

Building Children's Awareness with Local Knowledge-Based Mangrove Literacy Models in Coastal Areas

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Abstract

Degradation of coastal environment that occurs in parts of Indonesia's coastal areas is generally caused by erosion, climate change, development, and loss of mangrove forests. This degradation also has an impact on the reduction of the land area inhabited by the community. Bedono Village in Sayung District, Demak Regency, Central Java is one of the areas with the worst conditions, where a third of its area was lost due to tidal floods. One alternative solution that can be done is to restore the function of mangroves in a sustainable manner which is carried out on a local basis and inclusive awareness. This paper aims to discuss the concept of conscientization from Paulo Freire which emphasizes the presence of consistency and inclusiveness as the fruit of full self-awareness to solve the problem of the decrease of the quality of the coastal environment and the reduce of Indonesia's coastal areas. The research approach used is qualitative and Participatory Rural Appraisal (PRA). PRA is used to map the problems and potentials of coastal communities and children's groups, including the local wisdom values of the community. The data collection technique uses interviews, observation, documentation, and group discussions from August to November 2021. Through a socio-cultural approach, and collaboration with formal and informal educational institutions, the result of this study can be a repressive and preventive model in alleviating environmental problems, especially coastal problems. By formulating and applying the Paulo Freire conscientization model based on local potential, it was found that the reconstruction of mangrove conservation education was able to build children's critical and transformative awareness that would be able to solve problems in coastal areas. Based on an inclusive mangrove literacy approach, the application of education is targeted at the children of this generation as conservation agents capable of caring for and innovating to improve the environment with awareness that has been formed through mangrove literacy education from an early age.

Keywords

children; local knowledge; mangrove literacy; coastal areas

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INTRODUCTION

The World Health Organization (WHO) in 2016 and the United Nations Development Program (UNDP) in 2020 reported that at least 75% of the world's ecosystems has been damaged and humans lose several trillion dollars each year as a consequence of health problems, lost productivity, and recovery costs after natural disasters. The two reports have provided calculations of the world's environmental damage which leads to ecosystem problems and human welfare problems, as a fact that must be resolved immediately (United Nations, 2022; The Intergovernmental Panel in Climate Change, 2022; Manisalidis, et.al, 2020) . In order to solve these two problems, the coastal environment which contributes significantly to the destruction of natural and social ecosystems can be used as a starting point for a solution (Phillips, Walsh, & Martell, 2010; Phillips, Martell, & Walsh, 2010). The results of a report state that the world's coastal environment has experienced 75% of damage or severe damage with various adverse consequences for biodiversity, economy, ecology, and human welfare (United Nations Environment Programme, 2021; United Nations Development Programme, 2020; Global Environment Outlook, 2019 ; Bezner-Kerr, Veen, Suhandiman, & Mukminin, 2013; Kartika & Yusuf, 2012; Alamgir, Way, & Lough, 2011; Jutagate, Teeramaethee, & Siripong, 2006).

Currently, Indonesia as the largest archipelagic country in the world, with the longest coastline in the world is facing challenges from the decline in the quality of the coastal environment and the reduction in the area of the coastal area (Sui, Wang, Yang, & Wang, 2020; Hutomo & Moosa, 2005; Nurhidayah, 2011) . The decline in the quality of the coastal environment and the reduction of Indonesia's coastal areas are generally caused by various problems such as erosion, climate change, development and loss of mangrove forests (Fernando, Wijeyaratne, & Atapattu, 2017; Singh & Saini, 2016; Chan, Lam, & Leung , 2013). However, actually restoring mangrove functions properly can

be a solution in unraveling the complexity of this problem (Alongi, 2010; Dahdouh-Guebass, F., & Verhagen, 2005). Moreover, if sustainable restoration of mangrove functions can be carried out on a local basis and good inclusive awareness (Marquez, Cardenas, & Torres, 2022; (Wijaya, Lutfi, Fajar, Harto, & Fadly, 2022; Creevey, et.al, 2015; Bezner-Kerr, Veen, Suhandiman, & Mukminin, 2013; Agrawal & Gibson, 1999). With such efforts, the decline in the quality of the coastal environment and the reduction in the area of Indonesia's coastal areas will be solved more quickly.

Since the beginning of the millennium, Indonesia began to discuss and use the concept of locality or inclusive awareness as an approach for environmental improvement and development (Wijaya, Lutfi, Fajar, Harto, & Fadly, 2022; Bezner-Kerr, Veen, Suhandiman, & Mukminin, 2013). Nevertheless, the implications of this approach are still prototype-like, which are successful during the program or temporary (Wijaya, et.al, 2022: 223). It means that despite the correct approach used, in reality it fails to touch the deep structure level. Therefore, this study discusses the concept of conscientization from Paulo Freire which emphasizes on the presence of consistency and inclusiveness as the fruit of full self-awareness to solve the problem of the decrease in the quality of the coastal environment and the reduce of Indonesia's coastal areas (Freire, 2018; 2002).

