

# The Influence of a Culture in the Planning of Disaster Mitigation in Indonesia

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## ABSTRACT

Disaster is never expected by anyone, but awareness and knowledge about disaster preparedness should be owned by communities, cultivated in their daily lives and constructed based on local values that they profess, so that it becomes a reference in the act when the unexpected happened. This paper explores the potential of indigenous culture, to be a cornerstone of planning a mitigation system, especially in disaster prone areas. Described in three discourses that synergize when implemented in an integrated manner with the culture, from an analysis of local wisdom for settlement areas in disasters prone, community based for mitigation management through the application of local technology for the masses dwelling, which is expected to be a recommendation for an environmentally conscious development, disaster response, safety and security for all members of society.

**KEYWORDS:** disaster, local wisdom, mitigation system

## I. INTRODUCTION

Mitigation becomes popular in the last two decades, because a disaster occurs in almost all parts of the world. Its significance until the scope is extremely complex, especially in disaster mitigation, including the planning and execution of action to reduce the risk or impact of a disaster, both before and after the disaster happened [1].

Mitigation complexity makes it very closely linked with culture, some references specifically view that the culture becomes a fundamental aspect that must be considered in every mitigation action, particularly in disaster-prone areas.

As the Sanitary Revolution occurred in line with the development of "safety culture" for public health, as well as disaster mitigation should be developed through the evolution of a "safety culture" similar to public safety. [2]

In this case, the culture is not only as the complementary, in which its meaning is only restricted to the culture display (ritual-spiritual-traditional), but extends to the applicable study of all its components that are multi-dimensional. According to [3], the study can be seen from three pillars of the culture reinforcing mitigation planning, namely culture as a value system, as knowledge and as an institutional practice. [3] argue that the cultural components will affect the action of an institution differently in different contexts causing the different types actions, for instance the culture in the pre-disaster and post-disaster environment.

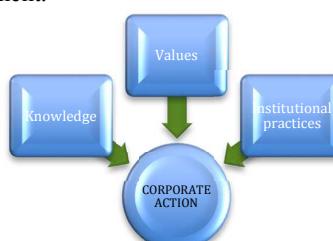


Figure 1. The chart of the relation of cultural component with the practice of an institution,  
Opinion interpretation from [3]

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Organizing and conceptualizing the culture are the steps to understand the relationship among those three components, which leads to the understanding of how to rationalize the culture itself. It becomes such an important case if the culture is explicitly understood so that the meaning of culture in the mitigation process is not absurd and abstract.

According to [4], rationalizing the culture can help to probe the core issues of mitigation, in this case, as crisis sense making so that the expected responses are more comprehensive.



Figure 2. Chart of cultural rationality,  
Interpreted by [4]

Based on the study of [4] above, the discussion of mitigation related to the culture in this paper is divided into three parts:

1. *Rationality Hierarchy Type*: which sees the culture in the biggest group referring to the government as the policy maker or other relevant institutions which are regarded as the limit-giver and the clear structure compiler, in this paper, it is more specifically discussed on the government regulation about the region arrangement pattern which is response disaster, specifically related to the society local wisdom,
2. *Market Rationality Type*: which sees managerial culture as a bridge to the implementation of the real policy, in this paper, it is studied from management mitigation and local community involvement, and
3. *Sects Rationality Type*: that focuses more on the application and the public response both individually and smallest group in an institution, in this paper, it is discussed from the local community responses of the relation between the mitigation technology and mitigation knowledge in their area.

## **II. THE LOCAL WISDOMS RELATED TO LOCATION MANAGEMENT FOR DISASTER PRONE AREAS**

As previously mentioned by [4], the cultural type of Hierarchy Rationality is grouped as a big institution whose its values include; having clearly structural management, distinct limited policy, unambiguous purposes even its ambiguity is regarded high. Otherwise, the mentioned purposes are various which focus on fulfilling all needs of whole society members. Moreover, it also covers broader rules relating to all sectors, followed by standard procedures as well as the rules emphasize, which all are targeted and implemented to control all members of community.

