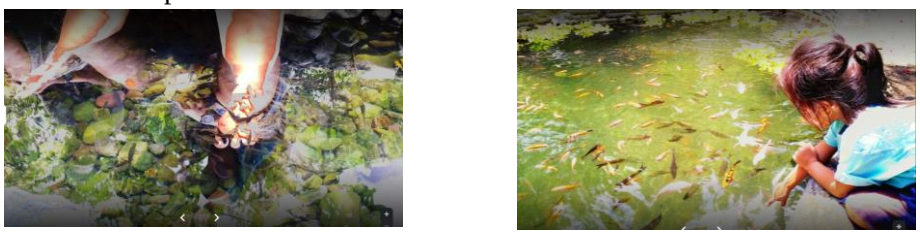
The next step is after the official establishment of the POKMASWAS, a site plan is made to fully describe the activities to be carried out in the watershed. This site plan is a development plan that will be carried out by POKMASWAS in collaboration with the Pertamina Muda TEAM, as well as the involvement of the Banyuwangi Regency Irrigation Service and Fisheries Service.To carry out environmental development and improve the community's economy, it is carried out by making conservation ponds and controlling fish stocking using aquaculture technology. Natural recirculation aquaculture technology is a river water circulation system by allowing the flow to continue flowing by maintaining the existing water quality, with the help of river conservation so that water for fish farming will continue to circulate with good quality.

Fig 4. Conservation Pond with Aquaculture Technology

After the construction of conservation ponds using aquaculture technology, controlled fish stocking was carried out in conservation ponds which functioned to increase the community's economy from the fish produced in cultivation and from conservation sites that function as tourist attractions.

Fig 5. Controlled Fish Stocking in Aquaculture Conservation Ponds

From the results of making conservation ponds and controlled fish stocking, the Banyu Binau tourist spot in Songgon District was produced.



(a) **(b)**

(c)

Fig 6. (a)therapy fish tours, (b)fish eating tours, (c)camping ground

3.1.2 Technology Development

Development in the field of technology in the Banyu Binau tourism area is carried out as a support for tourism facilities and the utilization of water flow from rivers as well as streams from conservation ponds, by installing hydro vortex turbines that can generate electrical energy. The electrical energy generated from the hydro vortex can support electricity needs for lighting at night.

Fig 7. Description of Hydro Vortex Technology as a Support for Tourism Facilities

In developing technology at this tourist location, it begins with rejuvenating the foundation according to the designed site plan. This foundation rejuvenation is carried out to strengthen the old foundation which will later be installed by Hydro Vortex. This foundation will later be used as a waterway that will flow into the hydro vortex tub to turn turbines to generate electricity.

Fig 8. Foundation Rejuvenation

After rejuvenating the foundation, a turbine tub was built which was made capable of providing energy to turbines of around 1Kw or the equivalent of 1000 watts. Making the turbine tub is adjusted to the design of the site plan and the size of the previous foundation.

Fig 9. Turbine Tub Maximum Capacity of 1000 Watts

Next, install the turbine tub on the foundation that has been made and try out the turbine with the existing river flow.

Fig 10. Trial hydro vortex turbine

The end result of all the stages and plans that have been implemented is to create a tourist spot with a conservation pond where fish are cultivated by utilizing hydro vortex energy as a means of tourism and education for the community.

3.2 Discussion

To develop the skills and skills of community monitoring groups (POKMASWAS) so that they not only supervise but can also carry out controls and improvements, it is necessary to hold a training and coaching program for existing facilities (Djbbar Atriana & Anisa, 2021).The development and management of Banyu Binau Songgon tourism must be carried out seriously, because Banyu Binau tourism is expected to have inclusive and sustainable economic growth, which provides a framework for opening up new economic opportunities that support the continuation of economic growth, sustainable social and environmental development. side by side (Purbandi Yohanes & Christophori Reginaldo, 2019).Power generation using hydro vortex turbines is the role of renewable energy using efficient hydropower and its potential for future power generation cannot be underestimated. (Abhijit Date & Aliakbar Akbarzadeh, 2009) because of that it is necessary to do some environmental socialization about the use of renewable energy.

IV. CONCLUSION

Based on the FPmuda social project that has been carried out, it can be said that this activity provides education and information to community groups in the Sragi village about river flow that can be utilized as much as possible by carrying out controlled fish farming and introducing new things to power plants with hydro vortex power so as to provide an overview to the community about the utilization of alternative energy from nature that can be used. From the results of the FPmuda social project, the creation of an educational tourist spot in terms of mechanical technology and fishing technology will boost the growth of stalls as SMEs, residents of the surrounding villages, which will improve the economy of the residents.

V. ACKNOWLEDGMENTS

We would like to thank the Pertamina Foundation (PFMuda 2022) for holding a social project activity that can provide an opportunity for the team to carry out the activities that have been proposed for this community. Thank you also to the community groups and experts in the energy sector who have provided directions to make this program a success.

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