CCD NOTE

Coordination SUD
Solidarité Urgence Développement

COMBINATION OF EARLY WARNING SYSTEM AND CLIMATE INFORMATION IS KEY TO ENSURE LONG-TERM RESILIENCE

Introduction

Making high-quality weather information available and implementing Early Warning Systems (EWSs) are not new tools when it comes to reducing the risk of disaster. The importance of these tools is highlighted in several international frameworks, in particular in the Rio Declaration on Environment and Development (1992), followed by the Yokohama Strategy on natural disaster prevention (1994), the Hyogo Framework for Action on disaster risk reduction (2005), and more recently the new Sendai Framework. One of the seven targets of the Sendai Framework is to substantially increase the availability of and access to multi-hazard EWSs and disaster risk information and assessments to the people by 2030.

Although progress has been made in recent years, *« as urban areas evolve into megacities, people crowd into exposed areas such as flood plains, and climate change increases the frequency and intensity of several types of extreme weather events, the risks to human life and socio-economic assets have become greater than ever »*[1]. The 5th IPCC[2] report and the World Bank's report, *Turn Down the Heat*[3], in addition to others, consistently expose the impact that climate change has on people's living conditions. The increased variations in precipitation and temperatures, the increase in the frequency and intensity of extreme weather events, and the uncertainty of weather forecasts in terms of time and place are major challenges for those populations that are most at risk and that are dependent on natural resources.

Agropasteur from Garissa, Kenya

Given that context, the implementation of early warning systems and the access to high-quality climate information that could be used to inform decision-making – is necessary all around the world, but in particular for the most vulnerable and the poorest –to ensure populations' long-term resilience.

Understanding risks in their entirety means including indicators of socio economic vulnerability, thus better meeting specific needs.

All stakeholders involved in development (communities, governments, national and local partners, NGOs, private actors) must seize upon this topic in order to strengthen the sustainability of their actions and to allow the decision-making and planning systems set up thus far to evolve.

Triggers:

1984-1985 **-** Famine in Sudan and Ethiopia => Creation of the Famine Early Warning System (FEWS, now FEWS NET) in response to the famines that cause nearly one million deaths.

2004 **-** Indian Ocean tsunami => More than 200,000 people die in the tsunami. The Intergovernmental Oceanographic Commission (IOC) adopts a resolution aimed at creating a framework for a global early warning system for ocean-related risks. Governments throughout Asia and the Pacific create disaster management departments and increase their preparation activities.

1 Mr. Michel Jarraud – Secretary-General of the World Meteorological Organization (WMO)
2 Intergovernmental Panel on Climate Change. UNO
3 World Bank Group. 2014. Turn Down the Heat : Confronting the New Climate Normal. Washington, DC: World Bank.

What are Early Warning Systems?

Early Warning Systems (EWSs) *include the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of loss*[4].

The data collected to send out an alert is not limited to meteorological data (rain, cyclones, etc.). Implementing an EWS also means understanding the risk as a function of vulnerabilities and hazards.

EWSs are used in all sectors involved in disaster risk reduction: health care, food security, agriculture and livestock farming, water and sanitation, architecture, etc.

They allow populations to respond both to sudden hazards (tsunamis, floods, storms, cyclones), or those that are more long-term (drought, etc.).

What types of data can be used?

1. Meteorological data (temperature, rainfall, information about cyclones, etc.) and geological data (seismic activity, volcanic eruptions).
2. Data about available resources (water, pastureland, biomass, etc.).
3. Prices of key resources (basic foodstuffs, cash crops, etc.).
4. Other socio-economic indicators: health risks for people and herds, prevalence rates of acute malnutrition, number of meals eaten, etc.

The data inputted into these systems evolves over time: the probability that a hazard will occur varies depending on the season and the year, as do socio-economic vulnerabilities.

Thanks to the identification of critical thresholds for indicators used, populations can monitor that data to anticipate the risks they face. Sustainable mechanisms allowing communities to access climate-related information in support of their decision-making processes are needed. It is also essential to use local languages and a wide range of communication technologies in order to adapt to the cultural context and provide warnings according to the intensity and probability of danger: colour-coded flags, alarms (whistles, horns, songs, bells, sirens), radio announcements, loudspeakers, SMS alerts and call centres.

