The Role of Social Practices on the Climate Resilience of Fishing Communities in Semarang Coastal Area

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Abstract. Climate change will have different impacts on individuals and communities, and showed strongest on the coastal communities. Fishing community would suffered the most since they inhabited areas with higher exposure to climate risks, and they have fewer resources to adapt to the changing conditions or recovering from sea-level rise and extreme weather events. This study had the objective to identify social practices within the fishing communities on the coast of Semarang and analysed their roles on the community’s climate change resilience. Data collection was carried out using participatory observations and in-depth interviews, supported by literature studies. Data were analysed qualitatively. The results indicated that the social practices found among the fishing community on the coast of Semarang comprised of 3 concepts, namely Habitus, Capital, and Field. The study have found that these social practices played significant roles in strengthening the community's resilience to climate change. The fishing communities were able to survive in the Field affected by the climate change-triggered rising sea level, because they have proper Habitus and Capital for the Field. However, in the context of climate change threat, the community's resilience was limited. Hence, under a very extreme climate scenario, the social practice-based resilience has some thresholds that if continuously suppressed, could become fragile.

1. Introduction
Climate change impacts are not distributed equally. Some regions, sectors, and individuals will be less affected—or may even benefit; while other regions, sectors, and individuals may suffer significant losses. The scenarios and impacts of climate change will affect, and in many cases have already affected, the lives of millions of those who are dependent on fisheries and aquaculture for foods and livings [1].The manifestation of climate change impacts is different for each fishery livelihood activity. In general, climate change demonstrates serious impacts on the livelihoods of fishermen [2].

Small-scale fisheries are important social–ecological systems in many developing countries as they provide essential ecosystem services and livelihood opportunities. Despite their significant contributions to both the local community’s income and food security [3], nevertheless small-scale fisheries are vulnerable to global and local stresses [4] provoked by climate change which threaten the community’s viability [5]. The uncertainty induced by climate change will increase future unpredictability of fishery systems, thereby impacting severely on the capacity of the dependent-local populations to sustain their livelihoods.

An estimated 200 million people are employed, directly and indirectly, in the fisheries and aquaculture sector[1], indicating the crucial importance of such sector in many coastal regions. These facts demonstrate the critical importance of providing adequate responses to the threat of climate change: not only are fisheries essential for food, livelihoods and trade, but the state of the resource base, limits their capacity to absorb climate shocks[6].
Fishermen are people who are most vulnerable to the impacts of climate change, which adds to the many threats and obstacles that have already confronted them [1]. Fishing community -like the inhabitants of Kampong Tambak Lorok Semarang - will suffer the most since their live in areas with higher exposure to climate risks, yet they have fewer resources to deal with the changing conditions or recovering from sea level rise and extreme weather events.

Although many climate change-related research have been conducted in Semarang Coast (e.g. [7], [8], and [9]), there have been lack of in-depth studies to analyse the relationship between social practices of fishing community and their climate change resiliencies. In the new context of climate change, the social practices of the fishing community will create solutions to withstand the changing climate, and promote ways to adapt to the effects of climate change.

This study has the objective to identify social practices within the fishing communities on the coast of Semarang and analyse their roles on the local climate change resilience. People in disaster contexts often self-organised and collectively cope with disasters. Therefore it makes sense that in resilience-thinking, social capital is believed to be a key constitutive feature of resilient individuals and communities[10]. This study uses the Bourdieu’s social capital theory to emphasise the role of binding people together and positively influencing disaster response and recovery.

2. Method
This study uses Grounded Theory Method (GTM), which is defined by Strauss and Corbin as a research method with a qualitative approach that uses a set of systematic procedures to construct inductively a theory or concept or abstract analytic scheme of a phenomenon[11]. The concept created through the GTM method was not obtained from the results of literature study or the opinions of researchers, but rather from participants who have or are experiencing a particular process, action, or interaction that has been studied.

