

CLIMATE VILLAGE: PRODUCTION OF CITIZEN'S KNOWLEDGE AND SOCIAL SPACE ON CLIMATE CHANGE ISSUE

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Change.**Abstract**

The climate change issue is authentic and recognized as the biggest threat to human life. Many actions should be taken to adapt to and mitigate climate change, one of which is to hold a Climate Village Program. This research aimed to describe the public participation process in developing Climate Village and the factors affecting it. The research was conducted in the Sekip Climate Village of Kadipiro of Surakarta City using ethnographic methods with Henry Lefebvre's social space reproduction. The urgency of Climate Village development in Sekip village is the environmental problem that has been faced since 2011, including flood, water puddles, drought, DBF, malaria epidemic, slump, and dirty village image. Production of knowledge and social space to develop climate villages was conducted through adaptation and mitigation activities. The program of adapting to climate change is the natural form of community action taken by constructing infiltration wells, repairing gutters, constructing retention basins, planting vegetables and fruits, and installing vertical gardens. The mitigation program included waste management, solar panel installation, bio-pore hole construction, and rainwater harvesting activities. The production of citizens' spatial space was conducted based on citizens' knowledge production concerning the effect of climate change and knowledge reproduction about adaptation and mitigation that can be accomplished in a participative manner. The factors affecting it, including ecology and social culture, became part of citizens' social learning process to mitigate the effect of climate change.

Corresponding Author: Siti ZunariyahE-mail: zunariyah@staff.uns.ac.id**INTRODUCTION**

Global climate change has become an exciting issue to many people, particularly following the organization of the Earth Summit in Rio de Janeiro, Brazil, in 1992. The world is becoming more aware of the adverse effects of economic development regardless of environmental aspects on humanity. The massive use of fossil fuels and deforestation encourages the incidence of greenhouse gases, becoming the leading cause of climate change (Secretariat, 2013). As such, it will result in the increased temperature of the Earth's surface, leading to global warming (Hu et al., 2018).

In recent decades, climate change has taken a central position in scientific arenas, including politics, economics, and the public sector. Some studies have recently shown evidence of weather and climate pattern changes, and the scientific community highly agrees that the Earth's atmosphere has warmed due to the continuous production of greenhouse gas emissions (IPCC, 2014), (IPCC, 2018). This climate change on Earth brings about environmental, social-political, and economic consequences because resources and activity are dependent on weather. The stakeholders' resistance to the climate change effect issue becomes a serious problem as it will inhibit mitigating attempts and adapting strategies. Some measures have been taken by the private sector, for example, that have taken into account the effect of climate change, with the increased operational cost and production disruption despite limitations in the adapting strategy (Goldstein et al., 2019). A study on

stakeholders' perceptions becomes essential as a form of support to conduct risk analysis and to prepare the public's response to climate change hazards and effects. It is also important because it can help communicate information on risk between local people and policymakers (Farjam et al., 2018). In urban areas, the effect of climate change results in so many challenges, from local floods during lousy weather to temperature increases and worsening quality of air and water (Miller & Hutchins, 2017). Some regions have experimented with some approaches to adapt to such challenges and reduce their vulnerability to climate change hazards and effects (Neset et al., 2019). Nevertheless, the region's ability to adapt to uncertain climate change is practical, particularly in developing countries (Goldstein et al., 2019). Instead, wealthy cities have taken proactive action lately to adapt to climate change, recalling the varying priorities, limited resources, and uncertain effects.

Indonesia is an archipelago state very vulnerable to climate change. Considering the research on degradation and deforestation in Indonesia in 2011, Indonesia also is in the sixth rank as the most significant contributor of carbon emission in the world, following China, America, the European Union, India, and Russia (<http://tekno.tempo.co/read/news>). Increased temperature, high rainfall, higher seawater surface, and threat against food self-sufficiency are the effects of climate change occurring in Indonesia (Gazzani, 2018). The effect of climate change will be felt strongly by those living in coastal areas, farmers, fishermen, and urban settlements.

Unfortunately, the effect of climate change has not been compensated yet with people's response and understanding. In recent years, some studies have been conducted on Indonesian people's understanding of climate change. The result of the BBC media study released in 2015 shows that a third of 4,985 respondents acquired adequate information on climate change, while the rest still need to acquire adequate information (BBC, 2014). Meanwhile, the research conducted by the Demographic Research Center of the Indonesian Science Institution in the same year found that the climate change issue is an elitist and special one. They still see climate change issues occurring in foreign countries rather than in their surrounding, while they have been able to feel its change. It impacts the people's low response to climate change (<http://kependudukan.lipi.go.id>: 2015).

