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**Natural Hazard and Semiotic Changes on the Slope of
Mt. Merapi, Indonesia**

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Introduction

This thesis focuses on the relations between volcanic eruptions and semiotic changes in the local communities on the slope of Mt. Merapi, Indonesia, paying special attention to the post-2010 eruption events. The study is conducted from a semiotic stance, especially by combining ecosemiotic and cultural semiotic perspectives.

The topic of this study, natural hazards and sociocultural changes, has been an important theme within humanities studies on hazards and disasters since the middle of 1970s. From Oliver-Smith's (1996: 312-314) review, we could identify that the previous studies on this topic were done from anthropology, sociology, archeology, and development and government studies. Related to the location of this research, eruptions and social changes have also been studied by Michael R. Dove, a professor of environmental anthropology (see Dove 2007 & 2008). Unfortunately, this topic is largely unexplored from a semiotic stance. In fact, semiotic studies might enrich the discussion on this topic with a specific point of view on the object of study on the basis of sign relations and processes involved. This study aims to explicate the semiotic character of the cultural changes in the local communities of Mt. Merapi that have been related to the particularities of local environment. I define a semiotic change as a transformation that involves a shift in representation and/or interpretation of both natural and cultural processes. Throughout the text I will also use the term 'culture change', but also in such a case I bear in mind above all the semiotic basis of cultural transformations. For the empirical part of the study, I rely on my firsthand observation and involvement as a volunteer during the emergency period of 2010 eruption, a review of the previous studies about local communities on the slope of Mt. Merapi and fieldwork conducted in the Karang Kendal and Kinahrejo hamlets.

During November - December 2010, I was involved in a variety of activities of emergency responses to the Mt. Merapi eruption. The focus of my work was to be an editor and reporter in an online media, specifically dedicated to the mitigation of the Mt. Merapi eruption disaster. As a journalist, I observed and interviewed many local people, volunteers, donors, and government officers. I moved from one camp to another camp and even occasionally came close to the peak to directly observe the destroyed villages.

Throughout these processes, I collected primary information about the local people who live on the slope of Mt. Merapi.¹

Approximately a year after that, in the first semester of my study in the University of Tartu, I began to read scientific articles about people on the slope of Mt. Merapi, most of which discuss local peoples' response to the previous eruptions. Here, I identified many basic differences between these academic explanations and my experience as a volunteer during the 2010 eruption, concerning especially the responses of local people to the eruption. Most of the previous studies describe the conflict between the local people and the government during and after the eruptions. Throughout the eruption, the conflicts usually occur because people stay in their village and ignore government instructions to evacuate (see for example Lavigne 2008; Dove 2007, 2008; Donovan 2010). The next conflict arises when the government offers the transmigration or relocation program, which means the migration of the local residents to other places outside Java, or relocating them to safer places around Mt. Merapi. Local people usually show a solid rejection in this matter (see for example Laksono 1980, 1985, 1988; Pramono 2012).

In contrast to the previous studies, I found something different was happening after the 2010 eruption. First, many communities in the highest villages evacuated themselves to the lower villages without waiting for the governmental enforcement. Some of them listened carefully to government's announcements regarding the status and activities of Mt. Merapi and obeyed government's orders to evacuate. Second, many local people accepted relocation program that was offered by the government after the eruption; majority of them were willing to leave their villages, occupying a new house in a new place.² Third, some survivors have been able to manage the ruins of their villages as a tourism place for what is

¹ We refer to our work as an alternative disaster-journalism. We use the word 'alternative' to distinguish ourselves as well as to criticize the journalism made by the mainstream media in Indonesia, which stressed the dramatic impact of their news and merely look at the disaster as if 'bad news is good news'. In our journalistic work, there were some basic principles: humanist principle or taking the side of victims, accuracy principle, equality principle or providing the equal space for all parties, commitment to the rehabilitation, and control of the disaster reliefs. There were approximately 40 volunteers-journalists who joined in this work; most of them are university students. This journalistic work is a part of a bigger work that deals with the management of disaster information, which optimizes all media, especially new media, such as mobile phone and social media (twitter and Facebook). We call this big work as '*Jalin Merapi*'. It was initiated in 2006 by several community radios on the slope of Mt. Merapi as a response to Mt. Merapi eruption in that year; during its development it was supported by dozens of civil society organizations; and it had more than 2000 volunteers during the 2010 eruption. The work, including news archives, can be seen at <http://Merapi.combine.or.id/> (Nazaruddin & Habibi 2012).

² In three districts, namely Magelang, Klaten, and Sleman, there were 3,652 families who should be relocated. However, when the program was offered, there were 2,556 families who were willing to relocate; the rest, 1,076 families, did not want to be relocated (<http://www.mediaindonesia.com>).

called a 'volcano tour'. Unfortunately, this new way of responses or adaptations to the eruption has so far received only little attention from the researchers. Therefore, I formulate the research questions of the thesis as follows: How and why do these cultural changes on the slope of Mt. Merapi take place? What kinds of cultural aspects have changed after the 2010 eruption, what still remain the same? How do the local people interpret these changes?

By stating that 'the changes occurred during and after the 2010 eruption', it seems as if I assumed that the eruption was a single cause, or at least the main cause, of these changes. Therefore, I should emphasize here that this is not the underlying assumption of my study. Indeed, many previous studies have shown that the most important factor that shapes social and cultural changes in the communities on the slope of Mt. Merapi is the eruption itself.³ Dove (2008) even states that volcanic eruption has become an agent or catalyst of social change in the communities who live in its slopes by saying "It might be more accurate, therefore, to call volcanic eruptions not agents of change, but 'catalysts' of change" (Dove 2008: 335). However, I would rather assume that changes that occurred in the communities on the slope of Mt. Merapi are the result of dynamic interaction processes between local people and their environment, as well as a reflection of socio-economic transformations and the influences of modern media. Thus, the eruption is only one factor (even if a very important one) in initiating culture change.

However, the answer about how important is the role of eruption in the socio-cultural changes should be based on an empirical research of the changes themselves and not on a theoretical assumption that precedes the research. For that purpose I conducted an empirical study to understand how and why these cultural changes occur, to identify what kind of factors shape these changes and to describe the relationships between these factors in the ongoing cultural changes. This study is based on in-depth interviews and participatory observations. I have completed my fieldwork in Kinahrejo and Karang Kendal from February to April 2013. Participatory observation has been intensively done mostly during February and March 2013 in some occasions, such as daily Islamic prayers in their mosque, weekly Islamic teaching, weekly futsal game by the youngers, their preparations for Labuhan, an annual traditional ritual, and generally their daily activities

³ In general, many studies have shown that a natural disaster is an important factor for socio-cultural changes. Natural disasters are usually followed by basic changes in the society in which the disaster occurred (Oliver-Smith 1996: 312-314).

both in Karang Kendal as their new settlement and in Kinahrejo as their original hamlet that lately has been their workplace. Besides, I also conducted interviews with more than fifteen people, including local residents, activists or volunteers, and experts. Eight residents of Kinahrejo have served as key-informants. They have been chosen with the age factor in mind, since it is one of the important factors that shape the response to the eruption (see Donovan 2010: 122). Each of them was interviewed three to six times, while one interview usually lasted for one to three hours. I have thereby used the format of semi-structured interview (see Annex 1 for the questions).

I should also clarify that ‘the last 2010 eruption’ is not a strict time frame of this study. I use this time boundary since one of the starting points in this study is my previous experience as a volunteer during the emergency period of 2010 eruption. Hence, this study investigates whether these cultural changes happened after the 2010 eruption only, or had already happened after the previous eruptions.

Furthermore, there are some arguments that underlie the selection of the research site. First, the village was completely destroyed by the 2010 eruption. Most of its residents survived because they successfully fled to the lower villages during the eruption, although 37 people were still killed, including Mbah Maridjan, the *juru kunci* or Mt. Merapi “guardian” at that time, who was late to move down. Second, I suppose there is a strong traditional belief among its residents, due to the presence of the *guardian* as the representative of Yogyakarta Kingdom among them (see Lavigne et al. 2008: 280), whether Mbah Maridjan who died in the eruption, or his son, Pak Asih (Mr. Asih), who was later elected to replace his father. Third, they showed a unique post-disaster adaptation, namely opening and managing the ruins of their broken-village as a tourism place. They also demonstrated a specific response towards the relocation program offered by the government. Instead of refusing the relocation program, they relocated themselves independently so they could legally own their old village, and then build it up as a disaster tourism village. In everyday life, most of them spend their days in their old village, Kinahrejo to work in their new tourism village, such as opening kiosks, selling souvenirs, managing parking areas, providing jeep or motorcycle service for tourist to go around the villages. At night, they stay in their new dwelling, Karang Kendal. Therefore, this study takes these two locations as the research sites.

This thesis is divided into three chapters. The first chapter contains the theoretical perspective of this study, especially how this study combines the ecosemiotic and cultural semiotic point of view to study hazard and disaster. The second chapter discusses the cultural changes that happened during the 1980s and 1990s , mostly based on the findings of the previous studies that have been reviewed, reread, and analyzed using a semiotic point of view. The third chapter discusses the cultural changes during the 2000s and 2010s, especially after the 2010 eruption, which is based on my fieldwork in Kinahrejo and Karangendal (hamlet or sub-village), Umbulharjo (village), Cangkringan (sub-district), Sleman (district).

1. Theoretical perspective: Cultural and ecosemiotic grounds for disaster research

In certain areas of the world natural disasters are constantly encountered by humans. Smit (2003: 97) even stated: “They are part of nature, have happened in the past and will happen again [...]” In many instances, disasters fundamentally change the relationship between nature and culture, force people to rethink their relationship with the environment (Hewitt 1983). Several classic studies have revealed the collapse of some civilizations because of disasters that befell them (see for example Crosby 1967). Until nowadays, disasters, especially natural disasters, are still threatening modern civilization.

Unfortunately, it can be said that the scientific studies of natural disaster has still lagged behind. Within the humanities, anthropology began to examine disasters since the 1950s. At that time, the studies were only conducted by chance, which means that anthropologists examined the disaster because it happened at their research sites where they were doing research. Thus, there is a very wide gap between intellectual analyses on the one hand and mitigation practices on the other hand (Blaikie 2002: 299).

Oliver-Smith (1996) has written an overview of hazards and disasters studies within humanities, particularly anthropology. He has classified disaster research into three groups, namely: “(a) a behavioral and organizational response approach, (b) a social change approach, and (c) a political economic/environmental approach, focusing on the historical-structural dimensions of vulnerability of hazards, particularly in the developing world” (Oliver-Smith 1996: 303). The first academic journal about disaster “Disasters: The Journal of Disaster Studies, Policy and Management” was published in 1977. In 2012 “International Journal of Disaster Risk Reduction”, the newest journal in the scope of disaster studies was launched.

Focusing on the site of this study, Mt. Merapi is a “well-used natural laboratory” (Voight et al. 2000). It has been much studied by various experts from volcanology, anthropology, geology, and some other related fields. Previous studies, especially in the social sciences and humanities, have focused on several dimensions, i.e. perceptions, responses, and adaptations of local people to the eruptions (Hudayana 1993; Hudayana et al. 2012; Lavigne et al. 2008; Dove 2007, 2008; Donovan 2010), the communities versus

government conflicts, including the problem of transmigration (Laksono 1980; 1985, 1988; Singarimbun 1980; Pramono 2012), cultural beliefs in the local communities (Schlehe 1996; Triyoga 1991/2010⁴; Minsarwati 2002), post-disaster social changes (Dove 2007, 2008; Dove & Hudayana 2008), ecological and agricultural systems on Mt. Merapi (Pranowo 1985, 1987; Dove 1985, 1987; Hudayana 1987; Humaidi et al. 2012), power relations and surveillance on Mt. Merapi (Dove 2010), crisis management during the disaster (Mei et al. 2012), disaster discourses (Schlehe 2008), the role of media during the eruption period (Nazaruddin & Habibi 2012), and the representation of eruption in the Indonesian media (Ahimsa-Putra 2000).

Some important notes about these previous studies should be made here. First, most of the studies mentioned above were conducted from the 1980s to the 2000s, in which the memorized eruption occurred in 1994 and 2006. As exception, there are two previous studies that discuss the phenomena during and after the 2010 eruption, i.e. a research that describes local communities responses to the last eruption (Hudayana et al. 2012), and a study about crisis management during the 2010 eruption (Mei et al. 2012). The research conducted by Hudayana and his colleagues in the Department of Anthropology Gadjah Mada University, is highly relevant to this thesis. Unfortunately, because of the vast scope of the study sites which covers 30 villages, the report merely describes the current condition of the local communities on the slope of Mt. Merapi and the types of their responses to the last eruption and is not accompanied by theoretical discussion of the findings. However, this rich-data study is very useful for my thesis, especially as a starting point for understanding the current condition of the communities on the slope of Mt. Merapi. But it must be clear here that my thesis is different from this research in terms of the research questions.

Second, the thematic mapping of the studies conducted on Mt. Merapi that I described above is not a strict categorization. In fact, these studies usually intersect with each other. The study that addresses the local community's perceptions and responses to the eruption usually point out the local beliefs, conflict with the government, or the agricultural system practiced by the local (for example, see Lavigne et al. 2008, or Donovan 2010). Similarly, studies that focused on post-eruption social changes usually

⁴ Triyoga's study was published as a book in 1991. In 2010, the book was reissued by different publisher with a different title, without any substantial changes in the content, except for a little addition placed as an epilogue that discusses the last 2010 eruption. In this thesis, I refer to the last issue of 2010.

describe the religious dimensions of local people, or their agricultural system (for example, see Dove 2008), while, the ecological studies of local communities usually discuss their conflict with the government (for example, see Pranowo 1985).

From this resume, we could say that the theme of cultural change has been studied by Michael R. Dove, particularly the changes following the 1994 eruption (Dove, 2007, 2008, Dove & Hudayana 2008), and mentioned at a glance in other previous studies. However, neither of these studies had used a semiotic perspective, with an anthropological perspective being predominant. Discussing more general, there are only three semiotic studies about natural disaster, which seek to develop the semiotic model of disaster (see Chang 2006, Kim 2006, Marimoto 2012) and they are limited to theoretical works, not based on empirical research about certain catastrophic events. In this context, a basic question could be proposed: what kind of knowledge could the semiotics approach add to the disaster studies? Basically, as I have said in the introduction, semiotic studies could enrich the discussion on disaster within humanities and social sciences by explaining how the semiotic processes mediate between the cultural and natural processes and between different social domains related to the disaster itself.

For that reason, this chapter provides a theoretical perspective for the thesis and explains the contributions of semiotic to disaster studies in a more detailed manner. I argue that semiotic studies to disaster could be done by combining cultural semiotic and ecosemiotic approaches. There are three theoretical frameworks that I propose for that: ecosystem as a semiotic system, disasters as sign processes, and the totality of human sign systems within an ecosystem as a semiosphere.

1.1. Ecosystem as a semiotic system

The ecosemiotic basis of this study lies on an assumption that ecosystem is constituted by sign systems (Kull 2010: 347-357). In this perspective, human sign systems are parts of the ecosystem as are the sign systems of other organisms. Every organism exists in its umwelt or species-specific subjective world, by virtue of which it could perceive and interpret the world around it (Uexküll 1982: 25-82). The objects, which are similar in one umwelt, may simply be distinguished in another umwelt, as well as can be unperceivable in a different

umwelt (Maran 1999: 144). In this notion, interactions between organisms, or between organisms and their environment, are not merely material relations, but also sign relations. Thus, we may view these relations, including human relations with his/her environment, as semiosis, defined as “sign process; the creation, action, and interpretation of signs” (Emmeche, Kull, Stjernfelt 2002: 29). This assumption is in accordance with ecosemiotics as “the study of the *semiotic* interrelations between organisms and their environment” (Nöth 1998: 333).

I define sign in this study in Peircean definition as “something which stands to somebody for something in some respect or capacity” (CP 2:228). This definition has been suggested by Nöth (1998: 337) as able to recognize semiotic relations between organisms and environment. In this Peircean perspective, the semiotic relation between organism and its environment is always a triadic relation, in which the organism experiences its environment not as a brute fact, or as an immediate dyadic organism-environment relation, but as a meaningful object. Organism interprets its environment with reference to the third, that is a ‘meaning’ (Nöth 1998: 337).

Referring to the relationships between organisms that underlie ecological processes, Alf Hornborg (2001: 125) has stated:

An ecosystem is not a machine, where the various components mindlessly fulfill their functions as a reflection of the external mind of the engineer. Ecosystems are incredibly complex articulations of innumerable, sentient subjects, engaging each other through the lenses of their own subjective worlds.

In these complex connections between different subjects, human sign systems are an inseparable part of ecosystems. This study assumes that Mt. Merapi ecosystem is constituted by complex sign systems, in which human sign systems play a major role. The role of human sign systems in the whole ecosystem of Mt. Merapi is thereby the focus of this study. Hornborg (2001) has given a good example of the Amazonian ecosystem, in which human sensory signs, linguistic signs, and economic signs are constitutive of the Amazonian ecosystem. Hornborg (2001: 127) thus stated “[...] the cultural predilections of human beings leave their marks even in the most “natural” of environments.”

Such a focus on human sign systems and not on the other organisms' sign systems, suggests that this study could be classified under cultural ecosemiotics.⁵ Thus, Kull's definition (1998: 350) of ecosemiotics as "the semiotics of relationships between nature and culture" is specifically more suitable for this study than Nöth's definition as cited beforehand. Kull (1998: 351) has explicitly said: "Ecosemiotics can be considered as a part of the semiotics of culture, which investigates human relationships to nature which have a semiotic (sign-mediated basis)". But also later clarifications of the object of ecosemiotics, which stress that humans as well as other subjects are to be considered as active subjects in this field serve as a theoretical basis of the current study (cf. Maran 2007: 278).

The next ecosemiotic basis is the assumption that the interaction patterns between human and environment vary from one place to another. The same natural event, which occurs in different places, may be interpreted differently. Here, we should take into account the concept of locality as a very important characteristic of the semiotic relations in the ecosystems. Maran (2002: 70) has defined locality as "the characteristic of semiotic structures by which they merge into their surroundings in such a way that they cannot be separated from their environment without significantly altering their structure or information contained in this structure."

In this definition, locality binds cultural and environmental semiotic processes. On one side, environment prescribes the subject some basic features, to what the subject should adapt and designate reflexive meaning. On the other side, the subjects could generate certain meaning to environmental features surrounding them, as well as could change these features. So, if the environmental features are different, the meaning system will be also different (Maran 2002: 71).

Further, the structure of the relations between culture and its environment will be the basis for the cultural identity (Ingold 1993). It is noticeable in many local cultures, in opposition to the global culture, that their identities are characterized by being intertwined with their own environment (Maran 2002: 76-77). These cultural identities have been constructed through a long period of adaptation to the environmental processes. During this long adaptation, individuals learn many features and information that connects them to their environments, whereof they could understand, interact and predict environmental

⁵ Noth (2001: 72-740) has identified two ways of ecosemiotics study, namely cultural ecosemiotics and biological ecosemiotics. The former studies how nature is interpreted from cultural perspective, and the later views the semiosis in nature as phenomena in their own right (see also Kull & Noth 2001: 9).

processes. Here, local environment has been included into cultural memory and reflected in many cultural texts, such as literature, art or myths (Schama 1995, via Maran 2002: 78). Thus, cultural identity and self-description cannot be fully separated from the environment where they have arisen.

1.2. Disasters as sign processes

When taking ecosystem as a set of sign systems, disasters could be regarded as sign processes. It could be discussed further by firstly defining disaster itself. United Nations has defined disaster as “a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources” (UNEP 2008: iv). Meanwhile, according to Oliver-Smith (1996: 305):

Recent perspectives in anthropological research define a disaster as a process/event involving a combination of a potentially destructive agent(s) from the natural and/or technological environment and a population in a socially and technologically produced condition of environmental vulnerability. The combination of these elements produces damage or loss to the major social organizational elements and physical facilities of a community to the degree that the essential functions of the society are interrupted or destroyed, which results in individual and group stress and social disorganization of varying severity.

Discussing specifically natural disaster, Pelling (2003: 4) defines natural disaster as “shorthand for humanitarian disaster with a natural trigger.” He continues: “Whilst physical phenomena are necessary for the production of natural hazard, their translation into risk and potential for disaster is contingent upon human exposure and a lack of capacity to cope with the negative impacts that exposure might bring to individuals or human systems” (Pelling 2003: 4).

From the definitions above, we may distinguish two important levels. In the first level there’s an event happening in a certain place, whether natural, social, technological, political, or a combination of them. In the context of natural events, we could give examples such as volcanic eruptions, landslides, earthquakes, tsunamis, hurricanes, and others. Then in the second level, this event becomes a sign as long as it has influence on human culture. In this level, by virtue of its negative impact and the lack of capacity of

human beings to cope with it, it would be translated or interpreted as a disaster.⁶

Thus, by virtue of its destructive dimensions, disaster will change the whole ecosystem and the semiotic structures between nature and culture. We may also regard a disaster as an abrupt event that fundamentally changes the cultural identity (Maran 2002: 76). Almost all studies about disaster have demonstrated that disasters always affect some specific responses and changes, both in the individual, group, or other structural levels (see Oliver-Smith 1996). However, these changes really depend on the context and locality.

