

Adaptation Strategy as a Social Engineering: *A Case Study of Changing Corn to Coffee Fields in Tanah Karo District*

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Abstract—This paper discusses one of the adaptation strategies of peasant society in Tanah Karo, North Sumatera. The eruption of the Mount Sinabung had impacted on the condition of the people in Tanah Karo, such as crop failures of corn. As a strategy, local people start to implement an adaptation of planting fields with coffee rather than planting the corn. This research was conducted through field research, and data were collected through interviews and observation in Perbaji village, and Tiganderket village, Tanah Karo. The changes show a form of adaptation strategy in Karo people. The adaptation strategy the Karo people used can be said in social engineering. This paper shows how Karo people adapt to their environment and show the transformation through social engineering.

Keywords—adaptation strategy; coffee; corn; social engineering

I. INTRODUCTION

Adaptation is a concept that has long been used in the study of cultural ecology/human ecology since it was first used by Julian Steward (1982). From the standpoint of human ecology, Adaptation is understood as a coping strategy by humans in responding to negative feedback from the environment of a living thing (Moran, 1982). Early emergence of the concept of adaptation comes from the concepts of biology and exact science. The concepts of biology and science must be the basis for explaining existing social phenomena. The concept of adaptation comes from the world of biology. There are two important points, namely genetic evolution, focusing on feedback from environmental interactions, and biological adaptation that focuses on the behavior of an organism during its lifetime, where the organism is trying to master environmental factors, but also continue the processes cognitively.

Adaptation is also a key concept in two versions of system theory, both biologically, behaviorally, and socially that was put forward by John Bennet (Bennet, 2005). Adaptation develops from an evolutionary understanding that always sees humans trying to adapt to the surrounding natural environment, both biologically / genetically, and culturally. The process of adaptation in evolution involves genetic selection and cultural variants which are considered as the best way to solve environmental problems.

Adaptation is a dynamic process because neither the organism nor the environment itself is constant. Ellen (1982) divides the stages of adaptation into four types. These include (1) phylogenetic stages that work through the genetic adaptation of individuals through natural selection; (2) physical modification of phenotypes/physical traits; (3) learning processes; and (4) cultural modification.

Cultural adaptation of the work process is considered faster than the three processes above because it is considered to work through the survival of the population where each community has a different endurance based on the feeling of risk, awareness response, and opportunity.

Adaptation can be called an active human strategy (Hardesty, 1977). Adaptation can be seen as an effort to maintain living conditions in the face of change. Adaptation is understood as a coping strategy by humans in responding to negative feedback from the living environment of a living thing. The intended sacrifice is any change caused by the environment, both the ecosystem/biophysical environment and social systems. Adaptation is divided into three types; adaptation to physiology, adaptation to behavior, and adaptation to culture.

Ethnic diversity and social groups have led to various adaptation strategies. Understanding of the adaptation strategies adopted reflects the cognitive forms learned through the socialization of supporters of a culture, which is then expected to be able to explain the social phenomena encountered. Adaptation is defined as a process that connects a cultural system with its environment. Adaptation always refers to a certain environment.

Helmi and Satria's (2012) research in Tanah Bumbu District, South Kalimantan showed the adaptation strategies applied by the fishermen are caused by ecological changes. These ecological changes are caused by various forms of utilization of coastal resources which tend to exploitative. Adaptation strategies that are applied by the fishermen are not limited to one type of adaptation, and it is in accordance with the resources owned.

Simbolon (2018) showed the role of women as a form of adaptation strategy as refugees of the Mt. Sinabung in Tanah

Karo. Its role is in reproductive, productive activities, as well as community and economic management activities. The role of women will improve living standards and well-being.

This research is conducted in Tanah Karo, North Sumatera. Karo is an ethnic group in North Sumatera. The Karo people live in Tanah Karo which is a plateau surrounded by mountains with an altitude of 140 to 1400 meters above sea level. Laying on the hillside of the Bukit Barisan, between the mountains to the north is Mount Barus, Pinto, Sibayak, Simole, and Sinabung. On the south, there is Mount Sibuat. There are two volcanoes in Tanah Karo, there are Sibayak and Sinabung (Tarigan, 2008).

