Gender Mainstreaming in Drought Disaster Risk Reduction

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Abstract. Climate change has affected the whole world and caused disasters, include drought. Since Tana Mbanas village in Central Sumba District is the driest remote area in eastern region of Indonesia, gender inequality has affected in daily life of people in the village instead of other social and environmental problems. This research aimed to evaluate how gender mainstreaming implemented in drought disaster risk reduction in Tana Mbanas village in Central Sumba Regency, East Nusa Tenggara Province. The result of the research is expected to become a mirror that reflects Sumba island gender and development issues. The research took place in Tana Mbanas village in Central Sumba Regency, East Nusa Tenggara Province, and conducted by qualitative method with purposive data sampling. The steps taken in the research were observation, data collecting by questionnaire and in-depth interview to respondents, and literature review. It was reported that Tana Mbanas village people has given water management assistance by village fund, conducting water management counselling, saving water, and harvesting rain systems in every household. This research meets conclusions that: (1) Several programs and planned actions in water supply system and infrastructure development have become initiatives of government agencies of village authorities, BPBD and Public Work Agency of Central Sumba Regency; (2) People demonstrated vulnerability to drought as well as lack of water supply and also water resources; (3) Strong efforts should be conducted to educate people and increase women capacity in coping issues of poverty, drought, and lack of water supply; and (4) Government agencies and other private institutions have to build women capacity as their participation in enhancing gender equality and mainstreaming gender.

1. Introduction
In last decades, the world got impact of climate change that caused disasters, included drought. It is obvious that drought becomes serious disaster, creeping phenomenon, and getting worse year to year. Meteorological, Climatological, and Geophysical Agency of Indonesia has announced long period of extreme drought in 2020, especially in eastern region of Indonesia, included Central Sumba Regency. Since Tana Mbanas village in Central Sumba District, East Nusa Tenggara Province, is the driest remote area in eastern region of Indonesia, gender inequality in drought disaster become important
issue because it affected daily life of people in the village instead of other social and environmental problems.

Drought is a form of meteorology disaster caused by hydrological conditions [1,2]. As a matter of fact, disturbance exists in hydrological cycle which then leads to disasters, one of them is drought disaster. Drought is a slow-moving phenomenon, as is its handling [3]. The amount of water circulating in the earth through a series of processes called hydrological cycles. These hydrological cycles remain in the same amount but it will depend on the location, distribution, and geographical condition. It should be emphasized that droughts occur because of the limited amount of water on the surface [4] and it leads to limited availability of water in a watershed.

During the period of dry season that drought happened in Tana Mbanas village, the issue of gender inequality happened. Since inequality role of women become concern of gender equality, mainstreaming gender may become a root from gender inequality happened in Tana Mbanas village. Gender mainstreaming is defined as “a process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in any area and at all levels” as the United Nations Economic and Social Council (ECOSOC) on July 1997 [5]. This approach becomes strategy in achieving gender equality as the ultimate goal of mainstreaming of gender itself.

In sustainable development context, gender perspective as well as women role in community in disaster risk reduction have been discussed by several research such as by [6–9], but special characteristic of community who live in very dry area with savannah surrounding with traditional culture indeed like in Tana Mbanas village will become novel issue. In fact, there is little research that reported the issue of gender mainstreaming related to drought in Sumba region. Hence, it is interesting to study gender perspective in drought disaster risk reduction as conducted by this paper.

The research evaluated how gender mainstreaming implemented in drought disaster risk reduction in Tana Mbanas village in Central Sumba Regency, East Nusa Tenggara Province. Disaster risk reduction (DRR) has become a global policy [10,11] that was implemented in many types of disasters. There were lots of efforts and studies in mitigating the disasters such as new approaches and models of DRR method and policy [6,12–14]; produces new innovations of material, design, construction [15,16,25–28,17–24] and also inventions of tool and equipment [12,14,30–31]; development of early warning systems, evaluation and monitoring, and any other efforts [13,31–35]. Since the gender equality awareness is not popular in such rural remote area like Sumba Island, then the research will present the gender mainstreaming as urgent issue to be implemented by the local authorities in drought disaster risk reduction. Hence, the result of the research is expected to become a mirror that reflects Sumba island gender and development issues.