In this way of thinking, ‘disaster’ is only one way how to interpret an event. It means that there are other ways to interpret the same event. Whether humans interpret the natural event as a disaster or whether they provide some other interpretations depends on the particular relation between nature and culture. Within a culture that strictly holds to the dichotomies between culture and nature, the natural disaster would be viewed as a natural phenomenon, not a cultural phenomenon. In this logic, it would be named as disaster. In contrast, within a community that does not make strict distinctions between nature and culture, human life would be closely interrelated to the nature around them, with the whole ecosystem. In such a case the natural event, even if it has a negative impact, is not always interpreted as disaster. We could find several examples that demonstrate how local cultures have adapted well and related to the immanent hazards in their environments. Such a unique adaptation prominently happens in the disaster-prone areas, where the disaster happens periodically with high intensity, such as earthquakes in Japan, three to five years’ eruptions of Mt. Merapi Indonesia, or annual floods in some countries like Bangladesh. In these cases, local communities usually have established specific patterns of adaptation to the disasters that regularly occur in their environments. They have their own explanation on how and why the disaster happens. They have their own approach on how to respond to the disaster, what actions should be taken and what should be avoided. Watts (1983: 252) states that the community’s capability to cope with hazards in the environment is rooted in their social relations of production. Bankoff (2004: 111) has also emphasized: “In some societies, natural hazards occur with such historical frequency that the constant threat of them has been integrated into the schema of both daily life and attitude to form what can be called ‘cultures of disaster’.” Here, the disaster confirms and strengthens the existent of

⁶ Hewitt (as cited in Oliver-Smith 2002: 25) has distinguished three types of disaster: natural disaster, which consists of atmospheric, hydrological, geological, and biological disasters; technological disaster; and social disaster, such as war, terrorism, social conflict, and so on.

cultural identity.

Furthermore, many studies show that a natural event which is defined as a disaster by many outsider parties, is often not perceived as a disaster, or not merely as a disaster by local people (Bankoff 2004: 110; Dove 2008: 326). Thus, hurricanes, floods, volcanic eruptions, landslides, or other natural phenomena, which we usually define as disaster, are not always perceived as disaster by the insiders. In the Southeast Asian cosmologies, the catastrophic natural events are also usually interpreted as signs of other phenomena, such as the divine destiny or spirit world, whereby the disaster is often understood as a warning or a destiny from God (Chester 2005; Dove 2010: 121-122). So, we may say that natural event (disaster) does not carry a single-level meaning, but rather entails possibilities for multi-level significations in different sign systems.

1.3. Human sign systems as a semiosphere

Another theoretical perspective that I apply in this work is semiosphere, an abstract model in which semiosis occurs and outside of which semiosis cannot exist. According to Lotman (2005: 205):

There exists boundary between the semiosphere and the non- or extra-semiotic space that surrounds it. The semiotic border is represented by the sum of bilingual translatable “filters”, passing through which the text is translated into another language (or languages), situated outside the given semiosphere. The levels of the semiosphere comprise an interconnected group of semiospheres, each of them being simultaneously both participant in the dialogue (as part of the semiosphere) and the space of dialogue (the semiosphere as a whole).

Within an ecosystem, the totality of human sign systems could be considered as a cultural semiosphere. In this notion, whether a natural event is interpreted as a disaster or not, depends on the presence of the dichotomies between nature and culture. In many traditional societies, in which the nature-culture distinction is not built on strict dichotomies, the cultural reading to the catastrophic events is an integral part of the culture as a way to interact with the environment. By this I mean that a catastrophic natural event belongs to internal semiotic space (see Lotman 2001: 123-130), whereby the local people always try to make sense of it or to provide meaning to it, and then generate certain proper response to it. Obviously, it is an “I to I” communication or autocommunication, by which

the given culture communicates with its environment as an integral part of culture itself (Lotman 2000).

On the contrary, in modern societies, in which nature is excluded from culture, the natural catastrophe is considered as a foreign sign. Thus, the communication between the people and the disaster is "I to you" communication. It confirms Maran's idea that texts of nature are similar to foreign cultural texts imported from other cultures, or to historical texts that have been long forgotten and then retrieved (Maran 2010: 81). The reading of disaster as a foreign text could also happen due to the lack of social memory of certain type of disaster, such as a huge tsunami disaster in Aceh and South Sumatera, Indonesia, in the end of 2004. For the local people it was something foreign and incomprehensible as a text, showing that the locals had forgotten the previous tsunami over a century ago (Donovan 2010: 118). Here, I would rather say that how the natural catastrophe is perceived depends on the real cultural and historical contexts— it could be read as a foreign sign as well as internal sign.

Moreover, in the increasingly mediated and globalized world, the disaster does not happen in isolation, as if only local people experience and respond to it. It is a regional, national, or even international event depending on its scopes and effects. Usually some external parties come to the disaster field, such as government, donor, and mass media. Theoretically, their presences also means the presence of new perspectives, even new semiosphere, in the disaster field. We should posit them as the external actors, who have their own semiospheres, which differ from each other. Media has its own semiosphere, perhaps centered on its nature as a profit oriented institution. Government has its own semiosphere, maybe characterized by their position as a supreme regulator of public affairs, and similarly donors also have their own semiosphere. This phenomenon would form the complexity of semiospherical interactions within the disaster field.

In the view of these external parties, disaster is not an original part of their semiosphere. Here, disaster is a foreign sign, which attracts attention from the side of these outer semiospheres and initiates communication processes. Therefore, as a new part of the outer semiosphere, disaster should be interpreted, reconstructed or modified according to the core and center relations of the given semiosphere. Generally, it could differ from the local culture's semiosphere, in which the environment and its disaster has already become an original part of it, forming often the core of the semiosphere. The semiospherical

differences between the local people and the external parties may become an important feature to explain many conflicts that often occur between them, especially between the local people and the government (Oliver-Smith 1996: 309-310, Dove 2008: 330).

The use of semiosphere as a theoretical perspective implies some more analytical perspectives that should be taken into account in this study, these are: holism, dialogism, and hierarchy (cf. Torop 2005). The first principle is perhaps the most important, differentiating it from other models of semiotic analysis, which tend to analyze the small and discrete text in its individuality as the object of study. Semiospherical understanding regards culture as a large text, a big bundle of semiotic system that should be understood in its wholeness. Portis-Winner (1999: 36) stated: “Lotman’s term *semiosphere* subsumes all aspects of semiotics of culture, all the heterogeneous semiotic systems or “languages” that are in constant process of change and at a deep level have some unifying qualities.” In the methodological level, Geertz’s concept of ‘thick description’ is very relevant, referring to the capacity of the researcher to identify these distinctions and then reconstruct the whole picture on the basis of very heterogeneous, discrete or ambivalent data (Geertz 1993: 10).

The second characteristic is the dialogue that exists in every semiosphere, underlying its ontological nature. A dialogue could take place between one semiosphere and another semiosphere, between the part and the whole, between different periods of time (diachronic dialogue), or even within one semiosphere. Hereby the boundary of semiosphere is very important, in which the semiosis or dialogue happens more actively, by the help of which the semiosphere can translate external messages into internal language and vice versa, and establish contact with another semiosphere (Lotman 2005: 210-212).

Dialogism is related to the basic perspective of this study that views ecosystem as composed of the subjects and sign relations between them. Here, I should emphasize the characteristics of the dialogue between subjects and their environmental semiotic structures. On one side, subjects actively inhabit, interpret and transform the environment. On the other side, the semiotic structures that exist in the ecosystem, guide, limit, and regulate the subjects’ actions. This ontological understanding importantly influences the epistemological awareness, as Torop (2006: 308-309) has claimed:

Each semiosphere can be analysed as a single whole, yet we need to bear in mind that each analysed whole in culture is a part of a greater whole, which is an important methodological principle. At the same time, every whole consists of parts, which are legitimate wholes on their own, which in turn consist of parts, etc. It is an infinite dialogue of whole and parts and the dynamics of the whole dimension.

Fundamentally, the researcher recognizes that the epistemological relationship also means semiospherical relationship, in which his/her semiosphere should be in dialogue with the studied object's semiosphere. It means that one should not only think about how to treat and analyze the object of study, but also how to be in a dialogue with them, which requires 'the need' and 'the will' to establish the dialogue itself. As emphasized by Lotman (2000: 143-144): "[...] the need for dialogue, the dialogic situation, precedes both real dialogue and even the existence of a language in which to conduct it." Similarly, Piatigorsky has underlined the definition of culture could not be separated from the researcher, since culture is a text as well as a metatext (Piatigorsky 1996: 55, via Torop 2006: 303).

The third characteristic, that is hierarchy, is closely related to the previous characteristic. We will recognize it through the centre-periphery notion as has been emphasized by Lotman in many of his writings (e.g. Lotman 2005: 205-229). Obviously, there is a hierarchical order between centre and periphery, by which the centre will dominate and determine the characteristics of the semiosphere. According to Tynianov (as cited in Torop 2003: 329), a system is not reciprocally or evenly influenced by all the elements; some elements have greater roles than others, and it is through the dominants that a work gains its importance. It seems that we could regard the centre as the dominant as introduced by Jakobson (1981).

However, at the same time, opposition between centre and periphery also means dialogue between them, which leads to self-communication within semiosphere. The autocommunication then becomes the basis for self-description, or we may say that autocommunication itself is already self-description, which is the basic mechanism of semiosphere. Lotman (as cited in Torop 2011: 24) has thus stated: "Self-modelling is a powerful means for the 'end-regulation' of a culture, attributing to it a systematic unity and largely defining its quality as a reservoir of information."

2. Natural conditions and semiotic changes on Mt. Merapi in the 1980s and 1990s

This chapter is devoted to the description and analysis of human sign systems within the ecosystem on Mt. Merapi, which had existed for a long time until the seemingly rapid changes of them during the last two eruptions in 2006 and 2010. Generally, this chapter is based on the review of previous studies that is one of the important sources for this study. But since many informants in the fieldwork often talked about their past experiences before the last eruption, I also use the fieldwork sources in this chapter. Basically, in this chapter, I demonstrate how the cultural changes have already been shaped by long-term historical processes of the communities on the slope of Mt. Merapi and not only by the last eruptions.

2.1. Mt. Merapi and its eruption cycles

Mount Merapi (2965 m) is a type of strato-volcano, which has some characteristic features, namely steep slopes, periodic eruptions, stack of materials around the crater, causing the unstable-crater and making it prone to landslides at any time, especially in the rainy season. Merapi volcano is the most active volcano in Indonesia, with over 23 eruptions in the last 100 years (Voight et al. 2000). Thus, it is often called as the most dangerous volcano in Indonesia. This volcano erupts effusively (non-explosive) roughly every 3.5 years, explosively every 8-15 years, and violently every 26-54 years (Thouret et al. 2000). Administratively, Mt. Merapi is located in the borders of four districts which belongs to two provinces in Indonesia, i.e.: Sleman (Yogyakarta Special Province), and Magelang, Boyolali, Klaten (Central Java).



Figure 1. The location of Mt. Merapi on the map of Indonesia (source: <http://rovicky.wordpress.com>). The red line is my personal addition in order to emphasize the position of the research site.

In general, as perceived by local villagers, Mt. Merapi has three kinds of volcanic hazards. The first is the most feared, called as ‘*wedhus gembel*’ (Javanese) or ‘*awan panas*’ (Indonesian); the pyroclastic flows consisting of spinning clouds of super-heated gases (more than 200 Celsius degree) that could fall to the slopes at speeds of 200-300 km/h. In a major eruption, it comes out from the crater with the thunderous sound that could be heard clearly by people living up to 20 kilometres from the summit. Shortly after coming out, it carried up to the sky or down to the slopes by the wind. The second is ‘hot lava flows’ (*lahar panas*), coming out from the crater of Mt. Merapi, also accompanied by thunderous sounds, then flowing down the slope, usually through canyons and rivers that are already used to track the lava. The third hazard occurs when the hot lava mixes with rainwater, called ‘cold lava flows’ or ‘*lahar dingin*’, which would normally flow through the rivers that disgorge at the peak of Mt. Merapi (Dove 2008: 331; Hudayana 1993: 10-11). There are thirteen rivers on the slope of Mt. Merapi, which used as the path of lava. These rivers are Woro, Gendol, Kuning, Code, Bebeng, Boyong, Krasak, Batang, Putih, Lamat, Blongkeng, Senowo, dan Pabean.

Mt. Merapi has a very long history of eruptions. Unfortunately, the ancient histories of its eruptions were unexplained due to lack of historical records. The oldest record notes that a large eruption has happened 7000 years ago, or probably between 10.000 and 12.000 BP, when a lake shaped around the present Borobudur temple (Newhall et al. 2000; Gomez

et al. 2006, via Lavigne et al. 2008: 280). Kartakusumah (1983: 169) who observed one of the pyroclastic sediment argues that it should be approximately 1900-year-old. The Dutch historian, RW van Bammelen, proposed a theory that the 1006 eruption had destroyed the Hindu Mataram kingdom during the reign of Wawa, therefore the kingdom was moved to East Java (Decker and Decker 1997).

The huge numbers of victims have been recorded following many eruptions. For example, the 1672 eruption has claimed 3000 human victims. Two centuries later, in 1872, Mt. Merapi erupted and destroyed three villages and caused 200 human deaths. In 1930, this volcano erupted again, claimed 1300 human lives, destroyed many villages and thousands hectares of fields and forests. Then, the 1994 eruption killed 69 people at Turgo village and made 2000 people homeless (Thouret et al. 2000; Schlehe 1996).⁷ The two last eruptions were also deadly; the 2006 eruption killed two people and totally destroyed Kaliadem village; and the 2010 eruption was more deadly — it killed 386 people in Yogyakarta and Central Java, ruined some villages, and more than 15.366 people had to be evacuated (Hudayana, et al. 2012: 36).

2.2. Adaptation patterns as sign systems

Clearly, the slopes of Mt. Merapi are not appropriate for human settlement. In fact, in 2008, according to the National Disaster Management Agency (NDMA, or BNPB in Bahasa Indonesia), the total population in the whole disaster-prone region is 94,225 people, spread across several sectors, i.e. 51,228 people in the southern sector, 40,209 people in the western sector, 1,419 people in the northern sector, and 1,369 people in the eastern sector (Hudayana et al. 2012: 73-74). Moreover, considering the possibility of a large eruption, Lavigne said that in 1995, there were more than 1.1 million people in 300 villages located on the flanks of this volcano. Among them, 440.000 people were at high-risk areas, which are prone to pyroclastic flows and lahars (Lavigne 1998: 280). This raises a question: what kind of factors drive people to dwell in this dangerous place?

⁷ A brief description of Mt. Merapi's long eruptive history was described in the Merapi Special Issue of the Journal of Volcanology and Geothermal Research (2000, vol. 100).

Even if we put this phenomenon into a broader context, the context of the Javanese culture for example, it is still not easily comprehensible. Clifford Geertz states that the Javanese, especially *abangan* groups, understand the spirit world as inhabited by many kinds of *makhluk alus*, whose world is similar to human world.⁸ Geertz concludes: “The spirit world is the social world symbolically transformed: the *prijaji* spirits lord it over *abangan* ones, Chinese spirits open stores and exploit the natives, and *santri* spirits will spend their time in praying and thinking up ways to make things difficult for unbelievers” (Geertz 1960: 28). The *abangan* believe that, when people open a new place for their dwelling, the spirits who previously lived in the place will move to the peripheral places, such as to the forests, hills, or mountains. So, according to the *abangan*, forests and mountains should not be used as human settlement, since these are the centres of the spirits world.

At this point, the local people on Mt. Merapi show conformity, as well as nonconformity in respect with the *abangan*. On one side, they accept the *abangan* beliefs that the mountain is the centre of spirits world; but on the other side, they demonstrate dissent solution compared with the *abangan*, as they have opened the forests on the slopes of mountain as their home. In this notion, we could regard them as a subculture of broader Javanese culture, and the *abangan* may be regarded as a parent culture.⁹

In this notion, the local terms, such as ‘*wong gunung*’ and ‘*wong Merapi*’ are very important. ‘*Wong gunung*’, literally means ‘mountain people’ and is a common name for people who live on a mountainside in Indonesia (particularly in Java Island), especially in the highest villages. While, ‘*wong Merapi*’ is a specific name for the people who live in the highest villages on Mt. Merapi. The people call themselves as ‘*wong gunung*’, as well as local people on Mt. Merapi name themselves ‘*wong Merapi*’.

⁸ Clifford Geertz (1960), in his classical research about Javanese religion, has distinguished between three groups in the Javanese based on their religious beliefs, namely *santri*, *priyayi*, and *abangan*. The *santri* is a group that adopts the Islamic teachings as their religious views and implements Islamic laws in their daily lives. The *abangan* is a widespread belief among ordinary people, which syncretizes animism beliefs with Hinduism, Buddhism, and Islam, with such strong beliefs about spirits. Meanwhile, the *priyayi* is an elite aristocratic group, who has its own religious belief, which could be differentiated both from the *santri* and the *abangan*.

⁹ The concept of parent culture was actually proposed by Cohen (1997) in 1972 that worked within the traditions of CCCS Birmingham. It refers to the working class as the parent culture, and the young people among them who solve their problem through leaving their original community as their children (see also Gelder 2007: 88). In this study, I use this concept in a more general meaning, referring to the original culture, from which a subculture arises.

As a subculture, *wong Merapi* has developed sign systems that are different from Javanese culture in general. These new sign systems are essential because they live in a different environment in comparison with the Javanese people in general. Javanese people live on flat, wet and fertile lowland, while they dwell in the bumpy, dry and less fertile mountain slopes and encounter periodic eruptions. So, they had to build certain distinctive ways to communicate and interpret their environment, in order to become an integral part of the environment itself. In other words, *wong Merapi* have to establish new sign systems in order to adapt to the different environmental conditions.

From the previous studies, I have found two important human sign systems, which perform vital roles in the ecosystem of Mt. Merapi. These two systems are the magical sign system and economic sign system. At this point, I should clarify that the previous studies did not call these two points as sign systems, but they often called them as the adaptation of the local people to their environment. These two patterns of adaptation, magical beliefs and economical-ecological adaptation, become the main explanation, why '*wong Merapi*' choose to live in such dangerous area.

Some previous studies also related these two patterns of adaptation with the conflicts that occur between the local people and the government, which usually happen during and after the eruption. In the time of crisis, the conflict usually occurs because people stay in their village and ignore government instructions to evacuate. In many cases, they were finally evacuated by force. Some time after the eruption, usually when people are still in the temporary shelters, the next conflict arises when the government delivers the transmigration discourse, that means migrating the local residents to other places outside Java. The eruption becomes a justification for the government to say that the existing villages occupied by the residents are unsafe; therefore they should be vacated, and then the inhabitants should be moved to another location that is more secure. In this matter, local people usually show a solid rejection.

In addition to these two sign systems, I believe that there are other sign systems, namely sensory and political sign systems, which are quite important in the ecosystem of Mt. Merapi, but are rarely mentioned in the previous studies. The presence of other sign systems of '*wong Merapi*' that remain unexplained is still possible.¹⁰ But at least these four

¹⁰ An interesting example of another sign system that has not been explored in this study is an aesthetic sign. It is closely related to the emergence of volcano tourism on the slope of Mt. Merapi since 2006 eruption that relied on the eruption debris. For the visitors, it is obvious that the eruption debris is an aesthetic sign. But, in

points: sensory signs, magical signs, economic signs, and political signs are vital signs that are constitutive in ecosystem of Mt. Merapi. Theoretically, we can imagine that the totality of these human sign systems forms a cultural semiosphere on the slope of Mt. Merapi, which is unique and specific, based on locality of Mt. Merapi ecosystem, which distinguishes it from Javanese semiosphere in general. There are several dominants or centres of this cultural semiosphere of Mt. Merapi, such as *'ilmu titen'* as the centre of sensory sign system, ritual as the main signifier of magical sign system, maize and cow as the main signifiers of economic sign system, and hamlet as the main political unit in the political sign system.

2.2.1. Sensory signs

Wong Merapi interact with their environment via visual, auditory, tactile, and other senses. Basically, they believe that all nature is alive: water, earth, mountains, plants are living subjects. In this belief, human being is only one subject that should live in harmony with other subjects for the balance of the ecosystem. For example, *wong Merapi* consider that land is alive, but it can die if it is overexploited, which they then usually called the barren field *'siti pejah'* (dead ground). Moreover, local people believe that nature has the ability to communicate, or to convey signs to human. Grandfather Wignyo Suprpto (73 years old) gave an example: "If *prenjak* bird sings, the singing is very brief, just two or three whistles, it means that there is relative who died." Grandfather Wignyo thus asserted in the interview: "Everything is a sign. The problem is whether human is capable or not to interpret the sign." Following Winfried Nöth's classification of historical models between nature and culture, this perspective is an example of the pansemiotic model, where nature is seen as semiotic throughout. The natural signs that humans perceive from the environment are in such a case messages released by god or any other supernatural power (Noth 1998: 334).

this study, I did not find any data to make conclusion that this aesthetic understanding also exist within local people.

