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Environmental History of Dayak Jalai Community as an Effort towards Disaster Risk Reduction

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Abstract— **President Soeharto's policy on granting forest concessions affected the destruction of forests, one of which was in Ketapang District, West Kalimantan Province, Indonesia. Vulnerability to the impact of natural disasters occurs in the Dayak Jalai community who lives around the forest. Disaster risk reduction efforts are carried out by the community and the government by utilizing the environmental history in the community. The research objective is to explore the potential of environmental history and its development for disaster risk reduction, especially the Jelai Dayak community in Ketapang Regency. Research method is a qualitative approach. Data validity uses triangulation, and data analysis uses interactivity.**

The result of the study shows that the environmental history has the potential aspect as an effort to reduce disaster risk in the Dayak Jalai community as a learning resource. Studying environmental history means finding the root cause of disaster triggers through past mass events to anticipate disasters early. Disaster risk reduction innovation is carried out by developing environmental history to shape the character of the community who is aware of environmental sustainability in order to increase awareness of the coming of natural disasters.

Keywords— environmental history; disaster risk reduction; Dayak Jalai community

I. INTRODUCTION

Forest damage in the Ketapang District of West Kalimantan occurred due to the conversion of forest functions carried out by the government during the Suharto era. The government policy is based on Law No.1 / 1967 and Law No.6 / 1968 concerning foreign and domestic investment, Forestry Law No.5 / 1967 and PP No. reinforced. 21 of 1970 yunto PP No. 18 of 1975 concerning Forest Concession Rights and Forest Product Collection Rights [1], [2]. The transfer of forest functions is carried out for settlement, transmigration, and utilization of forest products affecting the behavior and patterns of land use by the community. Land use that is not in accordance with its designation will cause a decrease in hydrological conditions, especially the flood hydrograph [3]. Forest abuse causes deforestation. The Jalai Dayak people who live along the Jalai river and who live in the Jelai Hulu, Marau and Manismata sub-districts are people who are directly exposed to the effects of deforestation, such as forest fires, haze and floods.

Community knowledge about the history of the environment as a source of learning is very much required as an effort to protect against natural disasters. Efforts to reduce disaster risk by involving the community have been carried out by researchers from abroad, and the results of DRR socialization with an approach to the community are more relevant [4 - 7]. Most community involvement in efforts to reduce the risk of natural disasters is physical only, for example involving households in efforts to mitigate disasters [6] and youth involvement [5]. Risk Reduction of Non-physical disasters in the form of education in the community is with a lack of local knowledge approaches. Therefore, disaster risk reduction education uses more modern media, such as computer games [8].

Research on disaster risk reduction efforts with the history of the environment is important because people do not have the awareness to protect the environment that has a tendency to trigger natural disasters. The aim of the research is to explore the potential of environmental history and its development for disaster risk reduction, especially in the areas that have potential disasters, such as in the area where the Dayak Jalai people live in Ketapang District, West Kalimantan. Research has the benefit for public education as an effort to minimize losses due to natural disasters through environmental history.

II. METHOD

The study used a descriptive research method with a qualitative approach. The research location can be seen in

Figure 1. The data were collected through observation and interviews. Observations were made by observing the activities of the Jalai Dayak community, and their oral traditions. Interview activities were carried out with indigenous Dayak Jalai leaders, Dayak communities and Dayakologi directors. The main informants are selected by snowballing, starting from the customary head to the community members who understand the topic. The information gathered includes the concept of environmental history, and the form and manner of the community to prevent or to reduce the risk of disaster in their environment. Data and information that had been collected were processed using qualitative descriptive analysis. The analyzed data are public knowledge about the environment including oral traditions and natural disasters that have occurred. Data validity used triangulation and data analysis techniques using interactive analysis techniques.

