# Sustainability analysis of climate village programs (case study of the main class)

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**Abstract.** The Climate Village Program (ProKlim) aims to strengthen community participation in local climate mitigation and adaptation. Although several areas in Surakarta have reached the Main Class category, sustaining community motivation remains a challenge. This study analyzes the sustainability of ProKlim by examining social, economic, and environmental factors influencing long-term engagement. Using a qualitative case study approach, data were collected through in-depth interviews, FGDs, observations, and documentation. The findings show that strong social capital and local leadership support sustainability, while fluctuating participation, dependence on external incentives, and limited cadre regeneration hinder continuity. Economic activities exist but remain small-scale. The results imply that continuous mentoring, strengthened community-based economic initiatives, and structured monitoring are essential to ensure sustained ProKlim implementation beyond assessment cycle. The result imply that continuous mentoring, strengthened community-base economic initiatives, and structured monitoring to maintain consistent ProKlim implementation beyond competition cycles. Strengthening these aspects is essential for ensuring the ling-term sustainability of Main Class ProKlim as a community-driven climate resilience initiative.

## 1 Introduction

Climate change is a global issue that requires collaborative collective action from all levels of society. This phenomenon not only causes a decline in environmental quality but also has implications for the social and economic welfare of communities in various regions. The impacts include an increase in global temperatures, changes in rainfall patterns, land degradation, and threats to food security and public health. In this context, community participation at the local level is crucial to strengthening adaptive resilience and reducing the risks of climate change. The Ministry of Environment and Forestry of the Republic of Indonesia (KLHK-RI) seeks to increase the active role of communities in community-based adaptation and mitigation activities aimed at controlling the impacts of climate change by initiating the Climate Village Program (ProKlim). ProKlim emphasizes community empowerment so that communities are able to recognize, overcome, and reduce the impacts

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of climate change in accordance with local potential and wisdom. Within the framework of national policy instruments, ProKlim serves to encourage changes in community behavior towards low-carbon and climate-resilient development at the local level.

Community-based participation in climate change mitigation and adaptation efforts and in building socio-ecological resilience is an important aspect of ProKlim's implementation. Active participation and community awareness in protecting the environment through collective action in the areas of waste, livestock, agriculture, energy, and forestry have proven to play a significant role in reducing greenhouse gas emissions [1]. The participatory approach implemented in ProKlim not only positions the community as beneficiaries of the policy, but also as agents of change who contribute directly to climate mitigation and adaptation at the local level.

The success of ProKlim in the context of sustainable development needs to be analyzed from three main dimensions: social, economic, and environmental. Dewi et al. [2] argue that the synergy between community social capital, productive economic activities, and sustainable environmental management is crucial for ProKlim's sustainability. This is reinforced by Alam and Anwar [3] who found that urban socio-economic resilience is strengthened through participatory household waste management. These studies affirm that the continuity of ProKlim is closely linked not only to environmental practices, but also to the strengthening of social cohesion and community welfare.

However, the sustainability of ProKlim faces various obstacles that can affect its long-term effectiveness. Limited human resources, weak coordination among actors, fluctuating community participation, and dependence on local leaders remain significant challenges [4]. These conditions indicate the need for stronger institutions, cadre regeneration, and long-term sustainability strategies.

Surakarta City is one of the regions in Indonesia that actively implements ProKlim. According to DLH (2025), Surakarta has established forty-three (43) climate villages from 2013 to 2024, including several that have achieved the Main Class category. Despite this achievement, a critical challenge remains: ensuring that ProKlim continues to run sustainably beyond the award phase and provides long-term social, economic, and environmental benefits.

Although previous studies have examined ProKlim implementation and its environmental outcomes, there is still limited research that specifically analyzes the sustainability of Main Class ProKlim by integrating social, economic, and environmental dimensions simultaneously at the local urban context. Existing literature also tends to focus on program implementation rather than on why communities fail to sustain ProKlim activities after achieving high-category recognition. Therefore, this study offers novelty by providing a comprehensive sustainability analysis of ProKlim in Surakarta that captures the dynamics of participation, leadership, economic reinforcement, and environmental practices.