These sensory signs were very prominent when the informants talked about the eruption. *Wong Merapi* are used to read natural signs to interpret the behaviour of Mt. Merapi, especially when its activity increases. They would be wary or even move down to the more secure villages if they see the animals running down, birds flying in unusual direction, hawks circling near the crater, if air feels hot, or due to other natural signs. They really trust the signs and they have such knowledge to understand the environment in their own way. As an example, after the 2010 eruption occurred, only a few hours later the local people dared to go back to their devastated villages to evacuate the victims, although with improper tools. When I asked why they were not afraid of eruption materials that were still very hot, Ngatimin (35) answered: “We know which are still hot, which would instantly cool when it gets to the ground.” Then, when I asked him to explain the differences of the ashes, he replied: “It is hard to explain, the names vary, such as *bledug*, *awu*, *krikil*, *krakal*, *watu*, and others. But, sometimes the name is the same, *awu*, although we can distinguish many kinds of *awu*. We are able to differentiate; this is cool, safe to be stepped on; while that one is still very hot. But it is hard to explain.”

Then, how were these sensory signs formed? I got one common answer when I asked the local people how they could understand these natural signs, namely ‘*ilmu titen*’, literally means ‘*titen* knowledge’. It refers to the local peoples’ method to investigate their environment, by which they do a scrutiny, cautious and persistence observation with their physical senses, from one event to the next events, from one phenomenon to the other phenomena, until they can find a pattern of relationships between phenomena. Then, this knowledge is passed on through the generations, and it is usually strengthened by the everyday experiences that confirms its truth. For example, grandfather Wignyo (73) explained: “It is true, I had it twice proved. I heard the *prenjak* bird singing very briefly near the house, and there was my relative in Klaten who had passed away.” Thus, ‘*ilmu titen*’ is an indigenous method in the Javanese culture, based on human senses, which has been established, inherited and learned through generations, and which is equivalent to the inductive logic of the scientific method.

2.2.2. Magical signs

In addition to believing that nature is alive, *wong Merapi* also believe that the place in which they live in is also inhabited by various kinds of *makhluk alus* (spirits or unperceivable creatures). They believe that Mt. Merapi is not just a mountain, but also a kingdom of spirits, where the crater is the palace of this kingdom. So, they consider the crater of Mt. Merapi as '*kraton makhluk alus*' (the palace of the spirits). The life of spirits resembles human life. They also have a social structure, division of labour, government, and so on. The residents can usually name the king and some of the officers or leaders in this kingdom (Triyoga 2010: 56-70; Schlehe 1996: 404; Dove 2008: 332; Donovan 2010: 122; Hudayana 1993: 13; Minsarwati 2002: 52).¹¹

The spirits can be disruptive to human life, but can also be the helpers or positive companions. People therefore should live in harmony with them, not provoke conflicts with them. To express this will of harmony, villagers then periodically conduct '*slametan*' (traditional Javanese ritual). By performing the rituals and avoiding some taboos, residents feel safe living on the slopes of Mt. Merapi because they have become good citizens of '*kerajaan makhluk alus Merapi*' (Triyoga 2010: 105; Donovan 2010: 122; Lavigne et al. 2008: 281; Hudayana 1993: 17).

When the 2010 eruption occurred, local residents believed that the eruption was actually a process of maintaining and cleaning the spirit's palace, which is done periodically every year in '*wulan suro*' (the first month in Javanese-Islamic calendar). Volcanic ash or lava that flowed out from the peak is believed to be the trash from this activity. A large eruption was usually regarded as the '*hajat*' (ceremony) being conducted in the spirit's palace, such as wedding ceremony of its family. In regard to this event, local people usually say "*Merapi duwe gawe*" (Mt. Merapi is having a ritual). Then, the villagers believe that the spirits cause damage in their crops, as they are borrowing their crops for their ceremony, which would be returned soon in greater numbers (Triyoga 2010: 83-84; Hudayana 1993: 14).

¹¹ I have to note that in many sides of the slope of Mt. Merapi, local people have a little bit different features of this cultural beliefs, such as different understanding in the origin of the spirit, the kingdom, and their ancestor; different names of the spirits, including name of the king of the spirit; varying way to interact with the spirits; and some other features (see Triyoga 2010: 43-87). But, as I have said, they have something similar: the faith that their mountain is a kingdom of spirits.

Before the eruption, the spirit usually tells people about when the eruption is going to happen, in which direction, and sometimes accompanied by an explanation of how to save themselves. This message from the spirit is called '*wisik*', which is usually obtained by the *juru kunci* (caretaker), or the shaman/guardian, who has an inner sensitivity and can understand the sacred-symbolic messages from the spirits. They usually get the sign through dreams, feelings, mystical events, animal behaviours, and other natural or mystical signs (Donovan 2010: 122; Lavigne et al. 2008: 280; Hidayana 1993: 15). With such belief system, during the eruption periods, people stay in their house, waiting for *wisik*. If no *wisik* is given ordering them to evacuate, residents believe that their village is safe. Therefore, the government instruction to move down is excessive.

This magical sign system makes them capable to understand or to interpret natural events that occur, including the eruption. It forms a set of rules that regulates their relationships with their environment. In this sign system, ritual becomes the most important signifier, indicating the recognition of the existence of other subjects in the ecosystem of Mt. Merapi, as well as the will to communicate and live in harmony and mutual benefit with them in the ecosystem of Mt. Merapi.

As a medium for communicating and living in harmony with the unique environment of Mt. Merapi, the rituals on the slopes of Mt. Merapi have differences in comparison with Javanese rituals in general, especially in the types and details of rituals procedure. In addition to conducting Javanese common culture rituals, such as the ritual of life cycle (birth, marriage, or death), *wong Merapi* have some special rituals, such as the ritual of '*merti tuk*' or '*merti kali*', in order to preserve the water resources and maintain harmony with the spirit that takes care of the springs. Another example is Labuhan (literally means 'offering'), the most popular ritual conducted annually in a specific place, next to the peak, led by the *juru kunci* (guardian) of Mt. Merapi, and attended by almost all villagers. The ritual has specific purposes—to get blessings from God and to offer good relationships with the ancestors and spirits on the peak of Mt. Merapi (Lavigne et al. 2008: 281; Dove 2010: 122).

If we observe carefully, the magical signs are related to, but at the same time distinguished from, sensory signs. On one hand, *wong Mt. Merapi* believe that nature is a living entity— water, mountain, land, and animals are sentient subjects and they live as individual entities. On the other hand, they also believe that nature has life because it is

inhabited by the spirits. Mt. Merapi lives because it is inhabited by spirits kingdom. Also the springs and soils are alive since they are occupied by invisible creatures. *Wong Mt. Merapi*, like the Javanese in general, calls the spirits who inhabit certain places '*dhanyang*'. Just as humans inhabit a particular place, *dhanyang* also inhabits certain places. So, there are two slightly different dimensions, nature as a living entity in its own right, and nature getting its life because of another entity, namely the *dhanyang*.

I argue that this magical belief is the main distinctive feature that gives the *wong gunung* on Mt. Merapi their status as a subculture. So, the status as a subculture could be recognized from their 'frame of reference', or let's say from their 'covert behaviour', instead of 'overt behaviour'. Thus, styles, postures, or appearances, as identifying marker of subculture as proposed by Hebdige and generally other exponents of the Centre for Contemporary Cultural Studies (CCCS) Birmingham (Gelder 2007: 89, see also Irwin 1997: 73-77) are irrelevant here. There is no specific style that can be seen on *wong gunung*, neither by their language nor their clothes, since they speak Javanese and wear common clothes as other people do.

This kind of faith is also widely held among the *wong gunung* on other mountains in Indonesia. Mt.Salak in West Java is believed to be the spirit kingdom, ruled by Prabu Siliwangi, a king from Padjajaran Kingdom, who got moksha on this mountain. Similarly, Mt.Lawu in Central Java is also believed to be the place where the last king of Majapahit Dynasty, Prabu Brawijaya, attained moksha. Meanwhile, Balinese believe that Mt.Agung, which is located in Bali Island, is the centre of the universe. Mathews (1983) stated that almost all Indonesian volcanoes have their own legends, which are commonly related to Gods, princes and princess, and mortals.

2.2.3. Economic signs

In the 15th century, the emergence of villages on the slopes of Mt. Merapi was related to a political problem of the citizens of the Hindu – Buddhist kingdom of Majapahit who avoid the spread of Islam in the lowlands of Java came to slopes of Merapi (Inandiak 2010: 58). Then, in the 19th century, the emergence of the villages was associated with the defectors who avoided high taxes in the period of *Cultuur Stelsel* or *Tanam Paksa* (Forced

Cultivation), which was governed by Van den Bosch (1830-1870), one of the Dutch governors general.¹² In this period, people were obligated to pay taxes in the form of certain agricultural products that were assigned by the Dutch colonial government. As a response to it, some people fled to the forest edge, cultivated even less fertile new farming land, to avoid the threat of taxation (Triyoga 2010: 25-31).¹³

In this early period, the first generations allegedly settled by way of shifting cultivation. They built shelters permanently in certain places on the slopes of Mt. Merapi, but cultivated many lands around their settlements in a certain rotation period (Triyoga 2010: 35-42). Therefore, I call this culture as based on semi-nomadic cultivation. The people opened the forest for the farming area by cutting down the large trees and burning the grasses and small trees. Then, they planted this new field. In the first planting season the results were usually not well enough since not all of the leaves decomposed. The second and third planting periods were usually the best times because soil fertility was maximal. Then, the fourth planting season will again be suboptimal as a result of declines in soil fertility. Therefore, after the fourth season, the field was left without cultivation in order to restore soil fertility, called as '*bero*' or '*diberokan*'. The '*bero*' fields were usually used as a grazing land for the livestock, which was maintained by leaving them freely to graze in the fields and woods. Their grazing also has a function to accelerate the process of soil enrichment, because animal waste could serve as natural fertilizer that improves soil fertility (Triyoga 2010; Pranowo 1985). Thus, during this '*bero*' period, a new forest patch should be opened again as a new cultivation area. This cycle would be repeated until they got back to the first field, after approximately two or three other fields had been opened. (Triyoga 2010, Pranowo 1985).

¹² Honestly, it was extremely difficult to describe clearly the beginning of human settlement on the slopes of Mt. Merapi, since the lack of historical data to explain this, except the oral histories that develop among the local people about their origin and '*cikal bakal*' or the ancestor who firstly build their village (Triyoga 2010: 25).

¹³ Most of the slopes of Mt. Merapi are dry land. Getting on the upslope, dry or less fertile lands are expanded. Conversely, on the downslopes, the wet and fertile fields are expanded. The people who live on the upslope are identified themselves as '*wong Merapi*'; while people on the downslopes that do the usual rice farming, do not identify themselves as '*wong Merapi*'. This phenomena confirm Cohen's perspective of subculture. According to Cohen (1997: 50-56), subculture is a solution to certain problems, which must entail some changes of the actor's frame of reference. The changes should be processed communally, on the group level, not on the individual level, which will give rise to a new-shared frame of reference as a basis for a new subculture. The peasants had changed the Javanese common understanding that forest is not suitable for human dwelling and had created new values on the basis of which they could still develop proper settlement, well organized community, while creating harmony with the nature and spirits who also live in their new place. These new values were only believed in their new little group, not shared broadly in the Javanese societies.

But since 1912, the semi-nomadic system could not be continued anymore because the Dutch colonial government established the forest on the slopes of Mt. Merapi as a protected forest. The Dutch government was worried about the destruction of forests on Mt. Merapi, and the hazards it might cause such as landslides and flooding. This policy has fundamentally changed the local people way of life. They could no longer open the forest as they wished, they were forced to settle and cultivate permanently certain limited areas, usually next to the border of the forest, called '*tegalan*' (Triyoga 2010: 89; Dove 2008: 333). Since this phase, they have established a residential area for the community located in the centre of the village, surrounded by their field or *tegalan*.

At that time, the main crop was maize, which served as a daily staple.¹⁴ This crop could not be separated from the presence of cattle as the producer of natural fertilizer. This fertilizer originating from cattle manure is very important since the villagers should cultivate permanently in a certain limited areas, and they therefore had to find new strategies to maintain soil fertility. Thus, without the presence of cattle, the ecosystem of Mt. Merapi would not function well to produce corn and other crops in a sustainable manner. Land would not be fertile if exploited continuously; in this case the cow provided manure to fix it.¹⁵

In this phase, the field was usually *pas-pasan* (enough, not less and not more) for home consumption during a particular period, until the next planting period. So, they primarily employed the *tegalan* to provide their daily basis. We can therefore call it a "subsistence-oriented agriculture." When people had surplus from their farm, then this surplus would be brought to the nearest traditional market to be exchanged with other daily necessities, such as salt, cooking oil, soap, sugar, and others. Besides this kind of inter-village barter, the other transaction practice that was also common was exchange between

¹⁴ *Wong Merapi* believed that corn was an original crop of Merapi, the yield of which depended on the kindness of the spirits. This belief was manifested in all rituals that always used corn as the '*sajen*' (offering for spirits) (Hudayana, et al. 2012: 106-107). They believed the corn as '*sajen*' was the demand of the spirits, therefore the ritual would not be accepted if there was no corn. Furthermore, corn became a distinctive marker of *wong Merapi* in respect with *wong Jowo* or Javanese people in general, who ate rice, not corn, as their daily food.

¹⁵ In this period, livestock was no longer free grazing in the forest because it was prohibited, but they were kept in a stall that was usually located near to the house. On one side, this stall-fed made it was easy to collect the waste and then processed into manure. On the other hand, this system had created a new everyday routine activity for the villagers, namely grazing. The local people usually did it on the yard around their houses. When the grass in one yard was finished, they moved on to the field, which was not being cultivated. Then, the sod was carried out in the woods when the grasses on the moor were exhausted (Pranowo 1985: 57-59).

families, since the types of crops grown vary from one family to another. I refer to 'economic signs' exactly in this notion: corn and cattle (economic property) as economic signs and exchange of them as semiotics flows. It follows Hornborg's analysis of the economic signs within Amazonian people. He has explained (Hornborg 2001: 138):

A third kind of ecosemiotic flows are the movements of artefacts, people, resources, and exchange values that comprise the subject matter of economics, economic history, and economic anthropology. As we have already noted, such flows presuppose specific, cultural/linguistic understandings of exchange, including notions about reciprocity and about its appropriate, institutional frameworks.

In this economic sign system, corn and cattle became the main signifiers, signifying the economic safety of the local people. They are the fundamental assets for the survival of villagers. Thus, having enough corn and cattle means having economic security. Besides, as in the previous semi-nomadic cultivation, cattle also signifies the social status, as the rich person will usually have more cattle. In this notion, cattle becomes a family treasure, the most valuable treasure. The process of taking care of cattle involves the whole family, including husband, wife, and children who are ready for work. When the parents are getting old, usually they will bequeath the cattle to their children.

Fundamentally, these two economic signs also signify the *wong Merapi* tight bond with Mt. Merapi ecosystem, as well as serve as markers of their independence from external things outside of the Mt. Merapi ecosystem. In other words, corn and cattle signified that the people who live on the slopes of Mt. Merapi were fully integrated with their environment. This also means that the basic things that they need were satisfied by the ecosystem, without requiring anything from outside the ecosystem. These two components were integral and could not be separated from one another; the breeders also had *tegalan* (dry fields) and the farmers also kept cattle.

2.2.4. Political signs

The emergence of the villages on the slopes of Merapi already suggests the significance of the political signs in this region. These villages emerged as a political resistance towards certain political regimes. Inandiak, a researcher who has studied local people on Mt. Merapi for years, has stated (2010: 58):

In the long history of the population, Merapi people are free people. The slopes of Merapi, one of the most active volcanoes in the world, always used to be a place of refuge for all those who do not defeat. In the 15th century, they were citizens of the Hindu – Buddhist kingdom of Majapahit who avoid the spread of Islam in the lowlands of Java. In the 19th century, they were the peasants who refused to join the *Cultuur Stelsel*, forced labor system imposed in the plantation area by the Dutch colonists. And the 1960s, they were members of the Communist Party of Indonesia (*Partai Komunis Indonesia - PKI*) that is punishable by death by the Soeharto regime.

In this historical context, we may understand the term '*wong Merapi*' as a political identification, as a political distinction between us (*wong Merapi*) and them (outside of *wong Merapi*). We may also understand why local residents tend to resist the post-eruption programs offered by the government. For them, the government program would basically evict them from Mt. Merapi, and then claim their land as government-owned land to be used as a national park or protected forest. Instead, *wong Merapi* present their own political claim, commonly associated with their ancestors who had lived in the same place for long periods and through generations and which has become the basis of the land ownership on the slopes of Merapi (Schlehe 2006: 292).

In addition to self-identification as *wong Merapi*, the other important political sign is the identification on a more micro-level. If we ask *wong Merapi*, "Where are you from?" they will answer, "Kinahrejo", or "Turgo", or "Kalitengah Lor" or the name of other hamlets (sub-villages). So, they identify themselves as a member of a particular hamlet. In this case, the hamlet becomes the political unit of *wong Merapi*. On this level, they decide whether they would accept or reject government programs, as well as evacuate or not during the crisis. The head of hamlet acts as a mediator between the external and internal spaces of local peoples' semiosphere. He would filter the presence of external parties and various external information sent to reach local people.

In addition to the head of the hamlet, another authority is the elders who are considered to have supernatural abilities and capable of communicating with the spirits. In Kinahrejo hamlet, Mbah Maridjan, the *jurukunci* of Mt. Merapi, conducts this role. In some hamlets, the head of hamlet often also rules as the magical leader. If a hamlet does not have this magical leader, they will refer to the figures in the nearest hamlet. These two types of leaders would always cooperate with each other and it is very rare that they are involved in conflict with one another. In everyday life, the hamlet chief would lead the general affairs of the villagers, while the spiritual leader only leads rituals and other

religious ceremonies. In times of eruption, the hamlet-head will usually seek for advice from the spiritual leaders, asking whether they need to evacuate or not, and will gather the other sectorial leaders, such as youth leader or farmer group leader, to make a collective decisions. The whole community would then follow the decision.

I argue that this phenomenon, the double level of self-identification, as *wong Merapi* and as a member of a certain hamlet, confirms the dynamics of part and whole of the semiosphere (see Torop 2006: 308-309). In one level, we may say that the whole *wong Merapi*, due to its characteristics, function as a semiosphere; on a smaller scale, we could also regard every hamlet as a semiosphere. Thus, ‘hamlets within *wong Merapi*’ is as if a ‘semiosphere within semiosphere’.

2.3. The changes of subsistence practices and the related sign systems

Since the 1980s there has been a gradual shift in the livelihood of *wong Merapi*. Subsistence-oriented system that lasted quite a long time was gradually replaced by a market-oriented system. In the previous subsistence system, local communities met their basic needs with existing resources in the environment; they grew corn as a staple food and consumed it every day. In the market-oriented system, they plant certain crops for sale, or do certain services to earn money, by which they buy rice as a daily food, as well as satisfy other needs. Thus, a shift in terms of staple food, from corn to rice, signifies a shift in the economic system on the slopes of Mt. Merapi.

On the basis of my participant observations, as well as the description in some previous studies (Hudayana, et al. 2012, Humaidi et al. 2012: 127-157), there are six economic systems that characterise the market-orientation phase, which consist of: dairy farm, vegetable farm, *salak* farm, tobacco farm, sand and stones mining, and tourism-based economy.

Cattle. This pattern developed since *wong Merapi* got to know dairy cow in the early 1980s. Since the late 1990s, this dairy farm has been more developed in the highest hamlets of Sleman district, such as Kinahrejo, Pangukrejo, or Turgo, because they had a lot of spare grass. They had replaced the maize with grass for cattle feed. If the grasses in the *tegalan* were eaten, they would graze in the forest next to their village. They do not need to

allocate money to buy livestock feed. In fact, they often sell surplus grass out of the village. With enough food, their cows produce a lot of milk, and then the money they get from selling the milk could be used to buy maize or rice in larger numbers. As in the previous subsistence system, the animal dung is processed into manure, which is then used to fertilize the *tegalan*. Families who have more than three cows usually get surplus of manure, which is then sold to other farmers. Thus, grasses and manures become commodities that are bought and sold. In this model the upslope hamlets are known as the supplier of grass and manure.¹⁶

Vegetable farming. In the subsistence period, the farmers had actually grown vegetables to meet daily needs, but only as secondary crops. However, since the middle of 1980s vegetables became the main crops in several villages in the district of Boyolali and Magelang. This trend was increasingly widespread in the 1990s. The transition was conditioned by the construction of a highway connecting Boyolali and Magelang district, which was inaugurated in 1974 (Hudayana et al. 2012: 94-95). Most importantly, at that time the economic outlook was very good for vegetable farming since vegetables demand from various towns around Mt. Merapi continued to increase.