Accessibility of EWSs, as mentioned in the Sendai Framework, also implies accessibility for everyone, including those with handicaps (hearing, sight, sensory, intellectual, physical).

In the event a risk of disaster and/or crisis exists, authorities and populations can then implement contingency measures: evacuation, protection of belongings, water and food storage and protection of wells. Defining, updating and regularly testing (through simulation exercises) disaster reduction plans helps mobilise resources in order to avoid/limit losses and to recover more quickly following the disaster.

ACF and Sentinel Sites in Central America fight food insecurity

Since 2011, ACF has supported the creation of 114 'sentinel' sites in Nicaragua and Guatemala. These sites were created in extremely vulnerable zones, identified in cooperation with the authorities. **In addition to gathering information, the sentinel sites facilitate the sharing and use of that information for national and local decision-making.**

Key stages:

1. Community-level sentinel sites are implemented over a series of five work sessions (12 hours). The initial meeting with the community and authorities provides them with information about the role of sentinel sites. Next, groups of key community members representing the community's specific characteristics participate in community workshops to provide information about the following: sources of income, seasonal calendars, migrations, prices, areas with high infant mortality rates, data on rainfall, etc. A list of key indicators for food and nutritional security is established; this is then measured locally, with several classifications: desired (green), warning (yellow) and emergency (red). For each indicator, the community determines the period, source of information and contributing factors to obtain the data (producers, women, volunteers).

2. Animators then draw up three posters to be displayed in the community sentinel sites: (a) the seasonal calendar, (b) the monitoring calendar and (c) the list of key variables, including critical levels.

3. *Follow-up:* Municipal teams are formed that collect, analyse the information generated at these sites, and record them in a computer programme that automatically compares the data. Monthly reports on trends are produced, allowing the community to monitor the situation and to react efficiently in the event that any of the critical thresholds are passed.

4. These reports are then transferred to institutional superiors, to be included in the national information systems. Partnerships and cooperation agreements are established between government agencies working on food and nutritional security in order to harmonise frameworks for intervention and to coordinate action, as well as with other bodies likely to produce information useful to EWSs.

This project is a good illustration of another key factor in the success of EWSs: coordination between different actors. Launching and strengthening forums in which data on food and nutritional security are analysed at community, municipal and national levels ensure a timely response and institutional monitoring.

