

REPUBLIC OF MOZAMBIQUE

MOZAMBIQUE'S REPORT TO THE WORLD  
CONFERENCE ON REDUCTION OF  
NATURAL DISASTERS

23-27 MAY 1994, YOKOHAMA, JAPAN

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I - INTRODUCTION

In general, natural calamities result from disturbances or abnormalities, beyond man's control, which occur in the interior of the crust of the enveloping atmospheric layer, and in the oceans. Due to the interaction between these systems, an abnormality initiated in the subsystem (ocean, crust or atmosphere) induce, in general, effects on other systems.

Mozambique is a country vulnerable to natural disasters, with greater predominance for drought, tropical cyclones, floods, plagues and, in a small scale, earthquakes. For this reason, it has always been the concern of the Government and the civil society in general to find means of minimizing the effects of these phenomena or, at least, maintain its impact within the supportable limits.

Owing to the complexity of the task of creating mechanisms for the prevention and mitigation of natural disasters, and the emerging of a civil war which lacerated deeply the country during more than 15 years, the prevention and mitigation of natural disasters was for many years relegated to the second plan, giving priority to the urgent necessity to render emergency aid to thousands of mozambicans victims of the combined actions of drought and war.

Nevertheless, the subjacent conditions referred to above, in the recent years there has been an increasing concern to associate the supply of emergency aid to institutionalization of mechanisms which permit the prevention and reduction of natural disasters in the sphere of UNDR.

On the other hand, the actions of aid which were done to help the victims of floods and droughts which in the past few years fell over the country constituted a valuable source of experience of how important the area of prevention is, for, as these phenomena turned into cycles it was possible to reduce their disastrous effects in terms of loss of human lives and property, thanks to a coordinated work of prior notices and alerts and taking subsequent timely actions.

As a result of the floods and droughts which, during the 1980s affected the country, the creation of a government institution framework in the area of prevention and management of natural disasters turned out to be even more urgent. It was for this that, in 1980, the Department of Prevention and Combat to Natural disasters (DPCCN) was created, through a presidential decree, whose mandate include:

- Emergency aid in case of a catastrophe;
- Institutionalization of mechanisms of community alerts over eminence of a calamity;
- Creation of mechanisms of prevention and management of natural disasters;
- Inter-sectorial coordination in the area of prevention and management of natural disasters.

## II - DEVELOPMENT

### II.1 - Actions done in the scope of Prevention and Management of Natural Disasters

The first phase in the fulfilment of the DPCCN mandate in the sector of prevention was training, to which constituted in the selection of personnel from the DPCCN to participate in regional and international courses. This personnel later organized National Seminars and others at district and provincial level, with technical assistance from international institutions in the field. The various national and provincial seminars held on prevention included some staff from various other sectors which are directly involved in the prevention and first-aid activities, this way giving body to the multi-sectorial nature of prevention and management of natural disasters.

In the context of combating hunger derived from the country's difficult situation, the Government introduced in the humanitarian assistance programme a component of distributing seeds and agricultural utensils to the affected population for their self reliance, therefore minimizing the syndrome of dependence on free external aid. On the other hand, to accelerate the reinsertion of the population which during the war and drought lived as refugees, mechanisms were created which facilitated the distribution of land where the population happened to reside.

The Ministry of Agriculture is implementing a programme of supplying seeds and vegetative material to 3 thousand families per Province in the four contemplated Provinces by the programme. This programme has the objective of supplying the resident population in the dry zones with local material resistant to drought (leguminous, tuberculosis), so as to guarantee that the villagers have seed of great important genetic type and variety for the next production season; also Multi-application Centres were created for distribution of seed and to create an adequate mechanism to encourage the local production and; creation of conditions to obtain geroplasma.

To substantiate the above referred programmes, local geroplasma was bought for the villagers; creation of conditions for storage and conservation of seeds; distribution of seeds to families and; reproduction of seeds acquired in the Multi-application Centres.

In addition, the Ministry of Agriculture created the National System of Early Warning for Food Security (SNAP), which during the drought period of 1992/93 played a relief role in the monitoring of the agricultural season, forecasting the harvests, in collaboration with the National Institute of Meteorology (INAM), whose data from meteorological observations permitted the determination of the yield and the estimation of national production.