Based on this gap, the objective of this study is to analyze the sustainability of Main Class ProKlim in Surakarta City by identifying the key supporting and hindering factors across social, economic, and environmental dimensions, as well as to provide recommendations for strengthening long-term community-based climate resilience.

## 2 Method

This research method is qualitative with a case study approach. The research location was determined purposively by considering aspects related to the sustainability of the implementation of the Primary Class ProKlim in Surakarta City, Central Java Province. The data collection methods used are as follows.

### 2.1 In-depth interviews

This technique was used to explore the perceptions, motivations, and experiences of informants directly involved in the implementation of ProKlim. In-depth interviews were conducted in a semi-structured manner using open-ended questions, so that informants could describe their views freely. The informants in this study consisted of representatives from the Environmental Agency, ProKlim administrators, community leaders, and members of the Women Farmers Group (KWT).

### 2.2 Focus Group Discussion (FGD)

Focus Group Discussion (FGD) is commonly used as a data collection method because it makes it easier for researchers to understand social interactions and group dynamics that can affect the sustainability of community-based ProKlim. FGD is a data collection technique that utilizes group interactions to obtain participants' views, perceptions, experiences, and attitudes towards an issue (Krunger and Casey, 2015). The purpose of conducting FGDs is to understand the various perspectives that emerge through the dynamics of discussion. In this study, FGDs were used to explore views on the sustainability of ProKlim implementation from ProKlim administrators, community representatives, environmental cadres, and the Environmental Agency. The FGDs were facilitated by a moderator using guidelines based on the results of preliminary interviews and documentation.

### 2.3 Observation

Observations were conducted to obtain empirical data on community activities in implementing ProKlim. Observation techniques provide a direct understanding of the social dynamics carried out by the community [5]. Community activities in ProKlim that can be observed include waste bank management, organic fertilizer production, and environmental education activities.

### 2.4 Documentation Study

Documentation studies were conducted to examine secondary data relevant to the research phenomenon. Documentation studies can be used to reinforce field findings and validate field findings from interviews and observations [6]. In this study, document studies were conducted using documents from the Surakarta City Environment Agency (DLH), photos of activities, and community group administrative records.

## 3 Results and Discussion

### 3.1 Overview of ProKlim Implementation in Surakarta City

Surakarta City is one of the areas that actively implements the Climate Village Program (ProKlim). This activity can be seen from institutional support, community participation, and guidance at the neighborhood association (RW) level. The local government's commitment to supporting mitigation and adaptation efforts to climate change is demonstrated by the policy to increase the number of climate villages through guidance and environmental competitions held annually at the village level. DLH (2025) [7] data shows that there are 43 active ProKlim locations spread across five sub-districts in Surakarta City, with several areas such as RW 8 Pajang, RW 9 Pucangsawit, and RW 29 Mojosongo successfully achieving the

Main Class ProKlim category. Based on the results of the FGD, it is known that the implementation of ProKlim in Surakarta City began with community concern for local environmental issues, which was applied through concrete actions, such as waste and floodwater management, as well as reducing household waste.

Community understanding of the ProKlim concept still varies. Most people are unaware that their usual activities are included in the ProKlim scheme, so implementation has not been sustainable. This finding indicates the need for continuous assistance and contextual education provided by the DLH of Surakarta City to improve community understanding of the implementation of environmental activities as a strategy for adapting to climate change.