It should be note that this paper is an initial study of the research project funded by Ministry of Research and Technology/National Research and Innovation Agency, Republic of Indonesia in 2020 [36]. The result of this initial study has been continued and developed by advanced study which published in [37].

2. Methods

The research took place in Tana Mbanas village (or known also as Central Tana Mbanas village) in Central Sumba Regency, East Nusa Tenggara Province, as described by Figure 1 and Figure 2. As an initial study of the project, this research conducted by qualitative method with purposive data sampling. There were observation as first step in this research to study the general village situation, behaviour of the villagers, and the governance of local authorities as well as the community leader’s influences. Survey became the second step of the research followed by in-depth interview. For primary data collecting, survey was conducted to 11 respondents and in-depth interview has been held to 2 respondents (Figure 3) which were chosen by certain criteria such as social economics status, occupation, and condition of the house, environmental health, and also education. Analysis of primary data of in-depth interview was enhanced by findings of observation and survey. A comprehensive literature review was also undertaken to gain knowledge of drought disaster and gender mainstreaming in disaster risk reduction.
**Figure 1.** Satellite photograph of map of Tana Mbanas area in Central Sumba Regency, East Nusa Tenggara Province

(https://earth.google.com/web/search/Tana+Mbanas,+Central+Sumba+Regency,+Nusa+Tenggara+Timur/@-9.41358306,119.86147164,203.22416182a,54040.6147611d,35y.0h.0t.0r/@data=CqIBGngScgolMHgyYxRiNDY4ZWJhZTE1NWQ1OjB4NmM5MWQzYTkwMTFhZjI0YRkMuzmmOPwiwCFzaOym7_ZdQC0v3VGfUYSBNYmFuaXMsIENlbnRyYWwvU3VyMgUmVvznZW5jeSwgTnVzYSBUW5nZ2FyYSBUaW11cngBIAEiJgokCTUM54hGjzFAETMM54hGjzHAGTqvI4WgUEhATuI4WgUEjA)

**Figure 2.** Entrance road to Central Tana Mbanas village, East Nusa Tenggara Province [36]
3. Results and Discussion

3.1. Results

3.1.1. Research site. Central Sumba region is hilly land with steep hills in northern side that are difficult to pass by. The area of Central Sumba Regency is about 1,868.74 km² with population as many as 58,964 people. Central Sumba Regency located on 9° 8’ – 10° 20’ South Latitude and 118° 55’ – 120° 23’ East Longitude and consists of 6 sub-districts of Katikutana, South Katikutana, Umbu Ratu Nggay, Umbu Western Ratu Nggay, and Mamboro [38]. The situation of Central Sumba Regency which has low economics level, limited human resources in quality, local financial status, accessibility, and also local characteristic, make the government determined Central Sumba Regency as one of least developed regions in Indonesia of 2020 that was stipulated by Presidential Decree of Indonesia No. 68 Year 2020. Topography of Central Sumba Regency influences the local climate by rain intensity as 100-150 days and dry season on June-October. There is lack of water resources, vegetation, and forest, as well as the soil types, which causes drought that becomes worse year by year. Central Tana Mbanas village is driest area Sumba Island and located in northern Umbu Ratu Nggay sub-district. Travel time from Central Tana Mbanas to downtown of Central Sumba Regency is about 4 hours.

3.1.2. Survey responses. Survey was conducted to 11 respondents and to several agencies/authorities such as village authority, BPBD (Badan Penanggulangan Bencana Daerah/Local Agency of Disaster Management) of Central Sumba Regency, and Public Work Agency of Central Sumba Regency. Most of respondents are farmers (36.4%) followed by students (18.2%), and others are civil servant, priest, community police, village secretary, and entrepreneur (45.5%). They live mostly in stony land which cannot absorb water (90.9%). The farmers prefer keep livestock than plant crops (90.9%) because of the lack of water resources (Figure 4).

It was found that water resources are not enough for most people (81.8%) and even it is in bad quality (90.9%). Only few people have access to water supply from government facilities (18.2%). Most people need public water storage in village (80%). The people who get water supply from Anakalang spring only get little amount of water (81.8%). Since there is a lack of water resources and supply, most people just take bath two or three times a week (77.8%). There just few people take a bath every day, once a day (22.2%).