Following this, the culture of Rational Hierarchy becomes possible reference to mitigation planning as the reflection of government roles as the highest authority makers in a state institution. Furthermore, the government as official institution has wide legitimization through policy decision, which one of them is creating rules about site planning for disaster prone areas. This point, for more details, could be coined as knowledge explored in governmental policy especially mitigation reflecting mentioned Rational Hierarchy as explained as follows:

According to [5], the mitigation is commonly defined as another possible effort to minimize disaster risks, by all means of physical building, society awareness, and skill improvement to face unexpected disasters.

In addition to this, the mitigation, accordingly the national rules mentioned above, include:

1. The implementation of site plan [6], where the site management plan is the process of area plan covering location use and the control of money use;
2. The building regulations, infrastructure building, site plans; and
3. The implementation of education, elucidation, and training is by means of conventional or modern way.

Therefore, the disaster mitigation is thus officially regulated based on the site management rules [7]. The UURP, moreover, provides an authority to local government to conduct self-improvement based on natural source potency, characteristics, and local wisdoms of their regions.

Further, there are four important points in relation to disaster mitigation, according to [8] as follows:

1. The availability of detail information and map of disaster prone areas for every single disaster.
2. The socialization in order to improve the understanding and awareness of society towards undetected disaster attack especially those living in prone dangerous areas;
3. Understanding the steps to take, to avoid, and self-rescue if any unexpected disasters happen, and
4. The regulation and good site management are all situated in prone disaster areas in order to avoid disaster threats.

Regarding the institution application which could be observed is site management including the management of city configuration with building quality and wide housing area. All must be well planned in order to effectively reduce the number of victims due to earthquake attacks.

Similarly, the planning of site management which relates to some aspects such physical aspects, social-cultural aspects, political and environmental aspects are all urgent elements through minimizing the disaster risks. For this reason, the function of site management is officially regulating the use of long-term site use. Through the appropriately site use, the preventions towards natural disasters at this time and in the future can likely be reduced even avoided.

For further details, the rules of site management plan in mitigation system are mentioned in the following:

1. To prohibit any building in disaster prone areas, particularly at historical sites where earthquake happened there in the past time.
2. To socially inform society about the sharply slope areas are merely possible for farming purpose.
3. To officially regulate the exploration of areas or particular zones which is estimated part of the way from any natural earthquake as well as to regulate building space.

As the realization of roles towards disaster mitigation system of site plans, it provides detail data regarding disaster prone areas into thematic maps such as:

1. The maps of ancient natural disasters
2. The maps of disaster prone areas

As mentioned above, the disaster mitigation is so much related to local wisdoms from one particular area or populated areas. At this context, the population is one of very determining factor of condition of one area. Thus, a management system, to easily adapt local wisdoms, is very essential. For this reason, the culture of disaster mitigation can be successfully implemented.

### III. THE INVOLVEMENT OF LOCAL COMMUNITIES TOWARDS MITIGATION MANAGEMENT

The culture in mitigation management conceptualized in cultural modes by [4] is classified into the market Rationality Type. This group reflects the efficiency of several aspects. In regard with managerial side, additionally, this type of culture becomes a facilitator to socialize the policies mentioned in the type of cultural hierarchy changes to sects type.

More specifically, **the values** mentioned on this type of culture have temporary limitation, clear purposes and evaluation which all are based on habits and togetherness. The independence in a managerial process becomes a very significant factor. The persons who could take decision without any dependence to others but with a high motivation for a better life become fundamental rationality at this type.

As its role as facilitator between hierarchy type and sect one, the managerial culture keeps valuing social controls through considering on-going policies.

Similarly, the disaster management, accordingly [1], means **the knowledge** closely related to whole activities which are implemented into planning and tackling, either before the disasters do not happen yet, happening, and after. This management of emergency steps aims:

1. To avoid any death victims,
2. To reduce sufferings of victims,
3. To acknowledge society about disaster risks.
4. To avoid any crucially infrastructure damages and to avoid loss of wealth and job fields.

Moreover, stated that once the disasters threat life, the society consequently faces any appearing risks. Without a good management, the rescue varying from individual, communal, environmental efforts considerably will lose ways. For this reason, the involvement of existing community becomes very important aspect into the planning of a mitigation system. [9]

Similarly to the statement mentioned above, [10] on their research, emphasized the importance of community involvement towards mitigation system. This is due to the failure tendency of one program to become a further program. Specifically, the state institutions sometimes do not widely consider the position of community or society as the front-liner victims who are supposed to have sufficient capability to face any attacking disasters.

