BIO Web of Conferences **189**, 03004 (2025) https://doi.org/10.1051/bioconf/202518903004
SAFE 2025

Implementation of the Climate Village Program (PROKLIM) in Karanganyar, Indonesia

Eny Lestari[1*], *Eksa* Rusdiyana[1], *Sugihardjo* Sugihardjo[1], *Retno* Setyowati[1], *Feri* Wibowo[1], and *Micelle Lovinia* Arwindianti[1]

[1]Faculty of Agriculture, Universitas Sebelas Maret, Jl. Ir Sutami 36 A, Kentingan, Jebres, Solo, Central Java, Indonesia

Abstract. Climate change is a global challenge that requires adaptation and mitigation actions from all levels of society. The Climate Village Program (Proklim) is a program initiated by the Indonesian Ministry of Environment and Forestry, with a target of 200,000 climate villages by 2024. This study aims to describe the implementation of proklim in Karanganyar Regency, Central Java Province. This research used a qualitative descriptive approach. Data were collected through interviews, field observations, documentation, and focus group discussions (FGDs). Informants included local driving figures, forestry extension workers, agricultural extension workers, health cadres, agencies, village governments, farmer groups, women's groups, PKK, and youth organisations. Data validity was determined by triangulating sources and methods. The results showed that proklim implementation in Karanganyar Regency has reached 40 villages (across 16 sub-districts), comprising 5 primary classes, 16 middle classes, and 19 main classes. Proklim initiation was carried out with 2 models: (1) intervention and support from the Environmental Agency, and (2) local community initiatives with assistance from forestry extension officers. The growth of proklim in Karanganyar is increasing, but its sustainability still faces obstacles in the form of low public awareness, dependence on mentoring, and the need to strengthen local institutions. These findings confirm that the success of ProKlim depends not only on external support but also on the community's ability to internalise the values of climate adaptation and mitigation in their everyday lives.

1 Introduction

The environment is a system that includes all natural and artificial elements that affect the lives of living things, including humans. According to [1], the environment includes elements such as air, water, soil, flora, fauna, as well as the interaction between these elements and human activities. The environment also encompasses social and economic aspects that are both affected by and affect environmental conditions, and its management seeks to maintain the balance and sustainability of the ecosystem. According to [2], humans have a reciprocal relationship with their environment. Human activities have an impact on the environment,

* Corresponding author: enylestari@staff.uns.ac.id

and the environment, in turn, affects human life. Environmental problems resulting from human activities contribute to the acceleration of climate change on Earth [3].

Climate change refers to the transformation of climate conditions resulting from human activities, whether direct or indirect. Climate change is generally defined as a condition in which the Earth's climate experiences an increase in air temperature, changes in rainfall patterns, and an increase in the frequency of storms. According to [4], although climate change is a natural phenomenon, it is currently occurring at an accelerated rate due to the influence of human activities. As a result, climate change is no longer entirely a natural phenomenon. Recent climate changes and variations have begun to impact various other natural systems and human life [5]. The impacts of climate change include the emergence of unpredictable natural disasters, longer-than-usual droughts, more frequent storms, and floods during both the rainy and dry seasons. According to [6], these conditions cause ecosystems to become more vulnerable, water quality decreases due to pollution, and species extinction threatens biodiversity. In addition, climate change also has an impact on people's social lives.

Law No. 32 of 2009 gives responsibility for environmental protection and management in Indonesia. [7] added that environmental management includes efforts to prevent, control damage and pollution, and restore environmental quality. This requires the development of various policies, programs, and activities, supported by systems such as stable institutions, human resources, environmental partnerships, and legal, informational, and funding tools. Given the interrelated and holistic nature of the environment, environmental management and its supporting systems cannot stand alone, but must be integrated with the overall development process in various sectors, both at the central and regional levels [8].