This study takes the province of Central Java as the case spatial area. Central Java is one of the provinces in Indonesia with high levels of erosion, complexity of coastal issues, and high population density in recent decades (Mulyana & Indarti, 2017; Sari, Wibowo, & Santosa, 2019). Thus, it seems that Central Java can be an interesting role model in solving the problem of the decrease in the quality of the coastal environment and the reduce of Indonesia's coastal areas. More specifically, this study chose Bedono Village, Sayung District, Demak Regency as the location of study. Bedono Village was chosen because it is one of the villages that has experienced very severe abrasion in the

last two decades, which submerged a third of the village area (Wijaya, et.al, 2022: 222). In addition, Bedono Village has also received various programs to solve the problem of the decrease in the quality of the coastal environment and the reduce of the coastal area from the government, domestic and foreign NGOs, but the results of which are not optimal (Wijaya, et.al, 2022: 223)

Further, Wijaya, et.al (2022: 223) explained that the declining community enthusiasm as programs from the government and NGOs ended was the main cause of the non-optimal mangrove conservation program in Bedono Village. Therefore, it is necessary to bring awareness, participation and full responsibility of the local community in mangrove rehabilitation in Bedono (Luthfi, 2020). In this case, mangrove literacy and local community knowledge can be put together, reproduced, and re-internalized so that mangrove maintenance becomes part of the community's socio-cultural activities.

The most potential and effective segment of society in the future in this local wisdom-based mangrove literacy effort is children as the next generation of Bedono Village. One of the manifestations of this literacy development model is the mangrove conservation comic. The internalization of the content of local wisdom-based mangrove conservation comic will simultaneously build awareness in children's cosmology. This will be a middle ground for solving the lack of literacy of children and possibly parents in general in Indonesia (Pertiwi, Febrianto, & Wibowo, 2016; Widayati & Purwanto, 2015). Thus, awareness of mangrove conservation and concern for environmental safety can be massively embedded in the Bedono community. In the end, this study can become literature on socio-cultural strategies as well as a breakthrough in efforts to conserve the coastal environment in a sustainable manner.

METHODS

To answer the problem regarding the effort needed to build mangrove environmental awareness for children based on local wis-

dom, this research uses a qualitative approach and is supported by Participatory Rural Appraisal (PRA). By using qualitative research as the basis, the research is focused on understanding the meaning of events and their relation to environmental degradation at the research location. Meanwhile, PRA is used to map the problems and potentials of coastal communities and children's groups, including the local wisdom values of the community.

The data collection process was carried out from August to November 2021 in Bedono Village, Sayung District, Demak Regency. The data collection techniques used were semi-structured in-depth interviews, observation, focus group discussions, and documentation. First, interviews were conducted with seven (7) informants through a purposive sampling technique. The main informants come from community leaders who fully understand the condition of their village up to the present condition, namely, village officials and mangrove activists. While supporting informants are community members in common.

Table 1. Research Informant

No.	Name	Occupation
1.	Khumaidi	Head of Bedono Hamlet
2.	Hambali	Chairman of Bedono Bangkit dan Bedono Juang Institutes
3.	Kharis	Chairman of the Bahari Mangrove Group
4.	Pasijah	Fishermen and Mangrove Activists
5.	Harno	Fisherman
6.	Nasuha	Headmaster
7.	Husein	Fisherman

Source: Research Primary Data, 2021

Second, observations were done to understand the daily activities of Bedono Village residents and their behavior in maintaining the coastal environment, including in terms of preserving mangroves. Apart from that, the researchers also observed the way of life and survival of the residents of Bedono Village who were affected by the rob. This

observation was carried out simultaneously with the interview. Third, a focus group discussion was held once in August 2021 with participants from the local government, local NGOs and community leaders who produced information about mapping environmental problems in Bedono Village and the potential the community has for environmental improvement. Fourth, documentation in the form of review of literature documents, village monograph articles, mangrove data, and so on. The collected data were then analyzed by source triangulation to check the validity of the data.