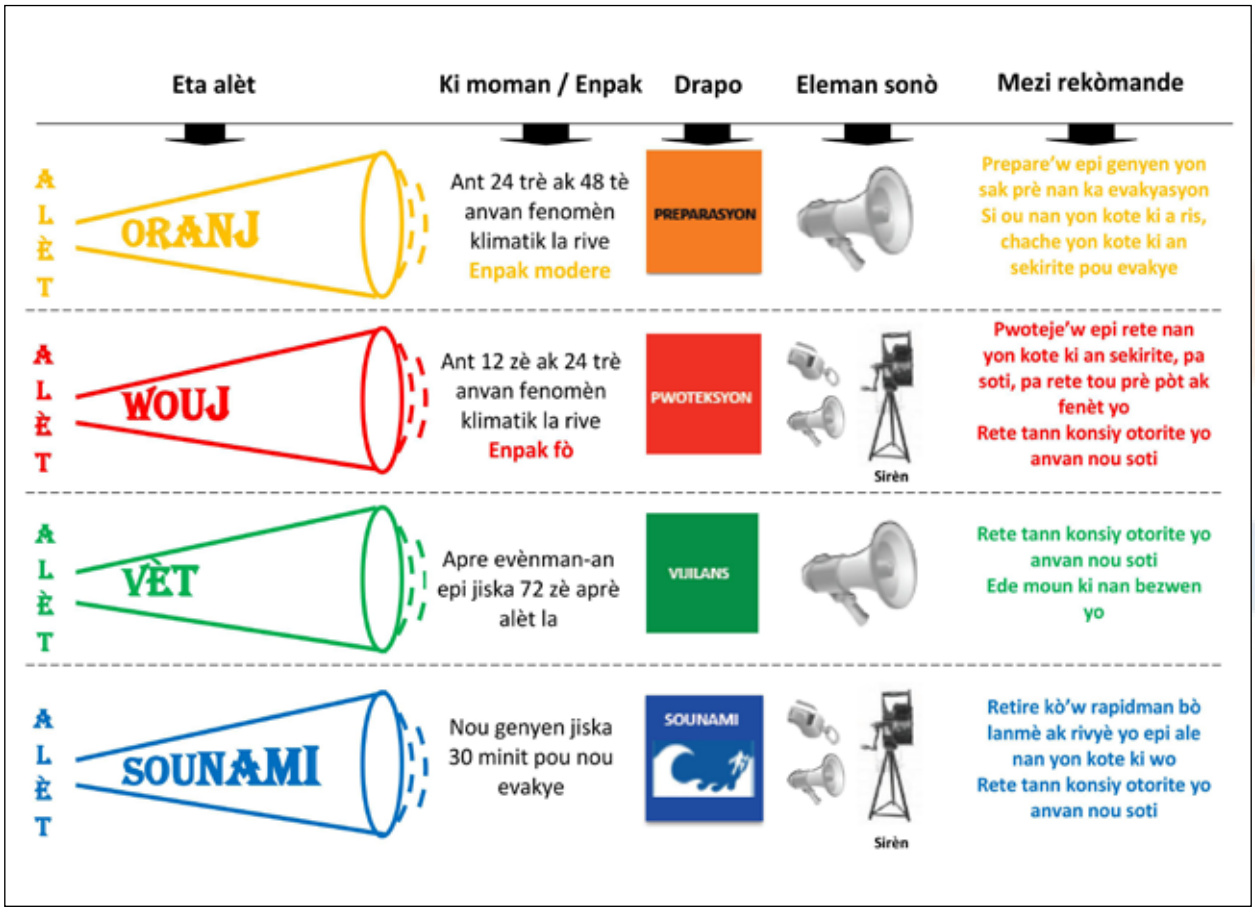
4. Definition adapted from UNISDR 2009 and other sources

Red Cross/Red Crescent Movement in Haiti: Making people aware of the EWS is one of the keys to successful dissemination of alerts

The Haitian and French Red Crosses, working with the Haitian government and NGOs involved in disaster risk reduction, established a community-based EWS using manual sirens, loudspeakers, whistles and flags, the colours of which correspond to different warning stages. This system helps inform people living in remote areas when there is a risk of cyclones, flooding or tsunamis. The warning messages are disseminated via SMSs, Red Cross volunteers, civil protection volunteers and community teams trained in risk management, awareness-raising, dissemination of risk-preparedness messages, and evacuations.

In addition, in order to inform people about the different colours used in warnings and about how to behave in the event of a disaster, leaflets (see image) and family emergency plans are explained, filled out and distributed during group awareness-raising sessions or by going door-to-door. Murals depicting the various colours and phases of an alert are painted near the warning pole, which is where the orange, red, green or blue flag would be hung, depending on the situation.

It should be noted that a complementary system to collect data from health care centres and hospitals has been set up in cooperation with the ministry for Health to monitor the epidemiological situation provide the population with information , raise people's awareness and facilitate emergency medical response services when, for example, there is a peak in cholera.



Awareness-raising pamphlet about the community-based EWS, Haiti, 2012

Encouraging traditional techniques that already exist and work in various communities around the world is essential (drums, horns, bells, bottles, etc.), as is harmonising messages and relaying them through the national EWS, and adding new alert dissemination methods (flags, loudspeakers, manual sirens, SMSs, etc.). Example of lessons learned: It was necessary to adapt the coloured warning flags in Haiti, writing the type of alert phase on them (vigilance, preparation, protection) so that they were not confused with the flags that indicate that a houngan (a spiritual voodoo leader) is in the area.

How do EWSs and climate information supplement one another?

Climate information is information about past, present and future climate conditions from both local and scientific sources, and the resultant implications on development, people's livelihoods and the environment.

a) **This information can help EWSs evolve by highlighting monitored data and indicators that need to be updated (i.e.: floods expected in a zone that has not often experienced that type of event in the past, etc.).**

b) Data collected by EWSs can help improve medium and long term climate information and can help in decision-making. Indeed, historical data collected by EWSs helps with longer term trend analysis. In some developing countries, meteorological and climate-based information is often unreliable and incomplete.

c) Finally, climate-based information supplements data used by EWSs to better plan for **local, regional and national activities, and to make them more resilient to current and future hazards and risks.** This is of significant use in improving planning: it makes it more flexible and forward-looking, in order to forewarn of risks of disaster. Uncertainty is not so much a problem to be solved, but rather a constraint that must be truly understood by the population.