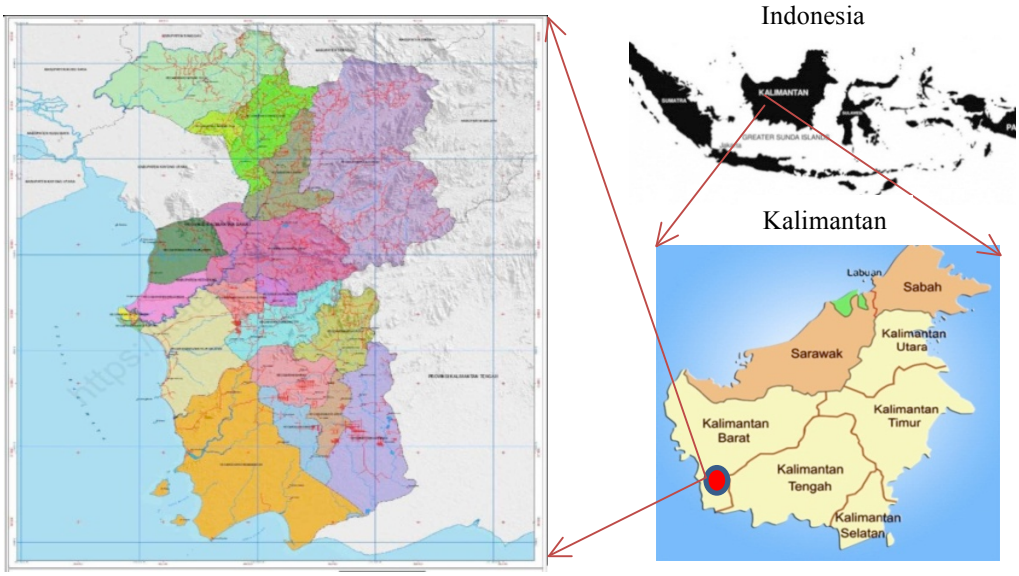

Fig. 1. Research location (District Ketapang)

III. Results and Discussions

Natural disasters due to the destruction of forests in Ketapang district are detrimental to the community. People who live by relying on forests, especially the Dayak people, are directly exposed to the impacts of disasters such as forest fires, haze and floods. The Dayak Jalai community is one of the communities affected by natural disasters due to forest destruction. Dayak Jalai settles along the Jalai river which lies along the Jelai Hulu sub-district to Manismata District, Ketapang district. Dayaks from South China are now called Yunan, and in Kalimantan they live in rural areas [9]. The Dayak community is pushed to areas in the direction of the river or inland areas on the edge of the forest. Barley Dayak administratively occupies 3 Districts in Ketapang regency namely Jelai Hulu, Marau and Manismata districts.

Forest damage that occurs in the Dayak Jalai customary area triggers natural disasters. Floods, forest fires are annual disasters in this region, for more details, see table 1. Disaster data in 2010-2015 keep people alert to the arrival of natural disasters.

TABLE I. Recapitulation of Disaster Events in 2010-2015 (District of Ketapang)

No	Districts	Flood	Forest fires
1	Marau	6 Villages	10 Villages
2	Jelai Hulu	5 Villages	12 Villages
3	Manis Mata	3 Villages	

Source: Focus Group Discussion with Dayak Jalai Community.

To increase awareness of natural disasters, the community conducted a mapping of disaster-prone areas. Table 2 explains the existence of potential disaster areas. In 2017, *banjir bandang* (massive flood) disasters occurred along the Jelai river basin which affects the people who live along the river flow.

TABLE II. Mapping of Vulnerable and Potential Disaster Areas in 2018 (Ketapang District)

No	District	Village	Disaster Hazard
1	Jelai Hulu	Riam kota	Flood
		Riam danau	Flood
2	Marau	Bantan sari	Dryness and tornado
3	Manis mata	Whole	Forest fires and floods in several villages

Source: Focus Group Discussion with Dayak Jalai Community.

A. Potential for Environmental History as a Disaster Risk Reduction Education

Learning the environmental history in Indonesia has not developed because so far it has focused on social, economic and political history. Recent environmental problems are very important to study, such as natural disasters and efforts to reduce the risk of natural disasters. Environmental history studies are more concerned with the involvement and role of humans in the process of the emergence of environmental problems and their responses to mitigate the impact of these problems [10]. Environmental history knowledge is not only useful for students, but also society needs it as a learning resource to reduce the risk of natural disasters. Disaster Risk Reduction Education is a conscious and planned effort in the learning process to empower students as an effort to reduce disaster risk and to build a culture of safe and resilient to disasters [11]. Disaster risk reduction is sustainable, so it requires the community as a party that is directly affected if there is a disaster. In the event of a disaster, the community must make use of knowledge, innovation and education to build awareness of personal safety and disaster resilience at all levels of society in order to reduce these factors that cause disaster risk and strengthen disaster preparedness at all levels of society so that the response is more effective [12].

Environmental history has the potential for disaster risk reduction. Knowledge of the environment that a person has will be the key to preparedness in dealing with disaster risk. Environmental history examines the relationship between humans and their environment in a diachronic manner [13]. The use of environmental history is a source of learning for the community because the Jalai Dayak community has not fully understood the technology. During this time, disaster socialization relied more on technology such as computer games [8]. For the community, studying environmental history has several benefits including: studying the environment is one part of assisting science in explaining historical phenomena around us, knowing the latest issues and the roots of the past, and knowing the development of natural phenomena [13]. By studying environmental history, environmental awareness will be embedded. By studying the history of the environment, we will look for the root of the problem through the events that have happened then we will formulate strategies and policies in dealing with forest damage that triggers the occurrence of disasters. Finding problems is essentially a part of problem solving [14]. Environmental history can be used as a role model in disaster risk reduction (DRR) efforts. with the community knowing the surrounding history, the community will sort out what is the best, so that the arrival of natural disasters can be anticipated early.

