

Sustainable Flood Disaster Risk Mitigation in Wonoasri Village, Tempurejo District, Jember Regency

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ABSTRAK

Desa Wonoasri merupakan salah satu desa yang berada di Kecamatan Tempurejo, Kabupaten Jember. Desa ini merupakan desa penyangga kawasan Taman Nasional Meru Betiri dengan karakteristik wilayah berupa dataran rendah, perbukitan, dan hutan yang diapit oleh dua sungai besar, yaitu Sungai Mayang dan Sungai Curahnongko. Berdasarkan hasil observasi tim PKM, desa ini termasuk wilayah yang rawan banjir akibat tingginya curah hujan, perubahan iklim, serta pengelolaan sumber daya alam yang kurang optimal. Oleh karena itu, tim PKM bertujuan untuk melaksanakan kegiatan mitigasi bencana, khususnya mitigasi risiko dampak banjir secara berkelanjutan. Metode pelaksanaan pengabdian kepada masyarakat menggunakan lima tahapan, yaitu: pendanaan hibah perahu karet, pendanaan peralatan pendukung, pelatihan dan praktik, pendampingan, serta evaluasi kegiatan. Hasil yang diperoleh menunjukkan bahwa terdapat empat permasalahan utama yang menyebabkan terjadinya banjir di desa ini, yaitu: curah hujan yang tinggi dan berlangsung lama, topografi wilayah yang landai, deforestasi di daerah hulu sungai, serta sistem drainase yang kurang baik. Tim PKM telah menyerahkan hibah berupa perahu karet dan berbagai peralatan pendukung lainnya yang bermanfaat untuk upaya mitigasi banjir. Kegiatan tersebut disertai dengan penyuluhan, pelatihan, serta survei langsung ke lokasi yang terdampak banjir. Kegiatan ini berhasil dilaksanakan, yang ditunjukkan oleh meningkatnya tingkat pengetahuan dan keterampilan masyarakat, pemerintah desa, serta Desa Tangguh Bencana (Destana) dalam upaya mitigasi risiko dan dampak bencana banjir.

Kata kunci: Banjir, Mitigasi, Desa Wonoasri

ABSTRACT

Wonoasri Village is one of the villages located in Tempurejo District, Jember Regency. This village is a buffer village for Meru Betiri National Park with regional characteristics of lowlands, hills, and forests flanked by 2 large rivers, namely the Mayang River and the Curahnongko River. Based on observations by the PKM team, this village is prone to flooding due to high rainfall, climate change, and poor natural resource management. Therefore, the PKM team aims to carry out disaster mitigation, especially mitigating the risk of flooding impacts in a sustainable manner. The community service implementation method uses 5 stages: funding for rubber boat grants, funding for supporting equipment, training and practice, mentoring and activity evaluation. The results obtained are that there are 4 main problems that cause flooding in this village: high and prolonged rainfall, sloping topography of the area, deforestation in the upper reaches of the river, and poor drainage systems. The PKM team has handed over a grant of rubber boats and other equipment that is useful for flood mitigation efforts accompanied by counseling, training and direct surveys at flood-affected locations. The activity was successful, as seen from the increase in the level of insight and skills of community members, village governments, and the Destanas in efforts to mitigate the impact of flood disaster risks.

Keywords: Flood, Mitigation, Wonoasri Village

PENDAHULUAN

Wonoasri Village is one of the villages fostered by the University of Jember, located in Tempurejo District, Jember Regency. This village is a buffer village for Meru Betiri National Park with regional characteristics of lowlands, hills, and forests flanked by two large rivers, namely the Mayang River and the Curahnongko River (Dianasari, 2018). The conversion of forest and hilly areas into agricultural land that is not well managed accompanied by shallowing of river flows has caused Wonoasri Village to be routinely affected by seasonal flooding every year (Guntoro, 2017; Setiawan et al. 2024). At the end of 2024, this village was affected by a flood disaster that caused losses such as causing crop failure and damage to community agricultural crops and disruption of community activities due to flooding that inundated residential areas (Wuryaningsih et al. 2019). Continuous flooding will also damage the environmental hue and change the topography of the area if disaster mitigation is not carried out properly and planned (Qodriyatun, 2020).