Indonesia has attempted to minimize climate change at the global level by participating actively in ratifying Protocol Kyoto on December 3, 2004, through Law No.17 of 2004 about the ratification of Protocol Kyoto to The United Nations Framework Convention on Climate Change. Protocol Kyoto is an international convention intended to lower greenhouse gas emissions produced by an industrial world that should have been achieved in 2012 (Bhansali et al., 2014).

The attempt has also been taken at the national level, one of which is to issue Presidential Regulation No.6 of 2011 about the National Action Plan for Reducing Greenhouse Gas Emission (RAN GRK). This movement is participatory, involving central government, local government, and interested parties. A realized form of RAN GRK is the launching of the Climate Village Program on October 24, 2011. This program is national and launched to encourage public participation in local action to improve resistance to the effects of climate change and to reduce greenhouse gas emissions. This program implementation refers to the Minister of Living Environment's Regulation Number 19 of 2012.

Studying the production of knowledge and citizens' social space to realize a Climate Village is necessary to recall the people's still limited knowledge of climate change as well as its effect and risk resulting from it. A citizen's limited knowledge of climate change becomes an essential factor in giving the citizen the space to produce knowledge through the citizen's perspective. Knowledge of climate change tends to be dominated more by the elite and government. Meanwhile, the idea of participation should give the citizens the opportunity to give alternative knowledge perspectives on climate change, its effects, and risk, thereby becoming social capital so that participation can run optimally.

Production of knowledge becomes a social space in the local autonomy context. The researcher's argumentation states that "(social) space is (social) product, and he furthermore elaborates that in reality, social space always combines social action constituting the action of subjects existing within it, either individually or collectively (Johnston, 2013). Through

this perspective, the behavior of the dwelled space becomes vital. It is transitory because they develop within it, give expression continuously, and deal with varying prohibited behavior in their Lived Space (Crowe & Fennelly, 2013). The treatment of dwelled space is then by Lefebvre called spatial practice or the acts undertaken in daily life. They do economic activities and biological activities, communicate with another human beings, and interact with life elements existing in the spatial domain.

It is this case that occurs in the people of Sekip Village Surakarta in the regional enclaves affected with environmental problems, particularly in flooded areas every rainy season, drought areas during the dry season, and inherent slump village predicate. In their past life, they have ever felt various spatial practices in the spatial domain free of environmental problems. The change of environmental conditions in this lived space, in turn, teases and brings about awareness to recover the lived space just like what has been felt in the past. In this context, it is a dry spatial area where they do any spatial practices that have been rooted previously.

RESEARCH METHODS

The research method used is ethnography. By using the "participant observation" technique, ethnography becomes a unique research method because it requires the author to participate directly in a particular society or social community. This research was conducted in Sekip Village, Kadipiro, Surakarta City, which is a pioneer of Climate Villages with a series of achievements both at the local and national levels. Social practices in this triadic concept become the framework for analyzing primary and secondary data as well as the results of the author's active participation in the production of space so as to create a village climate. Data analysis in this research was carried out using an interactive analysis model with three components, namely data reduction, data presentation and conclusion drawing. The author continued to move between these three components and the data collection component throughout the data collection process. After the data collection process, he then moves between data reduction, data presentation, and drawing conclusions using the remaining time for research. This analysis process is called an interactive analysis model.

RESULTS AND DISCUSSION

Environmental Problem in Sekip Hamlet

Sekip Hamlet RW 23 is a hamlet located in Kelurahan Kadipiro, Banjarsari Sub District, Surakarta City. This hamlet condition in the 1980s was originally an empty land on which such trees as teak trees grow. It can still be seen in the backyard of some citizens' houses, on which many teak trees still grow. The condition of Hamlet Road was still dirt road that would be muddy during the rainy season and dry and cracked during the dry season.

This hamlet could not access lighting initially, thereby increasing the darkness at night. In addition, the population living in the hamlet consisted of about 20 households, and the distance between one house and another was far. Then, in the 1990s, many newcomers from outside the area came and began to stay in Sekip hamlet, some of whom came from Sragen, Klaten, Pekalongan, Madiun, etc.