GTM has two main approaches, namely Glasserian and Straussian. The Glasserian approach starts with an empty thoughts, neutral research questions, data-based theories, passive researchers, and two stages coding. This approach is called the constructivist approach. While the Straussian approach uses systematic procedure that initiate research with initial ideas, more structured questions, theory based, data-based theories and interpreted by researchers, active researchers, and three stages coding namely open coding, axial coding, and selective coding[12].This study applied the Straussian approach with initial ideas and structured questions compiled based on Bourdieu's social practice theory. The qualitative approach was applied to identify the social practices of the fishing community living on the coast of Semarang.

This study was conducted in Kampong Tambak Lorok, which is the largest fishing village in Semarang City. The location of this village is on the northern outskirts of Semarang City which is directly adjacent to the waters of the Java Sea and on the banks of the Banger River (Figure 1). Kampong Tambak Lorok was also selected due to its specific natural condition and social aspects such as the local livelihood and occupation that were representative of the fishing communities of Semarang Coast.
Figure 1. Research location.

Key informants were purposively selected based on the length of residency (more than 30 years), using the assumption that they are likely to be more knowledgable and have had experienced the challenges and threats that occurred in Kampong Tambak Lorok. Overall, the key informants totalled to 12 fishermen.

Data collection was carried out using participatory observations and in-depth interviews methods, coupled with literature studies. In-depth interviews were conducted to adjust the qualitative data collection method in this study. The information collected were detailed, in-depth, and explorative (why and how) in nature, allowing the possibility for the development of related information. In-depth interview activities were concluded once no new information was gathered that could clarify and deepened the phenomenon under study.

The research data were processed using several techniques, namely: writing transcripts, writing memos, and analytical archives. This study organised systemic analytical data using four types of analysis, namely: transcript analysis (coding process), individual life history, diachronic analysis, and visual displays. Transcript analysis was done along with coding process of which comprised of 3 stages, namely open, axial, and selective codings.

3. Results and Discussion

3.1. Climate Change Related Disaster in Semarang Coastal Area

In recent years, natural hazards are more serious day by day in the Semarang coastal area. During rainy season, this region is exposed to climate change related disasters such as tidal inundation and flood [9], [13]. Most of the coastal areas of Semarang have high levels of risk, vulnerability, and threat to tidal inundation[14].The causes of tidal inundation are sea level rise due to climate change and land subsidence[7], [15]. Tidal inundation in Semarang Coast is estimated to be higher with the assumption of a constant increase of sea level rise to 15 cm/year[16].
There are many types of natural disasters-related climate change in Semarang Coast; however, tidal inundation is the most prevalent, triggering the Semarang coastal area to be often flooded. Discussions with key informants who are knowledgeable in the field of climate change in Semarang Coast revealed that Kampong Tambak Lorok has been affected by climate change-related natural disasters. Due to the rising sea level and heavy rains, most parts of the neighbourhood experienced daily floods. Accordingly, most serious natural disasters, including tidal inundation (rob-in Javanese), increased rainfall, and sea level rise, would continue to occur frequently in Semarang Coast causing severe impacts on the fishing communities. Although, the areas were prone to physical danger and socially unfavourable, in reality, the local residents stayed[17].

3.2. The Role of Social Practices on the Fishing Community’s Climate Resilience

This study employed Bourdieu’s social practice theory. In using his capital, field, and habitus theories, this paper will offer a reinterpretation of the resilience approach and explore unarticulated aspects of resilience.

The structures that make up human societies—political, economic, social, and ideological—provide both the structure for and are structured by human activity and action: “people create the conditions and structures in which they live, largely as a result of the unintended consequences of their actions”[18]. Bourdieu states that a person’s way of thinking and acting is strongly influenced by his habitus[19]. Bourdieu formulates that (Habitus x Capital) + Field = Social Practice. This implied that an individual as an actor, is influenced by habitus, whereas on the other hand, individuals are active actors to form habitus. Actors form and are formed by habitus through the capital at stake in the field. Social practice is a product of the relationship between habitus and the field by involving capital in it[20]. The role of social practice on the climate resilience of fishing communities in Semarang coastal area saw in following Figure 2.

![Figure 2. The role of social practice on the climate resilience.](image)

Field in Kampong Tambak Lorok referred to the deteriorating physical conditions of the area, from what was previously clean and beautiful area to the current slum and wasted. The degradation of environmental conditions that occurred in the long term was mainly due to the increasing severity of the inundation and the rate of land subsidence in the area. The Tambak Lorok fishing community lives in a field that has suffered severe degradation for more than 30 years.

