International Journal of Advanced Scientific Research
ISSN: 2456-0421; Impact Factor: RJIF 5.32
www.allscientificjournal.com
Volume 1; Issue 9; December 2016; Page No. 24-28

Analysis of the existing early warning systems: The case of Amhara national regional state

[1] Birhanu Gedif, [2] Wuletaw Wondmagegn, [3] Tarekegne Ayalew, [4] Legesse Gelaw

[1] Bahir Dar University, Lecturer, Institute of Disaster Risk Management and Food Security Studies, Ethiopia
[2] Lecturer, Department of Rural Development and Agricultural Extension Director, Institutional Transformation Management Directorate, Bahir Dar University, Bahir Dar, Ethiopia
[3] Lecturer, Bahir Dar University, Institute of Disaster Risk Management and Food Security Studies, Ethiopia
[4] Senior Expert in Food Security, GIZ, Bahir Dar Branch, Ethiopia

Abstract
Early warning of natural or human-induced disasters is a major element of disaster risk reduction and decision-support, with the objectives of the prevention of loss of life and the reduction of economic losses to a minimum. The international community and the United Nations system have established a suitable framework for advancing early warning as an essential risk management tool for the reduction of risk and vulnerability–known as people-centered or community based Early Warning System. The main intent of this study was to assess the existing early warning system of Ethiopia, in line with the global people-centered early warning system taking Amhara National Regional State as a case. The data was collected by using qualitative data collection techniques including key informant interviews and focus group discussions. Secondary data was collected through reviewing reports and existing literatures. The study reveals that, from the zone to the Keble levels there is limitation in early warning knowledge and understanding of its applications, lack of scientific monitoring and warning at expected levels and lack of clear system of dissemination and communication of warnings to the people at risk. On the contrary, though there is no up to date and tested community based response plans observed, each community has the capacity to mitigate respective hazards and cope up with risks. This is reflected for instance in dam building for flood and working as daily laborer for food insecurity.

Keywords: disaster, early warning systems, hazards

1. Introduction: Background

Ethiopia is vulnerable to a wide range of hazards allied with a varied geography, climate, and socio-economic situations. Among others, drought induced famine, flood, landslide, crop-pests, occasional earthquake and wars are the major ones that make the country one of disaster prone countries. (Mulugeta, 2009, UN, 2013) [5].

The vulnerability of the country is aggravated by poor agricultural and livestock practices, a fragile and degraded natural environment, extensive poverty, limited infrastructure, uneven settlement patterns, inefficient markets, variable and changing climatic conditions, high population growth, lack of good governance, competition over meager resources and border issues (FDRE, 2009).

The country has experienced a number of disasters in its long history. However, its government was more focused on post disaster activities like relief and response rather than an attempt to reduce vulnerabilities and augmentation of effective early warning Systems**.** The first disaster management institution, the Relief and Rehabilitation Commission (RRC) was established in 1974 following the outbreak of the 1973/74 famine with a mandate focused on disaster response and the distribution of relief supplies. (DDDM C, 2008, FDRE, 2009, Mulugeta 2009, PDRE, 1989) [5].

Early warning systems have received significant attention since the establishment of RRC and it has been in place since 1976, with the focus to monitor and warn the threat of disasters ahead of time. The National Policy on Disaster Prevention and management (1993) promoted the Ethiopian EWS as a mechanism to monitor factors that affect food and nutrition security at household, *woreda*, regional and national levels and it was said to be decentralized in line with the regionalization policy and bottom-up planning approach.

The international community and the UN system have established a suitable framework for advancing early warning as an essential risk management tool for the reduction of risk and vulnerability –known as people-centered or community based EWS which consists of four basic elements namely: - risk knowledge, monitoring and prediction, disseminating information and responses. (UN-ISDR, 2006, Reid, 2005, David R. and Vladimir T. (2011)) [9, 7, 2].