RESULTS AND DISCUSSION

Environmental Degradation and Lack of Awareness of the Bedono Society of Mangrove Reforestation

Bedono is one of the coastal villages on the north coast of Java which has experienced massive abrasion and damage. Besides being caused by tidal waves due to climate change, coastal environmental degradation in Bedono is also caused by infrastructure development such as the development of the Tanjung Mas Port in Semarang which affects the direction of the waves (Damaywanti, 2013). Since more than two decades, tidal floods and coastal erosion have caused people to lose their rice fields, houses and yards. There are 2 hamlets that can no longer be maintained and forced residents to be relocated. Meanwhile, the people who survive in Bedono have to live side by side with the threat of coastal erosion and make them always have savings so they can raise the floor of their house (Asrofi, Hardoyo, & Sri Hadmoko, 2017; Sanjoto, Sunarko, & Parman, 2016).

Environmental vulnerability results in social vulnerability which can be measured by several categories, such as poverty, limited access, marginalization, and social exclusion (Bjarnadottir, Li, & Stewart, 2011; Dolan & Walker, 2006). In Bedono, the social vulnerabilities experienced by the community are in the form of limited public access, social exclusion, loss of sources of

livelihood, decreased income, reduced space for social interaction, and increased individualism. In this case, social vulnerability does not only have an impact on the income and economic aspects of the community, but also on social and cultural aspects. The decline in the values of togetherness and solidarity in society is a big loss for the people of Bedono because the threat of beach abrasion and other environmental degradation requires strong social and cultural capital to create resilience for vulnerable communities (Luthfi, Husain, Prasetyo, Mustofa, & Santoso, 2020).

Various efforts have been promoted in the process of restoring the coastal environment in Bedono, starting from local community initiatives, local government programs, schools and universities programs (Nugroho, Indriastuti, Yulipriyono, Wibowo, & Hermawan, 2020), to assistance and accompaniment from international NGOs, such as OISCA from Japan and Wetland from the Netherlands. Through rehabilitation programs for the coastal environment, mangrove conservation, facilities and infrastructure repairment, construction of beach belts, local economic assistance, and mangrove education, the quality of life for the people of Bedono Village can be improved. The results of research by Chafid et al (2012) show that the area of mangroves in Bedono Village in 2004 – 2009 increased in area, namely from 22.41 ha in 2004 to 43.03 ha in 2009. The density of mangroves is experiencing an increase in area of 2, 41 ha in 2004 became 8.89 ha in 2009, while the density of rare mangrove areas decreased from 14.94 ha in 2004 to 7.08 ha in 2009. Furthermore, Pramudito, et al. (2020) explained that between the 2009-2019, there was an increase in the area of mangrove land in Bedono Village. In 2009, the area of mangrove land was 122.58 ha and increased to 197.19 ha in 2019. However, the higher coastal waves in recent years have eroded many mangrove tree roots until they fall, which results in a reduced mangroves forest area (Zaky, Suryono, & Pribadi, 2012).

The decline in the amount of mangrove vegetation in Bedono was not accom-

panied by awareness and community activity to replant and reforest it, although they have actually obtained knowledge about mangrove cultivation from OISCA combined with their local knowledge. There are some people who are still using this knowledge in protecting their environment, especially people whose houses are already surrounded by sea water and don't want to move for economic reasons. The mangrove track program initiated by the Bedono Village Government as a new tourist attraction in Bedono cannot also be maintained well. This program is run using the Village Fund budget. However, this mangrove reforestation and rehabilitation activity did not run massively in the community, due to the end of the OISCA program in Bedono Village. Most of the community no longer had a high concern for mangrove cultivation. The Bahari Mangrove Group as a local organization that has been working with OISCA is no longer carrying out its activities.

Conceptualization of Paulo Freire's Conscientizacao

Environmental problems in Bedono Village do not solely occur due to global climate change (Fajar, Wijaya, Luthfi, 2022: 178 in Gunawan, 2022). Economic, political and ecological issues related to the decision to develop the Semarang City economic area have triggered ecological problems in the Bedono Village area. Land subsidence, coastal abrasion, sinking of hamlets area, diversification of livelihoods to the relocation of residents are the impacts directly felt by the people of Bedono Village as a result of the ecological crisis. This ecological reality is an integral part of the history of the people of Bedono Village for approximately 3 decades. The way the community responds to this ecological reality is important to see in order to illustrate where the position of the Bedono village community is in this oppressive situation.

In order to provide an explanation regarding the position of society in the reality of the ecological crisis, it is necessary to present Freire's concept of conscientizacao.

The position of the community in observing, seeing, knowing and acting on the increasingly critical ecological conditions of their area can be identified through the types of awareness developed by Freire. The basic assumption of conscientizacao is that consciousness is not the creator of reality nor is it a reflection of reality, but awareness has a fundamental meaning in education as an act of knowledge, not only with regard to content but also about the causes of the economic, social, political, ideological and historical facts that explains where the individual finds himself (Freire, 2008: 134). Finding where the individual is in the history of his life requires a conceptual lens through the existence of a type of phase of human consciousness. The type of human consciousness is the phases that describe internally consistent perspectives that influence the parts of individuals to understand themselves, the world and their interactions with the world (Smith, 2008: 118).