In difficult situation of drought disaster, people demonstrates resilience because of one reason, it is their homeland (100%). Whenever drought happened, people goes to the forest to find plants and crops for food (63.6%) and some of them ask for help to neighbour or family (in this case, they call for help for rice), this is called “Mandara” in Sumba language (36.4%).
The findings of local authority’s of Tana Mbanas village survey reported that there were several programs of water supply, such as: (1) PAMSIMAS (Community based of Drinking Water and Sanitation Supply) as described by Figure 5, of 54.5% from village authority; (2) water storage (with profile tank, then it is named “profile tank”) of 27.3%, and (3) SPAM (Drinking Water Supply System) of 18.2%. Instead of local authorities of Tana Mbanas village programs, there were also other programs conducted by BPBD and Public Work Agency of Central Sumba Regency, for example: clean water assistance (54.5%), water supply infrastructure (27.3%), and also “Raskin-Beras Miskin” (Rice Subsidized Delivery) and “Rastra-Beras untuk Masyarakat Sejahtera” (Rice for Prosperous Population) (18.2%).

3.1.3. In-Depth Interview findings. This research tried to explore some issues to 2 respondents by in-depth interview. The respondents have been chosen by criteria of as social economics status, occupation, condition of the house, environmental health, and also education. It was found from the respondents that they suffered of water shortages because of the lack of public transportation (that brought them to the spring or public reservoir), human resources, and government assistance. First respondent preferred to provide water for her children that need it for bathing before going to school. On the contrary, the second respondent had argument that the primary need of water is for cook than for other reasons (such as for bathing, laundry, etc.). During the drought, whenever enough rain drops falls down, some people harvesting the rain water even though in just small volume. In the worst situation during drought, people faced starvation and asked family for rice (“Mandara”). The respondents emphasized that people need better infrastructure and public transportation to support water supply to their village.
3.2. Discussion
Survey and observation of Tana Mbanas village have shown that the people mostly uneducated, poor, and have low income as also reported by [38]. This community also faced of dry climate and land that is continuous. Lack of water supply and resources always comes with the drought and sometimes starvation. It was reported also that people in Tana Mbanas village has given water management assistance by village fund, conducting water management counselling, saving water, and harvesting rain systems in every household.

Results of survey and in-depth interview have shown vulnerability of the community to drought as well as lack of water supply and also water resources. Two indicators have been determined to integrate gender perspective to vulnerability analysis, they are Sensitivity Indicator and Adaptive Capacity Indicator. Sensitivity Indicator pointed the age, gender, employment, and education; while Adaptive Capacity Indicator pointed the role of man as well as dependency of woman to solve household issues.

Gender mainstreaming in drought disaster risk reduction in Tana Mbanas has officially found in some programs and also planned actions. There are programs in water supply system and infrastructure development conducted by government agencies of village authorities, BPBD and Public Work Agency of Central Sumba Regency. Infrastructure of water supply may be developed by simple design and local materials application which are low cost, ‘green’, and easy to find and also easy to construct as have reported by [21–24,39–44].

Even though several actions have been promoted, however, the water supply still rare and very limited, and gender equality in drought resilience seemed not exist. Other important issue is how to educate people and increase capacity of women in their hard situation of poverty, drought, and lack of water supply. Women participatory in enhancing gender equality should be increased by building their capacity. Lots of efforts should be done, for example to develop Sumba hand woven fabrics to national and even international market. It is also important to build community participatory in drought disaster risk reduction such as to develop rain water harvesting intensive program.

4. Conclusions
This research meets conclusions that: (1) Several programs and planned actions in water supply system and infrastructure development have become initiatives of government agencies of village authorities, BPBD and Public Work Agency of Central Sumba Regency; (2) People demonstrated vulnerability to drought as well as lack of water supply and also water resources; (3) Strong efforts should be conducted to educate people and increase women capacity in coping issues of poverty, drought, and lack of water supply; and (4) Government agencies and other private institutions have to build women capacity as their participation in enhancing gender equality and mainstreaming gender.

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