People-centered early warning systems are used to empower individuals and communities to act in sufficient time and in an appropriate manner so as to reduce the possibility of loss of life, damage to property, environment and loss of livelihood. However, the implementation of the Ethiopian EWS is not well assessed in the context of the global early warning models. This study was targeted on assessing the existing early warning system of Ethiopia, in line with the global people-centered early warning system with a case study on Amhara National Regional State.

2. Materials and Methods

2.1 Description of the Study Area

The study was conducted in *Libo Kemkem, Jabitehinan* and *Kalu Woredas* located in South Gondar, West Gojjam and South Wollo Zones respectively, Amhara National Regional State of Ethiopia. The *woredas* are situated at 85kms, 180kms

and 495kms far from Bahir Dar, the capital city of Amhara National Regional State respectively.

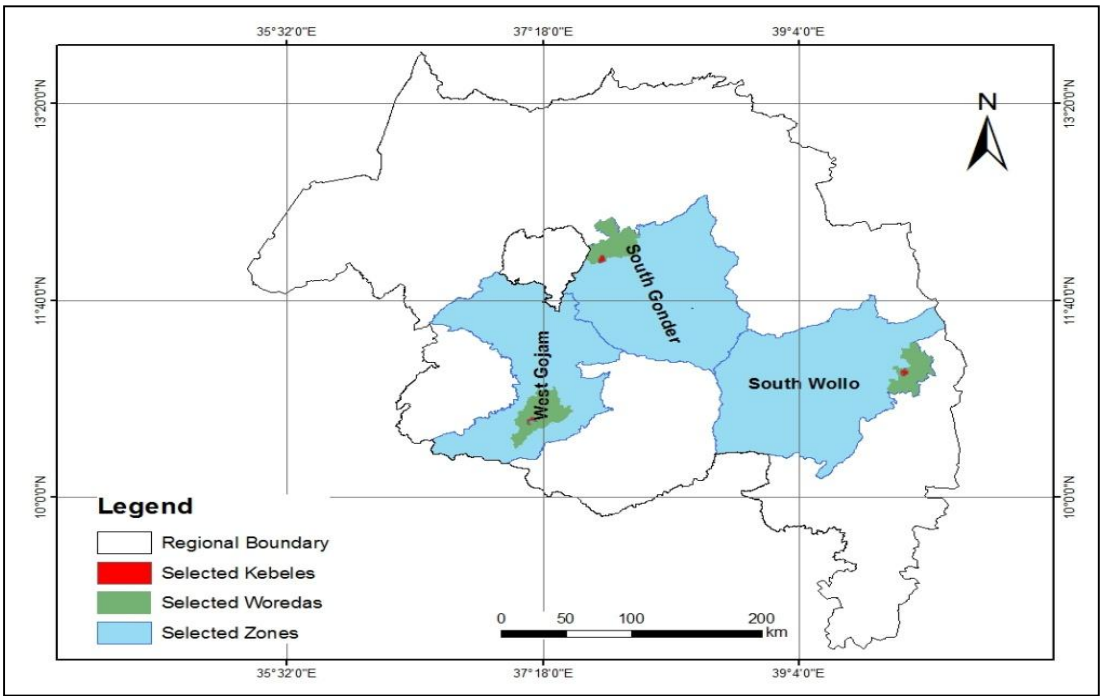

Fig 1: Map of the study area

2.2 Methods

The study was relied on more of qualitative methodological approaches. Both primary and secondary sources were used. The primary data was generated through a total of 40 in-depth interviews with key informants from local community, agricultural extension agents, officials from NGO's, early warning and livestock experts and researchers. In addition 10 focus group discussions were conducted in the selected Zones, Woredas and Kebeles. Secondary data were collected through reviewing of documents. Secondary sources of data comprise; Rural and Agricultural Office reports, Education, Health and Water Supply Service office reports, socio-economic survey, NGO's reports, Disaster Risk Management and Food Security Office reports, books, internet, and other published and unpublished sources.