Freire in Smith (2008: 3) divides awareness into three, namely magical awareness, naive awareness and critical awareness. Magical awareness is characterized by a closed and oppressive society and individual processes of fatalistic adaptation or adjustment to the existing system (Smith, 2008: 3; Collins, 2011: 104-105). People who are in this type of magical consciousness will accept and some even run away from the oppressive reality. Behaviors that arise in this awareness include the emergence of silence, short responses in response to complex questions, simple causal relationships and the absence of mistakes (Smith, 2008: 48).

Naive awareness is an awareness characterized by individual behavior that oversimplifies and romanticizes reality (Smith, 2008: 3). The way society simplifies the problem from the existing reality is by blaming the cause of the problem on oneself and not on the system. Individuals are unable to explain their relationship with the existing system, ultimately leading to arguments that dissolve with reality (Smith, 2008: 69). Individuals in this awareness do not put themselves in the actions that they should do, but always put others in the actions that

they should do to renew themselves. For individuals of naive awareness, a better life is a life that perpetuates the status quo, a better tomorrow means the improvement of today norms (Smith, 2008: 70). According to Freire, this awareness is vulnerable to manipulation by elite groups through propaganda, slogans and technology (Collins, 2011: 107).

Critical awareness is characterized by the ability of individuals to see social systems critically and think about the social reality in their lives in the individual's capacity as a subject (Smith, 2008: 3; Collins, 2011: 109). In this awareness, individuals consciously and empirically replace an oppressive system with a just system that they can control (Smith, 2008: 80). Critical awa-

reness is a condition in which individuals find themselves "in a situation" as a result of understanding and analyzing causal relationships, rejecting society's passive attitude in responding to oppressive realities, prioritizing dialogue, accepting what is right according to old and new views. . In this awareness, individuals consciously and empirically replace an oppressive system with a just system that they can control (Smith, 2008: 80).

The characteristics of the types of consciousness described are operationalized in detail through a coding system. The coding category for each type of consciousness can be seen in the following scheme (Figure 1).

