World Wide Fund for Nature (WWF) Attempt to Resolve Environmental Damage in Kampar River Basin, Riau (Case Study: Koto Panjang Hydroelectric Power Plant)

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Abstract: This study aims to investigate the World Wide Fund for Nature (WWF) attempt to resolve environmental damage in the Kampar river basin, Koto Panjang hydroelectric power plant, Riau. Various problems related to the function of the river basin that has changed in the long term will hinder the sustainability of community life and damage the environment. This study used qualitative research methods with a descriptive-analytic approach. Interview and observation were used as data collection techniques to see how WWF's role in resolve environmental damage in the Kampar river basin. This research reveals WWF's role in protecting the environment and empowering communities through the use of river basins, such as Forest and Land Rehabilitation run by local communities, Ecosystem Approach of Aquaculture (EAA) application as sustainable aquaculture management, and community empowerment through processed fish products.

1. Introduction
Environmental issues have become a global agenda among political leaders, governments, scientists, industrialists, NGOs, and citizens since the early 21st century. This shows that environmental problems that were previously considered to be in the low politics area now become part of central issues in world politics. Environmental issues have become a very important global issue accompanying the classic agenda in international politics, such as security and economic issues [1]. Nowadays, the dynamics of issues and actors in contemporary international politics have made the country or nation no longer the only actor in international politics since various actors can later become involved in these problems [2].

Several areas especially in the most populated cities in Indonesia have started to experience environmental damages as the result of ecosystem disruption by human activities [3]. Environmental threats will automatically become threats to humans themselves since the environment is a place where the human continues their life. In fulfilling their daily needs, people sometimes ignored nature or even neglected since the profit are the priorities. However, this action has consequences and leads the environmental damage to come and impact people themselves such as landslides and floods. Floods and landslides happened because of the instability of landscapes that have an impact on areas in the river basin which of course affects the hydrological balance with intervention and human activities increased the damage of river basin area [4]. The river basin has very important roles in protecting the environment and support community, such as maintaining water quality, preventing floods during the rainy season, and drought when the dry season arrives, and it can hold as much water as water storage.
Of the 458 river basins in Indonesia, 60 of them are in severe conditions, 222 are in critical condition, and 176 others have the potential to be in crisis due to land conversion which causes an imbalance in the environmental state. Riau is one of the provinces with severe river basins condition and caused disturbances in the hydrological cycle [5]. One of the river basins area that has been damaged and part of the 108 national priority river basins based on the Decree of the Minister of Forestry No. 328/2009 is Kampar that located in Riau. In regional autonomy, the river basin area of the Kampar river has divided into two parts namely the upstream, part of West Sumatra (Pasaman Regency and Limapuluh Kota Regency), and the downstream, part of Riau (Kampar Regency, Kuantan Singingi Regency, and Pelalawan Regency).

Figure 1 Tanjung Village Landscape, Kampar River Basin

The Kampar river basin has a 2,559,652 ha area with 91% of the total area are located in Riau while the rest are located in Sumatra Barat. Although the area Sumatra Barat is only around 9% (covering an area of 229,240.76 ha), this area is the upstream which greatly affects the conditions of the middle and downstream areas [6].

One of the conditions currently occurring in the river basin area is the unstable water level. In the Batang Mahat river basin (Sub-area of Kampar Kanan, Kampar river), there is a hydroelectric power plant, PLTA Koto Panjang, which produces 114 Megawatt from three turbines and supply for 10% electricity in Sumatra [7]. During the rainy season, the water level in the dam has exceeded the normal debit which makes the area along the river prone to flooding. Meanwhile, in the dry season, the water flow decreased drastically so that it cannot move the turbine. This resulted in reduced power supply and frequent rotating blackouts.

This problem appears because the condition of the water catchment area in Koto Panjang is the concerned state. Forest area decreased significantly from 3,331 km2 in 1985 to 886.1 km2 in 2015, or equal to 73.40% reduction of the existing forest area. Uncontrolled logging, conversion of function for oil palm, and rubber plantations affect water debit in the dam. The scenery Koto Panjang taken from the air shows the oil palm plantation has surrounded the dam which leads to reduced water catchment areas [8].
Decreasing forest area around Koto Panjang hydroelectric power plant was caused by forest encroachments activities in the forest area, even around the green lines of reservoir boundaries for cultivation and plantations. This resulted in increasing the plantation area while the abandoned one will increase the open ground area and triggering the potential for erosion and sedimentation.