Climate change adaptation refers to the process of adjusting to climate change that has occurred or is expected to occur, to reduce vulnerability and increase resilience to the impacts of climate change. Mitigation aims to reduce greenhouse gas emissions and the negative impacts of climate change by controlling the sources and causes of climate change itself. Adaptation and mitigation are crucial factors in dealing with climate change [9]. Climate change has a direct, negative impact on humans and the environment, making it a major focus that must be addressed by all parties.

The Climate Village Program (ProKlim) is a national initiative that focuses on climate and environmental issues, initiated by the Ministry of Environment and Forestry (KLHK). In its implementation, KLHK collaborates with local governments as program implementers and communities from various layers as active participants. In the MoEF Work Plan document, five main programs support national priorities, namely: Sustainable Forest Management, Environmental Quality Improvement, Vocational Education and Training, Disaster Resilience and Climate Change, and Management Support. ProKlim itself is part of the Disaster Resilience and Climate Change Program, which aims to develop areas, such as villages or kampongs, to become more environmentally and economically resilient and able to cope with the impacts of climate change. Efforts made in this program include water resource management, reforestation, waste management, and efficient use of energy. The main objective of the program is to establish communities at the neighborhood or village level that are resilient to climate change and apply the principles of environmental sustainability. The program also includes activities such as education, training, promotion of environmentally friendly technologies, and infrastructure development that are adaptively designed to deal with disasters caused by climate change. In general, ProKlim is a form of collaboration that aims to help rural communities become more prepared and resilient to climate change through a sustainable and environmentally friendly approach.

According to [10], ProKlim focuses on two main indicators: adaptation and mitigation, by establishing strategic partnerships with parties that have the understanding and capacity for program implementation. The focus of ProKlim is to mitigate the impact of climate change and harness the potential of surrounding communities, making it essential to integrate relevant concepts and strategies both locally and nationally. For the implementation of ProKlim to run optimally, collaboration from various parties is necessary. [11] states that the success of ProKlim is determined by the involvement of important actors, namely the government, supporting actors, and implementers who are participatory in nature.

The implementation of Proklim in Karanganyar Regency began with the issuance of the Minister of Environment's regulation, which was further strengthened by Karanganyar Regent Circular Letter Number 660.1/9504.9 of 2020, concerning the Appeal for the Establishment of Climate Villages in urban villages throughout Karanganyar Regency. As of 2024, the implementation of Proklim has reached 40 villages (across 16 sub-districts), with details of 5 primary classes, 16 middle classes, and 19 main classes. This number is still below 25% when compared to the number of villages in Karanganyar which reaches 162 villages and 15 sub-districts. A challenge in implementing ProKlim is the low level of public awareness and participation in climate change adaptation and mitigation actions. Communities have not yet fully embraced independent initiatives and still require support and empowerment to ensure the program's sustainability. Locations that have been certified as climate villages still face challenges related to community awareness and the need to continue the program. This situation demonstrates a gap between formal recognition through certification and actual practices on the ground. Based on these problems, this study aims to analyze the implementation and sustainability of Proklim in Karanganyar Regency, Central Java.

2 Materials and Methods

This research was conducted in Karanganyar Regency, Central Java from October 2023 to September 2024. The location selection was carried out deliberately, Karanganyar was chosen with the criteria of an area that has diverse characters, ranging from urban villages (urban), rural areas, and mountains. Diverse environmental characteristics lead to variations in the form of adaptation- mitigation, driving actors, program forms, and levels of sustainability. This research employs a qualitative descriptive approach, collecting data through Focus Group Discussions, direct interviews, documentation, and field observations by visiting Proklim according to class representation. Research informants were selected using purposive and snowball sampling techniques. The informants consisted of local driving figures (proklim focal points), forestry extension workers, the Environmental Agency, agricultural extension workers, health cadres, the Village Community Empowerment Agency, village heads and village officials, farmer groups, farmer women's groups, PKK and youth organizations with a total of 68 informants to reach saturated information. The data analysis technique in this study uses the Miles and Huberman model. Data validity was tested using source triangulation, which compares the answers given by informant 1 with other informants, and method triangulation by comparing the results of FGDs, direct interviews, documentation, and field observations.