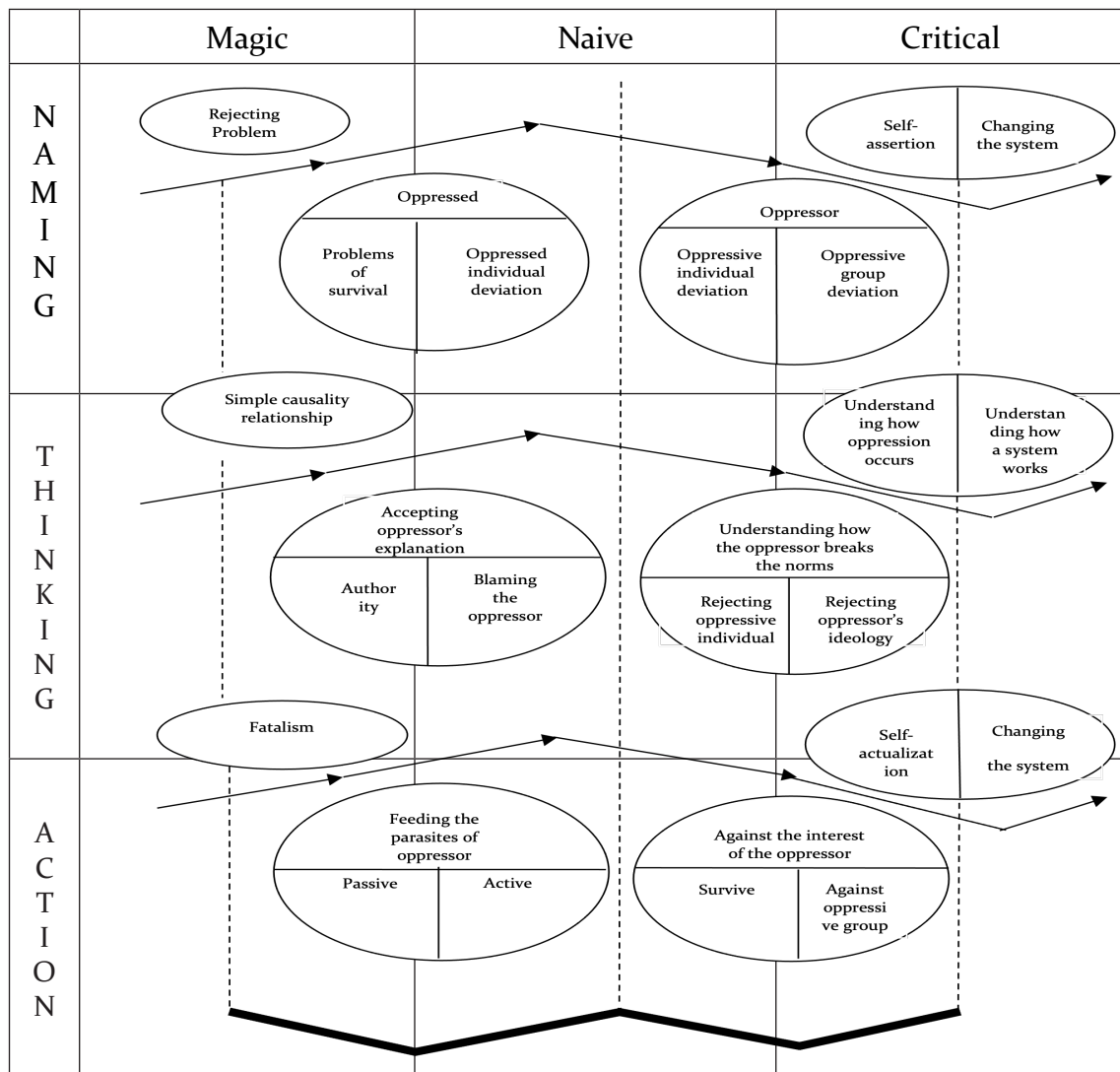


Figure 1. Conscientizacao Developmental Scheme

Source: Conscientizacao Developmental Scheme in Smith, 2008. P. 59

Level of Public Awareness of the Ecological Crisis

In the past, the arrival of rob could still be predicted so that the community had a rob calendar which was made based on fishermen's observations. Through this calendar, people can anticipate the arrival of rob. Later, after the occurrence of uncertain climate change, the rob calendar was no longer accurate. The rob problem in Bedono Village was further exacerbated by the reclamation of the construction of the Tanjung Mas port to become a national port to support the surrounding industrial area (Fajar, Wijaya, Luthfi, 2022: 178 in Gunawan, 2022). Community knowledge about the causes of environmental damage caused by natural and socio-economic factors illustrates that the community finds the source of the problem and understands how these factors work in accelerating environmental damage.

The problems that resulted in significant material losses can only be taken for granted. Society does not have the ability to oppose situations that oppress it. Because the development of the area on the other hand also provides benefits for the supporting community of Semarang City such as the people of Sayung Demak who work in the economic area. In this context, it can be seen that the way people think is naive about environmental problems that occur. Community efforts in overcoming the ecological crisis have not shown measurable progressive ways. The new community only makes efforts to avoid problems, not overcome problems

When non-profit organizations from abroad pay attention to the problems faced by the people of Bedono Village, then environmental problems are resolved through a programmed work agenda. Both OISCA from Japan and Wetlands International Indonesia (WII) from the Netherlands have made efforts to rehabilitate the physical, social and economic environment by involving the community in it. The environmental rehabilitation program carried out by planting mangroves at the beginning of the program still places the community as an object. This can be seen from the problems that arose in

the first period of implementing the environmental rehabilitation program through planting mangroves. Awareness of environmental conservation from the community has not grown, community suspicion has arisen towards this non-profit organization, low community participation in the mangrove planting program, requests for wages for planting mangroves, requests for land leases for former houses left to be planted with mangroves are other problems (Fajar, Wijaya, Luthfi, 2022 : 178 in Gunawan, 2022).

Positioning the community as the subject and actor of the rehabilitation of the environment in which they live is the right way applied by non-profit organizations to increase public awareness and participation. Community involvement in OISCA activities is carried out through the formation of the *Bahari* Mangrove Group. OISCA together with the *Bahari* Mangrove Group held a mangrove nursery program and carried out a mangrove planting campaign for the community. The program reduces disaster risk through raising awareness and capacity building in dealing with disasters which is focused on school-age children through Children Forest Production (CFP) activities. This children's forest program consists of planting mangroves every year, making school gardens, waste management campaigns and eco-camps (Fajar, Wijaya, Luthfi, 2022: 178 in Gunawan, 2022).

The community's acceptance of the rehabilitation program and their involvement in environmental rehabilitation efforts demonstrates the birth of the community's critical awareness. This can be seen from how people find themselves in a difficult situation and try to overcome it through an active attitude and reject passive attitudes in responding to ecological realities that are detrimental to them. The rehabilitation program has made a real contribution to the expansion of mangrove forests as natural coastal strongholds. Community participation and public awareness of the environment have also been formed, especially in community elements that actively collaborate with the non-profit organization.