3. Results and Discussion.

3.1 Risk Knowledge and Hazard Identification

The development of successful warnings relied on the generation of accurate risk scenarios showing the possible impacts of hazards on vulnerable groups. Practitioners in the early warning system need to define acceptable levels of risk to communities to determine whether and when to warn. Making this determination requires capabilities to analyze not only the hazards, but also the vulnerabilities to the hazards and the consequential risks. (UN, 2006). Contrary to this, from the zone to the *kebele* levels of the study areas, experts are with little knowledge of different risks and hazards. They lack comprehensive training on risk knowledge and hazards. Risk knowledge is acquired and built up on personal effort: through reading and attending trainings rather than being trained from the concerned department in higher education institutions.

Trainings which are directed towards improving experts' knowledge were uncoordinated, meager and too short. In this regard, experts from Libo Kem Kem *woreda* explained that *"It was only for three days in a year that they were trained by the zonal early warning Office about the concept of early warning. As refreshment, the regional food security office gave emergency and relief training. World Vision and Amhara Rehabilitation and Development Association (ORDA) are the other NGOs which trained experts to some extent.*

Experts both at the zone and *woreda* levels of west Gojjam Zone on the other hand explained that there is a Sevier shortage of either intensive training program for experts or experts with the right expertise to capacitate the experts from the zone through the *kebele* levels.

One of the informants strengthened this saying:

> "We are from different fields of specialization. I myself is from animal production technology. There are experts from crop science, food science and from other disciplines and only one expert for the zone who is graduated from disaster risk management and sustainable development department. Trainings given for us are very short and finger-counts. When we get budget for training we lack trainees to attend, when we have trainees we have no budget and this is a real danger to the system. We faced knowledge gap though, we developed some knowledge from the field and practical experience"

The Zone early warning process owner has confess that in order to reduce information gap for experts of the woredas the zone use to capacitate experts through supplementing UNICEF documents, short discussions with experts and short term trainings. He also admits that there is knowledge gap which need attention from the concerned bodies.

South Wollo Zone is not also different from the other zones on the issue mentioned above. Both the hazards and vulnerabilities are not well known by communities, *woreda* and zone officials. At zonal and regional level there is some early warning system applications knowledge. However, at these levels there is no

detail knowledge how to communicate early warning information communication on sustainable basis. According to officials at the Zone and *Woreda* levels, the risk maps and early warning data are not available in systematic and organized way.

Experts in all three zones from the zone to the *kebele* levels explained that, because they do have skill and knowledge gap, when they collect early warning data from the different concerned offices; there exist data discrepancies each month. The role of the experts both at the *woreda* and the *kebele* levels is no more than collection of information for weekly and monthly early warning reports. They send the reports they wrote to the respective zone offices and evaluations of reports are made at the zone levels. This is however is not followed by feedbacks from zones to *woredas*.

The knowledge gap observed at the expert level is also common among the local community at the *kebele* levels .though they have identified some of the risks and willing to develop knowledge they are not supplemented with appropriate trainings from the experts.

Discussants from "*Abasem Zeguay" kebele*, *Jabitehinan woreda of West Gojjam Zone* clearly stated that they do not know what EWS mean and about the existence of early warning committee in the kebele. Neither of the discussants remembers anybody who gives them early warning education. Almost all discussants in the selected *kebele* levels explained that there is no attempt to build their risk knowledge and about early warning.

Experts on their side stated that there is no mechanism for early warning education to the community. Even it is not incorporated in the plan of the process. They complain that the government is allocating no money for the desk, except salary. Because there is no early warning education, the communities lack deep knowledge on risks in respective *Kebles* except their long established indigenous knowledge system.

Hazard identification is also based on personal knowledge of experts and their field experience. Identified hazards vary from agro-ecology to agro-ecology and from livelihood zone to livelihood zone.