3 Results and Discussion

3.1 Implementation of proklim

Proklim implements the concept of community empowerment (Community Based Development), activities are carried out by the community and its institutions to mobilize and manage human and natural resources both from within and outside the village to reduce the negative impacts of climate change through natural resource management actions, food security, waste management, and community education [12]. Adaptation actions are carried out by adjusting to climate change such as soil conservation management (maintaining soil and water quality), erosion control, restoration of forest areas (anticipating floods and landslides), and organic farming practices [13].

Mitigation actions aim to reduce greenhouse gas emissions and increase the sequestration of greenhouse gases from various sources through green technologies (efficient irrigation and soil conservation techniques that reduce carbon release from the soil), waste management (waste banks), recycling training, reducing methane emissions from landfills and reducing the negative impacts of waste. Community education on carbon footprint reduction and environmentally friendly practices is also an important form of mitigation, leading to reductions in individual and collective emissions.

The main actor in the climate village program at the district level is the proklim team of the Environment Agency. In contrast, the leading actor at the village level comes from local community initiatives with assistance from forestry extension officers from the provincial Forestry Service Branch and various other community groups. The Environment Agency plays a role in community mobilisation and organising activities, while forestry extension workers assist in monitoring the program. In the context of climate change adaptation measures, the government plays a crucial role in designing and implementing policies, as well as regulating community behaviour, to promote adaptation [14]. Community participation in these activities not only enhances the effectiveness of the program but also fosters a stronger sense of ownership and responsibility for the environment.

Since its launch in 2016 at the national level and in 2020 at the district level, the development of pro-climate initiatives in Karanganyar Regency, Central Java, is presented in Table 1 below.

Table 1. Implementation of proklim in Karanganyar Regency until 2024.

No.	District	Village/Hamlet	Level	Description
1.	Ngargoyoso (Mountains)	Plesungan Hamlet, Berjo Village	Madya	2019
		Munggur Hamlet, Girimulyo Village	Madya	2019
		Segorogunung Village	Main	2019
		Dukuh Tambak Berjo Village	Primary	2024
2.	Tawangmangu (Mountains)	Tawangmangu Village	Madya	2019
		Karanglo Village	Madya	2019
3.	Matesih (Mountain slope)	Hamlet Lor Pasar Matesih Village	Madya	2019
		Karangbangun Village	Madya	2020
4.	Jaten (City)	Ngringo Village	Madya	2019
5.	Karanganyar (City)	Bejen Village	Main	2019
		Gedong Village	Madya	2019
		Genggong Hamlet, Delingan Village	Madya	2020
		Bolong Village	Madya	2020
6.	Jumapolo (Village)	Jumapuro Hamlet, Kwangsan Village	Madya	2019
7.	Jatiyoso (Village)	Wonorejo Village	Main	2019
8.	Kebakkramat (City)	Karangkidul Hamlet, Pulosari Village	Main	2019
		Kaliwuluh Village	Main	2020
9.	Jatipuro (Village)	Jatiroyo Village	Main	2019
		Jatiwarno Village	Madya	2020
10.	Tasikmadu (City)	Gaum Village	Main	2020
		Pakis Hamlet, Suruh Village	Madya	2020

11.	Kerjo (Mountain slope)	Kasihan Hamlet, Kuto Village	Main	2020
12.	Mojogedang (village)	Ngampel Hamlet, Gentungan Village	Main	2020
		Sumberbulu Hamlet, Pendem Village	Main	2020
		Dukuh Bendo Pojok Village	Madya	2021
		Dawe Hamlet, Mojoroto Village	Main	2021
		Sumberbulu Hamlet, Pendem Village	Main & Trophy	Re-registration & Trophy 2022
		Ngampel Hamlet, Gentungan Village	Main & Trophy	Re-registration & Trophy 2023
		Sewurejo Village	Primary	2024
13.	Jenawi (mountain slope)	Jenawi Hamlet Jenawi Village	Main	2020
		Menjing Hamlet Menjing Village	Main	2020
		Anggrasmanis Village	Main	2022
		Kadipekso Hamlet, Gumeng Village	Madya	2022
14.	Colomadu (city)	Gonggangan Hamlet, Bolon Village	Madya	2020
		Paulan Village	Main	2023
		Bolon Village	Main	2023
		Gajahan Village	Primary	2024
		Ngasem Village	Primary	2024
15.	Jumantono (village)	Kebak Village	Main	2023
16.	Gondangrejo (village)	Wonorejo Village	Primary	2024

Source: Data Analysis, 2024.