Salak farming. The western slope of Mt. Merapi, especially Kemiren, Dukun and Srumbung sub-district (Magelang District), and the southwest side, especially Turi sub-district (Sleman District) are popular with '*salak pondoh*' or '*salak nglumut*' production, a specific variety of *salak* (a type of palm, – *salacca zalacca* or *zalacca edulis*) typical of the slope of Mt. Merapi. This variety was first cultivated in the beginning of 1980s and increased sharply since 1998 when Indonesian Agricultural Ministry campaigned the salak agriculture, as a part of The Development Project of Agribusiness and Horticulture (Proyek Pengembangan Abribisnis dan Holtikultura - P2AH) (Hudayana et al. 2010: 115, <http://id.wikipedia.org/wiki/Salak>). The transition to salak was motivated by its high price, low maintenance time and costs. Cultivating salak is more practical and easier than corn cultivation. After planting the crop, the next stage is maintenance, including digging the soil, fertilizing, thinning the crop and its fruit, pruning, and pollinating. Such activities only

¹⁶ In Turgo village, the migration trend from Javanese cow to dairy cow was started in 1985. In this year, there were 90 families had 194 dairy cows, mostly belong to Kaliurang people and bred by *gaduhan* model. From year to year, the trend to breed dairy cow continues to increase, cause lesser number of Javanese cows. In 2010, there were 180 families had 365 cattle, owned by themselves (Hudayana et al. 2012: 177). While in Kinahrejo and surrounding areas, the shift to dairy cows was started in 1991 and developed rapidly in the late of 1990's (Badiman, 44, interview).

take two to four hours a day, and then the crop can be fruitful up to tens of years.

Tobacco farming. This plant is an annual plant, which finishes its life cycle in one year or less and therefore can be harvested in a single growing season. On the slopes of Mt. Merapi, tobacco is cultivated in Boyolali and Klaten district. In these two regions, the development of tobacco farming is closely related to the existence of market network to some cigarette manufacturers, both large and small (Hudayana et al. 2012: 97-98). This plant that does not need much water, but needs a lot of sunlight, is usually planted in the dry season. The end of February until the end of March is the best planting time. Then, in August and September the wide leaves of tobacco are ready for the harvest. Meanwhile, in the rainy season, farmers plant corn or vegetables for their own consumption.

Mining activities. This practice was started in the middle of 1980s (Hudayana et al. 2012: 214). Eruption usually makes the field broken and therefore the plants cannot be planted immediately. In these conditions, especially for the villagers who are directly affected by the eruption, mining activities are the most common choice to survive and to restore the family's economic situation quickly. The miners do their activities across the rivers and its banks tipped at the crater of Mt. Merapi, which used to be the lava flow during the eruptions. Just after the eruptions people usually mine sand, then if sand is getting depleted, they begin to mine small stones, and then finally boulders. Before the reserves of sand and stones are completely depleted, the mountain would usually erupt again, which brings an abundance of sand and stone.

Tourism activities. Some flanks of Mt. Merapi have been famous as tourism destinations since long time ago, such as Kaliurang village (Pakem sub-district, Sleman District), Kaliadem village (Cangkringan sub-district, Sleman district), or Selo sub-district (Boyolali district).¹⁷ The cultural patterns in this tourism area are somewhat different from the agricultural patterns, but both are related to each other. I suppose that the tourism was arrived later than agriculture. For example, people in Kaliurang village, as well as in other villages on Mt. Merapi are already accustomed to sustain their lives with farming and animal husbandry. However, due to the development of tourism industry in this region,

¹⁷ I did not found convincing data about the beginning of the tourism era in these areas. However, some secondary literatures suggest that these places have already become tourist destinations since Dutch colonial time. It has been noticed that the starting point of tourism in Kaliurang was the beginning of 19th century, when the beauty of its nature fascinated some Dutch geologists who lived in Yogyakarta, so they built bungalows as their resting place around there (<http://www.yogyes.com/id>, <http://www.jogjatrip.com/id>). Currently, hundreds of bungalows and hotels that were owned by either private or public agencies have already been built in this area.

they have slowly changed some aspects of their cultural and social systems. As a result, some types of occupation have been added, which could not be found in the agricultural system, such as opening a store or restaurant, managing the guesthouse, becoming a tour guide, renting the transportation means, and some others. In this case, the external factors, especially the arrival of the outsiders who built the resorts, may be seen as a trigger of this cultural change.

Many factors constituted this shift, both internally and externally. Internally, the growing number of local residents on Mt. Merapi led to the problem of limited environmental resources, particularly land ownership. In the 1950s and the 1960s, *wong Merapi* felt their maize supplies were enough for them. At this time, each family had averagely two hectares of land, which is enough to plant maize to ensure household food security for up to one year. A generation after that, in the 1970s, each family had one hectare field on average, which was still enough to live a year with subsistence crop. However, in the 1980s, where each family had an average of 0.5 to 0.25 hectares of land, the people started to meet the problems of daily staple in the subsistence system.¹⁸ The second internal factor that played an important role in this shift is the Mt. Merapi eruption that occurs periodically which I will further explain in subchapter 2.4. of this chapter. The third internal factor is the local natural conditions, which vary from one slope to the other slope, which determine the choice of the new economic system. For example, the *salak* farming developed only in Turi (Sleman district), Dukun, Srumbung and Kemiren (Magelang district) because the natural conditions in these areas are very suitable for *salak* plant, namely the specific type of soil with high porosity that formed from a very fertile volcanic sediments; the availability of water throughout the year; and mild weather, not too hot and not too cold.

Meanwhile, the external factor that performs a significant role is the development programs from Indonesian government, which have been introduced to the villages on the slopes of Mt. Merapi since the 1980s in the form of government offices, school buildings, asphalted roads connecting villages, public electricity, as well as several other public

¹⁸ Land ownership is indeed very diverse from one slope to another slope, even from one family to another family in the hamlet. In general, the poor people maintain subsistence crop in one season, and then plant commercial crops in another season. Conversely, people who have lots of land can be more flexible to use their field for corn and other commercial crops in the same season, or even to use the entire land for commercial crops.

infrastructures.¹⁹ The New Order government also campaigned for commercialization of agricultural products. The presence of these development programmes was coupled with the inclusion of modern economic ideas that rely heavily on the market mechanism. Thus, in the crisis conditions of subsistence system, these programmes were well received by the communities on the slopes of Mt. Merapi. As previously described, the communities have thereby adopted the dairy, tobacco, vegetables, and *salak* farming.

It is important to note that this shift is not rapid and drastic, but it is a slow change instead. In the beginning, the new pattern is performed alongside or in conjunction with a subsistence system that has long been practiced. In the end, there are two patterns that survive until nowadays. First, the villagers who completely left the subsistence crop and then cultivated commercial crops. The second pattern is to adopt the market-oriented agriculture, while maintaining their subsistence crop. In the pressure of the market-oriented economy, these villagers still planted corn as a guarantor of food security to reduce the economic vulnerability and in order not to rely entirely on the market mechanisms. Then the residents add additional activities, depending on the environmental resources around them, such as cultivating vegetables if the field has sufficient water, or mining sand and stones if the village is next to the river.

In the market-oriented period, people perform daily activities to earn money, not to directly meet the needs of daily consumption. With the earned money, they buy rice as their staple food, and satisfy many other daily needs. In the subsistence period, people feel safe because they have their own maize, while in the market-oriented era they feel secure because they have money. Hence, money has replaced corn as the main signifier of the economic sign system.

Interestingly, in the market-oriented system, the presence of cattle remains vital. The farmers of *salak*, tobacco, or vegetables usually have cows, which are bred to produce manure. The shift is in the number of cattle owned by each family. In times of subsistence, each family owned two to six cows on average. With two cows, a farmer had enough manure to fertilize their field. Meanwhile, with six cows, the whole family, including

¹⁹ Anderson (2001: 259) has noticed that the emergence of sub-district office, police office, military post, center of the society health, and school are the signifier of the presence of Indonesian government in every region. In the case of *wong Merapi*, people in the upslope hamlets were actually quite late to enjoy the development programmes. In the 1970s, they were neglected, while at that time people in the downslope has already enjoyed the economic growth as the impact of development programmes.

father, mother and children, had enough labour to maintain the cattle. Also the grasses in their fields or forest were sufficient for six cows. However, in a market-oriented system, a rich family can have more than ten cows, because they will produce more milk. The high need of fodder makes them buy grass from other farmers, and mix it with the manufactured concentrate in order to get more milk. Conversely, excessive manure production leads them to sell it to other farmers. Thus, grass, manure, and cattle become commodities, an integral part of the commercial system, which are no longer elements of the subsistence system.

The description above also shows that the commercial orientation makes people engineer or modify the capacity of the environment. The most obvious modification is the mixture of manufactured concentrate and grasses in the animal feed in order to increase the cattle's productivity, so that they could be milked twice a day. Without the concentrate, cows can be milked only once a day. Another manipulation is the chemical fertilizer to increase or accelerate the growing season.

The increasing role of money in everyday life of *wong Merapi* has reduced their closeness and interrelations with the surrounding natural environment.²⁰ In times of subsistence, farmers did not need anything else outside their environment; everything was available from the surroundings. Therefore, they had a very strong relationship with the environment. In a market-oriented system, people need many things from the outside, they gain even rice as their staple food by purchasing it from the outside environment.

Wong Merapi generally memorizes the shift from subsistence to market-oriented system as a change from *zaman pas-pasan* (difficult time) to *zaman ayem* (untroubled and prosperous time). As mentioned before, local people called the subsistence period *zaman pas-pasan*, which literally means 'enough, not too little and not too much'. Actually, it is a pejorative language to express their difficulties at that time. The field products were sufficient for daily consumption for a year, but from year to year, their household economic stayed static; they were not able to 'invest' or 'develop' their economic condition. Meanwhile, market-oriented period is memorized as *zaman ayem*, in which they

²⁰ As I have explained above, during the time of subsistence practices, there did actually exist economic transactions between one village and another village, between the upslope hamlets and the downslope ones, but what happened was barter, not trade. Usually, people exchanged their surplus maize with other necessary items, such as soap, toothpaste, cigarettes, or other things. However, these practices are very different with modern trade, in which people cultivate cattle, vegetables, tobacco or *salak* to earn money, which is then used to buy their commodities.

have a capacity to invest, and therefore they perceive that their life is more comfortable and prosperous. The most common form of investment is renovating the house, which at this period becomes the signifier of wealth and social status. The prosperity of the villagers is characterized by the increasing number of '*omah tembok*' (masonry houses), replacing '*omah gedhek*' (the house with woven bamboo walls) as the signifier of the subsistence period.

The use of these linguistic signs deserves some further observations. In the time of subsistence, 'investment' or 'economic development' was a foreign sign that was incomprehensible, since it was not part of the subsistence semiosphere. It means that the static economic life, that met the daily needs relying on the existing resources and that makes one feel satisfied with these conditions was something normal or it was an ordinary condition. The will of 'economic development' to purchase land, livestock, or new house was perceived as something foreign. However, the adoption of a market-oriented system, which began with the adoption of commercial crops or commercial service activities, had posited money in the central role in the everyday life of *wong Merapi*. Furthermore, this adoption had in turn changed the local way of thinking to be more 'commercial', whereby 'investment' is an ideal, which should be pursued. The static economy on the contrary is seen as a bad condition. In this case, we may understand why local people refer to the present time as '*zaman ayam*', while they mention the past as '*zaman pas-pasan*'. This linguistic sign signifies the adoption of a commercial perspective, not just the commercial farming systems.

To sum up, this shift indicates that the sign systems and semiosphere are not static, but dynamic. The vegetables, tobacco, or *salak* are actually foreign signs that came from an outer semiosphere, which stimulated 'I to you' communication. In this communication process, new elements from the outside are adjusted and modified according to the pre-existing sign systems in the semiosphere, which in the next steps could transform the composition of elements (centre and periphery) in the semiosphere. In the subsistence period, corn and cattle formed the centre of the semiosphere. However, in the market-oriented period, the centre has shifted towards money and cattle.

Thus, we may depict these cultural changes during the 1980s and 1990s decades into the figure below (see Figure 2).

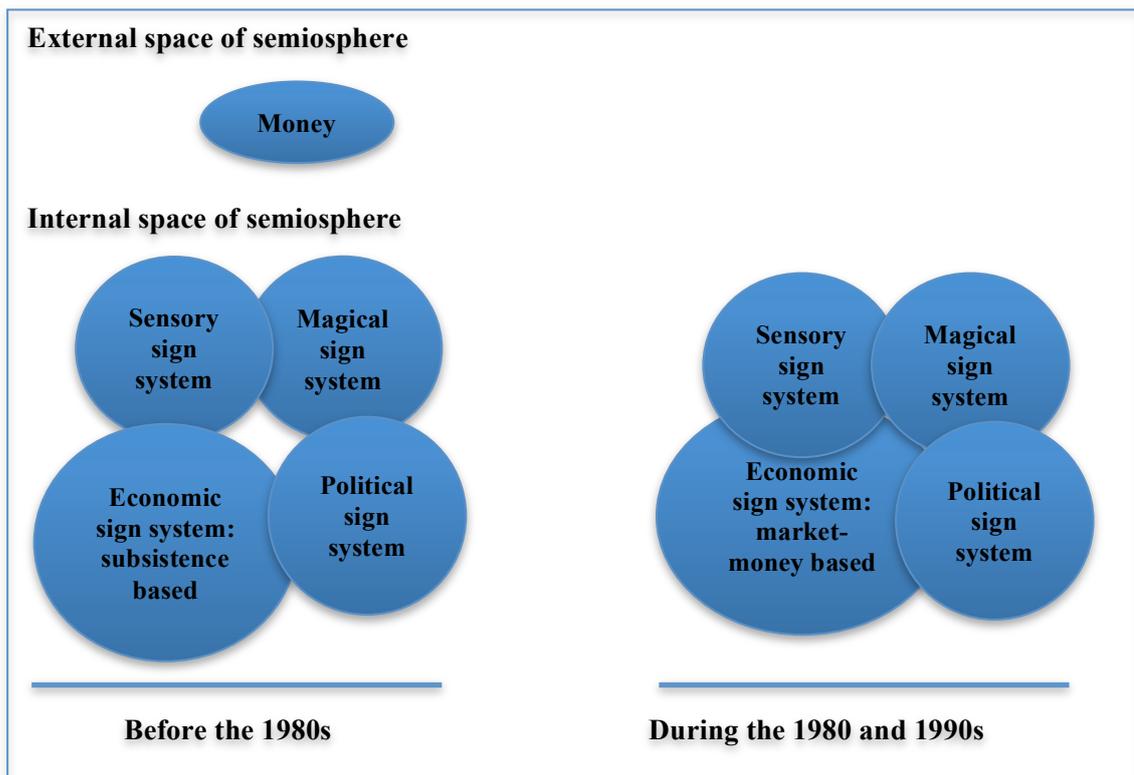


Figure 2. The cultural changes on the slope of Mt. Merapi in the 1980 and 1990s.

2.4. The role of the eruption in the cultural changes

Basically, local people do not see the eruption merely as a disaster, but instead as a blessing, because the ash from the eruption increases the soil fertility. At first, ash from the eruption that covers the whole field would damage the crops, which in turn bring along failed or late harvest. The eruption could also bring along late planting time because the farmers have to evacuate. Usually, the eruption would cause a loss of one harvest season for the farmers. However, after that, if managed properly and dug and buried in the soil, the ash can fertilise the soil much better than manure. Thus, the first harvest after the eruption generally would cause difficult times because the volcanic ash has not fully mixed with the soil yet. However, the second harvest onwards after the eruption would be great (Triyoga 2010: 92-93). Likewise, the volcanic ash will create fertile forest area, where fresh grass can grow for animal feed. The new grass would grow faster than other plants that form a wide meadow. So, eruption period is an important period to restore the soil

fertility. For the villagers, it means that they should take a rest for a moment, letting nature with its own mechanism to restore the ecological balance.

During the eruption, the villagers would keep the livestock in their house, because they cannot take their livestock to the emergency camps. The improper conditions of evacuation infrastructure to accommodate the livestock would make animals emaciated and stressed when taken to the evacuation site. Meanwhile, if they left the livestock in the village when they are in the evacuation, it will also be starving because of the lack of food and unkempt. For the same reason, the residents were also worried of losing their cattle. In this case, the loss of livestock is a threat to their survival after the eruption, since by having livestock they could soon recover their household economy. Hence, for them, the threat of losing their stocks because of theft while living in the camps is much more real, more concrete, than the threat of death because of eruption (Lavigne et al. 2008: 285).

But, if necessary, after receiving *wisik* to evacuate, seeing the animals running down, or catching other natural signs, they would evacuate themselves to more secure villages. Then immediately after the eruption subsides, they would go back to their villages. Therefore, we may understand why many people back to their village to feed their cattle and do some other activities, usually throughout the day, and stay in the camp at night for the times of eruptions. During the long eruptions in 2006, three types of behaviour were noticed: 1. Some people, mainly women, children, and elders, stayed in refugee camps, 2. Some other people, exclusively male, stayed in their village day and night to keep out looters, 3. Many people, mainly 20 to 50 years old males and females, chose to stay in the refugee camp at night and back during the day to their villages to feed their cattle, which Donovan called as 'part time evacuation' (Lavigne et al. 2008: 281; Donovan 2010: 124).

However, if their villages are completely destroyed, they usually choose to move to more secure villages, which are still located in the slopes of Mt. Merapi. For example, the 1930 eruption completely destroyed some villages, which are Bangkong, Patuk, Blubuan, and Semin. Most of the residents then moved to Turgo, as a more secure village. Likewise, the next major eruption in 1961, 1969 and 1976 has damaged one or several villages. Until the eruption of 1976, Turgo was seen as a safe place, its population therefore has increased along with the eruptions.

These phenomena lead to the conclusion that the eruption induces landscape change on Mt. Merapi. This happens when a big-violent eruption occurs, which totally breaks and erases one or more villages. The landscape of the affected area is fundamentally changed; the settlements, the *tegalan*, the forest, and all kind of lives in it are lost; the survivors move to the other villages. Here, Antrop identifies (2005: 25-26) that calamity is an unpredictable factor that drives the landscape change is absolutely true. But several decades later after the eruption, this affected area would be a virgin forest, and then returned to be opened as a new village. Frankly, there is a constant fundamental change of the landscape, as well as a long period of continuity, which can be described as follow: villages - totally devastated because of the big eruption – forest - the area then become villages again. Hence, we might propose the phrases ‘change in continuity’; or perhaps ‘continuity in change’ for these processes.

The eruption also has important roles in the social and cultural changes of the communities on the slopes of Mt. Merapi. Eruptions often act as accelerator or catalyst of the on-going changes, particularly the shift from subsistence to market-oriented system. For example, the 1994 eruption had triggered the Turgo villagers to fully leave corn (Dove 2008). The eruption that destroyed their villages had forced them to evacuate for three months. Consequently, their field was abandoned, their crops broken, and grasses grew thickly and widely on their unoccupied field. At that time, they lacked the basic food to reserve because there was no corn to harvest. Thus, the only one way to survive was to buy corn or rice in the market. They got money from selling the milk from their dairy cows. At this point, people got blessing in disguise from the abundance of grass on their land, by which they had adequate fodder stock, so their cattle could be more productive in producing milk. In this case, the money earned from the milk sale can be used to buy more corn than the amount that can be produced from their land. They chose to plant grass on their land as well as to raise the number of dairy cattle. The 1994 eruption has encouraged Turgo residents to leave corn as their subsistence crops.

These changes have dramatically increased the economic prosperity of Turgo’s villagers, which could be seen from the rapid increase of the number of ‘*rumah tembok*’ (masonry houses), as well as the higher level of education. The villagers of Turgo themselves said that the 1994 eruption has guided them into the era of ‘*zaman ayem*’ (untroubled age) (Dove 2008: 334). In general, a lot of people on the slopes of Mt. Merapi

posit the eruptions as the signifier or boundary between one particular era and the next era. The eruptions become important signifiers of the social memory of *wong Merapi*.

In addition to the roles of eruption in the landscape and cultural changes, eruption also shapes landscape rhythm or continuity on the slopes of Mt. Merapi. Here, we find a double-side relationship between human being and its environment on Mt. Merapi. On one side, as already suggested in the concept of ‘agriculture’, the villagers have manipulated their environment; they “controlled the reproductive cycle and the lives of plants and animals” (Bunkse 2004: 75). On the other side, their agriculture system is also controlled by the environment through the eruption cycles, which started from one eruption, then followed by a lot of planting seasons, usually between six and eight, and ended by the next eruption, which also means the beginning of the next planting season. As a natural rhythm, the eruption has generated a set of cultural rhythms, as well as has become the basic boundary of it.

According to Antrop (2003: 3), who understands landscape as a unique synthesis of natural and cultural aspects of a region, we may understand that the landscape rhythm on Mt. Merapi is marked by the eruption as natural rhythm and local peoples’ interpretation and adaptation to the eruption as cultural rhythm. Hence, the eruption cycles, not the seasons (dry and wet seasons in the Indonesian context), become the basic rhythm on Mt. Merapi.²¹ I suggest that this idea could be more generalized: in the disaster-prone area, where the disaster happens periodically, the disaster itself, not the seasons (for comparison, see Bunkse 2004: 74), becomes the grand rhythm of the landscape in question. Hence, we may suppose that the ‘normal’ annual flooding in some countries like Bangladesh has shaped the landscape rhythm of those countries.