The identity of the Karo people has distinctive characteristics from the other ethnic groups found in North Sumatera. The characteristics of the Karo people are strongly influenced by the natural environment surrounding it. As a society isolated in the highland interior, the culture which is formed is a culture that is a pattern for its people to connect with the creator, nature and its contents, and especially the relations between the people. The culture in the Karo community which is the identity of the Karo people has four identities including *merga* (clan), language, art, and customs.

The clan is the identity of Karo people. There are five Karo clans which are called in *Bahasa Karo* "*silima merga*" namely Ginting, Karo-karo, Perangin-angin, Sembiring and Tarigan. The clan is the most important identity for Karo people. In every introduction in Karo society, the first thing to be asked is the clan/surname. *Merga* comes from the word *meherga* (expensive). Expensive in Karo culture has a meaning "important".

Karo language is a special language that has a special script. Traditional Karo art are *gendang* and traditional clothes, like *uis gara* and *uis nipes*. The special custom which is identity is customary negotiations namely *runngu* (deliberation and consensus) in the marriage ceremony and other traditional ceremonies, and *rebu* (avoidance to talk with certain relatives).

The Karo people has never been separated from agricultural life. The majority of the Karo people are farmers. Besides agriculture as an activity subsistence economics is also a profit farming activity. Ethnic Karo is the biggest shareholder in classical agriculture in East Sumatera until North Sumatera. Karo is the largest pepper exporter in the 1800s was followed by tobacco. Karo farmers are tough farmers and exemplary farmers. Formerly, the Karo people planted corn and rice. In the 1940s, a group of Chinese people came to plant vegetables, like *peleng* spinach, chicory, and carrots, to meet the needs of Dutch residents who live in Berastagi. The Chinese cultivating vegetables by renting native land and hire them. There was a transformation of knowledge so that citizens' natives understand how to grow vegetables well. Gradually, the people of Karo besides plant corn and rice and then plant vegetables too (Pelzer, 1978).

Karo people live in Tanah Karo. Tanah Karo is one of the regencies in North Sumatera. There are 17 sub-districts in Tanah Karo, one is Tiganderket sub-district. In general, the main livelihood of the Karo community is farming. This is due to the very fertile agricultural land, which makes Tanah Karo

the largest producer of crops in North Sumatera. Likewise the Tiganderket sub-district, most of the population of Tiganderket sub-district work as farmers, especially for those who live and own agricultural land in rural areas, such as in Perbaji village, Tiganderket village, Tanjung Mbelang village, Nari Gunung Dua village, Jandi Meriah village and Suka Tendel village. This happens considering that in the rural areas most of it is still in the form of agricultural lands, so it is very supportive for the residents to cultivate it by planting crops or farming. The agricultural land in Tiganderket sub-district is in the form of gardens, fields, and plantations.

The existing crop products are corn, yams, peanuts, mung beans, and soybeans. Vegetables like spinach, leek, onion, garlic, beans, chilies, cabbage, chicory, and tomatoes. Fruits like avocado, durian, orange, mango, papaya, banana, and salak. The existing plantations are coconut, rubber, coffee chocolate, candlenut, and tobacco.

Tiganderket sub-district has 17 villages. This research is conducted in Perbaji, and Tiganderket village in Tiganderket sub-district, following Figure. 1.



Fig. 1. Map of Karo Regency

The reason for choosing this sub-district is this sub-district is located near the Sinabung Mountain and affected by the eruption of Mount Sinabung. Mount Sinabung (in Karo language: Deleng Sinabung) is the volcanic mountain in Karo highland, Karo regency, North Sumatera, Indonesia. Sinabung, along with Sibayak in its rear are the two active volcanoes in North Sumatera and become the highest peak of it. The height of this mountain is 2.460 meters. It is noticed that this mountain never erupts since 1600 but it became suddenly active in 2010 and 2013.

The eruption of Sinabung Mountain caused such thing the ashes which can harm the plants in the surroundings; the hot cloud is dangerous because it consists of high degrees (>200 C) volcanic materials (ashes, gas, and stones) that may harm the people and burn everything it passes. Lahar is quite potentially happened, because of tons of ashes/eruption materials and high precipitation. Lahar can occur in every river valley that started from the mountain peak. The potency of an avalanche in the northern slope of Mount Sinabung (Lau Kawar) is high because of the detour hole of new fumaroles and it happened several times.

Tiganderket is the name of one of the villages that were once known with the name Luhak, the village was formed when Marga Bangun was from the Raja's Urung Batu Karang

territory moved somewhere because the relationship was not harmonious.