The forecast for national production of food by the National System of Early Warning served as the basis to work out the food balance in the Ministry of Commerce (Department of Food Security) and, consequently, the calculation of the food deficit of the country, permitting this way that an emergency aid be requested from the international community, of the quantity of food necessary to meet the food and nutritional necessities, thus preventing the death of thousands of mozambicans.

On the other hand, the National Directorate of Agriculture participates in the Southern Africa Development Community (SADC) regional coordination meetings for a common strategy of food reserves in each of the Member country which may be faced by periods of food scarcity.

With the help of various donors, a National Seminar on Prevention was held in October 1991, with the main objective of sensitizing the various sectors of the civil society, in general, and create a political will to the "decision makers" on the importance of actions and prevention. The holding of this seminar received technical assistance from a British institution specialized in the field of Prevention, the Disaster Management Centre (DMC). The seminar outlined various recommendations and conclusions for the consolidation of mechanisms of prevention and management of natural disasters. Such recommendations served as the determining action to the elaboration of a legislation on prevention and management of natural disasters and the creation of a National Management Plan of Natural Disasters, which will regulate the responsibilities of each intervener in the process.

The recommendations of the seminar, grouped as follows, indicate 4 phases to the implementation of the National Plan of Disaster Management:

i) **Creation and definition of the objectives of the National Plan of Disaster Management**

Due to the constraints imposed by lack of funds, it's only now that elaboration of the legislation on natural disasters is in process, having a political commitment on a very high governmental level so that each sector include in their undertakings and/or projects preventative measures of disasters. It is also planned to give much more emphasis to pre-disaster preventative planning in order to minimize the possibility of occurrence of natural disasters and reducing, as much as possible, their effects.

ii) **Management of Pre-plans and Post-disaster**

Bearing in mind the exhortation of the General Assembly of the United Nations regarding the necessity of natural disasters during the present decade, the national seminar referred above analyzed deeply the complexity of management of natural disasters and established that such management calls for a complex and inter-dependent process involving a vast number of responsibilities.

The necessity of institutional reinforcement of the DECCN was recognized, which functions as the focal point for all that concerns prevention. As it can be deduced, it is an action which requires funds to contract specialists who will help the government in the implementation of the Plan, funds which are not easy to obtain from donors.

Therefore the creation of the focal point for the control and coordination of the actions of disaster management, the specific responsibilities of planning and management of disasters remain under the concerned ministries and institutions.

### iii) Detailed plans for Disaster Management

The national seminar recognized the necessity to maintain the vital links in the planning and management of disasters, namely the inter-dependency between the actions of aid, rehabilitation, reconstruction and prevention. On the other hand, it was recommended that the plans of disaster management should constitute a logic process, and have a sequence by phases so as to obtain good results.

The necessity of flexibilization of the management plans was equally recommended so as to allow for its adaptation and of the people, institutions and available resources to changes of vulnerability or from standards of disasters, having to also define priorities in what concerns protection of more vulnerable social groups, services and essential economical and social properties. All this process should take into consideration that the main objective of the plan is the protection of people, thereafter the necessity of involvement of the vulnerable communities themselves in all the phases of the process of planning.

### iv) Maintenance of the Plan for Prevention and Disaster Management

In order to maintain the plan of prevention and disaster management, it was recommended that a training programme at all levels be established, from the communities to the highest level of the sectors. The training should be realistic and be directly related with the work which is done by the people.

It is necessary that preventative measures and management of disasters should not be imposed on the communities, but instead accepted voluntarily and constitute part of their culture in a manner which maintains the interest in its implementation. On the other hand, even during the disaster-free period the prevention measures should be maintained active through regular simulator exercises, follow-up and evaluation of the efficiency of first aid operations previously done and alterations of the plan basing on the acquired experiences and lessons.

In fulfilment of the recommendations of the national seminar, the Coordinating Council of Prevention and Combat to Natural Calamities (CCPCCN) was put under the presidency of the Prime Minister and, in it are represented all the key sectors.

At the level of the Ministry of Agriculture, a **National System of Early Warning for Agriculture** was created, which acts upon the following operative inter-sectorial units:

- i) Monitoring Unit of Cultures and Harvest Prognostics:
- ii) National System of Prior Warning for Food Security (functioning in the Ministry of Commerce).

The Monitoring Unit and Harvest Prognostics is dedicated to the collection of agricultural data (area planted with diverse cultures and production) and collection of agro-meteorological data, evaluation of the agricultural calendar and income estimates.