In this landscape rhythm, eruption is a threshold. We may compare it with Olwig’s idea of liminality and seasonality in the Western countries, whereby he states (Olwig 2005: 261): “The cyclical change of seasons was thus marked by holidays/ holy days – literally ‘whole’ days, the name suggesting a kind of pause or break in the normal flow of time.” Olwig exemplifies July as one such main holiday. The basic similarities between Mt. Merapi and this Western rhythm could be noticed, namely the existence of the cyclical

²¹ I do not mean that the seasons are not important anymore. Still, on Mt. Merapi seasons provide important indicators for determining agricultural practices; when is the suitable time to start cropping and when the plants could be harvested, is still measured by dry and wet seasons rhythm. But, in the more basic notion and longer period, the agriculture rhythm is formed by the eruptions cycles; even the perception of seasons is itself also shaped by the eruption cycles.

change and its boundary. But we may also underline the difference: the character of the boundary. By the Mt. Merapi's rhythm, the boundary is the eruption, not the holidays.²²

Thus, noticeably for the local people, the eruption is part of their daily life. For them, the long peaceful periods between one eruption and the next eruption are much more important than a short-term eruption crisis, which is usually just a few weeks, or at most a few months. Dove (2008) emphasizes that the villagers have domesticated, naturalized, and even utilized the mountain and its hazards (see also Lavigne et al. 2008: 280). Bankoff (2004: 111) notes that the communities, in which natural hazards occur frequently and become constant threat to them, have usually integrated the hazards into their daily schema that are called 'cultures of disaster'.

In this notion, we may imagine a cultural semiosphere of the local people as an attempt to integrate and unite all elements of Mt. Merapi ecosystem, including eruption and all its impacts to their everyday life; to use the natural resources in the respecting way to nature; also to believe in the spirit kingdom on the top of the mountain and therefore to show appropriate actions to them. Here, Merapi and its eruption is an integral part of the cultural semiosphere of *wong Merapi*. Eruption is an internal sign, which the locals always try to make sense or produce meaning of it, and then generate certain proper self-response to it. This is an example of 'I to I' communication within local semiosphere of *wong Merapi*. According to Lotman, autocommunication in turn becomes the basis for self-description as the basic mechanism of semiosphere, attributing to it a systematic unity (as cited in Torop 2011: 24). The local culture on Mt. Merapi clearly confirms this idea, as its relations to the environment, especially to the eruption cycles, constitute the basic cultural regulations and generate fundamental cultural rhythms.

As a contrast, the resettlement or transmigration or relocation programs offered by the government are the external or foreign messages for the villagers. For them, these programs are just another form of hazard, which they do not know how to deal with, in

²²Further, we may compare the 'eruption' and the 'holidays', which are both thresholds. In the Western country, holidays mean a kind of pause or break in the normal flow of time. Sunday is a break of weekly routines. July is a break of winter and summer. This break time is usually used for some kind of leisure activities. It is a holiday, exactly in our common sense. Comparable to this concept, an eruption also means a kind of break of the normal flow of planting time, when the villagers do not work on their *tegalan*. But how do they usually use this kind of break? Seemingly, they do not conduct any leisure activities at all; instead, they will organize some *slametan* in order to be saved during the eruption period. Generally, the local will move into contemplation during the eruption. At this point, we may propose that some questions should be explained by the next studies. What does actually 'break' mean for the local? Do they have such a concept as 'holiday', which means leisure activities, as in modern common sense? Or, perhaps, they have different understanding of 'leisure'?

comparison to the threats of violence, stress, accident, or crime. Moreover, these government policies deprive people from access to land and other resources on Mt. Merapi, which also means leaving them into poverty. Therefore, they chose to stay on the slope of Mt. Merapi as they know the environment well and know how to cope with its hazard just as they know well their own diseases (Schlehe 1996: 403; Dove 2008: 333). Hence, we may understand why the villagers demonstrated solid unanimity to resist the program of resettlement or transmigration, which was often offered and forced by the government right after the eruption (Dove 2010: 125).²³

We may see that the conflict between government and local people is caused by the lack of dialogue between both semiospheres. Or, since the dialogue itself should be preceded by some certain dialogic situation (Lotman 2001: 143-144), we may also say that the conflicts are caused by the lack of these ‘dialogue situations’. It could be that the government always uses the scientific language in delivering their recent updates of Mt. Merapi status, in running their evacuation instruction, or in explaining their post-eruption programs; in order not to have a dialogue, but to “emphasizes the exclusivity of this authority in representing the activity of the volcano to the public” (Dove 2010: 125).

²³ For example, in 1962, 34 households, of the 228 households that transmigrated to the Central Lampung Province after the 1961 eruption, returned to their old land and established a new village (Singarimbun 1980: 52-58). In 1977, the survey conducted by The Institute of Demography, Gadjah Mada University, to the residents on the slopes of Mt. Merapi showed that only 4% of respondents who committed their selves to the government, 8% committed their selves to the god, the remaining 88% chose to move into the surrounding villages (Laksono 1977: 26). The latest example, because of 1994 eruption, the Turgo villagers has been moved to the new well-built resettlement, called Sidomoro, located 10 kilometers down from their old village. Gradually, they come back to Turgo. Nowadays, more than 90 households are in Turgo, only about 50 households remain in Sidomoro (Dove 2008: 333).

3. Post-eruption semiotic changes in the 2000s and 2010s

In the previous chapter, I have described human sign systems that played important roles in the ecosystem of Mt. Merapi in the 1980s and 1990s. In this chapter, I describe the changes of these human sign systems in the 2000s and 2010s, particularly during and after the 2006 and 2010 eruptions. Nevertheless, I need to emphasize that the changes in 2000s and 2010s should be connected to the phenomena that already happened in the previous periods, due to the fact that the changes, as I mentioned in the previous chapter, usually occurs slowly through decades. In addition, the changes in human sign systems are not uniform in different areas. Usually, the downslope areas adjust faster to these new changes than the upslope villages.

I distinguish between 2000s and 2010s period and the previous periods as the character of changes that have taken place at that time are different from the previous one. Important signifier of this period is the presence of many outsiders on the slope of Mt. Merapi, especially in the times of eruption crisis, such as government, media, civil society organizations, and other institutions. This started since the 2006 eruption and continued in the 2010 eruption. As natural phenomena, these two recent eruptions have significant roles in the cultural changes on Mt. Merapi.

The presence of these outsiders conveys a scientific perspective on Mt. Merapi and its eruptions. I argue that the influx of scientific sign systems as the most authoritative explanations for the behavior of Mt. Merapi is the most important change in the 2000s and 2010s, which has shifted the roles of the other sign systems that had already been established. This chapter explains this phenomenon, its wider implications, as well as the other changes that related to it. Specifically, this chapter is based on the fieldwork that I have carried out in Kinahrejo and Karangkendal hamlets, Umbulharjo village, Cangkringan subdistrict, Sleman district (see Figure 3). Thus, the descriptions and analysis in this chapter refer to these locations. When I try to compare my field data with other locations or to provide generalizations, I mention it explicitly.



Figure 3. The position of Kinahrejo as the research site on the map of Mt. Merapi (source: <http://rovicky.wordpress.com>). The written text of ‘Kinahrejo’ is my personal addition in order to emphasize the position of the research site.

3.1. The 2010 eruption and the responses of local people

Indonesian government has established and regularly published a ranking system that signifies Merapi’s activity, from ‘normally active’ (level 1), ‘on guard for Merapi’ (level 2), ‘prepared for Merapi’ (level 3), and ‘beware Merapi’ (level 4) as the most dangerous condition that means people in disaster-prone areas must be evacuated immediately. By the 2010 eruption, the government increased the status of Mt. Merapi from ‘normally active’ (level 1) to ‘on guard for Mt. Merapi’ (level 2) on September 20th 2010. One month later, it was raised to ‘prepared for Mt. Merapi’ (level 3). Finally, on October 25th 2010, the government announced the highest status, that is ‘beware Mt. Merapi’. Just a day later, Tuesday, October 26th 2010, Mt. Merapi erupted; heat clouds slid down to the west - southwest and south – southeast. After such an explosive eruption, Mt. Merapi’s activity was fluctuating. On October 30th 2010, Mt. Merapi erupted again with a longer duration and greater than the first one. Since Wednesday, November 3rd 2010, the activities of Mt. Merapi increased rapidly. From this date on, the government extended the disaster-prone zones from 10 kilometers to 15 kilometers from the peak. Only a day later, the government expanded more disaster-prone areas to 20 kilometers from the summit. Finally, on Friday early-morning, November 5th 2010, Mt. Merapi erupted explosively, throwing out a very large volume of volcanic materials. The exposed area was much broader than by the earlier

explosive eruptions. This long-period eruption caused remarkable socio-economic disadvantages, 386 people died, and no less than 356,816 people evacuated (Kedaulatan Rakyat, 11 December 2010); while the official data from government mention only 15,366 people as displaced (Hudayana et al. 2012: 36). Many experts argue that this eruption was a big eruption that cycles from 80 to 100 years, not the regular eruption that occurs every 3 to 5 years (Wunderman et al. 2011: 2). The previous major eruption was the 1930-1931 eruption, which had buried 13 villages, destroyed 23 villages and killed 1,369 people and 2,100 livestock (Voight et al. 2000).

Since the expansion of the disaster-prone areas from 10 kilometers to 15 kilometers, the government could no longer control the emergency conditions. The official emergency maps and plans only consider the affected areas up to 10 kilometers from the summit. So, when the hazard-prone areas expanded to 15 kilometers, moreover to 20 kilometers, this official emergency plan was inadequate, since the number of residents who had to be evacuated enlarged beyond the prediction. Emergency camps were not prepared, even their locations were not specified, not to mention the needs of people in the camps.²⁴ Then, what happened was that civilian people started to help other civilians (people help people), whereby the residents from non-affected areas around Yogyakarta province and many civil society groups became the saviors. They did it in various ways, such as collectively supplying rice packets for many days, providing their houses as emergency camps, setting up and managing the camps and the aids, opening emergency public kitchens, doing free medical care, performing some entertainment programs in the camps, and so on (Nazaruddin & Habibi 2012).

Since the government had raised the status of Mt. Merapi from 'normally active' (level 1) to the 'on guard for Mt. Merapi' (level 2), many groups of people, especially in the highest villages, observed independently the peak of Mt. Merapi. For example, the residents of Kaligentong independently observed Woro River that was flowed by lava.

When Mt. Merapi first erupted on October 26th 2010, some of the people in the highest villages fled to the lower villages, such as Turgo or Deles villagers. However, groups of people remained there who did not listen to the government's advice to evacuate, such as Kinahrejo people. Almost all informants told the same story about what happened

²⁴ Here we may recall the warning from some scholars, who have said that the official maps only take into account relatively small to medium eruptions, and underestimate the potential large eruption and its impact around the volcano (Hadisantono et al. 2002; Thouret and Lavigne 2005).

during the crisis time of 2010 eruption. For about a week before the eruption, the government came to Kinahrejo, specifically to the house of Mbah Maridjan as the guardian at that time, where the villagers had gathered, explaining that Mt. Merapi was becoming far more active. Its behavior was different from usual, and it seemed that the eruption would be greater than the previous ones. At that time, the government had asked residents to get ready to evacuate. However, in general, the villagers did not really believe in the government information. Conversely, they believed that their hamlet was safe. As an anticipation, a few days later the vulnerable groups, such as the elderly, pregnant or lactating women, and children, were evacuated to the village hall of Umbulharjo, which is about 15 kilometers from the summit. But the majority of residents, including many elderly people, remained in their houses even though the status of Mt. Merapi had been raised to '*awas*' (beware).

Finally, when Mt. Merapi first erupted on Tuesday, October 26th 2010 at 18:00 PM, and the day was getting dark, they fled in panic, amid thunderous sounds from the top of the mountain, the meaning of which is obvious. Some fled on foot, others on motorcycles, and some on cars that were used together. Unfortunately, 37 people were killed, many of them were the residents who were not willing or were too late to flee, while many others were young men who had climbed back into their hamlet to evacuate residents who were still on top, but they ended up being victims themselves.

3.1.1. Scientific signs

The scientific signs actually have a long history in Mt. Merapi, their introduction is associated with the Dutch colonial government in the late 19th century. After the big eruption in 1930-1931, in the year 1935, Stehn, head of Volcanology Research Department of Dutch government divided the slopes of Mt. Merapi into three parts, namely the restricted areas, danger zones one and danger zones two. He also built seven observation posts on the various sides of the slopes of Mt. Merapi (Triyoga 2010: 127-129). This map was then further improved, including by the Indonesian government, on the basis of the dynamics of the eruption. Nowadays, the last version of this map is widely known as *Daerah Rawan Bencana* (Disaster Prone Region), which gives a three-zone classification,

namely Disaster Prone Region III which includes the most dangerous areas; Disaster Prone Region II, which is a few kilometres outside of region III; and Disaster Prone Region I, which is the edge of rivers that used as the ways for lava. The newest version of the map has been changed after the last 2010 eruption (see figure 4).

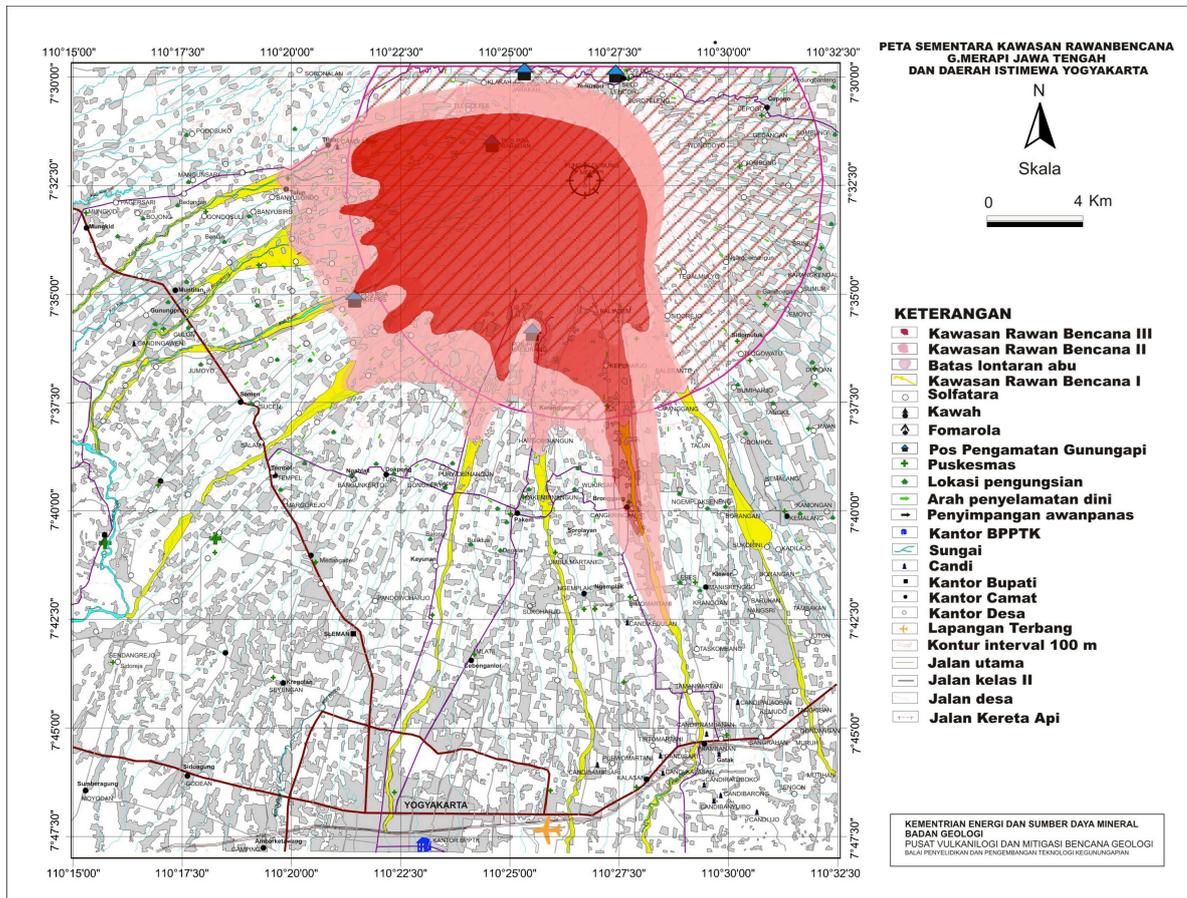


Figure 4. The newest version of the disaster prone regions map on Mt. Merapi. The red is the disaster prone region 3, the pink is the disaster prone region 2, and the yellow is the disaster prone region 1 (source: <http://geospasial.bnpb.go.id>).

Continuing the Dutch government’s policies, the Indonesian government has built world-class scientific services to monitor Merapi. There are at least two government bodies that monitor volcanic activities in Indonesia: Center of Volcanology and Geological Hazard Mitigation (CVGHM) (*Pusat Vulkanologi dan Mitigasi Bencana Gunungapi* (PVMBG) in Bahasa Indonesia) and the Center of Volcano Technical Research (CVTR) (*Balai Penyelidikan dan Pengembangan Teknologi Kegunungapian* (BPPTK) in Bahasa Indonesia). In addition, there is a special agency to deal with the disasters, the National

Disaster Management Agency (NDMA) (*Badan Nasional Penanggulangan Bencana (BNPB)* in Bahasa Indonesia), which has hierarchical bodies in the province and district levels, namely the Regional Disaster Management Agency (RDMA) (*Badan Penanggulangan Bencana Daerah (BPBD)*).

Besides, as I have mentioned briefly beforehand, the government has established a ranking system that signifies Merapi's activity, which is routinely published, i.e.: *aktif normal* (normally active), *waspada Merapi* (on guard for Merapi), *siaga Merapi* (prepared for Merapi), *awas Merapi* (beware Merapi). When the government raises the status to 'beware Merapi', it means that people in disaster-prone areas must be evacuated immediately. The current status of Merapi is published regularly, with different time intervals depending on the activities of Merapi itself. In the normal conditions, the announcement of the status is conducted every three months. But during the crisis times, the announcement of status is distributed every day, even four times a day. Fundamentally, the government is taking these various policies in the scientific method and modern technology, such as earthquake observation with seismograph, deformation observation with tiltmeter, magnetism observation, and other methods (see <http://www.merapi.bgl.esdm.go.id>; Triyoga 2010: 136-139).

Thus, scientific sign systems as a way of understanding the behavior of the mountain has been around a long time, starting with the Dutch government and continued by the Indonesian government. However, until the 1990s, these modern sciences were still foreign to *wong Merapi*. For example, during the 1994 eruption, the villagers did not have knowledge about the classification of disaster-prone areas or different stages of the status of Merapi. The categorization of active normal, on guard, prepared, and beware was something foreign to local residents.

Based on the interviews with several researchers who have long examined the communities on Mt. Merapi, such as Bambang Hudayana (53) and Eko Teguh Paripurno (51), I believe that this situation is caused by several factors. First, the announcement issued by the government, in this case by BPPTK, was filled with scientific language, geological terms that could only be understood by certain experts. The only meaningful information to the public were the recommendations brought at the end of the announcement in the form of the latest status of Mt. Merapi, as well as the

recommendations for action to be performed by local residents.²⁵

Second, communication lines that were used for the distribution of this announcement followed the formal bureaucracy flow, by which BPPTK submitted the announcement to the district, which then forwarded it to the sub-district, then to the village level, to the head of hamlets, and finally to the residents. This bureaucracy flow was inefficient, time-consuming, and full of distortion. The eruption often occurred before the information had reached the residents. Even if the information had finally reached the villagers, it was usually in the form of an order to evacuate immediately. For local people, the order to evacuate suddenly, without any adequate explanation of why it should be done, is very confusing.

Third, local people did not have access to media that might have opened their access to information from outside. At that time, as explained by Ramijo (46), the head of Kinahrejo hamlet, the presence of mass media was still very rare among *wong Merapi*, only few people had television, and noone subscribed to newspapers. The most common media was the radio. Moreover, at that time, the government did not publish the announcement regarding the status of Mt. Merapi to the reporters, so that media was not informed about the condition of Mt. Merapi prior to the eruption. Media only covered post eruption situation.

Scientific knowledge entered the villages only in 1994, after the eruption that killed 64 villagers of Turgo in southwestern side of Mt. Merapi. At that time, as explained by Eko Teguh Paripurno (51), when Mt. Merapi started to increase its activity, many civil society organizations were involved in the evacuation processes, particularly activists, academics, and student groups. Then some academics and activists began to realize that the local people did not have access to any knowledge about the activities of Mt. Merapi. Due to this fact, in 1995, some activists initiated the disaster training for local youth, the head of the hamlet, as well as other community leaders in Turgo. Paripurno stated: "In principle, if the government is not able to give the information, we will exercise by ourselves."

Because of its participatory methods, especially recognizing local knowledge that already exists among the residents and then combining it with modern knowledge, the training was well accepted by local people, especially among the youth. This positive reception led to an idea to hold a similar training on the other side of the slope. For about

²⁵ Many examples of the government's announcement regarding the status of Merapi could be seen on <http://www.merapi.bgl.esdm.go.id>.

two years later, this training had covered all highest villages on the entire side of Mt. Merapi (Paripurno, 51, interview). The local youth who had been trained then took the initiative to form an organization named 'Pasag Merapi', the abbreviation of '*Paguyuban Siaga Merapi*' (Group of Prepared for Merapi). With this organization, local youth organized various activities, such as training, workshops, or social campaigns, in order to increase local awareness of the hazard that was embedded in their environment (see <http://pasag-merapi.blogspot.com>).