The involvement of adults in real ac-

tion in studying environmental damage and efforts to rehabilitate the environment shows what is expected. However, efforts to raise awareness and involve children in understanding their ecological realities are still relatively low, because there are not many children participating in the CFP program. Placing children as active subjects in environmental rehabilitation efforts is an important sustainable step. This can be implemented through a collaborative strategy with the school to provide awareness and increase participation in understanding environmental problems and acting to make changes. Classrooms at school can be an arena for learning what, how, and why environmental rehabilitation in Bedono Village is important for students to know. Supervising the transformation of children's awareness of their ecological reality is an effective and massive way that can be taken as a sustainable environmental rehabilitation effort.

Mangrove Conservative Comics: Building Inclusive Critical Awareness for Coastal Children

Comics are a convenient literacy medium or can also be said to be age-inclusive for children (Duncan, 2010; McCloud, 1993). Comics are a subtle and gentle literacy medium for unconsciously internalizing values to children. This unconscious internalization of values becomes important in the context of eliminating pressure or coercion (Chute, 2010; Kress, 2003). On the other hand, the internalization of values through comics to children feels paradoxical because of the presence of external intentions towards children. However, these assumptions and actions seem to be wise in the context of internalizing mangrove conservation values for the future of coastal children. This assumption also seems to be justified, because conservation comics can stimulate children to think critically and reflectively about the reality of their vulnerable environment.

Reflective-Critical Thinking: Children as Mangrove Conservation Cadres

Reflective-critical thinking is a cognitive

process that focuses on analyzing-evaluating information and viewing context-specific situations (Apple, 2001; Freire, 2000). Reflective-critical thinking frequently leads to wise, independent and responsible decision making (McLaren, 2007; Schön, 1983; Maher, Tetreault, & Kenway, 2002; Field, 2000). It is this value of wisdom, independence and responsibility that later becomes the target of the presence of mangrove conservation comics by this study. It is expected that the children in Bedono Village will become cadres for mangrove conservation in Bedono Village in particular, so that the effects of abrasion, erosion, reduction of the coastal area and other negative impacts can be overcome preventively or repressively by local residents.

The reflective-critical learning uses a participatory approach that involves the children of Bedono Village in the educational process. These beneficiaries are placed as the main actors in problem-based learning, knowledge and practice of the subject's own experience. This lesson will also prioritize aspects of saving socio-cultural and environmental aspects to build awareness for the children of Bedono Village. It aims at bringing awareness to the children of Bedono Village as actors who must act to save themselves and their cultural identity as a coastal community from the negative effects of the loss of mangrove forests.

As a conclusion, reflective-critical learning in the context of mangrove conservation is a learning model that should be able to build cultural identity of coastal communities in a sustainable manner. This means that reflective-critical learning must be a key skill, not just learning that merely creates proficiency in ideas, practices, and learning systems.

Dialectic of Conservation Problems and Opportunities: Inclusive Approach as a Solution

The concept of reflective-critical thinking as the core of the idea of mangrove conservation comic is a response to the weak critical awareness of the people of Bedono village in maintaining mangrove conservation. This

weak critical awareness is indicated by the replacement of the awareness of the multiple benefits of mangroves (ie economics, medicine and the environment) with a single benefit from the economy (namely by expanding ponds to respond to demand for export commodities in the 1980s).

The mangrove conservation comic program aimed at the children of Bedono Village is a possible solution due to the death of the informal (family) and formal institutions (school) in the socialization of mangroves care. Besides, the sociodrama representation at school after the distribution of the mangrove conservation comics is also well done as a manifestation of age inclusiveness (children), the environment and also mangrove re-culture in Bedono village. This program can be an inclusive effort to fill children's cognitive, affective, playful, environmental and socio-cultural space in the context of mangrove conservation from the void of previous programs. As a follow-up effort, family assistance in strengthening the formation of conservation cadres will be very good. This is done to ensure that [at least] the family can resume its function as a socialization agent and an extension that has a chain effect for both mangrove conservation cadres and Bedono Village.

A Model that Answers Facts: Local Wisdom-Based Mangrove Literacy for Coastal Children

The model is a building representation that functions to simplify and explain a phenomenon (explanatory model) (Ahimsa-Putra, 2016). In the explanatory model, research results in the form of problem identification and various potentials according to the problem formulation are used to formulate a problem solving model based on community needs. The innovation of model idea that was successfully formulated is an alternative role model that is considered ideal in overcoming problems by prioritizing the potential of research subjects. The formulation of a mangrove literacy development model for children based on local wisdom is a formulation that was developed from a discussion process involving various actors

during the research. Even so, for the success of its implementation, the formulation of the model that is built requires the synergy of various actors to realize the model on an ongoing basis. More about the formulation of a mangrove literacy development model based on local wisdom for children in tidal disaster-prone areas on the North Coast of Java is visualized in the following Figure 2.