Several factors influence seasonal flooding in Wonoasri Village, Tempurejo District, including high rainfall. The rainy season, which brings excessive rainfall, often causes the Mayang and Curahnongko Rivers to overflow. This situation is exacerbated by the topography of Wonoasri Village, which consists of low-lying basins that have the potential to become overflowing water from these two large rivers. High rainfall in the upstream area causes high water discharge and inundates most of Wonoasri Village. Another problem is climate change. Global climate change, which causes more extreme weather, can also exacerbate seasonal flooding in the southern Jember region, especially in Tempurejo District, which is crossed by two large rivers. Climate anomalies that occurred in Indonesia at the end of 2024 were the main cause of flooding in Wonoasri Village. The final problem is poor natural resource management. Deforestation, unplanned urbanization, and narrowing of rivers or drainage channels can exacerbate the risk of seasonal flooding. This condition also occurs in Wonoasri Village due to the shallowing of the Curahnongko River which carries material in the form of mud deposits and inorganic waste, causing river sedimentation and worsening the flood disaster.

One effort that can be undertaken by the village government and the community in Wonoasri Village to address the impact of flood risks is disaster mitigation, specifically mitigating the impact of flood risks on an ongoing basis (Azhar et al. 2016; Qi et al. 2021; Wicaksono et al. 2023a). Flood mitigation is the steps taken to reduce the risk and impact of flooding on the community, environment, and infrastructure. Therefore, ongoing flood risk mitigation efforts are needed, accompanied by appropriate management methods, to minimize the impact of seasonal flooding that occurs in this area. One area that is given special attention to this flood disaster is the watershed (DAS) in the Curahnongko River in the southern part of the Meru Betiri National Park (MBNP) area, which functions as a water reservoir, habitat for plant vegetation, and also a variety of wildlife (Balai TNMB, 2020; Tanjung et al. 2020; Wicaksono et al. 2023b).

METODE PELAKSANAAN

The Village Development-Based Community Service Program team's activities will be detailed as follows:

1. Rubber Boat Grant Funding

The grant funding activity involves the purchase of rubber boats. These rubber boats will be donated for use by the Village Government and the village community during floods. This equipment will be donated to the Village Government to be used by the proposal team in the worst-affected flood areas in 2024 to ensure optimal utilization.

2. Funding for Supporting Equipment

Funding for supporting equipment includes 10 flood disaster management guidebooks, 10 environmental conservation books, and 20 standard operating procedures (SOPs) on what needs to be done to manage the impacts of flood disaster risks. These books and SOPs will serve as guidelines for the Village Government and the village community to optimally manage the impacts of flood disaster risks.

3. Training and Practice

The training and practice activities to be conducted are: 1) training and practice on the use of rubber boats, where the Wonoasri Village government and community will be taught the proper use of rubber boats; 2) training and practice on the factors causing flooding and steps to manage flooding; and 3) training and practice on environmental awareness and preservation, as well as the natural factors that influence efforts to reduce the impact of flooding. Following the training, the village government and community will be given the opportunity to practice directly, ensuring that these activities are effective and targeted in addressing the problem.

4. Mentoring

Mentoring activities are needed to monitor and ensure that village officials and the community: 1) understand and master the use of rubber boats; 2) possess knowledge and skills regarding the factors causing flooding and steps to prevent and minimize the impact of flood risks; and 3) possess knowledge and skills regarding environmental awareness and preservation, as well as the natural factors that influence efforts to manage the impact of flood risks from an environmental conservation perspective.

5. Activity Evaluation

Evaluation techniques are needed to assess the success of this community service activity. This involves using a questionnaire to assess the knowledge and skills of the village government and community before and after the training and practical activities. Technically, the activity evaluation is conducted by: 1) comparing the knowledge and skills of village officials and the community in using rubber boats and a series of donated supporting equipment; 2) comparing the knowledge and skills of village officials and the community regarding the causal factors and steps that must be taken to mitigate flood disaster risks; and 3) comparing the knowledge and skills of village officials and the community regarding environmental awareness and conservation.