As far as I know, Pasag Merapi is the first organization that has successfully brought modern ideas about Mt. Merapi and its eruptions to the local people. After that, especially since the early 2000s, a variety of other organizations were growing rapidly, driven both by external activists or local residents, both local, national or international, offering modern disaster mitigation perspectives. Some examples are *Jalin Merapi*, *Taruna Siaga Bencana*, *Lingkar Merapi*, *Forum Merapi*, and *Forum Penanggulangan Resiko Bencana (Forum PRB)*. In this context, the number of modern-minded persons who are better informed of the eruption danger is increasing, especially among youth who have received a lot of natural disaster mitigation trainings.

Because of this historical context, the acceptance of scientific knowledge in the early stage has taken place among the youth since the late 1990s. For them, the government's announcements of the status of Mt. Merapi during the crisis are very important, as well as that the evacuation should be done soon. Ngatimin (35), one man from a younger generation from Kinahrejo, who was wearing a t-shirt depicting the *wedhus gembel* on the crater of Mt. Merapi and the message 'Power of Nature', stated: "I prefer technology, it provides a guarantee." Even, when I asked him to describe Merapi, he replied: "Merapi is a pile of materials, a landscape, or a source of life. As a stack of materials, it contains some elements, such as magma and poisonous gas."

The acceptance among the youth should be related to the increasing level of the formal education among them. In the previous chapter, I have mentioned that the market-oriented economy had increased the prosperousness of the local people, so that the locals could send their children to high schools or even to universities. Grandfather Wignyo, one of the elders, stated: "Nowadays, people are different from the old times. For example, people now prefer to spend the money to send their children to school, hoping that his son could be an employee." Even Mr. Asih, the new *jurukunci* of Merapi, in an interview with

media (Henschke 2012) said: “I do not want my daughters to be *jurukunci*, I want them to focus more on getting an education. Being a *jurukunci* is a very traditional job. I want them to do something more modern, be not just like your dad, children have to be smarter and better than they parents!” Thus, in the 2000s, these educated youth joined various trainings on disaster, adopted modern perspectives on the environment, and established many local organizations around Mt. Merapi.

Other factors that accelerated the acceptance of modern scientific signs were intensive mass media coverage during the 2006 and 2010 eruptions, which generally supported the modern discourse on Mt. Merapi. In general, media considers that the eruption is a natural phenomenon, which is very dangerous and therefore evacuation is the only way to avoid casualties. Media looks at the local peoples’ responses who do not want to evacuate as a strange and silly behavior (Fauzanafi 2012).

I should add that the intense media coverage in the disaster areas is a new phenomenon in Indonesia. It started with the tsunami wave attacking Aceh and North Sumatra at the end of 2004. The huge number of human casualties, material loss and affected areas led the media crews; local, national and international; to come to Aceh and to report the post-tsunami conditions intensively for months. Since then, media has always been present by any catastrophic events. This means that bigger disaster leads to more intensive media coverage. Besides, disaster becomes a new independent desk in many media newsroom in Indonesia, not only a topic of coverage under the desk of war and conflict. In this case, the 2006 eruption was the liminal event, when the presence of media was very strong, distinguishing it from previous eruptions that got minimal media coverage.

In the 2000s, television was a common medium within *wong Merapi*. At that time also, as explained by Ramijo (46), many young people began to own mobile phones. Thus, *wong Merapi* was no longer an isolated community, but rather an open society to which modern knowledge had already come through various media. Perhaps the media consumption has affected the perceptions of *wong Merapi* toward the eruption.²⁶ A simple example may help to explain this. In the 2006 eruption, some residents on the slopes of Mt. Merapi were frightened and panicked by the eruption. It was not caused by their

²⁶ I should note that I have not found research that specifically addresses the effect of disaster news to the perceptions and behavior of local people on Mt. Merapi; or in general, research on the effects of disaster news to the people who live in the disaster areas that were reported.

observations of the mountain or by government's announcement, but by their relatives in another town, who called them in panic and asked them to evacuate immediately. In fact, these relatives imagined that the condition of Mt. Merapi was very dangerous, since they got information from media that often shows the top of mountain and the *wedhus gembel* in a close up way, so that the impression is horrifying (Yusuf 2006: 46).

The presence of media indicates how the local people are thereby made dependent on the information provided by the external parties, especially the government, whereas they lose their independence to rely on their environment. They have been attached to the scientific system in order to lower their vulnerability in terms of natural events; but in this way they become more vulnerable in social terms, such as economic crises, governmental failures, and so on.

I also found that the real experience to be directly affected by the eruption is the important factor that leads the entire community to adopt scientific sign systems. An obvious example is Turgo community, which was directly hit by the 1994 eruption. In the two subsequent eruptions, in 2006 and in 2010, they did self-early evacuation. The more obvious example is the case of Kinahrejo residents. As mentioned above, in the 2010 eruption, they initially refused to evacuate because they believed that they were safe. Finally, they fled in panic, causing human casualties among them. Some youth lamented these casualties since they actually had tried to persuade the residents to evacuate soon. They were even unexpectedly involved in opinion collide, especially against the elderly group, who believed that their village was safe. Obviously, it was a conflict of sign systems, sensory-magical signs versus modern scientific signs.²⁷ Ngatimin (35) expressed: "It was with *eyel-eyelan* and strong debate in order to decide whether we would evacuate or not."

After 2010 eruption, the whole community of Kinahrejo, including the older generation, accepted the scientific sign systems, due to the fact that their old sign systems, namely sensory and magical signs appeared to be inadequate to guide their responses. All informants from the elderly people stated that they would listen to the government's

²⁷ Actually, Donovan noted this phenomenon, when some young residents in Pelem Sari, a village on the slope of Mt. Merapi, did not agree to use traditional warning systems as the tools of mitigation (Donovan 2010: 122). Lavigne also noted this phenomenon in the 2006 eruption, although he has not explored it yet. He says, "Actually, although many people living on the volcanic slopes still have animist convictions and worship spiritual gods, most of them also listen to the local authorities and the scientists" (Lavigne et al. 2008: 281).

announcement in case of next eruptions. When I was wondering how they would know when and in which direction the eruption would occur, grandfather Wardi (72) replied: "The volcanologist. The local people do not know."²⁸ Then, when I asked to whom he would listen during the eruption, he asserted: "The government. Who else?"

Thus, I believe that the eruption became the accelerator of the acceptance of the scientific sign system. This is to reconfirm my statement in the previous chapter that the eruption serves the role of an accelerator of the ongoing cultural changes within *wong Merapi* communities. I suppose that this statement could be generalized: a disaster could act as accelerator of ongoing cultural changes within the community where the disaster happens (see also Dove 2008; Oliver-Smith 1996: 313).

I should also note that this acceptance of scientific sign systems is not uniform among the villagers. The most commonly accepted is the status categorization of Mt. Merapi into active normal, on guard, prepare, and beware. The informants emphasized the importance of 'beware' status, which according to the government means that the hamlets in the disaster-prone zones III, or in accordance with the specific provisions at the time the status was announced, have to be emptied. However, in this case, local people have their own interpretation. For them, it is very difficult to empty the village, simply because they consider the existence of their cattle. Moreover, when the status of Mt. Merapi is raised into 'beware', it does not necessarily mean that the mountain will erupt, even BPPTK themselves do not know exactly when and in which direction the eruption will occur. Therefore, for some people, such as Ngatimin (35) or Badiman (44), the 'beware' status means evacuating as soon as possible the vulnerable groups including the elderly, children and infants, pregnant or lactating women, and increasing preparedness of people. In this case, people who have bravery and physical health, especially the youth, could stay in the village while monitoring the activities of Mt. Merapi intensively. They will gather at a certain place, equipped by the vehicles that are ready to ride for immediate evacuation. The announcement about the beware status is significant for the villagers, but they do not find it necessary to accept the prescriptive meaning that is attached to it by the government, i.e. evacuate immediately. Ngatimin (35) described:

²⁸ The name of BPPTK or BVMBG is too difficult to be pronounced by the villagers, so that some of them call these government bodies as 'volcanologists'.

Beware could mean eruption and could not mean. The four classes of vulnerable people should move down, and the rest of community should keep the security of the hamlet. It is impossible that beware status means the village is empty. Beware status means the villagers should be on guard. Eruption has its processes, when there is an increasing in the status; it is not erupting straightforwardly, so there is still time to get ready. The time is enough, but without debating and picking up the other people.

Meanwhile, the other scientific signs provided by the government are not fully accepted by the community, such as the categorization of disaster-prone areas. There are so many communities that choose to return to their villages that are very close to the peak of Mt. Merapi and belong to the disaster-prone area III, such as residents of Kalitengah Lor, Kalitengah Kidul, Srunen, or Pangukrejo. Ngatimin (35), a Kinahrejo resident who lives in the new residential area, which is located about 10 kilometers from the summit, stated that for him there is no difference between staying in such a new place and returning to his original village, which is about 4.5 kilometers from the crater. He asserted:

I myself do not believe that here is secure. It depends on the type and distance of the eruption. Actually, wherever we live does not matter. I brave to live in the upslope hamlet. People could live pleasantly together with hazards. The problem does not lie in the position, but in awareness and preparedness.

Thus, the villagers accept the scientific sign system with a very limited scope, that is to say the increasing status of Mt. Merapi during the eruption period. Even then, they give these scientific signs their own interpretation. In the semiospherical perspective, it is an instance of 'I to you' communication, whereby the local cultural semiosphere of *wong Merapi* communicates with an outer element of another semiosphere that is based on scientific signs. But as a foreign message, these scientific signs are translated or interpreted in such a way that they could be integrated with the structure of the internal space of semiosphere. By the term 'to be integrated', I mean that these foreign signs should carry specific functions in the internal space of semiosphere, which could be different from its original function in the external space of semiosphere. Conversely, the foreign signs that would not perform any function in the internal space of semiosphere, would not be integrated. In this notion, we may say that the status of increasing activity of Mt. Merapi carries a specific function for the local people, i.e. guiding their response during the eruption and therefore it would be integrated to their cultural semiosphere. On the contrary, the differentiation of disaster-prone zones does not have functional meaning for them, therefore it would not be integrated.

3.1.2. Sensory and magical signs

In the previous chapter I have explained that *wong Merapi* believe that nature is a living entity, so they have to live in harmony with the surrounding natural environment. After the 2010 eruption, this belief, that water, soil, and animals are sentient subjects remains strong among residents. They still believe that '*ilmu titen*' is very important in their daily lives.

In addition, people still believe that many spirits also inhabit the natural environment in which they live. Sunardi (41) firmly replied, "believe" when asked about the Mt. Merapi as spirits' kingdom. For him, there are so many empirical experiences proving the existence of the spirits on Mt. Merapi. He described: "When we are there, near to the crater of Merapi, then we talk what we want to happen. For example, we say "I am confused", thus we would really become confused." In general, this belief is still very strong among the villagers, even in the younger generation.

As explained in the previous chapter, magical signs have different features in different areas. In this case, Kinahrejo people have a quirk in the magical signs, believing that their village, which is on the southern slope of Mt. Merapi, is the front side of the spirits' palace. Therefore, when Mt. Merapi erupts, which is magically interpreted as that the spirits are having a ceremony (*Merapi duwe gawe*), it will not throw the dirt to the front side of the palace. So, it means that Kinahrejo hamlet is safe.

Kinahrejo residents also understand that the Mt. Merapi spirits' kingdom has a very close kinship with other spirits' kingdoms located in the southern sea of Java island, which is located on the southern side of Mt. Merapi. The ceremony held by Mt. Merapi spirits kingdom will involve southern sea spirits kingdom, and vice versa. So, usually there will be a convoy of troops from the former palace to the later one, or vice versa. This convoy is believed to have a fixed path, i.e. along the valleys or rivers that start on the peak of Mt. Merapi and flow into the southern ocean. The volcanic materials that slid along these rivers are understood as the spirits convoy. Grandfather Wignyo (73) described: "Merapi and southern sea are related. If they marry their children, they would usually give gifts one another. This process will use the lava way. In fact, Opak River ends up in the sea; Gendol River also reaches the sea." Kinahrejo people therefore perceive that their hamlet is safe because it is not on the edge of the rivers. "Merapi has its own way" is a popular phrase

referring to this belief.

This belief is supported by the empirical fact that during the last century, the southern slope region, including Kinahrejo hamlet, was almost never affected by the eruption; except for the 2006 eruption that had destroyed Kaliadem hamlet. In this period of hundred years, the eruptions occurred on the west and southwest sides, especially Magelang district (Thouret et al. 2000). In the 2006 eruption, Kinahrejo people were already asked by the government to evacuate immediately. But since Mbah Maridjan refused to follow this order, the whole community also refused to evacuate. At that time, Mbah Maridjan's belief that his hamlet is safe was proved empirically, the eruption did not pass through Kinahrejo, but through the neighboring hamlet, namely Kaliadem. This event reinforced the belief within Kinahrejo residents that their village is safe.

We may therefore understand better why in the last 2010 eruption they did not want to evacuate. For them, there was no reason to evacuate. There are three explanations that I obtained from the interviews for such responses to the eruption. First, people believed they were safe, as I have just explained. The second reason is the absence of natural signs that usually precede the eruption, such as rumbling sound, hot temperatures, or forest animals descending to the village. All informants in Kinahrejo stated that they did not find natural signs preceding the eruption. Hence, they commonly considered the last eruption as an anomaly. Grandfather Wardi (72) said: "In the 2006 eruption, every day, day and night, the lava always flowed, we could see. In the 2010 eruption, there was no lava, we could not see. The first eruption was straightforwardly huge." The third reason is the existence of the *juru kunci*, Mbah Maridjan, who remained in his house. At that time, Mbah Maridjan had actually suggested people to evacuate, while he himself would remain in the village because of his responsibility as the guardian. However, the presence of Mbah Maridjan, who is believed to have supernatural powers and capable of communicating with the spirits of Mt. Merapi, was interpreted as a sign that the hamlet is safe from the eruption. Sunardi (41) told how residents usually said at the time: "*Simbah wae ora mudun, ngopo mudun*" (Even the grandfather does not go down, so why we should move down).

However, this last eruption had totally destroyed their hamlet and killed 37 of them. So, how do they understand this? One aspect of the answer has been already described above, i.e. the integration of the scientific signs, especially the categorization of the status activities of Mt. Merapi, into local cultural semiosphere of *wong Merapi*, due to the fact

that these scientific signs function to guide them during the eruption. In this notion, we may propose the next questions: don't the original existing sign systems, namely sensory and magical signs, function anymore to understand the eruption? Will these sign systems be excluded and then changed with the new sign systems?

The residents perceive the eruption as a natural phenomenon, which cannot be predicted by their traditional sign systems, but by modern technology owned by the government. All informants expressed this uniformly. For example, grandfather Wignyo (73) told: "The residents could not predict. How could they predict? But who brings technology, such as volcanologist, they could know." The new *jurukunci* of Merapi, Mr. Asih, in the interview strongly confirmed: "I prefer the technology."

Thus, eruption is a natural event. So, does it mean that the eruption is no longer a magical sign caused by the spirits? There were vague answers from many informants. Pakdhe Kote expressed his opinion with the words "believe and do not believe." Meanwhile, Ngatimin said: "I believe, but I do not understand." Most of the older generation still believes that the eruption should be related to the spirits, caused by them. Mbah Wignyo said: "It is not possible if there is no relation with Empu Rama and Empu Permadi. That Mt. Merapi is having ceremony is true. But the villagers did not know anymore how this ceremony happens."²⁹

Thus, eruption is a natural event, as well as a magical event. Before the 2010 eruption, people felt confident to communicate with the spirits, particularly via the *jurukunci* or the elders. Due to the existence of this communication process, people believed that the spirits would guide their actions through magical or natural signs. After the 2010 eruption, people still believe that the eruption is a supernatural phenomenon, but they do not believe that they are capable of communicating with the supernatural beings on the crater of Mt. Merapi, irrespective of whether they will get the signs from these supernatural beings or not.

In this case, people still believe that *wisik* could be a clue. However, the problem is the coming of the *wisik* itself, which could not be predicted. It rather depends on the spirits' will, not on the human effort. The next problem is that if there is someone who receives *wisik*, it is usually very personal, in the form of very metaphoric or connotative signs, called '*sanepo*'. *Wisik* never told directly when eruptions will occur and in what

²⁹ According to Mbah Wignyo, Empu Rama and Empu Permadi are the kings of the Mt. Merapi spirits kingdom.

directions. The example is *wisik* that was received by Mbah Maridjan prior to the 2006 eruption in 2006, as told by grandfather Wignyo (73):

There is a jackfruit tree having three fruits. The middle is completely healthy, the western is rotten, and the eastern is mature. Then, it was an eruption flowing to the Gendol River and Krasak River. The flow towards Krasak stopped, it is the meaning of rotten; the flow towards Gendol moved down, it is mature; while the middle area is safe, completely healthy.

Grandfather Wignyo added: “That is how to interpret the *sanepo* or *wisik*, could be done after the events.” Thus, the person who receives *wisik* tends to remain silent, since whether the *wisik* is true or not, could only be proved after the eruption has happened. Consequently, *wisik* could not be used as a guide to act in the eruption. Ngatimin (35) explained: “*Impen* (dream) only comes to one or two people, may not be distributed to others. The story would come after the eruption, not before it.” Similarly, Mr. Asih (48) asserted: “I do not think that it could be used. *Impen* is like news. The information is usually vague, such as “Merapi would do this and that, so you should be careful”. It is only signs. Suppose it is used, no one will believe, there is no proof.”

Given uncertainty of these magical signs, people will listen to the government’s announcement, and tend to choose to evacuate soon. Interestingly, this new action pattern gets magical justification. For example, Mr. Asih (48) said: “If we know they are having a ceremony, it will be better if we move down in order not to interfere with their ceremony. It is our tribute to them. Supposing that our parents are busy, while we cannot help, we better step aside so that our parents would not be angry.”

We may argue that the main problem lies in the communication via magical signs, not in the whole magical sign system itself. It refers to the common feeling among local people that they do not have the power to communicate with the spirits. In this notion, magical signs become uncertain and therefore could not be used as guidance to act during the eruption. In this condition, they should adapt to the new sign system that could fulfill this guidance function: the scientific signs.

However, I need to add that in normal times, a much longer period compared to the eruption period, these two sign systems remain vital, people still believe in and practice the magical and sensory signs in their everyday lives. For example, they continue to perform the *labuhan* ceremony, specifically dedicated to spirits on the top of Mt. Merapi, as well as many other traditional rituals. Also, as I have mentioned at the beginning of this

subchapter, residents will be sensitive or *'titen'* to the natural signs around them, especially the behavior of the animals, which they consider are intended to send a specific message to humans.

In the previous subchapter I argued that in the integration process of the foreign signs to the inner semiosphere, the new element should act certain function in the internal space of semiosphere, which could differ from its original function in the external space of semiosphere. Here, I would add an important theoretical argument that in this integration process, not only the new element should be reinterpreted or adjusted to the old element, but also the old element, due to the presence of new element, should be recreated or reinterpreted. In this notion, the presence of the scientific signs and new action patterns in the eruption has recreated the old sign system, in the form of new magical justification to this new element.

Carefully paying attention to this shift, we would find a fundamental change of the relation between culture and nature within the ecosystem on Mt. Merapi. In the previous decades, eruption was an integral part of the cultural semiosphere of *wong Merapi*. The communication between local people and the eruption during the crisis was a type of 'I to I' communication, in the form of traditional rituals or waiting for wisik or natural signs during the eruption. In recent times, especially after the last 2010 eruption in the case of Kinahrejo people, it has changed. Nowadays, local people perceive eruption as an unpredictable phenomenon; it is a foreign sign that could not be interpreted by magical or sensory sign systems as in the previous period. Thus, eruption has been excluded from their semiosphere. Here, there is no sign system in the internal space of semiosphere that is capable of interpreting this foreign sign. Therefore, they should adapt to a new sign system from the outer semiosphere in order to be able to interpret this foreign sign better.

In this case, this so called scientific sign system could only be encoded by the element of the outer semiosphere or in this case the government. It is very different from the old sign systems, i.e. sensory and magical signs, which could be performed by internal elements of semiosphere. I argue that this semiospherical interrelation between local people and government, whether equal or not, widely change both of those semiospheres. Minimally, it partly detaches the interdependence of local people semiosphere and their natural environment.

This detachment is actually more obvious from the exclusion of eruption from the semiosphere of *wong Merapi*. Of course, we may say that eruption is only one part of the natural environment on Mt. Merapi. Nevertheless, we may also view that the eruption is a vital sign of the ecosystem on Mt. Merapi. Thus, the exclusion of eruption from the cultural semiosphere of *wong Merapi* reveals the fundamental change of the nature – culture relation within the ecosystem on Mt. Merapi. Moreover, due to the fact that the cultural changes always happen slowly through periods, perhaps this is only the beginning of the next detachments between nature and culture on Mt. Merapi.

3.1.3. Economic signs

The other important phenomenon that occurred after the 2006 and 2010 eruptions was the emergence of a new pattern of economic adaptation, i.e. tourism-based economy. This new model does not rely on the beautiful green landscapes, verdant forests, waterfalls, enchanting wildlife, or fresh air; but relies on the eruption effects. Indonesian calls it as “*wisata bencana*” (disaster tourism).