World Wide Fund of Nature as a conservation organization, with a mission to stop the destruction of the natural environment on Earth planet and to build a future where humans live with nature in harmony. Through the biodiversity protection, WWF ensuring sustainable use of natural resources, and promoting pollution reduction and excessive use of natural resources reduction. WWF-Indonesia with its track record in conservation and sustainable development has great attention to the availability and sustainability of freshwater because water has an important role in life. The river basin is a type of wetland that is the focus of WWF-Indonesia's conservation attempt.

WWF-Indonesia is committed to implementing water catchment revitalization activities with the main focus in six areas, the Peusangan river in Aceh, Kampar river in Riau, and Sumatra Barat, Mahakam in Kalimantan Timur, Ciliwung in Jawa Barat, Rinjani in Lombok and Bikuma river in Papua. This river basin revitalization activity is the nature-based solution (SBA) that includes restoration of natural forests and wetlands, reconnecting rivers to lowlands which are often flooded, and creating vegetation along with river flows.

2. Methodology
In this study, we used qualitative methods to explore facts or phenomena. The descriptive-analytic were used as a type of research that uses a pattern of depicting empirical facts and relevant arguments to study the attempt of the World Wide Fund for Nature (WWF) to resolve environmental damage in the Kampar's River Basin, Riau at Koto Panjang Hydroelectric Power Plant. Descriptive-analytic research is intended to provide an overview of the phenomenon that is relevant to this study. This qualitative research emphasizes deeper thinking and based on social phenomena or the paradigm of social facts. This type of research is more sensitive and able to adapt to qualitative methods that the phenomenon has taken [9].
3. Result and Discussion

3.1. Forest and land rehabilitation by local community groups
The tree-planting project provides a new way for the community to assist the reforestation process to protect the national park and control the growth of trees through Geotags (labeling trees with the exact latitude and longitude/location coordinates). As an international organization, WWF-Indonesia carried out a motivator function in this activity by involving local communities in reforestation activities and coordinating with the local government.

Land restoration in Koto Panjang accompanied by sedimentation mitigation also improves water debit and improves water quality in the river basin, revives the balance of the ecosystem, and provides economic benefits for the surrounding community who planting, caring, and monitoring the growth of the trees. WWF-Indonesia will do land rehabilitation of 50 hectares through the NEWtrees scheme which is known as the involvement and support of corporations and an additional 15 hectares through the Mybabytree scheme as individual support in the rehabilitation of the forest and land. The location chosen for forest and land rehabilitation activities is in Tanjung Village, Koto Kampar Hulu District, Kampar Regency, Riau. The area to be planted has the status of a national forest with a degraded production function. The exact location is on the border of the Kampar Kanan River which is the catchment area (DTA) of the Koto Panjang dam.

3.2. Application of the Ecosystem Approach of Aquaculture (EAA) as sustainable aquaculture governance
The development of aquaculture in Indonesia has increased quite significantly in recent years, both land expansion and business intensity. The development of aquaculture also provides added value to meet the needs of fish and increase the economy for the community, but if aquaculture development is not properly controlled it can have an impact on the environment.
The WWF-Indonesia program in the Koto Panjang aquaculture area began in December 2018 where WWF-Indonesia acts as a motivator. Pre-assessment of the application of EAA had been done to equalize perceptions between WWF-Indonesia and local communities also to get suggestions or input from stakeholders by the EAA pre-assessment team. Through these activities, an explanation about EAA parameters application status in aquaculture of the Koto Panjang power plant area has been done and got feedback from participants. EAA pre-assessment result and the suggestions from participants were very useful in preparing the EAA implementation plan in that area.