### 3.2 Social Dimension: Participation, Local Leadership, and Collaboration

Social capital and participatory leadership are key social factors underlying the success of the Climate Village Program (ProKlim) in Surakarta City. The presence of local heroes plays a key role in raising public awareness by strengthening coordination and communication among stakeholders. The sustainability of community-based programs using the principle of community empowerment is influenced by the level of trust, togetherness, and sense of belonging among stakeholders [8]. Efforts to implement ProKlim in a sustainable manner still face challenges, such as fluctuations in community participation after assessment, which have the potential to weaken the social sustainability of the program. To overcome this problem, strengthening the capacity of cadres and regenerating environmental activists are strategic steps to ensure that the program does not depend on certain individuals.

### 3.3 Economic Dimension: Empowerment and Independence

The implementation of the Climate Village Program (ProKlim) in Surakarta City also encourages green economic activities based on households. Based on the findings, most community groups have developed circular economy businesses by implementing environmentally friendly activities such as organic fertilization and productive yard utilization. At the research site, there are agricultural activities to support local food security and waste banks that also provide economic benefits, but still on a limited scale. Resilience can be defined as community efforts to implement environmentally friendly policies and solutions, ensure local food availability, and strengthen the capabilities of pre-productive to productive age populations [9]. Based on the results of the FGD, the main obstacles found were limited market access, lack of product innovation, and dependence on external capital assistance. Economic sustainability through ProKlim can be pursued through strategies to increase business management capacity and the formation of environmental cooperatives tailored to the conditions and local wisdom of each region. These efforts are expected to provide effective and targeted solutions.

### 3.4 Environmental Dimension: Sustainable Adaptation and Mitigation

The environmental dimension is the main pillar of the implementation of the Climate Village Program (ProKlim) in Surakarta City. ProKlim is a means to create a more comfortable and beautiful environment to support the community's life. Based on in-depth interviews, observations, and focus group discussions, the people of Surakarta City have carried out various climate change mitigation and adaptation actions oriented towards environmental preservation and increasing ecosystem resilience in urban areas.

First, the community has implemented the creation of biopores and infiltration wells to reduce waterlogging and increase groundwater infiltration. This activity is implemented as an adaptation effort to extreme rainfall increases that have the potential to cause local flooding. This effort is supported by a policy from the Surakarta City DLH, which states that each neighborhood association (RW) must have at least 100 active biopore points as an indicator of environmental adaptation actions.

Second, the sorting of organic and inorganic waste, as well as the processing of waste into organic fertilizer and recycled goods that have higher economic value. This activity not only contributes to reducing the volume of waste entering the Putri Cempo Final Disposal Site (TPA), but also supports the circular economy at the local community level. These activities are usually initiated by waste banks. However, in practice, many people are still not interested in participating in waste bank management due to a gap in understanding between the community and waste bank managers. This is influenced by the fact that waste sorting and weighing activities are considered too time-consuming, resulting in the accumulation of waste in residents' homes, which causes discomfort and an impression of uncleanliness. In addition, the economic value of waste sales is not yet commensurate with the time and energy expended by the community. Community participation in waste management can be influenced by the level of knowledge. The community will tend to carry out waste management activities when they have a high level of knowledge, but if their knowledge is still low, it is difficult to encourage their participation (Wildawati & Hasnita, 2020 in Nurfadillah et al. [10]). These findings are in line with the results of the FGD, which showed that community motivation tends to increase when there are rewards, but will decrease if external support is reduced.

Third, the community utilizes Rainwater Harvesting (PAH) installations to support agricultural activities during the dry season. This initiative is considered effective in improving water use efficiency while strengthening local food security. In addition, it does not cause social conflict because it involves the continuous use of private assets for public interests. Fourth, the greening of yards and the planting of productive trees. These activities not only support the aesthetics of the environment, but also contribute to improving air quality and providing a source of food for families. Several sub-districts in the city of Surakarta have launched the "One House One Tree" program as part of climate change adaptation actions in urban areas. These programs illustrate the increased public awareness of the importance of resource efficiency and carbon emission reduction. The success of climate mitigation and adaptation at the community level is greatly influenced by active community participation and sustainable local innovation [1].