In the five stages of the implementation method, Village Government apparatus partners and village communities are required to follow these five stages, so that it is hoped that optimal results will be obtained in accordance with the output targets. The sustainability of this activity program, namely the PKM Team will periodically maintain intense communication with partners, so that they can know the progress of partners in efforts to deal with the impact of flood disaster risks that may occur at any time. In addition, it is also to monitor the use of rubber boats and supporting equipment that have been donated, so that they can be used properly and can be accounted for.

HASIL KEGIATAN

Based on the results of in-depth activities conducted with village officials and the Wonoasri Destana team, the flooding problem in Wonoasri Village is caused by eight main issues. This is consistent with the findings [4, 5], which, when related to Wonoasri Village, can be explained as follows:

1. High and Prolonged Rainfall

Jember Regency is known to experience quite high rainfall during the rainy season between the end of the year and the beginning of the year. Several areas, such as Tempurejo District, located in the southern part of Jember Regency, receive high rainfall and are traversed by a fairly large river, the Mayang River. High and prolonged rainfall can increase the Mayang River's discharge and cause it to overflow into residential areas along its banks.

2. The Topography of the Region is Gently Sloping

The area along the Mayang River banks is gently sloping and lacks access barriers. Therefore, when the river rises, floodwaters can enter residential areas in Wonoasri Village. There has been no follow-up from the village to raise the river embankment or dredge the riverbed, so the flooding problem continues to this day.

3. Deforestation in the Upper River

Deforestation in the upper reaches of the Bedung River and the conversion of forest to coffee

plantations have reduced water absorption in this area, resulting in high water discharge that cannot be dammed. Consequently, the river cannot accommodate the high water discharge during the rainy season, and downstream areas experience flooding from upstream and surrounding areas.

4. Poor Drainage System

Wonoasri Village has a drainage system consisting of canals connected to each house and ending in the Mayang River. However, residents often dump organic waste such as dry leaves, twigs, and other organic waste into these canals. A small number of residents also dump household waste into these canals. During heavy rains, these canals fail to function optimally due to blockages and silting. Therefore, flooding can also be caused by a poor drainage system.



Figure 1. Handover of Equipment Grant

To address the aforementioned issues, the Community Service Program (PKM) team implemented the following activities (Figure 1):

A. Rubber Boat Grant

The rubber boat grant was provided at the request of the Wonoasri village government, which needed a vehicle to access areas affected by severe flooding near the river and inaccessible to motorized or manual vehicles. The rubber boats are expected to assist officers in evacuating residents from the floodwaters and providing logistical supplies.

B. Life Jacket Grant

Life jackets are also essential for evacuating residents trapped in floodwaters and assisting in the distribution of logistics to flood-affected areas. This equipment is needed as personal protection for the Disaster Response Team (Destana) when carrying out their duties in and around the worst-hit flood areas.

C. Flood Mitigation Book Grant

Flood mitigation books have many important benefits for the community, particularly in increasing preparedness and reducing the risk of disaster impacts. Flood mitigation books are not only a source of information, but also an educational and empowerment tool for communities to be more prepared, resilient, and independent in facing flood risks.



Figure 2. Survey of Flood-Affected Locations in Wonoasri Village

In addition to the aforementioned grant of flood mitigation equipment and books, the Community Empowerment and Development (PKM) team also conducted a survey and retraced the flood-affected residential areas and river basins in Wonoasri Village (Figure 2). This was done as an effort to provide direct solutions by examining the impact of the flood and its implications for the communities surrounding the riverbanks. The PKM and Destana teams hope that the factors that cause flooding can be minimized and effectively addressed in the future.

KESIMPULAN DAN SARAN

This community service activity is a form of concern and training for the community regarding efforts to mitigate the impact of the ongoing flood disaster to the Village Government, the Community, and especially the destana group in Wonoasri Village. This activity ran smoothly and was beneficial for both parties, namely the UNEJ PKM team and the Wonoasri village government. The activity was successful as seen from the increase in the level of insight and skills of community members, the village government, and destana in efforts to mitigate the impact of flood disaster risks. This event is expected to provide new knowledge and science that can be applied by community members when facing future flood disasters that may occur in Wonoasri Village.

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