The ability to survive in such fields was related to the capital they possessed, namely economic and social capitals. The economic capital is in the form of a high level of income obtained by the fishermen. Tambak Lorok fishermen have an average income above the regional minimum wage of Semarang City due to the close distance of the village to the sea (fuel costs saving) and the cultivation of green mussels which provide stable and high income for the fishermen. This economic capital has enabled the fishermen to upgrade their housing conditions to prevent being flooded. This showed that economic capital was the source of strength for the fishermen of Tambak Lorok in facing the degraded field. Similarly, in the context of social capital, the community showed a harmonic social relationship.
The fishermen of Tambak Lorok, although administratively live in urban areas, but showed social tightness with each other, familiarity and harmonious, know each other, and care for each other. Such social capital has enabled the fishermen to acquire social strength in facing the fields that threatened their survivals.

Furthermore, both capitals (economic and social) were formed and strengthened simultaneously by their habitus. Habitus of Tambak Lorok residents is in the form of cakrukan. The habitus has social values as it was created through the process of socialising the values that were long lasting and lived out by the residents, so that it deeply sank into the way of thinking and behaviour patterns that resided within the Tambak Lorok residents. The habit of cakrukan was able to build contacts and cohesiveness among the villagers. Every afternoon after work, fishermen gathered on the cakruk uninvited and chat about their voices. Cakruk is a place for exchanging information and news among the villagers so it developed into an institution of social communication that is still maintained today. This cakrukan habitus strengthens and fosters the social capital of the fishermen where they have become more familiar and harmonious with each other. Thus, Tambak Lorok fishermen have the habitus and the capital that were suitable for the fields in Tambak Lorok, hence they were able to survive in the area affected by climate change.

Ecosystems are ever-changing, and they are embedded in a world in which many other things are continuously changing at various spatial scales[21]. Consequently, relationships fitted to extant observations will always become outdated as system change makes them irrelevant and misleading. Indicators of resilience that are appropriate for the current regime may become useless as ecological structures and social expectations shift.

Faced with such constraints and multiple uncertainties, the fishing community of Semarang Coast could change in order to adapt and survive the climate disaster-related events. The adaptive capacity of a socio-ecological system is related to the existence of mechanisms for the evolution of novelty or learning.[22]

Bourdieu’s capital theories could be one of the fruitful theories for future resilience research as it expands already-popular social capital theory to more critically contextualise resilience in disaster contexts and conceptualise the link between resilience and disasters[23]. The possible linkage between various forms of capitals and resilience, and some non-economic forms of capital, particularly social capital, can be valuable components of disaster resilience[24].

Bourdieu uses the term capital to refer to ‘resources’ in the broadest sense. This capital may be economic (financial assets), cultural (knowledge, attitudes, organisational skills, norms, past experience and education), social (networks, social cohesion and group membership) or symbolic (rewards accruing from status, respectability and reputation). His concept of social capital (which is similar to social networks, social cohesion or social infrastructure in the disaster literature) is commonly used by disaster researchers[23].

As demonstrated in this paper, Bourdieu’s concepts can provide a useful way to examine how the interplay of capitals not only affected individuals and communities’ social vulnerabilities, but also their resilience. Practical capitals are often created and employed by social agents in disasters. In addition, the solutions given by the community to adapt to climate change should be further analysed to indicate their contributions to adaptation and mitigation of climate change impacts on the living processes of the fishing communities.

4. Conclusions
Social practices of the fishing community on the coast of Semarang involved three concepts, namely Habitus, Capital, and Field. These social practices play a role in strengthening the community’s resilience to climate change.

The fishing community is able to survive in the Field that affected by sea level rise triggered by climate change because they have proper Habitus (cakrukan) and Capital (economic and social) for that field. However, in the context of the threat of climate change, the community’s resilience is limited resilience. So, in a very extreme climate scenario, resilience based on social practices has a threshold that, if continuously suppressed, could be fragile.
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