The empowerment of society participation becomes a very valuable point for both [9], stating that the society level who mostly become victims of natural disasters are those included as isolated or marginal society, who considerably do not have sufficient human resource as well as access to good infrastructures and appropriate social services.

Thus, the action to establish *Community Based Disaster Management (CDBM)* is regarded an implementation of institution which is a forward step to apply more appropriate management among society. The empowerment of this community, in addition, is supposed to be followed by approach of local culture with few considerations in the following:

1. The implemented approach is bottom up where the members of society are instructed to recognize the vulnerability and capacity of their own areas. So, they can analysis both their strengths and weaknesses. The outcomes of proposed programs could be effectively achieved therefore.
2. The cultural approach is regarded as an identifying tool to detect any possibilities towards gap between mitigation policy and its real implementation.
3. The identification of disaster risk levels in their own regional be done by means of activating communal works among society. By this, they are expected being able to evaluate the dangerous as well as safe levels in their own regions. So, the target of quick emergency response could be gained appropriately.
4. The participation of society by combining physical, technological, and economical assets in their own regions will considerably enhance the sensitivity towards disaster potency.

Discussing the managerial one therefore could not be disclosed with running leadership in a community. However, the management of mitigation is not only supposed to be depended on this factor. The management of disaster prevention with the involvement of community could result a High Reliability Organization (HRO), an effective system where the society takes primary roles, not only as secondary actors. This consideration is then enforced by preserving appropriately building-style traditions and is proved effective to quickly respond disasters. For this reason, the possibility of mitigation can be realized not only such as an impossible dream.

#### **IV. THE CONSTRUCTION METHODS BASED ON LOCAL WISDOMS IN MITIGATION PLANNING**

Both the policy and mitigation management could not achieve their targets without the implementation in real context. Thus, [4], accordingly, categorized the type of Sects Rationality which specifically focuses on the application and responses of society members both individually or small communally at an institution, and is regarded as key factor in a process of comprehensive mitigation planning. This point, in details, elaborates the perspectives of local society towards existing technology and construction in their own regions. The particular character of applicative Sects Rationality Culture demonstrates its values which strongly coins equality, together-decision making, maintains self-exsistency and improves critical skills and quick responses towards every single thing happening in their environment. In similar word, another characteristic of this type viewing the use of local technology as unique potencies from every different community.

To deeply understand the characters mentioned previously, it is just significant and regarded as the best solution to implement the approach of bottom-up mitigation society by means of developing the mitigation policies through consultation with various local society groups using techniques and actions where the society members can organise themselves and are capable of being indepence with technically limited assistances from outside.

In addition to this, the programs of mitigations society-based are considerably more success to result actions which respond the real needs of local society as well as to take parts into society development. This is much expected being able to emerge the culture of awareness in relation with the dangers that they perhaps face and their ability to protect themselves in the future.

Besides that, it is also necessary to re-socialize that the local wisdoms as *knowledge* should be referred to the implementation of construction into the building. The vernacular and traditional

buildings in Indonesia, for more details, have been examined more resistant towards disasters because of the application of hereditary building styles based on *trial and errors* towards natural challenges.

This local culture, therefore, necessarily needs to be preserved and widely sosialised their strengths. So that, the surrounding society eventually becomes more respect to local tecnology as the strengths and spesific characters of their own regions which are stronger through facing disasters compared with modern building which are commonly made from brick walls.



Figure3. Few examples of vernacular and traditional houses in Indonesia. [11]

As the examples of **institutional implementation**, is the vernacular houses in the village Dukuh, West Java. To be more spesific, the houses at this village are shaped likely grandstands with stone pedestal. This houses are constructed using light in weight, elastic with local materials which mostly consist of woods, bamboos, palms, and sago palms. Additionally, the connecting system uses pin systems and connection with bamboos bunch.

The building methods are done through togetherness with local society along with the knowledge about building technology which is continually inherited from their founding fathers.

This method, therefor, is relatively easy as it uses the local building materials as well as local workers.