An assessment of EAA status is needed to measure the extent to which EAA principles are applied in an aquaculture area. The results of the EAA assessment are an important reference for parties to improve the performance of aquaculture area management sustainably, especially for Local Governments which in Undang-Udang No. 23/2014 concerning Regional Government. This law is said to have the authority in the management of fish farming. Furthermore, the pre-assessment results are used as the basis for developing a program to improve aquaculture management with an ecosystem approach in that area. Several recommendations related to assessment activities include (1) The local government and floating net cage fish farmers (KJA) are expected together to continue to monitor and maintain the number of cages and their production thus not to exceed the environmental carrying capacity of the Koto Panjang Reservoir; (2) Local government issues legality for floating net cage farming (KJA) in Koto Panjang Reservoir; (3) Local government has joint management of the Koto Panjang reservoir utilization to resolve social conflicts between users/users of the reservoir; and (4) Efforts to increase the EAA assessment in Koto Panjang Reservoir must be accompanied by EAA Management Team led by the Kampar Regent consisting with the Steering Committee and the Implementation Team.

The benefits of implementing EAA are: increasing food security programs, strengthening the existence of aquaculture areas and provide employment also the business. As well as allowing the opening of business opportunities for tourist objects in the area, the development of tourist objects can be developed anywhere depending on how community participation in managing greatly affects the success of tourism in the area [11]. WWF-Indonesia encouraged the community to collaborate to strengthen the aquaculture area. Furthermore, increasing the competitiveness of environmentally friendly aquaculture products and promote business investment. After collaborating, WWF-Indonesia performed its motivational function, to pushed the community to improve product competitiveness. The organization also motivated the community in maintaining and improving the quality of the environment to integrate sustainable development programs in an area that also reduces the cost of certification of aquaculture products.

3.3. Community Empowerment through Processed Fish Products

The livelihoods of some Indonesian people depend on maintaining access to control the natural resources, the preservation, and maintenance of the surrounding environment and the implementation of sustainable forest management (SFM) can provide sufficient space for social, economic, and environmental interests [12]. Community and government participation through good communication between the actors will affect the involvement and role of the community [13], in the context of preservation and maintenance of the surrounding environment, community participation, maintenance and development efforts are needed. This fact causes the importance of community involvement and participation in conservation efforts in good collaboration. WWF-Indonesia through the Community Empowerment program in Koto Panjang formed a fish processing group, based on the high yield fisheries in the Koto Panjang Hydro-Electric Power Plant area itself. The recent potential survey conducted by WWF-Indonesia in XIII Koto Kampar District supported the community's economy. From the high fisheries, the community processes the fish into smoked salted fish and the others. If it’s managed properly, this activity will create added value and open up new jobs by building the home industries that can increase economic income and welfare.

The main targets of this activity are women, fishermen's wives, young women, and fishermen's families. WWF-Indonesia as an international organization hopes that the presence of women as the main target can help the household welfare and productivity that can increase the incomes. It is also motivated the fisherman families and group members to get involved in fishing environmentally. From
this, a fish processing group was created. Based on the high potential of consumers, deliberations were held in two villages in the XIII Koto Kampar District that involved the local government, namely Pongkai Istiqomah Village and Muara Takus Village. The purpose of this activity is to develop and innovate The Fish-Processed products in good quality and high selling value, to increase income and the level of society, especially processing and marketing. The objectives of this activity are opening new job’s opportunities for members and the community, Increasing the income of fish processing groups and marketing of fishermen's catches, Developing and improving the quality and innovation of fish processing products, and Increasing community participation in tourism and activities development, and Increasing the consumption power of fish to support community nutrition.

WWF-Indonesia carried out two fish processing groups were formed, The smoked fish processing group (Asap) in Pongkai Istiqomah Village and the smoked fish processing group (Asap) in Muara Takus Village. Figure 4 showed the processing of fish products in the two villages.

![Fish processed product](Source: WWF-Indonesia)

**Figure. 4 Fish processed product**

### 4. Conclusion

Environmental threats are indicating environmental imbalances in life nowadays. There are so many problems that arise, such as natural disasters due to environmental damage that almost occur throughout the country, river pollution, garbage, forest and land fires, and the others. Every citizen, government, and Governmental Organization should be responsible to protect the environment and utilize the environment in a good manner for sustainability. The role of the World Wide Fund for Nature (WWF) as an environmental control has a big role in protecting the environment and empowering the community to live side by side with the environment. From this study, the various activities that were carried out by the World Wide Fund for Nature (WWF) for communities in the Kampar’s river basin demonstrated the role of empowerment and increased environmental awareness by Non-Governmental Organizations, in collaboration with the government and local communities.
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