In addition, longer-term information on the climate can help define adaptation and development plans that incorporate climate-based risks. By analysing climate forecasts, increases in sea level, and demographic and socio-economic projections, those involved better understand future situations, limiting long-term risk. Authorities can then take advantage of this data when thinking about urban planning, land settlement and development plans. Finally, households can use this data to determine where to build and how best to make a living.

AVSF in Senegal: information on agro-pastoral systems

In Ferlo, a typical example of a pastoral region in Senegal, AVSF supported the development of an EWS called the Pastoral Alert and Information System (SPAI). Its objective is to disseminate relevant information needed for pastoral activity to be successfully carried out in the context of climate change. To that end, three fundamental components of that activity were explicitly identified by livestock farmers: water, pastureland, and the market. The SPAI is therefore involved in information pertaining to the following:

1. Climate data and forecasts: rainfall (amount, distribution, seasonal forecasts and, in the shorter-term, rainfall out of rainy season) and temperature (cold spells, heat waves, etc.);[5]
2. The state of the biomass: bushfires, fodder zones and pastureland, regions with greater or lesser biomass density to identify those that may be at risk for transhumance;
3. Water resources: drilling (types of management, water prices, storage capacity, reported breakdowns, etc.);
4. Markets: price of cattle (large and small), meat prices, milk prices, prices of grains and animal fodder;
5. Animal health: epizootic parameters, disease outbreaks, vaccination parks and veterinary centres.

This information allows pastoralists to take the necessary measures to ensure they use the best transhumance routes. Second, it provides the technical extension services with an all-encompassing view of the situation and of any problems that need to be solved. Third, decision-makers can use it (ministers, local elected officials) to draw up appropriate adaptation policies and plans.

In order to disseminate the information, partnerships and distribution channels are established. This mainly involves the website (www.spaif.org), which is currently under construction, radio shows aired by local community broadcasters, and the use of mobile telephones, which is perfect for use in pastoral activity, where those involved are constantly on the move. In addition to these methods, an innovative approach was taken by establishing two alert centres in strategic zones. These centres are managed by organisers and relay information onwards. They also constitute a library which manages relevant information for pastoralists. The number of such centres is expected to increase in the near future in order to better connect the entire country.

This project demonstrates the importance of making meteorological and climate information available to all those involved; that information, produced by triangulating data, must then be translated and adapted depending on needs and targets (national agencies, technical services, local governments, livestock farmers, households).

5. These data are provided by the Meteorological Agency of Senegal

CARE and Participatory Scenario Planning (PSP), Adaptation Learning Program (ALP)

Participatory Scenario Planning (PSP) is an approach involving multiple actors, which evaluates seasonal forecasts and makes them understandable in order to meet populations' needs. The goal is to generate useful information that will help with decision-making and planning. This approach guarantees access to climate information to both government services and smallholder farmers, and allows communities to strengthen their ability to identify relevant solutions. PSP is a continual process, which favours continued learning and creates bonds between those who are not used to working together.

The process has five steps:

1. Identify the meteorological services and forecasts available and the stakeholders to be involved (local forecaster, meteorological services extension services, etc.) Preparation: collection of seasonal information.
2. Organize a multi-stakeholder forum where the forecasts from the two sources (local and scientific) are discussed, integrated and interpreted to develop three probabilistic hazard scenarios.
3. Assess risks posed by the hazards to develop impact scenarios and develop recommendations to face these risks..
4. Communicate the recommendations from the forum to reach a large audience ,
5. Evaluate the challenges, advantages and impact of PSP on the choices and decisions made by communities and on their livelihoods.