Libo Kemkem *woreda* for instance has two major livelihood zones: *Tana Zurya* and North *Dega* livelihood zones. Interviewed experts in *Tana Zurya* livelihood zone reported that flood is the major identified hazard. Interviewed experts from North Dega livelihood zone on the other hand reported that land degradation, hailstorm and drought are the major hazards.

Experts interviewed in West Gojjam Zone explained that 12 out of 15 *woredas* in the zone are vulnerable to different hazards. The reported major hazards and which seriously attacked different *woredas* of the zone especially in the last 2-3 years include: Hailstorm especially in "*Dega Damot", "Kuarit", "Dembech" and "Kesela" woredas*, Flood in *Bahir Dar Zuria, Andassa* and North *Achefer woredas*, land slid in *"Dega Damot"* and *"Kuarit" woredas*, high acidity of soil in *"Kesela"* and *"Dega Damot"woredas*, malaria in *"Mecha"woreda,* and stock borer(locally called "*Afe mar*"?),natural resource degradation, shoot blight, termite and rat plague in "*Jabi Tehnan"* worded respectively.

Experts from south wollo Zone on the other side reported that drought, flood and pests are the common identified hazards that affect the livelihood of the people in the zone.

Some other risks were also stated by informants from the three zones. The increasing trend of drought, landslide, flood and hailstorm in *Libokemkem woreda* put a number of people in the state of emergency.

One of the most prominent phenomena observed by the researchers and reported by informants in all the selected zones all through the *woreda* and *kebele* levels is that there is no practice of preparing and documenting risk profile.

Interviewees from *Libo Kemkem Woreda* stated that risk profiling is almost forgotten practice in the *woreda*. It is not a common practice in west Gojjam Zone neither as informants stated that hazard identification is not followed by hazard prioritization, characterization, capacity building and risk profiling. South Wollo Zone seems relatively different from the other zones mentioned in that around nine Woredas have their own risk profile. However, the profiles were found at Zonal level and not still functional at ground level. The communities were knew the risks when occurred. They knew little about the causes, effects and control measures of disaster risks. Sometimes the communities were taking some control and mitigation measures through mass mobilization and individually.

3.2 Monitoring and warning services

Predicting risks which possibly will be faced needs for a sound scientific source. Therefore constant monitoring of possible disaster antecedent is vital to generate accurate warnings in a timely fashion. However, the collected data from sample, zones, *woredas* and *kebeles* revealed that the monitoring and warning services found are not as scientific as they are expected to be. As interviewee said this is partly because of lack of budget allocated to the EW process, lack of commitment from the experts' side and lack of proper encouragement to properly monitor using the indicators for the identified hazards. There is also lack of involvement of various monitoring agencies and different organizations which are related with the issue.

The early warning indicators in the zones as reported by informants are: rainfall(including intensity and amount), the level of input supply, occurrence of crop disease or pests, crop maturity rate, human disease, market value(price) and supply chain analysis, purchasing power analysis, post harvest analysis and labor movement.

Type of warnings frequency of warnings and communication channels for each of the messages varies from one type of hazard to other. In the case of floods, modern technology such as mobile phones, light indicators and color signals are used in some areas like South Gonder Zone. While, for drought hazards and risks, the communication system is not standardized. Whatever the case, there is no well defined responsible organization for generating and issuing warnings in almost all zone levels. There is almost no designed strategy for processing, reviewing and disseminating data gathered from the *woreda*. Apart receiving monthly data, there is no strong communication between the zonal and *woreda* experts.

3.3 Dissemination and communication

Dissemination and communication of clear Warnings to those at risk is one of the basic elements of the early warning system. Consequently, people at risk need to understand these warnings, which have to contain useful information that enables them to prepare proper responses.

Communication channels from national to regional and community levels have to be pre-identified and it is necessary to have one trustworthy voice. This is however not; practical in the sample zones there is no analysis at *woreda* level. One cannot expect information dissemination. But sometimes, if zonal, regional or Federal respective bodies warn for example about late coming or early termination of rainfall, the *woreda* EW process will forward the warning to *kebeles* using telephone or written letters.