Around the 2000s, Sekip hamlet faced some problems: drought due to healthy construction conducted by factories and pondok pesantren (Islamic Boarding School) located near the hamlet. The construction of deep wells, in fact, exerted adverse effects on the people. Therefore, they fulfill their daily need for water by going to the masjids (mosques) existing around the hamlet. In addition, another problem faced by Sekip hamlet was the presence of water puddles in some areas of the hamlet due to the limited water catchment area, thereby inviting mosquito larvae to live there, potentially causing disease epidemic, particularly DBF and Malaria (Zunariyah, 2018)

The location of Sekip Hamlet is adjacent directly to the Road connecting one Regency to another, so that the air pollution problem is faced, and the air temperature of Hamlet is getting warmer and less comfortable. Such conditions encourage citizens to arrange a plan of action aiming to repair their environmental condition in order to recover comfort and

composure. Departing from such collective awareness, the process of producing knowledge and social space regarding climate change is conducted.

Activities of Mitigating and Adapting to Climate Change

Adaptation and mitigation, according to IPCC, are attempts to reduce greenhouse gas emissions because their effects are very complex (Kumar, 2018). Several effects of greenhouse gas are the increased temperature of Earth felt and, in turn, thawing out the ice in the poles, the increased seawater surface, disrupted agriculture, and eventually, impact on a state's economy.

Building a community's consciousness of climate change is an important keyword used in the process of producing knowledge and social space. The early measure taken to build the people's consciousness is to explore their knowledge and understanding of the climate change issue itself. The understanding of climate change issues can be explored through their empirical experience of what has occurred and is occurring. The experience with daily life mainly includes the air temperature that is very hot during the day and decreases dramatically at night, unpredictable season-changing patterns, limited supply of clean water during the dry season, and floods occurring during the rainy season. Furthermore, the effect of climate change will harm the local economy. This effect will last for a long time and spread. Urban people become vulnerable to extreme weather and disaster. For that reason, an attempt should be made to mitigate and adapt to climate change through the climate village program.

Climate Village Program (ProKlim) is a national program developed by the Ministry of Living Environment and Forestry. It is intended to encourage the public and all stakeholders' active participation in implementing the local action to improve the resistance to the effect of climate change and to reduce Greenhouse Gas emissions by applying ProKlim based on adaptation and mitigation actions and support from the community groups relevant to the environmental health.

The action of adapting to and mitigating climate change related to environmental health can be developed and implemented at the local level, including flood, landslide, or drought control, rainwater saving, water catchment, water source protection, healthy toilet infrastructure, clean water providing infrastructure, clean water sanitation, yard utilization, climate-related disease control, and clean and healthy life behavior. In contrast, mitigation action is taken through the attempts of processing and utilizing rubbish/waste, using new energy, cultivating low greenhouse gas-emission agriculture, improving the target of vegetation land closing activity, and preventing as well as coping with forest and land fire.

The Climate Village Program activity supports the reduction of Greenhouse gas emissions in an attempt to improve people's knowledge and understanding of climate change and its effect on public health. Thus, people participate in doing action and activity as a genuine adapting attempt, thereby improving the public health degree in dealing with climate change, and this mitigation attempt can reduce greenhouse gas emissions.

The adapting activity in Sekip hamlet is divided into household scale and group scale. The adapting activity done at the household scale includes (1) developing bio pore holes and infiltration wells to cope with a flood; (2) improving food self-sufficiency by utilizing the yard for breeding chicken and catfish; and (3) reforestation by planting productive plants. Meanwhile, the mitigation activity includes: (1) installing glass roof tile as a lighting means during the day and reducing electricity emission; (2) sorting organic and non-organic rubbish. The adapting activity at a group scale is conducted through (1) harvesting rainwater to deal with the dry season by constructing water pump; (2) controlling flood by constructing bio pores and storage; (3) improving food self-sufficiency using the intercropping system on plant compartment; (4) repairing gutter and drain; (5) constructing water reservoir (bung). Meanwhile, the mitigation activity includes the utilization of solar cells as a renewable energy source (Ghina & Zunariyah, 2017).

Factors Affecting

Some factors affect the process of producing knowledge and social space in creating a climate village. Firstly, ecological and environmental constraints are often found, particularly in the early times of pioneering the climate village. It is related to the

geographical characteristic of Sekip Hamlet, which is located in an industrial area, so some of the roads have been asphalted and paved, and only a little open space is left to be planted. Similarly, dry and relatively infertile soil condition leads to failure and failure in planting. Many plants cannot survive, so the citizens have become less confident in realizing it.