For more information:
http://www.careclimatechange.org/adaptation-initiatives/alp

« The most important thing about PSP is the added value it brought to my work. I used to carry out training sessions focused on needs without taking the climate into account. Thanks to PSP, I can now use information about the climate to plan community training sessions and on-site evaluations which are relevant to those scenarios that are most likely to happen. I allow myself some flexibility as to planning because I know that each season is different. »

Joel Okal, Agent for Animal Production for Ladgera Sub-County, Garissa County, Kenya

PSP limits the uncertainty surrounding climate information, which remains a significant constraint. It allows those involved to understand the information so that shocks can be anticipated, reduced and managed. This strengthens the ability of actors to design appropriate plans based on sustainable and productive practices, so as to improve food and nutritional security and resilience. It allows for the implementation of mechanisms that are able to integrate new forecasts as they evolve.

Arzika Miko, Rain gauge Volunteer in Maigochi

Prerequisites for efficient alert and climate information systems that work on behalf of the most at-risk populations

Available and reliable information about the climate

Increase available resources in order to produce high-quality, sound information, in particular of long series, to understand how the climate is changing at local level. For many countries this means better coverage by weather stations, and therefore must be supported by political will. Although government authorities cannot change the shortcomings of the past by moving in this direction, they can nonetheless guide future research. **Building scientific knowledge** for the future is essential to promote resilience.

Participation guarantees an impact

Ensuring community participation, and in particular that of those most at risk, throughout the entirety of the process (analysis of vulnerabilities, identification, collection and monitoring of key data) guarantees that the project will have an impact. Gender inequality and power dynamics must be understood when carrying out an analysis of vulnerabilities and determining specific needs. Understanding the dynamics of change, gender-related risks and uncertainties, diversity, and cultural and social norms is necessary to ensure that appropriate adaptation plans and measures are taken which strengthen the capacities of both men and women in those communities. Their involvement in this approach ensures that the information available corresponds to their needs **and that it can be accessed and used.**

GERES, Central Highlands project, Afghanistan

In the Wardak and Bamyan provinces of Afghanistan, climate data is seriously lacking: data is lost (in particular as regards rainfall), there are gaps in historical data, etc. Repeated conflicts and low levels of weather station coverage thus limit the possibility of using past trends found in the local climate. Although the use of regional models is important in identifying certain major trends, it does not do much to help in understanding local weather fluctuations in this mountainous country. The use of scientific « *proxies* », which are programmes that store data such as that concerning the surface area under permanent snow coverage or about how the populations themselves perceive changes, partly make up for these shortcomings.

The team of the Central Highlands project

Production and communication partners

Combining traditional knowledge and technological innovations.

Populations have always used their indigenous know-how to plan their activities: animal behaviour and migrations, plant activity, reading of the land and the stars. Thanks to technological innovations (GPS, Geographical Information Systems and models), scientific data now allows that data to be sharpened and *vice versa*. This combination of local climatology and innovation increases the strength of the information produced and guarantees that it will be used by populations.

In addition, multiple actor partnerships between communities, meteorological institutes, government services responsible for water and forests, veterinarian and agricultural services, research centres and companies guarantee that this information is relevant and of high quality. This multiplication of actors means that the tools and dissemination channels for this information must be adapted depending on the context, as well as on the profile and needs of users (local radio, GPS, kiosks, newspapers, etc.).

Monitoring, updates and capitalisation

Recognise that information about the climate will change and keep that information up to date.

For example, the prior dissemination of climate forecasts on seasonal fluctuations can be carried out in an inclusive way, using appropriate means of communication. Workshops involving multiple actors and a mix of different sources of information can help harmonise the data.

A participatory system of surveillance/monitoring of the data at various levels (risks, weather, herd movements, available seeds, price of foodstuffs) encourages the regular updating of forecasts.

Trained community monitors measure and record data on rainfall and transmit that information to the local weather services. Users can then hone their knowledge and improve their planning. These types of monitoring and evaluation systems are essential to evaluating and documenting the risk analysis and vulnerabilities, as well as the results of adaptation, the impact achieved, and lessons learned at all levels, in order to measure changes and the response to those changes over time, glean information on what works (or does not work), and demonstrate any impact.

Strengthening abilities to interpret the data in order to take corrective and preventative measures

Strengthening decision-making capabilities.