There is early warning committee chaired by head of the *woreda* office of Agriculture. But there is no regular meeting arranged for the committee. As to the experts there is no regular attendant from an office for the meeting. Therefore; stakeholders do not have full information about the system and are not much concerned about the EWS.

There is disparity in early warning data dissemination. In the case of South Gondar Zone, there is no a general well organized EW communication and dissemination system and equipments at zonal level. However, it is reported that Mobile Phones, warning flags and messenger runners are available for flood prone *woreda*s. However, there is no evidence of monitoring mechanisms to check whether the warning messages reach, understood and interpreted into action by the community.

Informants from West Gojjam Zone for instance stated that almost all *kebeles* in the zone have telephone; however information delay is very common because of network related problems. In addition, for some *woredas*, especially for *Bahir Dar Zuria Woreda*, which has well organized early warning committee at the *kebele* level, bells, phones and "*tirunba*" are purchased and supplied by a SNIF project. Kebele level meetings are the other methods of information dissemination and communication. However, in some *kebeles* of the Zone people are reluctant to attend meetings of such a kind and only the elderly and women used to attend meetings.

In the case of south Wollo Zone All the warnings were not reached and agreed by all of those at risk. Government officials and communities did not understand all the warnings and the risks. The warning information was not clear and usable to all. There were no uniform and systematic dissemination and communication strategies established at all levels. However, in the selected *Woreda* there were established dissemination and communication strategies and early warning system modalities for timely responses of risks. As one of the informants said, "*there was emergency coordination forum (NGO, GO; s) in the woreda to disseminate and communicate early warning information to concerned parties including Current situation analysis of the area, action point and Implementation strategies, and designed response actions for disaster risk".*

3.4 Response capacity

Response capability is associated with knowledge and preparedness people to act. It is interplay of the facts that communities understand their risks; they have to respect the warning service and should know how to react. Building up a prepared community is one of the fundamentals in the EW system. At zonal and *woreda* levels of the study area, development of contingency plans is a well-established culture in Amhara region (for drought and floods) but not common for the others. The response capacity of the community is associated with knowledge, preparedness and willingness to act; that needs awareness raising. It also depends on the type of hazards and the livelihoods they engaged. Even though there is no up to date and tested community based response plans observed, each community has the capacity to mitigate from respective hazards and cope with risks –such as dam building for flood, migration in search of job for food insecurity as attested by interviewees and participants in the focus group discussions of different Zones, *Woredas* and *Kebeles* of the study areas.

3.5 Strength and weaknesses of the Existing Early Warning Systems

While analyzing the existing early warning systems in the sample areas, different strengths and weakness of the system were also identified

3.5.1 Strengths of the Existing Early Warning Systems

The early warning system in Amhara Regional State exceptionally has a very good structure extending from region to *kebele* level though, the *kebele* early warning committee is not strengthened and capacitated.Another strength identified is the establishment of EW committee at each level. They are available at regional, zonal and *kebele* levels.

3.5.2 Weakness of the Existing Early Warning Systems

The major weaknesses identified by researchers from different sample zones, *woredas* and *kebeles* were:-weak coordination among different actors in the EW system, lack of appropriate allocation of resources for effective sharing of information and knowledge transfer for each EW sector, lack of planned and targeted training, persistent belief which dictates that some zones like west Gojjam are self-sufficient and not risk-prone Zones, replication of reports, lack of technology based early warning information flow, Weak information flow, the existence of nominal and inactive early warning committees and Lack of feedback from the region to the zone and from the Zone to the *Woreda* and the *kebele* levels.

4. Conclusion and Recommendations

4.1 Conclusion

Good overall progress in disaster risk management is one of Ethiopia's major achievements, but challenges remain in the implementation of effective early warning systems. Although early warning systems have been implemented since 1970s in the country, there are limited success stories in using early warning information for designing effective interventions in alleviating vulnerability partly because of capacity problems. There are problems in accurate hazard warning; assessment of likely risks and impacts associated with the hazards; a timely dissemination of information and understandable communication of the warnings; and the capacity to act on warning particularly at local level. There is also lack of capacity to translate the data collected by monitoring systems into policy decisions and to design interventions which poses a formidable challenge at local areas.