In addition to ecological factors, social-cultural factors also affect the production of knowledge and citizens' social space. Community leaders play an essential role in the process of producing knowledge because they tend to dominate more ideas and thoughts about climate villages than ordinary people do. Most community leaders, constituting civil servants instead, often become the source of information from the government rather than attempt to accommodate and formulate the citizen's ideas and thoughts. Meanwhile, the Javanese culture of *ewuh-pekewuh* (reluctance) and preferring to avoid conflict makes the knowledge production still dominated by community leaders, particularly at the beginning of the climate village establishment.

Ecological and social-cultural factors in the process of producing social space instead show the light (way). Ecological problems can be coped with gradually with the citizens' spirit and desire to create a healthier and more comfortable environment. Biopore construction, infiltration wells, and rainwater harvesting began to be fruitful. The soil became not too infertile, and the plants began to grow and become green. In addition, the domination of community leaders in ideas and thoughts can compromise gradually and reconcile with the citizen's ideas and thoughts due to the presence of an environment-care community facilitating the production of knowledge and social space. Thus, the inhibiting factors can be dealt with gradually.

The Climate Village program is an attempt to encourage all parties to take real action in dealing with climate change in both the private sector and citizens. The UN's framework convention about climate change in Paris (Agreement, 2015) identified civilians, the private sector, financial institutions, and local government as the essential actors responding to climate change. There is a broad consensus that the private sector and citizens, particularly urban people, along with other public authorities, should be involved in adapting to climate change. The 5th IPCC about Climate Change reported and stated that the government and private sector are recognized to be essential factors in the advance of adaptation (IPCC, 2014). The chapter addressing urban areas clearly highlights the importance of citizen and private sector participation but also mentions that citizen and private sector participation practice still needs to be improved (Revi et al., 2014).

The community's strong pragmatism also affects its willingness to be involved and to participate in the implementation of the Climate Village Program. Somehow, citizen's participation in adapting to climate change is a part of local environmental management through decentralization and autonomy (Goldstein et al., 2019). Nevertheless, participation at the local level is actually done more quickly than that at national and global scales because the citizens can move quickly to take collective action at the local level. In principle, citizen's participation through social space reproduction will result in a more effective plan to adapt to climate change (Scannell & Gifford, 2013). As such, the participation space could be more neutral because it is the space developed to give an opportunity for agency, inclusion, and exclusion (De Vos & Delabre, 2018).

Sekip Hamlet people have made attempts to mitigate and adapt to climate change before the climate village program is implemented, for example, by conducting reforestation and tree planting in their surroundings and installing glass roof tile in most of their houses. Such action has yet to be followed with understanding and knowledge of climate change. However, it is still oriented to beauty, thereby not being the solution to the environmental issue they face. It is this real action that underlies the process of producing citizen's knowledge and social space to mitigate and adapt to climate change.

The production of knowledge and social space among Sekip hamlet people to deal with the effect of climate change is conducted in some stages. Firstly, the consciousness stage aims to make the Sekip people aware (conscious) of environmental conditions and problems around them; community leaders and the Living Environment Office play this role as the facilitator. This stage starts with a transect walk activity facilitated by a youth community

caring about environmental problems (Kampungnesia) to invite the citizens to identify the environmental problem and potency of existing surroundings. This technique is an attempt to map the environmental problem enslaving the Sekip hamlet by means of strolling around the hamlet from one outermost point to the next in the hamlet. People are invited to have dialogue and discussion concerning the cause and the effect of environmental problems they find.

Furthermore, the result of the transect walk is presented in citizen discussion and dialog. The utilization of dialogue rooms either formally in the preexisting social institutions or non-formally personally and in groups is conducted gradually. This activity is conducted by the living environment office with the help of some local community leaders. This consciousness stage is a challenging one, recalling the characteristics of urban people, who tend to be pragmatic and individualistic, making this process run pretty slowly.

Secondly, the problem identification and problem-solving stage aims to give knowledge to Climate Village people and to invite them to express their opinions about the problems they feel in their village. In this problem identification stage, various ideas, thoughts, and opinions should be accommodated to fulfill the citizens' wish to be involved and to participate in mitigating and adapting to climate change well. Dialogue, discussion, and Focus Group Discussion (FGD) are held intensively related to the negotiation process and the determination of priority scale for the environmental problem that is important and urgent to solve. The determination of problem ranking, the mapping of priority scale, and feasibility analysis are implemented as essential social learning processes for citizens. This process involves the parties' commitment to participate in bringing the decisions made into reality. The product of this second stage is an action plan and program along with the citizens to drive the existing social space to enable the product of knowledge yielded to contribute really to reducing the effect of climate change.