Based on the model development picture, it can be described that the emergence of the idea of a local wisdom-based mangrove literacy model for children is based on an in-depth analysis of basic research that sees model innovation as an effort to save coastal areas experiencing abrasion and tidal flooding. Unfortunately, these creative efforts have not touched on conscious efforts to educate children who live in areas prone to abrasion and tidal disasters. So far, efforts to deal with it have been carried out by the community together with various parties, both at the national and international levels, and are still focused on how to maintain the area of residence as the root of life by planting mangrove forests and managing them. Such conditions have not placed children as supporters as well as successors of culture and knowledge of mangrove conservation, and as subjects who need to gain knowledge about maintaining, accepting and continuing the culture of coastal environmental conservation. Meanwhile, if the knowledge of coastal area conservation is not internalized in children, the culture of mangrove conservation that has been built so far will experience discontinuity. This explanation becomes the basis for rationalizing the importance of continuing efforts regarding various strategies that have been carried out by the community, so that there is no degradation of mangrove functions and cultural discontinuity of people living in coastal areas.

In an effort to maintain cultural continuity and environmental conservation that have been carried out for several years, the researchers contextualized the formulation of an alternative model by looking at the needs, problems, and various potentials that the Bedono people could have. With

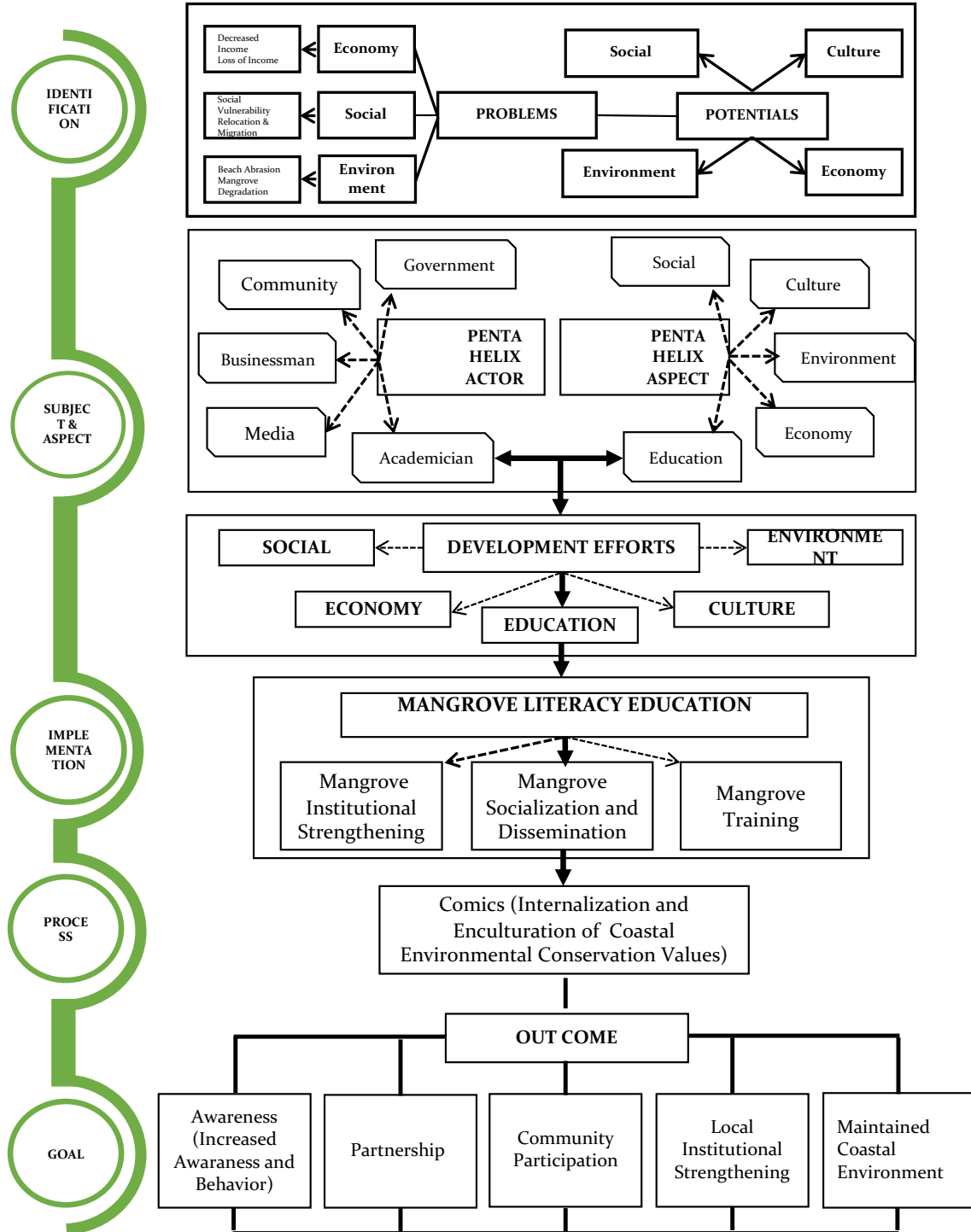


Figure 1. Local Wisdom-Based Mangrove Literacy Model

the identification of needs and problems in order to survive, the community can maximize various potentials with various innovations both generated from within the community itself and from collaboration with external parties. Based on an analysis of identified problems regarding the economy

(decreased income, loss of income), social (social vulnerabilities of relocation and migration), and environment (coastal abrasion and mangrove degradation). Meanwhile, in terms of potential, the community has various potentials ranging from economic, social, environmental to cultural potential.

The collaboration of various actors (which are then referred to as penta helix actors) will focus on 5 areas of development (which are then referred to as penta helix aspects) which include social, cultural, economic, environmental and educational aspects.

The potentials possessed by the community are the key to the birth of new ideas and the continuity of the mangrove literacy model which will be internalized to children. The main activity in efforts to develop mangrove conservation focuses on the educational aspect by building mangrove conservation literacy based on wisdom values. The birth of a mangrove literacy development model based on local wisdom will facilitate subject acceptance as well as bring new values of literacy closer to the original culture of coastal communities. Integration of local wisdom into mangrove literacy education can be carried out by instilling values regarding mangrove institutions strengthening, mangrove socialization and dissemination, as well as various trainings to maintain and make the most of mangrove existence. The creative product idea