B. The Development of Environmental History for Disaster Risk Reduction (DRR)

Community involvement is significant in disaster risk reduction because they are considered to understand what is happening in their environment. Disaster risk reduction activities with communities are effective because they know what they will and can do through environmental studies [5 - 7]. Vygotsky argued that the interaction of a person's interaction with the environment can help learning [15]. Unlike animals that react to the environment, humans have the capacity to change the environment according to their needs. If human interaction with the environment was written, it will become the history of the environment. Table 3 shows a form of experiences by the Jalai Dayak community that can be applied to disaster risk reduction education in the community.

TABLE III. ENVIRONMENTAL HISTORY OF THE JALAI DAYAK COMMUNITY FOR DISASTER RISK REDUCTION

No	Environmental History	Form of Disaster Risk Reduction
1	Dayak Jalai Season Calendar	The community becomes aware of seasonal changes and their effects on the environment
2	Hunting system	The community can be wise in managing forest products so that the balance of nature can be maintained.
3	Myth	The people take good care of the forest because they believe that if the forest is damaged the forest creatures will be angry and there will be a disaster
4	Customary law related to forest management	The community will not damage the forest for fear of customary sanctions in the form of objects and social sanctions
5	Plantation change	The community will know how the conversion of forests to rubber plantations then become oil palm plantations and are prone to fires and floods.
6	Farming culture	Prevent environmental damage and natural disasters through discipline in the cultivation process according to ancestral instructions
7	Customary area management system	The division of tasks in custom will cause the community to be more responsible in maintaining the environment as well as minimizing natural disasters

Source: Field analysis and Focus Group Discussion with Dayak Jalai Community

Community knowledge of its environmental history will cause people to be able to understand how they react and adapt to nature including natural disasters. Season Calendar is one of the knowledge possessed by the Jalai Dayak community which functions to find out how the weather changes. Dayak Jalai community divides the season into 12 of them; Get off *Panggulan, Sujiq, Krentikaq, Meragaq, Pesiaq, Magaq, Kelambuq,* Cricket, Young *Duyung, Duyung Tuhaq, Pemarang sanjaliq and Penggalian Keribang.* Seasonal changes can be seen from the natural signs. *Meragaq* and *Magaq* seasons are prone to natural disasters. *Meragaq* is estimated to occur between late July and August, marked by hot weather and large black worms starting out of the ground. This season is prone to forest fires because the weeds around the forest dry up and the friction triggers coals. *Magaq* season is marked by the changes from the east wind to the west

wind accompanied by hurricanes and heavy rain. In this season, Grasshopper *Magaq* (green grasshopper) began to appear and became a pest for the community, and the estimation is from October to early November. This season, the Dayak Jalai community was very wary because the river was usually overflowing and flooding. By studying the history of the environment, in this case, the seasonal calendar will make it easier for people to understand the symptoms of natural phenomena so that people are always vigilant to anticipate the arrival of natural disasters.

The Hyogo Framework for Action 2005-2015 stated that one of the priorities in Disaster Risk Reduction (DRR) is the importance of using knowledge, innovation and education to build a culture of safety and resilience at all levels [12]. This is also in line with the smart framework for 2015-2030 disaster risk reduction. The environmental history knowledge of the Jalai Dayak community is one of their forms of innovation by developing knowledge and increasing people's understanding by utilizing oral traditions that develop around them.

Disaster risk reduction by studying environmental history in accordance with Vygotsky's theory. Vygotsky's scaffolding idea was given by giving a number of assistance to the community in the early stages of learning, then reducing it and giving students the opportunity to take over the responsibilities they could only afford. The assistance is in the form of instructions, warnings, encouragement, describing problems in the steps of solving, giving examples or other things that allow students to grow on their own. Vygotsky's theory focuses on the interaction of interpersonal factors, historical culture, and individuals as the key to human development [15]. This theory can work effectively because in accordance with the conditions of society, especially the Vygotsky scaffolding theory directs people who know better to guide people who do not yet have knowledge, in this case knowledge of natural disaster risk reduction.

This study found the fact that effective learning in the area is by using local knowledge and wisdom. Knowledge of environmental history is optimized into learning for the community as the importance of environmental awareness for disaster risk reduction. This paper is not in accordance with research that uses computer game technology as a medium for disaster risk reduction [8]. The use of technology cannot be conducted in the Jalai Dayak community because of the limited access to technology in the community. Environmental history developed from the experience of the Jalai Dayak community can be used for all communities in an effort to protect their environment in order to reduce disaster risk, especially related to forest destruction.

IV. CONCLUSION

Environmental history has the potential as a source of learning for the community in disaster risk reduction efforts. Studying environmental history means we look for the root causes of disaster triggers through the past mass events to anticipate early. Disaster risk reduction innovation conducted by the Jalai Dayak community by developing environmental history. Historical learning carried out the community, so the community has shaped the character of the people who are aware of environmental sustainability, thereby reducing the risk of forest damage that triggers the onset of natural disasters. Environmental history knowledge in the Jalai community can be applied to people in any areas to increase public awareness in the importance of protecting the environment, especially forests from damage which is the trigger of natural disasters.

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