Insufficiency or lack of financial, human or technical resources and inadequate capacities are the main findings that are tangible obstacles existed to the implementation of the EWS at *Woreda* level. Efforts have been made to build the capacity of Early Warning Experts who are responsible for the collection of information from the grass roots level. However, the entire efforts have been focused on capacity building of non-governmental partners, regional and federal staffs and

failed to recognize and capacitate *Woredas* and community beneficiaries.

There is a political commitment and a shift disaster risk reduction and management thinking, however, some sections of the leadership does not appreciate the institutionalization of EWS fully and thus it meets resistance among some of the *woreda* leaders.

The early warning information is said to be disseminated on a regular basis through a monthly Early Warning and Response Bulletin prepared by Early Warning Department. The regional states are expected to duplicate the EW information and distribute it within their region and the *Woreda* offices are also expected to duplicate the information and distribute it to community farmer's training centers to make the information reach at the grass root level. However, there is lack of structured printed flow of information from the region to the grass root level.

The study finds insignificant progress in developing the knowledge and technical tools required to assess risks and to generate and communicate predictions and warnings. The study thus, concludes that the region's implementation of people-centered early warning systems is low.

4.2 Recommendations

- The existing EWS, including the chain of command, roles and responsibilities of different agencies engaged in early warning systems need to be re-evaluated, based on the global early warning system
- The existing knowledge and skill gap in EWS should be narrowed, trainings should be given to reduce the knowledge gap and strengthen the skills of EW experts who are responsible for the collection, compiling and analysis and dissemination of EW information.
- The Region should give more attention and allot budget for recruiting more EW experts and for capacitating those experts who are already at work.
- For scaling up of risk management initiatives, it is important that local governments, particularly, at *Woreda* level are supported both with budgets and human skills.
- Early warning committee needs to be enhanced, maintained and strengthened so that stakeholders can communicate with valuable EW information
- Future early warning investments should be more focused on promoting a more decentralized EWS approach to enable local level stakeholders such as community leaders, community organizations women and youth groups, experts and administrations contribute to the enhancement of the existing early warning system.

5. References

1. Buchanan S, Davies S. Famine Early Warning and Response-the Missing Link, London: Intermediate Technology Publications, 1995.
2. David R, Vladimir T. Implementing Hazard Early Warning Systems: Global Facility for Disaster Risk Reduction and Recovery, 2011.
3. Dillo District Disaster Management Committee September. Dillo District Disaster Management Contingency Plan. Borena Zone, SNNPR, Ethiopia, 2008.
4. Federal Democratic Republic of Ethiopia March. National Policy and Strategy on Disaster Risk Management. Addis Ababa, Ethiopia, 2009.
5. Mulugeta Abebe. Emerging Trends in Disaster Management and the Ethiopian Experience: Genesis, Reform and Transformation. JBAS, 2009; 1:2.
6. People's Democratic Republic of Ethiopia March. National Disaster Prevention and Preparedness Strategy. Addis Ababa, Ethiopia, 1990.
7. Reid T. Global early warning systems for natural hazards – systematic and people-centered. Germany UN-ISDR, 2005.
8. United Nations Development Programme Ethiopia Disaster Risk Management and Livelihoods Recovery Programme Annual Report, 2013.
9. UN-ISDR. Developing Early Warning Systems: A Check-List. The Third International Conference on Early Warning (EWC-III) from Concept to Action, 27-29 March 2006, Bonn, Germany, ISDR, 2006.
10. United Nations. Global Survey of Early Warning Systems: An Assessment of Capacities, Gaps and Opportunities towards Building a Comprehensive Global Early Warning System for All Natural Hazards, 2006.