is realized in comic form. Mangrove literacy comics will continuously be internalized and enculturated, so that they will form knowledge and behavior that are in accordance with the values of coastal environmental conservation. As a form of enculturation, the product of mangrove literacy comics is introduced to educational institutions, both formal, non-formal and informal. In the context of non-formal and informal education, comic literacy can be materials and efforts for the community and families to instill values that are appropriate to the child's culture, environment and condition. Meanwhile, in the aspect of formal educational institutions, mangrove literacy comics can be one of the projects in strengthening the module of the Pancasila student profile by understanding and exploring character through playing socio-drama or performing at school. Through guided and mentoring activities, efforts to raise critical awareness for children can be carried out simultaneously.

CONCLUSION

Environmental degradation that occurs globally has become a hot issue that is rolling down to the local level. In fact, the impact of this local environmental degradation has become a complex problem that is difficult to unravel. One case that needs to be paid attention and attracted international [NGO] attention is the loss of one-third of the land inhabited by the people of Bedono Village, Sayung District, Demak Regency, Central Java, Indonesia due to tidal floods. The loss of this place to live has, in fact, had a strong socio-economic and cultural impact on the people of Bedono Village. In order to respond to this reality, this study has taken both repressive and preventive steps in the future, namely by applying the model and concept of conscientizacao from Paulo Freire. These models and concepts were chosen based on the results of mapping the level of awareness of the people of Bedono Village (namely magical awareness, naive awareness and critical awareness) which explains that [re]construction of mangrove conservation education is necessary to unravel the complexity of environmental, socio-cultural and economic problems. Using an inclusive approach, conservative mangrove comics made on a socio-cultural and environmental basis have targeted the children of Bedono Village. The aim is for the children of Bedono Village as agents of the future for Bedono Village to be able to maintain, preserve and innovate to improve the environment. The implication of learning mangrove conservation comics that are fun, imaginative, reflective and critical, is carried out by collaborating with formal (school) and informal (family) educational institutions. It is expected that by cooperating with the two institutions, a natural social culture of mangrove conservation will be created, so that the complexities of environmental, socio-cultural and economic problems will naturally be unraveled.

Finally, this study has provided an inclusive model of discourse in its efforts to analyze socio-cultural and economic environmental problems, so that it has appa-

rently succeeded in providing a considerable framework in analyzing environmental problems. Even so, the model discourse in this study may not be implicated in all environmental problems, due to the locality of the case study. Therefore, this study suggests that further studies be able to carry out massive environmental comparative studies, in order to find a general model in solving environmental problems.

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