Tiganderket comes from the words *tiga* means market and *nderket*, is a kind of large wooden tree. At that time in the west of the Tiganderket village (now a market location) has a large Nderket wooden tree. Under that tree, transactions of people's agricultural products are always carried out there so that the location more famous as "Tiganderket" (Market under the Nderket tree). Tiganderket sub-district is located at 03 ° 08 North Latitude and 98 ° 37 east longitude whose entire territory is on a stretch of the plateau with elevation ranges from 500 to 1500 meters above the sea level. Tiganderket sub-district is an area of 86.76 km² which is consists of 17 (seventeen) villages. The north Tiganderket sub-district is bordered by Langkat Regency, to the south is bordered by Munte and Payung sub-districts, in the west, are bordered by Kutabuluh sub-district, and in the east is bordered by the Naman Teran and Payung sub-districts. (BPS Kabupaten Karo, 2019).

The area of the village of Perbaji is 2.60 km² with population 575 and Tiganderket village is 5.90 km² with population 1943. Perbaji village is located on the hillside of Sinabung and the red zone of Sinabung Mountain. Social engineering, moreover, must come to be viewed as self-management, as is outlined by modern Yugoslavian sociologists (Horvat, Markovic, & Supek, 1975; Sher, 1977). As Markovic illustrates, the application of sociology in the form of self-management requires that the social world adopt a renewed version of what it means to engage in social planning. No longer, as is the case with positive science, is the efficient development of an already sediment social structure thought to be the goal of social planning (Murphy, 1981).

"The social engineer believes that man is the master of his destiny and that in accordance with our aims we can influence or change the history of the man just as we have changed the face of the earth ". But the history of man is fundamentally different from the face of the earth, and so is the science of it. " The beginning of social science . . . is marked by the distinction between two different elements in man's environment his natural environment and his social environment (Rhees, 1947).

Social engineering simply can be interpreted as an action to influence social attitudes and actions in a large scale. The term social engineering was born in the Union Soviet in the 1920s to overthrow the power of the Tsar. The Soviet government used newspapers, books, films, architectural materials to change the order and structure of ideology Public. (Handoko, 2013). Social engineering is a way to make a planned social change. The concept of social engineering basically in the form of planned social change (planned social change). Social engineering is related to efforts to realize a certain vision, mission, and goals. The process of social change must begin with ideas about these three things.

For Marx, social change is driven by the use of science, knowledge, and technology so that it can accelerate its movement. As a result, people feel a rapid and fundamental change. According to Weber's view, stated that before the change in technology first, it has become a change of new ideas in thought public patterns. In every society, there is a living value system and develop specifically, and this is what

distinguishes society from other communities. The value which is the idea finally becomes the dominant force of a group of people, which differentiate existence from other communities (Salim, 2002).

Social change is a living phenomenon experienced by every society wherever and whenever. Every human society during his life must change various aspects of his life, which occur during the interaction between fellow individual citizens of the community, as well as between communities with the environment (see Figure 2 & Figure 3).

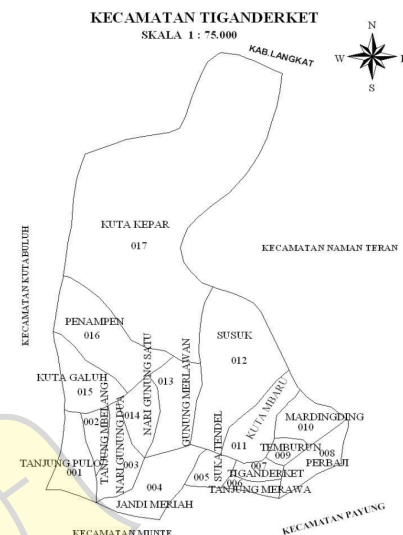


Fig. 2. Map of Tiganderket Sub-district



Fig. 3. Perbaji village located in the red zone of Sinabung Mountain

II. METHOD

The research method used in this study is a qualitative descriptive method and a case study with an ethnographic study approach. Qualitative research methods are carried out in natural settings and the data collected is qualitative. Qualitative methods are based more on phenomenological philosophy that prioritizes appreciation. Qualitative methods seek to understand and interpret the meaning of an event in human behavior interactions in certain situations (Usman &

Akbar, 2006). According to Yin (2002), case studies are used extensively in social science research, both in traditional disciplines (psychology, sociology, political science, and anthropology). Case studies are also used as research methods to complement qualitative descriptive methods. In this study, researchers used an ethnographic approach. Ethnographic studies describe and interpret culture, social groups or systems (Yin, 2002).