In my personal observation, this kind of tourism has been growing rapidly since the 2006 eruption that destroyed Kaliadem village (Cangkringan sub-district, Sleman District). This re-adaptation to the eruption occurred again in 2010 eruption, which completely destroyed Kinahrejo village (Cangkringan sub-district, Sleman District). At first, some time after the eruption, many people from outside came to witness the eruption debris. More and more people came, so the local residents were inspired to open kiosks and to manage parking areas. Over time, due to the significantly increased number of the visitors, the local people then started to organize this new tourism area more systematically, including establishing an information tourism center, providing the entrance tickets, managing the parking lots, developing the area of souvenir and food sales, renting the transportation services, doing the promotions, and so on.³⁰

³⁰ At this point, I personally suspect, there is a close relationship between the intensive media coverage of disasters and the emergence of disaster tourism. Theoretically, in the uncertain conditions of disaster, people’s need of information rise sharply. In this condition, information about the disaster from the media may be the first and the most important information, which fulfills the public need. This collective curiosity then encouraged people from different regions to visit the disaster area, to get the first hand experiences about disaster which they had watched intensively for days, even weeks, in various media, especially

But, how do local residents perceive this new type of adaptation? There are several interesting things to note. First, this practice has raised the competition climate among people, even social jealousy, either between one family and another family, or one hamlet and another one. Not all people could engage in this tourism practice. The most involved group is young people, who tend to see opportunities and to perform new adaptations faster than the rest of community. In addition, the activities that would gain more benefits at this tourism site, such as opening kiosks or providing tourist transport services, require a lot of economic capital. Not all people can buy a jeep, trail bike, or materials to open a shop. In the end, only those who have enough money could benefit most from this volcano tour. Meanwhile, a large number of residents who do not have the capital can only be involved as a parking guard or postal charges. As the number of such people is big, they were divided into groups. There are ten groups, whereby one group gets a turn to serve only one day in ten days. It means, someone who only relies on his/her labor, can only engage in the volcano tour activities once in ten days. Meanwhile, those who have trail bike, jeep car, or stall, could run their businesses every day. So, obviously there are certain parties that have benefited more than others from the eruption, rising social inequalities and jealousy among local people.

This is in contrast to previous practice, in which people relied on cattle-based economy. In this system, people who did not have a cow could *nggaduh* or take care of someone else's cattle and receive certain rewards in return, in order to be able to buy their own cow from the profits earned in this *gaduhan* system. It is clear that the *gaduhan* system has a very important social role, i.e. maintaining economic equality among people. In the tourism-based economy, there is no similar model that replaces *gaduhan* system. In this condition, many people, especially the elderly people, have no jobs at all. They either have no capital to engage in tourism site or buy cattle or *nggaduh* from the others since only few of them still have cattle since the last eruption. Eventually, they can only wait for

television. In Indonesia, as I have mentioned beforehand, every catastrophic event always gets intensive coverage from the media since the 2004 tsunami in Aceh and North Sumatra. At that time, the very intense media coverage has made the public curious about the real condition of Aceh. Then, a few months after the tsunami, after the emergency period, many outsiders came to Aceh, usually under the guise of providing assistance, but they spent a lot more time to witness the tsunami debris. In my personal observation, it was the beginning of the natural disaster-based tourism in Indonesia. But, it should be noticed here, I did not find previous studies that specifically discuss the relationship between media coverage and the emergence of disaster tourism. Several studies have only discussed the role of media in the disaster mitigation (Prajarto 2008), the disaster discourses in Indonesian media (Nazaruddin 2007, Isbandiyah 2008, Wahyuni 2008), and the role of public and community media in the post-eruption responses (Nazaruddin & Habibi 2012).

the government's promise to assist them with new cattle, which no one knows when it will be realized (Warno, 67, interview).

Second, the involvement in tourism practices determines their perspectives about the eruption. Those who can take advantages of the volcano tour and have a better economic situation after the eruption, see the eruption as a blessing. Conversely, for those who lose access to the economic sources and could not take the opportunities in the tourism economy, the eruption is a disaster. Badiman (44) argued: "It depends on who said it. For people who got advantages from disaster, it would be a blessing. But, for people who are really attacked by the disaster, it would be disaster."

This is clearly different from their perception in the previous period when they saw the eruptions as blessing because the volcanic ash that covered the land would restore soil fertility. Theoretically, this change of perspective could have happened since the eruption itself has been excluded from their daily life, it has been eliminated from their semiosphere. Thus, as a foreign sign, the eruption could be interpreted in various ways by the members of community depending on certain considerations. Within the rapid development of the economic signs throughout the local community, the economic consideration becomes the main feature in perceiving the eruption.

Third, many people realize that this tourism-based economy cannot be the permanent livelihood in the future. Again, this awareness shows that economic signs have become their main considerations. According to their common description, higher number of residents who engage in the volcano tour means smaller number of visitors per tour provider, causing the smaller level of profit per each person. For example, due to more people having jeep cars and fewer visitors coming to the site, the jeep owners should make a queue system. Consequently, an owner sometimes only serves the visitors once in two or three days. Moreover, this practice highly depends on the future eruptions. If the eruption occurs again and destroys another slope region, then the volcano tour will emerge and flourish in the latest eruption location, and the previous location will fall off, or be even forgotten. The real example is Kaliadem lava tour, which became very popular after the 2006 eruption ruined this place, but became suddenly quiet after the 2010 eruption hit Kinahrejo, in which the tour shifted to this new location.

Then, what would the people of Kinahrejo do in the future? Generally, I found out that they do not have a clear picture. Badiman (44) said: “Nowadays, there is no people having a focus in their lives. Nowadays is still disorder.” This unconvincing vision shows that the local people have been in some degree detached from their environment. They do not see the natural resources in their environment as enough for them as before or that they could provide their permanent livelihood. Conversely, they need a lot of things from outside of their natural environment, such as tourists, travel agents, government support, or many modern technologies.

Fourth, the involvement in the tourism practice brings cash to many people almost every day, which is different from previous dairy farming in which they got money from selling the milk every month. Apparently, having cash every day influences their consumption patterns, making them more consumptive. Mr. Asih (48) described: “Usually, in previous time, we ate tofu or *tempe*. Well, now we add chicken or other dishes. Now we want the new motorcycle, we want specific type of motorcycle.”

To sum up, nowadays, especially after the emergence of the tourism destination, *wong Merapi* are becoming much more economically minded. Money has become the most important sign in their economic activities and exchanges; the centre of the economic sign system of *wong Merapi*. Perhaps the following conversation could well exemplify this ongoing change. In one occasion, I asked Ngatimin (35) about the possibility of conducting training for young people the whole day, from morning to evening. Ngatimin seemed to think a moment, and then replied: “It is unlikely because they are having jobs; some of them do the volcano tour, others have it in other places. It could be done, but it means that there must be money for participants to substitute the money that they could actually get from their work. As attending the training means they do not work; it means losing money. Well, the problem is there.”

This finding confirms the general conclusion of some Hornborg’s works. Specifically based on his work in Amazonian ecosystem, he has concluded that the contemporary incorporation of Amazonian communities into a global market economy has accelerated natural devastation. He emphasized (Hornborg 2001: 142), “It is obvious that modern money and commodities are signs capable of radically transforming, if not dismantling, Amazonian ecosystems.” Then, he has further analyzed that the main cause is the semiotic property of money itself (Hornborg 1999). Modern money is a sign that

signifies everything and nothing, lacking a conventional relation to any specific referent. Or, we may say that money is totally an empty signifier (see Laclau 1990). In the end, Hornborg (1999: 159) proposed:

If there is to be any hope of achieving ‘the mastery by society of society’s mastery over nature’, money signifiers must once again be equipped with *signifieds*, i.e. reconverted into symbols. I believe that this is an insight with which any struggle for environmental justice and ecological sustainability will have to begin.

In my opinion, this conclusion is theoretically logic and insightful. But, the problem is its realisation that seemed to be unrealistic nowadays.

3.1.4. Political signs

Unlike the previous eruption, instead of offering transmigration programs, which were always unsuccessful, the government created new program, namely ‘relocation’. In this program people would be relocated to the new houses, called ‘*hunian tetap or huntap*’ (permanent house), located on the slope of Mt. Merapi, but not in the disaster-prone areas level III. The provincial government of Yogyakarta province also announced nine prohibited hamlets in the highest places for human inhabitation. These are Kalitengah Lor, Kalitengah Kidul, Srunen (Glagaharjo village), Kaliadem, Petung, Jambu, Kopeng (Kepuharjo village), Kinahrejo and Pangukrejo (Umbulharjo village) (Pramesti 2011). The residents of these hamlets should be relocated to *huntap*. It seems that government based this relocation program on scientific arguments. Scientifically, the highest hamlets that have been marked as prohibited hamlets are indeed very vulnerable to the direct impacts of the eruptions that occur periodically. So, ideally humans should not inhabit these hamlets.

However, local people interpret this relocation program as political signs, not as a scientific sign. In the end of 2010, while still in the shelter, residents met with the governor of Yogyakarta province. At that time, residents proposed two requests. Ngatimin (35) explained: “We agree to be relocated under two conditions, we will own the relocation land, as well as own our field in our original hamlets legally.” Unfortunately, the governor replied that it was too much for the residents, and therefore the government could not accept it. Instead, the government planned to include the highest hamlets into the area of The National Park of Mount Merapi, which means that the local peoples’ fields would be

legally owned by the government.

This governor's response apparently offended local people, who look at this response as not wise, and as something that does not solve the local peoples' problem. Thus, there were many rejections from local people to this program. The village-head of Glagahharjo had pioneered his villagers to rebuild their houses on their original village that was located about four kilometers from the crater of Mt. Merapi. Meanwhile, Pangukrejo residents returned to their hamlet and produced a lot of banners containing their resistance statements to the relocation programs.

Likewise, residents of Kinahrejo also refused the relocation. However, they did interestingly react differently, i.e. they built independently a new hamlet in the new location. Badiman (44), one of the key figures in the development of this new house, told in details:

Since in the evacuation we have already thought, whether we would back or not. In the temporary resident, every day we conducted meeting. If I am not wrong, it was 17 times. The agenda were various. We made the site plan by ourselves. Then we decided to look for new land. The considerations were the safety and the future of the children and trauma. Some people still had trauma. It was impossible to back, even if we forced to go back, the consequences were not good.

This means, they had rejected the relocation program because they did not want to lose their ruined village. However, they realized that their village had been totally destroyed by the eruption and could no longer be inhabited within next one or two years. Therefore, they had collectively and independently bought a new land, which is enough for all 81 households member, located for about 10 kilometers from the crater of Mt. Merapi. Then they built their houses and other infrastructures, funded and assisted by the Java Reconstruction Fund.³¹ They called this new village as '*Karang Kendal*'. In this way, they could still own '*Kinahrejo*' as their village also, since they did not receive relocation assistance funds offered by the government.

As a comparison, Pangukrejo people, whose hamlet was partly destroyed by the eruption, also rejected the relocation. However, there was no shared agreement among them, so their responses were split. Those who had enough money to renovate or rebuild their houses preferred to be back at the hamlet. Conversely, those who had less economic

³¹ JRF is "a multi-donor reconstruction fund pledged by the European Commission, the Netherlands, the United Kingdom, ADB, Canada, Finland and Denmark. It is governed by a Steering Committee and co-chaired by the Government of Indonesia, the European Commission and the World Bank as Trustee" (<http://javareconstructionfund.org>).

capital, while their house was destroyed, ultimately had no choice but to accept the relocation program. Grandfather Wardi (72) commented on this phenomenon: “It is such a shame that the hamlet head was not taking care of his people.”

Later on, the government’s position to accommodate the peoples’ request was softened. The government was willing to legally concede resident’s land, both in the relocation and in the original village; even though government is conducting land certification program for the residents of the prohibited hamlets, called as PRONA program. Residents are allowed to use their fields in the prohibited land for farming, livestock, or other productive ways, but not for residential location. However, this decision was too late, since many people had already rebuilt their house in the prohibited hamlets, such as almost all residents of Kalitengah Lor, Kalitengah Kidul, and Srunen. Finally, considering this realm, the government was more tolerate. For those who were not willing to relocate, the government asked to apply the concept of ‘living in harmony’ through some rules about disaster mitigation that must be followed, such as the obligation to evacuate when instructed by the government. They were even obligated to write a formal letter that declares their acceptance to apply this ‘living in harmony’ according to government (<http://www.mediaindonesia.com>).³²

In this case, there was an obvious tension among the political authorities. On one hand, the government was trying to use their political authority to regulate land use on the slopes of Mt. Merapi. On the other hand, the head-village or head-hamlet maintains their political authority by rejecting the government’s relocation program, which also means maintaining certain economic resources. Eko Teguh Paripurno (51) and Bambang Hudayana (53) confirmed this political economy of the objection of some hamlet or village head against the government’s relocation program. Paripurno explained that these rejections are related to their authority as head of the hamlet. If they accept and then live in the *huntap*, it will reduce their authority, moreover usually in one *huntap* there are several hamlets combined together. Meanwhile, in the original hamlet, they have a large coverage area of the hamlet. Paripurno firmly stated: “As a head of hamlet, I would think if I move down to the relocation, I would lose my authority. It would be difficult, such as looking for the *bengkok* land. Becoming the head of hamlet within the other hamlet, there is no

³² It is such irony, since actually for their whole life, through generations, the villagers have already applied ‘living in harmony’, they have their own deep understanding how to live in harmony with their environment.

regulation about it.”³³

Another important phenomenon to be noted is the shift in the internal authority of the people, from the older generation to the younger generation, which also indicates a shift in the sign system, from the sensory-magical signs to scientific signs. In Kinahrejo, before the 2010 eruption, the younger generation who brought modern ideas about the disaster could not do much because of the authority of knowledge was still held by the older generation who relied on the magical sign systems. However, the eruption that had totally destroyed their village led them to believe in the modern scientific knowledge.

In the case of Kinahrejo, it was strongly associated with the loss of the magical knowledge authority, i.e. the previous *jurukunci*, Mbah Maridjan, who died because of the 2010 eruption. Actually, this authority should be passed onto the next *jurukunci*, but that did not really happen. Mbah Maridjan was replaced by one of his son, Mas Lurah Surakasihono, used to be called as Pak Asih. Interestingly, Mr. Asih works as administrative staff at a big private university in Yogyakarta. It makes him close to the modern or scientific discourses. So, not surprisingly, when appointed as *jurukunci*, Mr. Asih give a statement to the public, which implies a shift in the sign system or knowledge that he believed in. According to that he will not merely hold on to the magical signs, as practiced by his father, but he will hold on to the modern knowledge in order to avoid human casualties in the future eruptions. In an interview with Pramesti (2011) he stated: “I am not just going to take a cultural approach based on the dreams or guidance from the spirits, but I will also coordinate with the authorities to protect human life and the environment on Mount Merapi and anticipate the fall of victims to future eruptions.” In another occasion (Henschke 2012), he said: “I will not disobey the government, as a good citizen of the country you do not do that. You cannot break the law. If you disobey the government that means you are breaking the law and you might get in trouble yourself. I believe in their ways of reading Merapi. It makes sense they have the technology in their hands.”

The loss of the authority of magical knowledge occurred in the chaotic condition when the residents still shrouded of post-disaster trauma. Under this circumstance, the young generation of Kinahrejo took vital roles, guiding the process of evacuation,

³³ In the Javanese culture, a head of the village or hamlet is usually rewarded in the form of the right to cultivate certain field and take the advantages from the use of it. This field, which belongs to the hamlet or village's property, is commonly called *bengkak* land.

searching and coordinating a lot of assistance for the residents, leading the development of new residential program, and so on. These active involvements of young people lead the rest of community to believe in them, so that eventually they formed apolitical authority among the residents. I think this phenomenon could be generalized to other areas on Mt. Merapi: the acceptance of modern signs is characterized by strengthened authority of modern science by the younger groups, as well as the weakened authority of magical signs. In general, the authority of the youth is formed through their active role in the community, especially during the crisis time of eruption.

Interestingly, the youth who carry scientific signs do not attempt to remove the magical signs. Rather, they seek to somehow combine modern and magical signs for the sake of practical interests of the villagers. For young people, the magical sign system is still important in order to respect their own culture as well as their ancestors, but its application must be more practical, efficient and effective. Again, it reveals that they are becoming more 'economic'.

A concrete example is a cultural ritual called *kenduri*, signifying the important phases in individual life, as well as in social level. In previous period, each family prepared its own rice and a set of side dishes that would be brought for the *kenduri*. In the ritual, which is usually held at the hamlet-head's house, the food brought by the residents is gathered in one place, and then prayed by the spiritual leader of the community. After the ritual prayer, people will exchange the food with one another, and bring it back home. People believe that the food that had been 'blessed' by the prayer in the *kenduri* would bring goodness for the people who eat it. Nowadays, the process is simplified; the food is prepared and coordinated by the wife of the hamlet-head using peoples' fund, usually by ordering from certain catering company. So, people do not have to prepare the meals by themselves. They only need to come to the *kenduri*, and then back home with food that has been 'blessed'. Of course there are missing signs in this simplification, as food prepared by the villagers themselves from their own field, signifies hope of good harvests from their field in the future. However, for the young generation in Kinahrejo, the important thing is still holding the *kenduri*, in order to preserve their culture, but the implementation can be simplified.

This shift in authority might be explained with the help of Margaret Mead's categories of generational interactions that she used as a basis for a cultural typology (Mead 1970). Following Mead, we may conclude that a shift from postfigurative culture to cofigurative one is taking place by Kinahrejo people. For a long period, especially during the semi-nomadic cultivation and subsistence-oriented agriculture, Kinahrejo people, and *wong Merapi* in general, was a postfigurative community that was intimately related to its habitat). In this type of culture, the young look to the elders as the sources of values and authority. Mead (1970: 2) has explained: "The essential characteristic of postfigurative cultures is the assumption, expressed by members of the older generation in their every act, that their way of life (however many changes may, in fact, be embodied in it) is unchanging, eternally the same." In the case of *wong Merapi*, they have had for generations the strong belief that their mountain is the kingdom of the spirits, that some elders could communicate with the spirits, and that they should therefore put their trust to these elders.

The last eruption that caused the death of the jurukunci brought along a shift of Kinahrejo community to cofigurative culture "in which the prevailing model for members of the society is the behavior of their contemporaries" (Mead 1970: 25). The eruption as the breaking moment of this change explicates Mead's (1970: 25) statement: "Cofiguration has its beginning in a break in the postfigurative system. Such a break may come about in many ways: through a catastrophe in which a whole population, but particularly the old who were essential to leadership, is decimated." In this transitional type of culture, both elders and younger people have and share with one another some aspects of authority, as it could also be found in Kinahrejo community after the last eruption.

One might further ask, what will the Kinahrejo community become, since according to Mead, the cofiguration period lasts only for a short period (Mead 1970: 26)? This is hard to predict, as the change from postfigurative to cofigurative phase is still an ongoing process. But many phenomena that go along with this change, as was explained beforehand, such as the fast arrival of many modern technologies and mass media, also the higher education of younger generation, lead to the prediction that Kinahrejo community will become a prefigurative community, in which the young will set the goals and stride the elders to follow (Mead 1970: 51). The adoption of scientific signs is an irreversible cultural change. It means that after adopting the scientific signs to predict the activity of

the volcano, they can not go back using magical or sensory signs for the same purpose.

Semiotically discussing these generational changes, we could say that the postfigurative – cofigurative, cofigurative – postfigurative, or cofigurative – prefigurative changes also usually mean changes in the sign systems between generations. In the case of Kinahrejo people, the postfigurative – cofigurative cultural change after the 2010 eruption happened hand in hand with a shift from the sensory-magical signs to scientific signs.