The achievement of 40 villages over the past four years, or 10 villages per year, can be said to be quite productive, as this program emphasises local community initiatives. However, the implementation of Proklim in Karanganyar Regency faces several challenges. Limited funds and human resources are often an obstacle in implementing various activities. Additionally, there is a need to increase awareness and promote broader community participation to ensure the program's success. Periodic evaluations are also necessary to identify areas for improvement and ensure that the program can continue to deliver long-term benefits to the community and the environment. [15] state that evaluation is a systematic process of collecting, analyzing, and interpreting data or information to determine the level of achievement of objectives. The results of the evaluation indicate that, despite significant progress, certain areas still require further attention, including enhancing technical support, expanding cooperation networks, and strengthening local capacity.

3.2 Variations in proklim implementation

Based on Table 1 above, the regional variation between rural-urban and mountainous areas is not much different. This is evident from the number of proklim in rural areas, totalling 13 proklim, urban areas, totalling 14 proklim, and mountain slopes, totalling 13 proklim. Initiators of proklim in rural-mountainous and urban areas are dominated by women's groups through the organization of farmer women's groups, waste banks and PKK. Other actors are involved through institutions such as tourism awareness groups (pokdarwis) and youth organisations. Variations in activities in urban areas emphasise mitigation programs for waste and waste management, allowing local actors from PKK and waste banks to play a more visible role. Waste remains a significant issue in urban areas due to limited land availability. Independent food programs through the use of yard land are also widely carried out by urban proklim as an effort to provide food from the surrounding environment. Adaptation in urban areas also emphasises education on environmentally friendly housing models, such as those with numerous air vents and windows to allow for sunlight.

Rural characters who work a lot in the fields and have fields tend to be led by farm women group actors. Independent food production is not a problem for villagers or mountain slopes. Actors involved in proklim in rural areas are significantly more numerous due to the communal character of rural communities, which are easily mobilised for social activities. Although the leading actor is the farm women's group, or PKK, the participation of farmer groups, health cadres, youth, and religious groups is also actively contributing. Mountains and mountain slopes are highly suitable for producing various types of vegetables. Adaptation is more about efforts to utilise alternative energy sources, which still need to be improved. While mitigation is more emphasised in relation to the anticipation of landslides, the exploitation of buildings and tourist sites is also a concern. Efforts to maintain water sources in the mountains are becoming increasingly challenging, particularly with the operation of various types of drinking water companies that utilise water for refills. Sustainability is a significant challenge for mountainous areas and their slopes.

3.3 Strategy sustainability proklim

Efforts to address the sustainability issues of ProKlim in Karanganyar Regency focus on increasing public awareness, strengthening local institutions, and enhancing the capacity of village cadres to drive ProKlim implementation. Raising public awareness can be achieved through ongoing educational activities, community-based outreach, and integrating environmentally friendly values into daily activities. Strengthening local institutions can target farmer groups, youth groups, health care workers, and village organisations. Strengthening local institutions can encourage the creation of independent agents of change. Local institutions need to be facilitated and supported to become the main driving force behind ProKlim's sustainability.

These efforts align with the national climate resilience strategy outlined in the National Action Plan for Climate Change Adaptation (RAN-API) and Indonesia's commitment to the National Determined Contribution (NDC). Raising public awareness aligns with the strategy to build adaptive capacity, while strengthening local institutions supports the principle of community-based adaptation, a crucial pillar of national climate resilience. Therefore, the sustainability of ProKlim in Karanganyar not only strengthens local climate resilience but also makes a tangible contribution to achieving national climate resilience targets.