The awareness to preserve construction methods of vernacular building should be maintained as the culture of modern society does not wipe out the local wisdoms which is proved more sustainable compared with modern buildings which precast and use bricks which are regarded more difficult to be repaired once the natural disaster such earthquake happened.

## V. ANALYSIS AND RECOMMENDATION

It can be fairly said that there are inappropriate processes of mitigation system in Indonesia starting from the identification until the disaster rescue. For further details, in disaster prone areas both the location close to coastal areas or highland, sometimes there are still many societies who build houses or villas for rest spots, where that location is considerably disaster prone areas or protected areas. Any building, at these locations, should be prohibited. In fact, there are still increasing number of houses or villas built at those locations without paying attention the material construction unfortunately. Ironically, the increasing disaster victims are caused by the uneducated society towards exploring their areas or are caused by little data and information about the area exploration to them.

Another case, in addition, is case of the fire mountain [12], whose status had increased to warning level. According to the prediction of experts, the mountain eruption was explosive but the evacuation process to local society surrounding fire mountain faced obstacles. It was because the unfriendly behavior of local citizens who kept staying at their homes or doing their daily activities around the rim of fire mountains. This condition, moreover, became difficult for officer who had given warning since the two last weeks when the mountain status was just reported either wary or alert. The illustration mentioned above describes that the role of existing institutions to socialize and to manage disaster mitigation is not fully realized well. So, there are still many constrains which cannot be handled wisely.

In the case of earthquake occurred at Cianjur, many damages happened at building with disproportional brick stones because of limited knowledge, financial supports, and without carefully paying attention to the building standard based on earthquake resistance. The established buildings are traditional and vernacular houses which keep using local materials and technology such woods and bamboos. For this reason, the awareness of society about the significance values of local wisdoms should be encouraged and raised. So, the society will more respect their heritage cultures and eventually implement those values into their environmental buildings.

Referring to the analyses mentioned above followed by the explanation of value management, knowledge, and institutional practices which all are related to the components of crisis sense-making. Therefore, there is a couple of following recommendations in regard with the complement of planning of mitigation disasters in Indonesia:

1. Socializing the culture of safety first through illumination, demonstration through either printed or electronic media, and some others whose all access are opened and easy for society (documenter films, wayang, dance-drama, folks, local songs, ballads, and movie screens)
2. Publishing the model cultures among officials or relevant institutions such giving good and applied examples. For example, not giving permission for any building plans in disaster prone areas.
3. Publishing the policy implementation (BCR, FAR, GSB, GSP, dll) which is all obvious for site exploration in disaster prone areas towards any possible disasters by giving zones in that location.
4. Functioning the traditional architectures and local workers who have intangible knowledge in regard with constructions, followed by providing current information to them about the appropriate building technology in disaster prone areas.
5. By all means of culture of local communication, it informs to the society about disaster prone areas. So, the local zones of that disaster prone areas can be published to wide people.
6. Encouraging the society to recognize disaster potency in their own regions in order to enhance society awareness in that areas, either those living in coastal and sheer areas.
7. Reactivating the potency of association among community followed by training programs of quickly emergency responses towards any disasters. It could be functioned as monitoring facility of cultural mitigation in their regions as well as mitigated people at happening disasters.
8. Recovery actions towards disaster prone areas aimed for society and physical buildings which are influenced by the model of local culture.

## VI. CONCLUSION

The contents of culture undeniably have been influencing the mitigation planning in Indonesia in general. However, the implementation seemingly does not meet the ideal aims in fact. In developed countries, for example, with cultures of safety first, the disaster victims or other physical damages can be minimised in order not to marginalise the living in disaster areas. Thus, if the mitigation will be actively implemented in Indonesia, the antisipative culture with approach *bottom up* must be continually improved into many aspects and reduce creative cultures by means of *top down* approach

In addition to this, the local wisdoms have many potency which are proved more sustainable towards disasters and therefore necessarily to be preserved by following the currency but without changing fundamental values of those local wisdoms.

Eventually, the integrated planning of mitigation needs cultural revolution which precisely involves all stakeholders, including decision makers in governmental offices, institutions, and society groups facilitating the mitigation management, broader society among academicians, professionals, and civil society as well

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