To conclude, we may depict the cultural changes on the slopes of Merapi after the 2006 and 2010 eruptions into this scheme (see Figure 5):

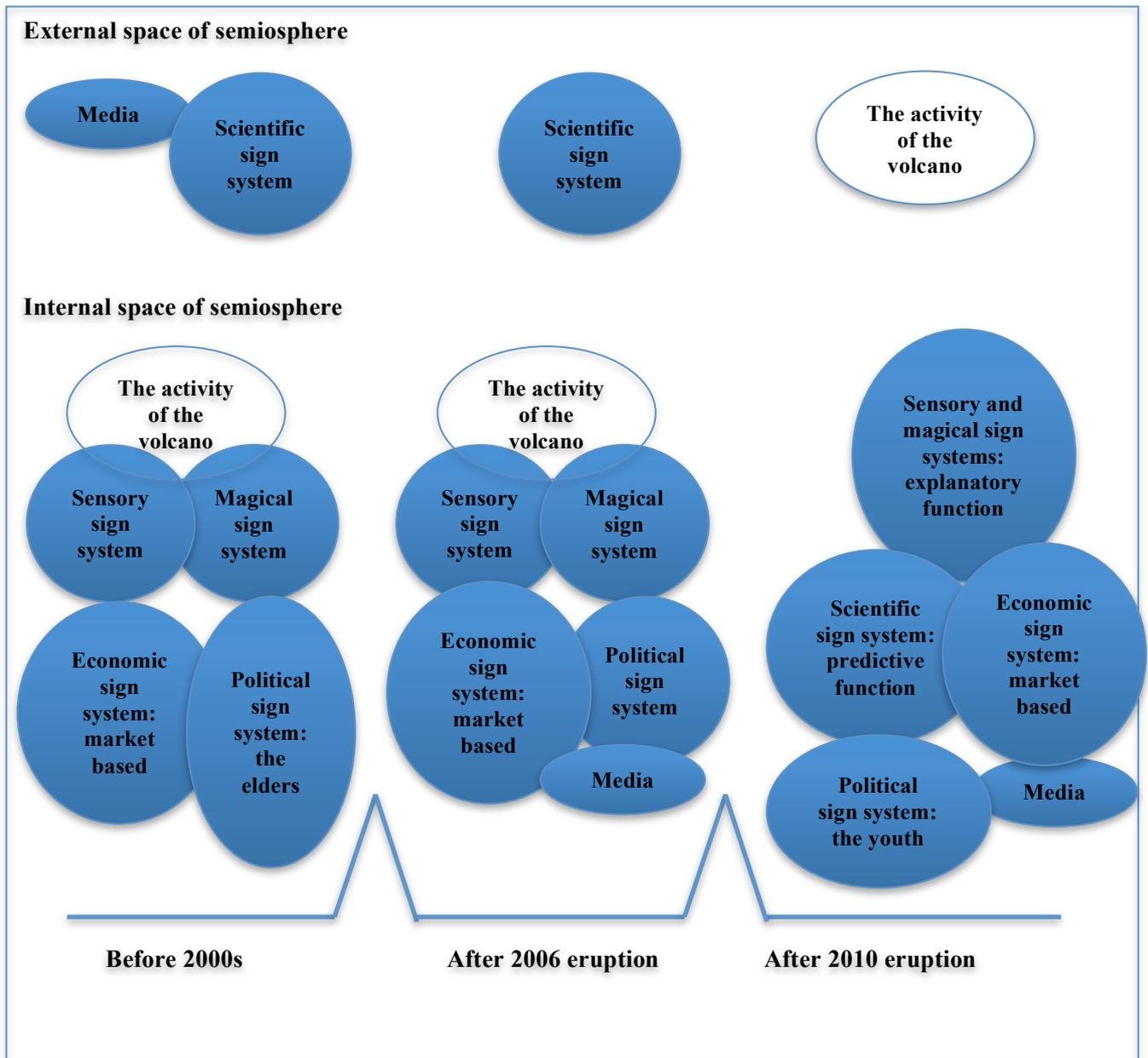


Figure 5. Transformation of the semiosphere of Kinahrejo during 2000s and 2010s

Conclusion

This thesis has discussed the relationship between volcanic eruptions and semiotic changes in the communities on Mount Merapi, paying special attention to the post-2010 eruption phenomena. This study is based on in-depth interviews and participatory observations in specific sites, namely Kinahrejo and Karangkendal hamlets, Umbulharjo village, Cangkringan subdistrict, Sleman district, that were conducted from February to April 2013.

Combining ecosemiotic and cultural semiotic approach, this study considers that ecosystems consist of sign systems, in which human sign systems are a part and perform vital roles in the changes of the ecosystem. Further, we may regard the totality of human sign systems as a semiosphere, which differs from one ecosystem to the other, binding it thus with the locale. Thus, human sign systems within ecosystem of Mt. Merapi shape the local semiosphere of *wong Merapi*, a specific name of local people who live on the slopes of Merapi. This study specified the human sign systems that are vital in the ecosystem of Merapi and that have been shaped since the emergence of the settlements on the slopes of Merapi, namely sensory, magical, economic, and political signs.

First, sensory or perceptual signs are tied to the belief that all nature is alive: water, earth, mountains, plants are living subjects. *Wong Merapi* believe that they should live in harmony with them for the balance of the ecosystem. In order to create the harmony, *wong Merapi* would communicate with their environment via visual, auditory, tactile, and other senses. They have thus developed '*ilmu titen*' – a local method which refers to the careful and detailed empirical observation of the behavior of different living beings in the environment.

Second, magical signs are related to the belief that spirits also inhabit the environment where humans live. *Wong Merapi* believe that their mountain is the kingdom of spirits, centered in its crater. Similar to the sensory signs, *wong Merapi* also believe that they should live in harmony with the spirits. '*Slametan*' or traditional Javanese ritual is hereby the most important signifier, indicating human expectation to live in harmony with the spirits.

Third, economic signs signify how *wong Merapi* meet their needs with the existing resources from their surroundings, without a need for lots of things from the outside. Thus, we may say that this economic system is a subsistence-oriented system, characterized by planting and consuming maize as daily food, as well as breeding cattle to produce manure and thereby maintain soil fertility. Maize and cow have become the centers of this subsistence system.

Fourth type of signs are political signs. *Wong Merapi* have a long history of resistance to outside parties, especially to those who have tried to get rid of them on the slopes of Merapi. They usually propose a political claim that they are the rightful owners of their land, as their predecessors have long inhabited the land. The realm of this resistance occurs at the level of hamlet (sub-village) as a political unit of the *wong Merapi*. In this case, the head of the hamlet functions as a mediator between the outside elements with villagers, filtering the external parties or information and making decisions for the community, including whether the community would evacuate or not during the eruption.

Theoretically, this confirms the dynamics of part and whole within semiosphere. Hamlet is a part, as well as a semiosphere, within *wong Merapi* as a larger semiosphere. In both of these semiosphere levels, culture and nature are closely related, in which nature is an integral part of culture. The four sign systems above reinforce this nature-culture interdependence as well as independence from external elements.

Eruptions form an integral part of this semiosphere. The four vital sign systems play significant roles in this integration. Sensory and magical signs have predictive and communicative functions, by which local people communicate with their surrounding environment, as well as with the spirits of nature and Merapi, believing that natural or magical signs will precede the eruption. Additionally, magical signs also have an explanatory function as the villagers believe that the eruption is a magical event caused by the spirits. In the economic system, the eruption is a sign that local people should take a rest for a moment and let nature regenerate via its own mechanisms. Political signs carry boundary functions, filtering and rejecting external signs that might potentially destabilize the semiosphere.

From the 1980s to the 1990s, there was a significant change in the economic sign systems, namely the inclusion of market-oriented economy to internal space of the local semiosphere of *wong Merapi*. In this new system, residents practiced a particular activity,

such as dairy farming, vegetable farming, tobacco farming, or others, to get money. With the earned money they bought rice as staple food and satisfied many other daily needs. The presence of this market-oriented economy has posited money as a center of the economic signs. Furthermore, it has decreased the interdependence between local culture and nature, since people need a lot of things from the outside, which are obtained by way of purchase.

In the 2000s and 2010s, there was a fundamental change, namely the acceptance of scientific signs in the semiosphere of *wong Merapi*. As a system of signs, the scientific signs have been developed since the late 19th century by the Dutch colonial government and then continued by the Indonesian government. The two most important sign systems are the categorization of Merapi's activity into four levels, i.e.: *aktif normal* (normally active), *waspada Merapi* (on guard for Merapi), *siap Merapi* (prepared for Merapi), and *awas Merapi* (beware Merapi); and the mapping of the upslope of Merapi into three zones, namely Disaster Prone Region III as the most dangerous areas; Disaster Prone Region II, a few kilometres outside of region III; and Disaster Prone Region I, the edge of the rivers that used to be the way of lava.

Until the middle of 1990s, these scientific signs remained alien to *wong Merapi*. Their acceptance began in the early 2000s by the younger generation. It was influenced by three factors, namely: the youth involvement in disaster training activities held by outside parties, which developed since the early 2000s; the high level of their education; the presence of a very intensive mass media coverage on the slopes of Mt. Merapi during the eruption crisis since the 2006 eruption.

This study found that the last 2010 eruption was an important boundary of the acceptance of these scientific signs by the whole community, especially the Kinahrejo community. The experience of being directly affected by the eruption was the most important factor by the acceptance. It marked the failure of the predictive function of the sensory and magical signs that have been around for a long time. The scientific signs thus replaced the predictive function of the sensory and magical signs in predicting the behavior of Merapi and guiding people during the crisis. However, I have to add that the replacement does not mean an elimination of the sensory and magical signs in the semiosphere of local people. These two sign systems still run explanatory functions in the daily life of local people, including the new magical explanation of the eruption. This study also found that the inclusion of the scientific signs is limited only to the categorization of

the status of Merapi, and has not taken place in other cases. The announcement of the status, especially the ‘beware status’ is significant for local people. But they have given their own meaning to this status of Merapi, which differs from the prescriptive meaning attached to it by the government.

The presence of the scientific signs is closely related to the shift in the political authority within local communities. In the previous decades, the elders, especially the spiritual leaders, were the center of the political authority. They relied on the magical and sensory signs for the communal decision-making, including whether they will evacuate or not during the eruption. In the 2000s and 2010s, the authority has shifted to the younger generation, who emphasize economic and scientific signs in their communal and political decisions. The mediating and filtering functions between internal spaces and external spaces of semiosphere become more diverse. They are not led by the head of hamlets only, but also by the younger leaders.

The inclusion of these scientific signs also coincided with the strengthening of market-oriented monetary economy. It should be related to the emergence of the disaster tourism-based economy since the 2006 eruption, which has changed the economic lifestyle of *wong Merapi* from subsistence culture to ‘economic’ culture. *Wong Merapi* have slowly been integrated to the market system, in which the considerations of effectiveness, efficiency, and financial cost and benefit occupy the center of the local culture.

The inclusion of scientific signs has also excluded the eruption from the internal space of local peoples’ semiosphere, whereby the eruption is considered as an incomprehensible and unpredictable natural phenomenon. This change is an important marker of the shift of nature – culture relations. A significant element of nature, namely the eruption, has been excluded from the internal space of local semiosphere of *wong Merapi*, whereas various elements of the external spaces of semiosphere have been included, such as government, scientific knowledge, money, mass media, modern technologies, and others. On the one hand such inclusions reduce the vulnerability of local people to the natural hazard from their environment, but on the other hand it opens the communities to possible new vulnerabilities like economic crises, political conflicts, governmental failures, and other vulnerabilities that come from the external spaces of semiosphere.

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Annex 1 Interview Guide

1. What happened during the last 2010 eruption? When and how did you evacuate?
2. What does Mt. Merapi mean to you?
3. What does eruption mean to you?
4. How do you perceive the death of the *jurukunci* in the last eruption?
5. What did you do during the crisis time of the last eruption? To whom did you listen at that time? How did you know when and where the eruption would happen?
6. What will you do in the future eruption? How will you know about the next eruption, to whom will you listen?
7. What will be your permanent occupation in the future? The volcano tour, or cattle-based livelihood as in the previous time before the eruption, or the other works?
8. Which one do you prefer, the new settlement or the original village, and why?
9. What kind of changes have you perceives after the last eruption?

Annex 2 List of informants

Name	Age	Position	Topic of Interview
Asih	48	Local people – head of Kinahrejo hamlet	Main questions as in the interview guide and the history of media and modern technology presence by Kinahrejo people
Ramijo	46	Local people – the <i>juru kunci</i> (caretaker) of Mt. Merapi	Main questions as in the interview guide and the role of the <i>juru kunci</i> of Mt. Merapi
Ngatimin	35	Local people – young generation	Main questions as in the interview guide
Sunardi	41	Local people – young generation	Main questions as in the interview guide
Badiman	44	Local people – young generation	Main questions as in the interview guide
Wigny Suprpto	73	Local people – old generation	Main questions as in the interview guide
Wardi Wiyono	72	Local people – old generation	Main questions as in the interview guide
Warno Surakso	67	Local people – old generation	Main questions as in the interview guide
Eko Teguh Paripurno	51	Pasag Merapi initiator - researcher	The history of Pasag Merapi and other modern institutions regarding disaster mitigation on the slope of Mt. Merapi
Budhi Hermanto	35	Jalin Merapi initiator	The history of Jalin Merapi and other modern institutions regarding disaster mitigation on the slope of Mt. Merapi
Bambang Hidayana	53	Researcher	The economic changes on Mt. Merapi since 1980s.

KOKKUVÕTE

Käesolev töö „Looduskatastroofid ja semiootilised muutused Indoneesias Merapi mäe nõlvadel“ käsitleb vulkaanipursete ja semiootiliste muutuste suhteid Merapi vulkaanil elavates kogukondades, keskendudes eriti 2010. aasta vulkaanipurske järgsetele nähtustele. Töö eesmärgiks on analüüsida eriti pärast 2010. aastat Merapi nõlvadel elavates kogukondades toimunud kultuurilisi muutusi semiootika vaatepunktist. Sellest tulenevalt on uurimisküsimused järgmised: Kuidas ja miks toimusid Merapil semiootilised muutused pärast 2010. aasta vulkaanipurset? Millised kultuuri aspektid on 2010. aasta vulkaanipurske järel muutunud? Mis on samaks jäänud? Kuidas inimesed neid muutusi tõlgendavad? Suur osa selles uurimistöös kasutatud empiirilistest andmetest pärineb minu isiklikest kogemustest 2010. aastast, kui ma vulkaanipurske kõige kriitilisemal ajal seal vabatahtlikuna töötasin, aga ka varasematest Merapi nõlvadel elavaid kogukondi käsitlenud uuringutest, ning eriti olulisel kohal on 2013. aasta veebruarist aprillini Slemani piirkonna Cangkringani alampiirkonna külades Karang Kendalis ja Kinahrejos toimunud välitööde käigus minu poolt kogutud materjal (süvaintervjuud ja osalusvaatlused).

Käesolev uurimistöö kombineerib ökosemiootilist ja kultuurisemiootilist lähenemist, lähtudes sellest, et ökosüsteem koosneb märgisüsteemidest. Inimeste märgisüsteemid moodustavad neist vaid ühe osa, kuid mängivad ökosüsteemide muutumises olulist rolli. Lisaks võib kõiki inimeste märgisüsteeme vaadelda koos kui ühte semiosfääri, mis on ökosüsteemiti erinev ja järelikult paigaga seotud. Seega vormivad *wong Merapi* (nii kutsutakse Merapi nõlvadel elavat rahvast) kohalikku semiosfääri Merapi vulkaani ökosüsteemis paiknevad inimeste märgisüsteemid.

Uurimistöös tuvastati need inimeste märgisüsteemid, mis on Merapi ökosüsteemi seisukohalt olulised, ning nendeks osutusid sensoorsed, maagilised, majanduslikud ja poliitilised märgid. Esiteks on välja toodud sensoorsed ehk tajumärgid, mis on seotud uskumusega, et kõik looduses on elav ning et inimesed peaksid elama kooskõlas loodusega. Selleks et seda harmooniat luua, on *wong Merapi*'l eriline kohapeal välja töötatud meetod nimega *ilmu titen*. See hõlmab mitmesuguste looduses elavate olendite käitumise hoolikaid ja detailseid vaatlusi, kasutades selleks visuaalseid, auditiivseid,

taktiilseid ja teisi tajukanaleid. Teine rühm, maagilised märgid, on seotud uskumusega, et Merapi vulkaan on vaimude riik. *Wong Merapi* usub, et elada tuleks ka vaimudega kooskõlas. Traditsiooniline Jaava rituaal *Slametan* on siinkohal väga oluline tähistaja, viidates inimeste soovile elada kooskõlas vaimudega. Kolmas rühm, majanduslikud märgid, viitab sellele, kuidas *wong Merapi* ümbruskonnas leiduvate ressursside abil oma vajadusi rahuldab, ilma et oleks vaja liiga palju väljast sisse tuua. Neljas rühm, poliitilised märgid, tähistab *wong Merapi* poliitilist väidet, et nemad on selle maa õiged omanikud, sest nende eellased on siin juba ammu ajast elanud. Kohalike elanike vastuhaku aluseks on väiksemad külad (suuremate külade alajaotused) kui *wong Merapi* poliitilised üksused. Sel juhul toimib väiksema küla külavanim ühtlasi ka vahendajana külaelanike ja välismaailma vahel. Need neli märgisüsteemi tugevdavad looduse ja kultuuri vastastikust seotust Merapi vulkaanil, samuti tagavad need sõltumatuse välistest elementidest.

Vulkaanipursked kuuluvad lahutamatu osana *wong Merapi* semiosfääri. Neli olulist märgisüsteemi mängivad selle integreerimise juures olulist rolli. Sensorsetel ja maagilistel märkidel on ennustav ja kommunikatiivne funktsioon. Nende kaudu suhtlevad kohalikud inimesed oma keskkonnaga, aga ka vaimudega, uskudes, et loodus ja maagilised märgid võivad vulkaanipurset ette ennustada. Maagilistel märkidel on ka seletav funktsioon, kuna külaelanikud usuvad, et vulkaanipurse on maagiline sündmus, mida põhjustavad vaimud. Majanduslikus süsteemis tähistab vulkaanipurse seda, et sealsed inimesed peaksid korraks aja maha võtma ja laskma loodusel taastuda. Poliitilised märgid kannavad piiritlemisfunktsiooni, filtreerides märke ja jättes kõrvale kõik välise, mis võiks nende semiosfääri destabiliseerida.

1980.-1990. aastatel leidis majanduslikus märgisüsteemis aset oluline muudatus, nimelt turule orienteeritud majanduse kaasamine *wong Merapi* kohaliku semiosfääri sisemisse ruumi. Selle uue süsteemi tingimustes hakkasid piirkonna elanikud tegelema mingi konkreetse valdkonnaga, näiteks piimakarja, köögiviljade või muude produktide kasvatamisega, mille eest nad said raha, mille eest osta riisi kui põhilist toiduainet, aga ka muud igapäevaselt vajalikku. Selline turule orienteeritud majandus on tõstnud keskse majandusmärgi kohale raha ning on kahandanud kohaliku kultuuri ja looduse vahelist vastastikkust sõltuvust, sest inimesed vajavat nüüd paljut ka väljaspoolt.

2000. ja 2010. aastatel leidis aset oluline muudatus, nimelt lülitati *wong Merapi* semiosfääri ka teaduslikud märgid. Märgisüsteemina on teaduslikud märgid arenenud

alates 19. sajandi lõpust, algul Hollandi koloniaalvalitsuse all, seejärel Indoneesia valitsuse all. Kaheks kõige olulisemaks märgisüsteemiks on: 1) Merapi aktiivsuse jaotamine neljaks astmeks, milleks on *aktif normal* (normaalne aktiivsus), *waspada Merapi* (Merapi suhtes valvel olla), *siap Merapi* (Merapi jaoks valmis seada) ja *awas Merapi* (Merapi eest hoiduda); ning 2) Merapi ülemiste nõlvade jaotamine kolmeks tsooniks, milleks on Katastroofi piirkond III ehk kõige ohtlikumad alad, Katastroofi piirkond II ehk kõige ohtlikumast tsoonist paar kilomeetrit edasi, ja Katastroofi piirkond I ehk nende jõgede kaldad, mida mööda laava on alla voolanud.

Kuni 1990. aastate keskpaigani olid need teaduslikud märgid Merapi rahvale võõrad. Noorem põlvkond hakkas neid omaks võtma alates 2000. aastate algusest. Seda mõjutas kolm tegurit: noorte osalemine väljastpoolt tulijate korraldatud katastroofikoolituse programmides, millega on tegeletud alates 2000. aastate algusest; haridustaseme kasv; ja 2006. aasta vulkaanipurskega kaasnenud kriisist peale Merapi vulkaani nõlvadel toimuva väga intensiivne kajastamine meedias.

Käesolevas uurimuses leiti, et viimane, 2010. aasta vulkaanipurse oli oluline piiritähis teaduslike märkide omaksvõtmisel terve kogukonna poolt, eriti Kinahrejo kogukonnas. Selle omaksvõtmise juures oli kõige olulisemaks teguriks kogemus, et vulkaanipurse mõjutab neid otseselt. See tähistas väga pikka aega kasutusel olnud sensorsete ja maagiliste märkide ennustava funktsiooni nurjumist. Niisiis asendasid teaduslikud märgid sensorsete ja maagiliste märkide ennustava funktsiooni Merapi käitumise ennustamisel ja kriisiolukorras inimese juhtimisel.

Teaduslike märkide *wong Merapi* kohalikku semiosfääri sissevõtmine on sellest siseruumist välja jätnud vulkaanipurske, sest vulkaanipurset peetakse nüüd arusaamatuks ja etteennustamatuks loodusnähtuseks. See muutus on looduse-kultuuri suhtes toimunud muutuste oluline tähistaja. Üks tähtis looduse element, nimelt vulkaanipurse, on nüüd *wong Merapi* sisemisest semiosfäärist välja arvatud, samas on mitmed semiosfääri välise ruumi elemendid, näiteks teaduslik teadmine, raha, moodsad tehnoloogiad jms sellesse sisse arvatud. Ühelt poolt vähendab nende elementide lisamine kohalike elanike haavatavust elukeskkonnast tulenevate ohtude suhtes, kuid teiselt poolt avatakse need kogukonnad uutele ohtudele, milleks on majanduskriisid, poliitilised konfliktid, valitsuste ebaõnnestumised ja muud probleemid, mis tulenevad semiosfäärivälisest ruumist.

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