The National System of Early Warning for Food Security has the objective of supplying timely information on the nutritional situation of the country, which serves as the basis for implementation of programmes of action.

Due to the vulnerability of Mozambique to a variety of natural disasters, the Ministry of Health created an **Emergency Technical Group** whose duty is exclusively to administer situations of crisis. The coordination of activities of their group is done through the Offices of the Director of Planning and of Cooperation, Assistant National Director of Health, Director of Provisioning Division, and the Director of Pharmaceutical Department. This group is activated only during situations of disaster. However, a structure at all levels was established to guarantee a regular coordination in case of any epidemic even in normal situations.

At provincial level the coordination of the activities deriving from the occurrence of a disaster or epidemic is done by the Chief of Public Health Services, while in the districts the main coordinator for disaster situations is the District Director of Health, with the help of the Chief of Public Health Services.

At the health level, a sectorial plan is in preparation for the management of disasters, including diarrhea illnesses, particularly cholera, dysentery and meningitis. At this moment the Emergency Technical Group was reactivated and the vigilance of the epidemics is done by the vigilant units of each district and province, under the coordination of the Central Unit of Epidemiology.

As far as environmental health is concerned, there is a national programme of environmental health which is under the responsibility of the Ministry of Construction and Waters. This programme will undertake the supply of drinking water and improvement of sanitation at low cost in the rural and urban areas.

The DPCCN is making efforts to the implementation of the recommendations of the National Seminar on prevention. In the ambit of the project of institutional help to the DCCPN in the area of prevention, the UNICEF gave funds to carry out consultants in order to elaborate a legislation and to create a National Plan of Management of Natural Disasters.

### II.1.1 Meteorology

#### i) The Impact of Tropical cyclones in Mozambique

In Mozambique the tropical cyclone season goes from October to April. There are, however, depressions which develop outside the official season, although less frequently and of weak intensity, with a trajectory which maintains to the north of Mozambique. The Tropical Cyclones affect the security conditions on the sea, and when they come close to the coast, originate incalculable damage both in terms of property and lives.

There are two types of Tropical Cyclones: Those that originate from the Southwest Indian Ocean, cross Madagascar to enter into the Mozambique Channel, and those that develop in the Mozambique channel. The former are, by general rule, more intense than the latter.

In this region of the globe, the World Meteorological Organization (WMO) adopted a classification basing exclusively on the average wind velocity in the regions near the centre of the depression (see Table 1 on the next page).

In the Mozambique Channel there occurs, on average, three to four cyclones per year, with maximum frequency of occurrence in the months of January and February. Some studies based on observations done in Mozambique reveal that the cyclones originating from the Mozambique channel are of weak intensity and possess a diameter of about 100 miles. They belong to groups 1 and 2 of Table 1.

In general these Tropical Cyclones are associated to very intense rains which give rise to floods when they hit the coast of Mozambique.

The Cyclones which have their origin in the Southwest Indian Ocean are normally severe. However, they lose a greater part of their energy while crossing Madagascar and, as consequence of their reduced intensity by friction, they eventually dissipate. Of the most intense Tropical Cyclones observed with winds above 100 mph figure the ones in November 1912, March 1949 and January 1954 respectively. None of them hit the coast of Mozambique. Table 2 shows the monthly frequency of cyclones with a trajectory to the East and West of Longitude 45° in the period 1912 - 1984.

TABLE 1

Classification	Average Velocity near the centre	
	mph	kmh
1 - Weak Tropical Disturbance	38	62
2 - Moderate Tropical disturbance	39 - 54	63 - 88
3 - Severe Tropical Depression	55 - 73	89 - 113
4 - Intense Tropical Cyclone	74	119

TABLE 2

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Location
Frequency	0	0	4	10	7	4	1	0	W of Long. 45°
	2	3	11	32	18	13	4	1	E of Long. 45°

During the summer, the resident anticyclone of the Indian ocean immigrates to the south. This movement is accompanied by an immigrating movement of the Inter-Tropical Convergence Zone (ITCZ) in the same direction. These movements associated to thermal conditions which take place at this time of the year constitute essential conditions for a generating mechanism as well as development of the Tropical Cyclones. During the winter the anticyclone, accompanied by the movement of the ITCZ in this same direction, moves towards the north and blocking any possible disturbances of this nature to develop. Of the total number of Tropical Cyclones which were observed in the Southwest Indian Ocean since 1950, 30% entered the Mozambique Channel.