Information about the climate only serves a purpose if it can be used to meet people's needs. EWSs must therefore be accompanied by training activities focusing on good practices for those responsible for sounding the alarm, those who spread the word (the media), and for communities. Indeed, an alert that is poorly handled can lead to panic and in fact increase the number of people injured in the event of a disaster.

It is important, for example, to integrate a system for agricultural advice into medium-term EWSs, and to set certain parameters: planting date/period, appropriate types of varieties and species, appropriate cultural practices, choice of inputs, management of pastureland and disease management, as well as the monitoring of herd movements and appropriate transhumance routes. In certain cases, climate data can serve to limit conflicts, providing better management of and access to resources in accordance with their availability.

Mechanisms to boost the capacity building of communities, civil society and institutions must be implemented to help interpret the information and to help with decision-making. Community representatives, for example, could use weather forecasts to identify three scenarios (i.e.: low, average and high levels of rainfall) with three sets of adaptation measures to be taken, depending on the actual situation.

Limiting long-term non-resilient adjustment strategies.

Unprepared populations or those with little preparation for fluctuations in the climate may implement adjustment strategies which are unsustainable in the long-term: deforestation, decapitalisation, forced migration, dietary reductions, etc.

However, by carrying out an analysis that covers risks, vulnerabilities, production and access to high-quality information and capacity building, populations are able to focus on resilience.

Community adaptation is a holistic approach that centres on strengthening communities' ability to adapt by attacking the underlying causes of vulnerability (structural, socio-economic, political). This approach combines analysis of vulnerabilities and decision-making based on climate data with the definition of adaptation and risk reduction measures.

Recommendations for political leaders

Production and capitalising on what already exists

• Increase funding in order to produce reliable climate data (more extensive national coverage of weather stations) and capitalise on existing information (train people to compile and analyse that data);

• Promote indigenous knowledge and make the most of it, linking it to scientific innovations in order to strengthen the availability of and access to climate data and to create an EWS.

Access and communication

• Promote access to information through appropriate means of communication to ensure it reaches target groups (radios, posters, telephones, etc.), including remote communities;

• Use multiple tools to disseminate mid- and long-term information about the climate (seasons/years) and adapt the means of communication in accordance with when a risk is expected;

• Incorporate climate data into all levels of institutions across all sectors, and make doing so systematic. Monitoring this data must also include an understanding of the specific vulnerabilities, needs, know-how and abilities of at-risk populations;

• Harmonise and guarantee coherence between national, regional and community EWSs (cycle, communication tools, etc.).

Strengthening adaptation capacities

• Ensure that communities are involved, in particular those that are most at-risk, throughout the entirety of the analysis and decision process: from the analysis of vulnerabilities to the management of EWS-generated data, and all the way through to the implementation of adaption measures;

• Strengthen community capacities to interpret the data and to facilitate decision-making;

• Increase funding for analysis of the links between EWSs and community adaptation in order to increase anticipation, adaptation and management capabilities of at-risk populations (in particular those who are marginalised, indigenous populations, women and girls);

• Promote resilient and fair development models, and deal with the root causes of vulnerability by including an analysis of power relations and gender inequality, access to and control of resources (land, assets, etc.), access to services, and access to information and support for the agricultural sector.

Coordination SUD is the French national platform of international solidarity NGOs. Founded in 1994, it brings together more than 160 NGOs active in the fields of humanitarian aid, development assistance, environmental protection, the defense of disadvantaged people's human rights and international solidarity education and advocacy.

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The Climate and Development Commission (CCD) of Coordination SUD works to influence the strategies of the development actors , to pass on good practices and to influence international negotiations. It brings together about 20 international solidarity NGOs: 4D, Acting for Life, Action Contre la Faim, Agronomes et Vétérinaires Sans Frontières, Association la Voûte Nubienne, ATD Quart-Monde, CARE France, Centre d'Actions et de Réalisations Internationales, CCFD - Terre Solidaire, Electriciens Sans Frontières, Fondation Energies pour le Monde, Groupe Energies Renouvelables, Environnement et Solidarités, Gevalor, GRDR, Gret, Initiative Développement, Institut de recherches et d'applications des méthodes de développement, Médecins du monde, Oxfam France, Peuples Solidaires, Planète Urgence, Secours Catholique-Caritas France.

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