Scenario of the Early Warning System (EWS) in Disaster Prone Khulna and Satkhira District

Bangladesh is considered a role model in early warning systems (EWS). Bangladesh has achieved remarkable success in reducing deaths due to cyclones by building early warning systems, shelters, and organizing evacuations. For example, Cyclone Bhola killed about 300,000 people in 1970, Cyclone Sidr killed 3,500 people in 2007, while Cyclone Fani killed fewer than 10 people in 2018. The nation now has an early warning system that can evacuate millions of people in 24 hours and coastal embankment systems that safeguard over 6,000 km of vulnerable shoreline. The coastal regions of Bangladesh are at risk from natural disasters such as floods and storms. To reduce the impact of these disasters, an early warning system has been put in place to disseminate information and allow for necessary action to be taken.

The coastal regions of Bangladesh are considered high-risk zones that are frequently affected by natural disasters and calamities. These negative environmental circumstances cause floods, storms, destruction of socioeconomic conditions, livelihoods, housing, and so on. To reduce the vulnerabilities of targeted beneficiaries to increasing climate change impacts, the GCA project will strengthen awareness and understanding among the beneficiaries, value-chain actors, as well as local government institution (LGIs) staff in the use of climate risk reduction strategies to safeguard their livelihoods and assets. It will also capacitate and equip women and girls to support the last-mile dissemination of Early Warnings (EWs) and preparedness information to facilitate timely and effective response to extreme events in coordination with the 'Cyclone Preparedness Program' (CPP). The project will create an inundation model by estimating rainfall, embankment height, and damage through simulations. The output will be used to help in developing evacuation plans and flood risk reduction strategies for people's lives, livelihoods, and property by sending forecasts and early warning messages to those living in the project unions in Khulna and Satkhira.

> **"Women, children, and the elderly, are not receiving adequate information and there is a significant lack of gender-focused early warning messages."**

Therefore, to understand the pre-intervention scenario of the EWS and practices in targeted upazilas of Khulna and Satkhira, the GCA project conducted a baseline survey, creating an experimental[1] group and non-experimental group for comparing the response results. According to the survey, the majority of respondents receive early warning messages from friends, family, community volunteers, and local disaster management

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[1] The experimental group (also called the treatment group) receives the treatment whose effect the researcher is interested in. The control group receives either no treatment/intervention or a standard treatment whose effect is already known.

committees. Radio and television also play a crucial role in disseminating the messages.

The survey found that 90% of respondents in the experimental areas and 93.5% in the non-experimental areas can interpret the warning messages and take necessary protective measures. However, there is a significant lack of gender-focused early warning messages. The most vulnerable groups during disasters, such as women, children, and the elderly, are not receiving adequate information on how to protect themselves. The respondents mainly receive instructions on heading to safe locations and carrying dry food, water, and saline, but the information does not address specific gender-related issues such as women's hygiene, pregnant women's needs, or childcare.

The significance of the early warning system lies in the recognition of its benefits by the local people, and if they do not receive the messages in a timely manner, they will not be able to protect themselves from disasters. It is evident that there is a need for separate and gender-specific early warning messages in the coastal regions. Despite receiving disaster-related information, around 57% of the experimental group respondents and 59% of the non-experimental group respondents have stated that they do not apply the information in their real-life situations, indicating a lack of awareness.

> **"Majority of the local people can't interpretate the early warning information and do not receive the messages in a timely manner"**

Cyclone shelters, each of which can house 500–2,500 people in the event of a cyclone, have been a major strategy used by the government and development partners to lessen the impact of cyclone disasters. According to the survey, there are 2,500 cyclone shelters along the coast of Bangladesh, but they are not optimally utilized due to various reasons, such as the sheltering facilities not being women friendly. Ninety percent of the respondents mentioned that the facilities do not have necessary support for women such as separate toilet facilities for women and girls, facilities for pregnant women, breastfeeding room etc. The survey found that Assasuni has the least women-friendly shelter in comparison to the other four regions, and most respondents raised the major concern regarding support for women and girls in Dacope upazila of Khulna, Assasuni, and Shymnagar upazila of Satkhira district.

Based on the survey findings, there is a significant need for their livelihoods and asset specific forecasting and early warning messages as well as the early warning dissemination groups in the vulnerable communities. The study area of Paikgacha, Assasuni, and Koyra had the least number of such groups according to the respondents, suggesting that these areas may require additional attention and resources to improve their early warning systems. On the other hand, Dacope in Khulna district and Shymnagar in Satkhira district had the highest number of volunteer groups compared to other areas, indicating that these regions may have more robust early warning systems in place.

It is also concerning that a large majority of respondents did not receive training on climate change risk reduction, adaptation monitoring, and livelihood issues, which are essential skills for individuals and communities to respond effectively to climate-related disasters. The fact that only 3% of respondents received some training on these topics highlights the need for increased education and training programs in vulnerable communities to build their resilience to climate-related risks.

In summary, while the early warning system in Bangladesh effectively disseminates disaster-related information, there is a crucial need to improve the gender sensitivity of the messages and make sheltering facilities more user-friendly, with a focus on the needs of vulnerable groups such as pregnant women. It is essential to take proactive measures to raise awareness and guarantee the safety of the coastal population and their livelihood assets during natural disasters.