In this study, data collection was carried out by in-depth interviews with the secretary of Perbaji village and Tiganderket sub-district government employees. In this interview, the author obtained a cultural view and identified the actions and understanding of Karo people in Perbaji village and Tiganderket sub-district in the acts of planting coffee rather than planting another corn. The research is conducted both at the village office, sub-district office, and coffee plantation (see Figure 4).



Fig. 4. Perbaji Village Office

III. FINDINGS AND DISCUSSION

The Sinabung eruption that occurred several years ago even today (eruptions continue) did not only bring sorrow to the people of Karo Regency, North Sumatra Province (North Sumatra). Behind that long sorrow, there is greatness given by the Divine for the people of Tanah Karo. Their agricultural land which has been 'powdered' volcanic ash as if transformed into fertile land.

The beginning of this study began with the author's objective to examine the use of corncob waste in Tanah Karo. Our initial research location in Berastagi, which took us to the Tiganderket sub-district, began with the Cattle farm/Gundaling Farm in Berastagi. Every day trucks of corn stalks and corn come to this cattle farm to feed cattle. Based on an interview with the truck driver, he mentioned one of the places produce corn near Berastagi village is Perbaji village. After we visited Perbaji village, we find there is social change in the community because of the eruption of Sinabung Mountain.

The plantation is divided into the types: *tegal/ kebun* or garden is agricultural land which is not rice fields (dry land) which planted annual or annual plants and separated by the

yard around the house and its use does not move. *Ladang / huma* is agricultural land, which is not rice fields (dry land) usually planted with annual crops and their use only one season or two seasons.

According to data from the Central Statistical Bureau (BPS) of Tiganderket sub-districts in the village of Perbaji there are 154 gardens, 2 fields, 14 plantations, and 11 community forests. The area of coffee plantations in Perbaji village is 73.14 hectares. It is the largest area in the Tiganderket sub-district with a production of 14.50 tons (BPS Kabupaten Karo, 2019)

As the secretary of Perbaji village office stated people in Perbaji after the eruption of Sinabung Mountain, started to plant coffee. Many horticultural crops developed by farmers were damaged and died due to the splash of very hot volcanic dust. Many farmers turn to coffee and leave horticultural crops that they have been concentrating on like oranges, corn. Coffee is one commodity that was considered a crop that was resilient against Sinabung volcanic ash. Karo nature can give coffee plants two times the peak harvest in a year, ranging from October to December and April to June each year. While in Java, only one peak harvest per year. Karo nature is indeed very extraordinary for coffee plants, he explained.

Perbaji Village is one of the villages in the red zone because it is located at the hillside of Sinabung Mountain. Many of the villagers left their homes for refugee camps. Karo culture in farming does not fade. Many people returned to their villages to just look at the fields and their pets. No matter how dangerous the fury of Mount Sinabung that can spit hot clouds at any time. The majority of plants that live around Mount Sinabung are unable to withstand the influence of hot clouds and volcanic ash that continue to be present. Until the villagers understand the plants that were more able to withstand the effects of Sinabung ash. With reason to survive, people turn to grow coffee because of the resistance of coffee plants to volcanic ash.



Fig. 5. Coffee farm

As shown in Figure 5, coffee has indeed become the most popular commodity of the Karo people and the type of coffee planted is Arabica coffee. Perbaji village, which was originally

known as a corn farmer, has turned to coffee. Although coffee plant, in the beginning, is not very popular in Karo society, and Karo people regard coffee as a barrier plants but due to the disaster, people start to adapt. Similar a research conducted by Helmi and Satria (2012), the adaptation strategies applied by the people is caused by ecological changes. The adaptation strategies that are applied are not limited to one type of adaptation, and it is in accordance with the resources owned.

IV. CONCLUSION

The way people move from growing corn to growing coffee can be called an active human strategy in adapting to their environment. Visible community efforts to maintain living conditions in the face of change. The strategy of switching from growing corn to coffee is understood as an adaptation strategy by humans in responding to negative feedback from nature. The adaptation strategies deal with all changes caused by the environment, both the ecosystem/biophysical environment and social systems in this case of nature.

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