4 Conclusion

4.1 Conclusion

From the result of research, the following conclusions can be drawn:

1. Karangayar Regency has implemented proklim for 4 years and achieved 40 proklim in 16 sub-districts with 5 primary classes, 16 middle classes, and 19 main classes.
2. The growth of proklim in Karanganyar is increasing, but its sustainability still faces obstacles in the form of low public awareness, dependence on mentoring, and the need to strengthen local institutions.
3. Proklim initiation is carried out using two models: intervention and support from the Environmental Agency, as well as local community initiatives with assistance from forestry extension workers.

4. There is no significant difference between ProKlim, which is located in rural, mountainous, and urban areas.

4.2 Advices

Considering the research conducted, the following recommendations can be given:

1. The District Environment Office needs to map local actions related to ProKlim and create a roadmap for further ProKlim establishment.
2. The village government, as a stakeholder in the village, needs to synergise ProKlim with various community group programs, as joining through ProKlim actions will automatically catalyse the activities and productivity of social institutions in rural areas.

References

1. M. Gavrilescu, Water, soil, and plants interactions in a threatened environment. Water, 13(19), 2746 (2021)
2. L. Head, D. Trigger, J. Mulcock, Culture as concept and influence in environmental research and management. Conservation and Society, 3(2), 251-264 (2005)
3. T. Iriani, PL Nugraheni, Pembangunan Kampung Iklim Ramah Lingkungan di Jatinegara Kaum Sebagai Bentuk Aksi Adaptasi dan Mitigasi Perubahan Iklim. Seminar Nasional Lahan Suboptimal, 10(1), 469-479 (2023)
4. TR Karl, KE Trenberth, Modern global climate change. science, 302(5651), 1719-1723, (2003)
5. OC Change, Intergovernmental panel on climate change. World Meteorological Organization, 52, 1-43 (2007)
6. L. Hakim, Agroforestri kopi: mendorong taman hayati dan wisata kopi (MNC Publishing, Malang, 2021)
7. N. Herlina, Permasalahan lingkungan hidup dan penegakan hukum lingkungan di Indonesia. J. Ilmiah Galuh Justisi, 3(2), 162-176, (2017)
8. IMA Utama, Hukum Lingkungan: Sistem Hukum Perizinan Berwawasan Lingkungan untuk Pembangunan Berkelanjutan, (Pustaka Sutra, Bandung, 2007)
9. E. Jahanzad. BA Holtz, CA Zuber, D. Doll, KM Brewer, S. Hogan, AC Gaudin A, Orchard recycling improves climate change adaptation and mitigation potential of almond production systems. PLoS ONE,15(3) (2020)
10. Oktaviana, R. F. (2021). Analisis Jejaring Aktor Dalam Program Kampung Iklim Kelurahan Bukit Cermin Kota Tanjungpinang. Jurnal Ilmu Administrasi Negara, 19(3), 251-261.
11. Gunawan, R., Kurnianingsih, F., & Setiawan, R. (2023). Penerapan Konsep Smart Environment Melalui Program Kampung Iklim Menuju Tanjungpinang Smart City (Studi kasus Kelurahan Tanjung Unggat Kecamatan Bukit Bestari). JURNAL HUKUM, POLITIK DAN ILMU SOSIAL, 2(2), 303-320.
12. AN Medha, Climate governance and the role of local institutions in facilitating adaptive capacity: The case of the ‘Climate Village Program’, Doctoral dissertation, DKI Jakarta, Indonesia, 2020

13. I. Suci, Analisis Implementasi Program Kampung Iklim untuk Meningkatkan Derajat Kesehatan Masyarakat di Korong Pasa. Jurnal Kependudukan dan Pembangunan Lingkungan, 1(1), 39-47 (2020)
14. K. Urwin, A. Jordan, Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. Global Environmental Change, 18(1), 180–191 (2008)
15. Darodjat, M. Wahyudhiana, Model Evaluasi Program Pendidikan, Islamadina, 14(1), 4-11 (2016)