The next stage is citizen's social program implementation concerning climate village. In this stage, the activity planned starts to be implemented in Climate Village. This implementation stage is driven by local actors consisting of community and religious leaders along with Climate Village people with the Living Environment Office of Surakarta City's help. In this fourth stage, people implement the *kerja bakti* (service work) agenda by planting trees along the hamlet roads. In this stage, people also initiate connecting electrical pump to the pipe and faucet installed close to the tree to facilitate tree maintenance. Other activities include constructing an infiltration well and installing solar panels and integrated agricultural activity using Green Open Space and rubbish processing, bung and bio pore hole, building a park on a water puddle location, and developing a vertical garden and rubbish bank. Such production of knowledge becomes the social space for the citizens to participate in the attempt to mitigate and adapt to climate change.

The fifth stage is production and information publication. This information dissemination is conducted by distributing the citizens' experience with knowledge and social space production. Social media such as Facebook, Instagram, and Twitter are used to share citizens' experiences so that knowledge on climate village can be disseminated broadly. In addition, part of the process of producing knowledge and social space is the development of manual instruction, modules, and infographics about climate villages that can be the material for social learning and environmental education to other citizens beyond Sekip village.

In the context of social space production, Lefebvre's production theory states that spatial construction or production is the fusing of conceptual domain and material activity at the same time (Schwarze, 2023). Sekip Hamlet citizen's social space successfully binds the human soul gesturally – contemplation space and ecological abstraction; at the same time, its manifestation physically can express itself symbolically as part of the practice of adapting to and mitigating climate change. Meanwhile, researchers stated that space, according to Lefebvre, is always composed of concrete material conditions (Robet, 2014). Such material conditions are established and symbolized into spatial concepts and order. However, at the same time, apart from various spatial conceptualizations and scientification, the space always consists of human active experiences. Lefebvre's thesis aforementioned seems to

spread widely in many cities in the world. In a third-world country like Indonesia, which experienced substantial economic growth in the early 2000s, it can be seen that capital power has firmly gripped the direction of city development by creating new spaces replete with capital interest. The presence of climate village becomes a part of spatial production by citizens among the domination of spatial production by capital owners.

It indicates how the conversion of the city's public spaces into skyscrapers and shopping centers has reduced the number of green open spaces, thereby leading to lower environmental supportability. Such a condition is worsened with climate change occurring in nearly all areas, mainly urban areas. It is here that we enter into the advanced capitalism stage, as suggested by Lefebvre, in which we have passed through the stage of producing goods in the room. Currently, we produce the space itself. The space has been a commodity.

We can no longer submit the direction of space production to the capital owner's hands. Private is only subjected to the interest in multiplying profit. It is an illusion to involve the private in the process of producing space to bring an ideal result into reality. What occurs is instead a variety of compromising solutions between parties. (Sangaji, 2011) discusses injustice/uneven distribution, expelling, and the socio-ecological effect of spatial production solved through philanthropic mechanisms or a series of policies entitled sustainable development. To retrieve this control over spatial production, Lefebvre suggested a slogan right to the city, a slogan to reposition the people's control over the spatial production in urban areas, and it can be initiated by pioneering the climate village.

The right to this city is a joint attempt to make the produced spaces involving the citizens' daily experience, the social space constituting the natural for the urban people to live. How should we retrieve the right to the city? Researchers said that the key to getting the right to the city is to strengthen democracy as the firm control over capital mastery (Nganje, 2022). In addition to being a working slogan, this slogan should be the political objective. Grasping control over spatial production can be done through democratic space and by eliminating the influence of capital owners from the policymakers.

CONCLUSION

Climate change is a natural phenomenon that occurs naturally, but currently, the change runs more rapidly due to human intervention. Indonesia is one of the states participating in reducing greenhouse gas emissions that has been agreed in Protocol Kyoto by developing the Climate Village Program. The production of knowledge and citizens' spatial space in encouraging the adaptation to and the mitigation of climate change is conducted gradually and in a participatory manner. Some crucial stages are taken: giving consciousness, identifying and solving problems, and implementation. Those three stages are conducted in a participatory manner by involving some parties, putting the local actor as the main driver. Many social, ecological, and cultural problems become a part of the process of creating a comfortable social space and healthier environment for the citizens. This attempt to produce knowledge and social space is the recognition of people's knowledge and capacity to determine social space and to shape it corresponding to their own needs and wishes. This essential work mechanism is a form of subtle resistance against the domination of spatial determination, tending to be impartial to the capital owner. As such, the production of knowledge and social space becomes social learning and political space all at once for the citizens to determine independent environment management in the local autonomy spirit.

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