### 3.5 Supporting and Hindering Factors for Sustainability

Data triangulation results show that the sustainability of ProKlim in Surakarta City is supported by three main strengths:

1) The commitment of the local government through policies, ProKlim competitions, and funding for each sub-district of IDR 300-500 million per year.
2) Community involvement and local institutions that play an active role in environmental activities.
3) The role of local heroes who consistently lead and set an example in climate villages.

The factors hindering the sustainability of ProKlim include:

1 Limited community administrative capacity in compiling activity reports as community group archives.
2 Lack of technical assistance and regeneration of environmental cadres.
3 Dependence on external assistance.

To reduce the impact of inhibiting factors, a structured monitoring and evaluation system is needed so that ProKlim is not only active during competitions, but also runs independently and sustainably. Community independence can be built by implementing community development strategies based on participation and independence that are relevant to the actual environmental conditions and community needs [11]. The sustainability of ProKlim in

Surakarta City is closely related to the integration of three dimensions, namely social as a driver, economic as a reinforcement, and environmental as a result. ProKlim is not only a symbol of environmental appreciation, but also a sustainable movement in the socio-ecological aspect that strengthens the resilience of urban communities to climate change. The result of the ProKlim sustainability analysis are presented in Table 1.

**Table 1.** Results of the Sustainability Analysis of the Climate Village Program in Surakarta City

| Dimensions of Sustainability | Field Findings | Supporting Factors | Hindering Factors |
|---|---|---|---|
| Social | Community participation was quite high in the early stages until the ProKlim assessment<br>• The role of local heroes is very strong in building collective awareness<br>• Effective collaboration between stakeholders<br>• Education and mutual cooperation become the main culture | The presence of active environmental cadres<br>• Collaboration *between stakeholders*<br>• ProKlim competition and award program | • Dependence on certain local figures<br>• Decline in participation after the assessment regeneration of environmental cadres |
| Economy | • Productive economic activities developed from environmental activities<br>• Utilization of productive yards and waste processing as additional sources of income<br>• Existence of external funding support | • Capital support of IDR 300-500 million/year<br>• Environmental KWT and MSME activities<br>• Adoption of environmentally friendly agricultural innovations | • Small economic scale and unsustainable marketing<br>• Results have not yet had a significant impact on household income<br>• Dependence on external funding |
| Environment | • The community implements biopores, infiltration wells, and waste banks<br>• Greening and rainwater utilization programs have been implemented<br>• Awareness of waste management has increased, but is not yet comprehensive | • Technical support from DLH and other partners<br>• Local innovations<br>• Monitoring and evaluation by relevant *stakeholders* | • Low community interest in waste bank management<br>• Low market value of waste and logistical challenges<br>• Lack of environmental facility maintenance |

Source: Researcher Analysis, 2025

## 4 Conclusion

This study finds that the implementation of ProKlim across Surakarta generates measurable social, economic, and environmental impacts. Socially, ProKlim strengthens community participation, collective environmental action, and local initiatives. Economically, circular-economy activities such as waste utilization and urban agriculture provide additional value for households and community groups. Environmentally, ProKlim contributes to improved waste management, increased vegetation cover, and better adaptation–mitigation practices. However, program continuity remains constrained by limited institutional capacity, uneven community engagement, and insufficient incentives for long-term participation.

## 5 Recommendations

Efforts are needed to strengthen local institutions and environmental cadres through regeneration of activists and ongoing mentoring after assessment so that ProKlim activities can run independently in the community. In addition, increasing participation and providing economic incentives need to be done by encouraging circular economy innovations, such as promotion in digital media so that information is more widely disseminated and can attract public attention. ProKlim also needs to be integrated with green economy programs, urban agriculture, and corporate social responsibility (CSR) so that its impact can be felt by the community in a broad and sustainable manner. Strengthening the documentation and environmental education system can be done through improving digital reporting and expanding school-based environmental education on an ongoing basis as an effort to foster ecological awareness from an early age.

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