At present Mozambique has a system of Tropical Cyclone warnings, addressed essentially in three ways: general public, provincial authorities, and maritime and aeronautical activities.

In the first case the mass media is utilized (radio, television and newspapers). The provincial authorities are advised through special communiques. In as far as maritime and air navigation is concerned the warnings are disseminated regularly, mentioning the coordinates of the storm, its intensity, the affected area and the probable evolution. The warnings directed to maritime activities are disseminated twice per day. For aeronautical operations, the Weather Watch Centre at Maputo elaborates warnings regularly destined to aircraft which are in the air space corresponding to the Beira FIR (Flight Information Region covering the air space in the Mozambique Channel).

These warnings are a result of prior work at national and international level, which must abide by the following established scheme: regular observations and registers of the atmospheric variables in meteorological stations at national, regional and global scale; transmission of this data in real time to National, Regional and World Telecommunications Centres through the Global telecommunications System (GTS) of WMO; processing of this data in Meteorological centres; dissemination of the meteorological products elaborated for the various users. In this process advanced technology in tele-detection is utilized, namely that related with meteorological satellites and radars.

Mozambique is part of this chain through its network of meteorological and telecommunication stations, as well as its meteorological and telecommunication data collection centres at Maputo, Beira and Nampula.

For the weather watch a good network of national and regional observations is indispensable, and efficient means of tele-communications, through which the information to serve as the basis for analysis of meteorological situations and of the evolution of the weather of these phenomena is channelled

Apart from these meteorological and telecommunication networks, it is necessary to have personnel specialized in the field of meteorology, so as to proceed with the analysis of the meteorological situations and unleash the process which leads to the diffusion of the warnings, in such a manner that these arrive at the destinations in useful time.

#### ii) **The Actual State of the Meteorological and Telecommunications Network**

The network of meteorological stations has been degrading due to non accessibility of a great part of the country and, on the other hand, the withdrawal of technical personnel from the stations because of reasons related to the war which was on during the past few years in Mozambique.

Before the war broke out, the climatological network of Mozambique was constituted by about 900 climatological stations and more than 1000 rainfall stations. At the moment these numbers are reduced by about 50%. The network of synoptic stations, engaged in three hourly observation for purposes of weather analysis and forecasts, has also suffered a considerable degradation.

This degraded and sparse network has implications on the fact that great extensions of the surface of the globe not being subjected to regular observation of meteorological parameters, which in turn provokes grave gaps in the inputs of the mathematical weather predict models. These models run on powerful computers of various meteorological centres which render services to the international community, namely the **European Centre for Medium Range Weather Forecast (ECMWF)**, with its headquarters at Reading, and the **World Area Forecast Centres (WAFCs)** in London and Washington. The products from these centres constitute the basis for forecasts at medium range of numerous countries. The increase of stations in places where its density is presently low, will be reflected in the increased quality of forecasts at both national and global level.

since the meteorological phenomena are interlinked by complex teleconnections, whose physical-mathematical formulation depends greatly on the study of behaviour of the various meteorological parameters in all the regions of the world.

The last actions developed in Mozambique will permit a significant improvement in the national meteorological network, because recently a telecommunication system with radios in many of the operational synoptic stations was introduced. Three principal collection centres of meteorological information were put into function (Maputo, Beira and Nampula). A system of Meteorological Data Distribution (MDD), which constitute a great help in weather forecasting, was installed at Maputo's Main Weather Forecast Centre. A project allowing for a circuit link Maputo-Reunion via satellite on hire basis was established.

### iii) Actions to be Taken to reduce the Effects of Tropical Cyclones

#### At National and Regional Levels

To define a programme of investigation which permits a higher knowledge of the mechanisms which contribute to the development or weakening of these disturbances, contributing in this way to improve the Operational Watch System, linked to the Observation and Forecast of Tropical Cyclones and Depressions, there is need to:

- Rehabilitate urgently the network of stations;
- Create a centre for maintenance which guarantees the operation of the whole network;
- Introduce a radar network which covers the whole territory;
- Create a system which permits a bigger fluidity of information in the Mozambique Channel region;
- Introduce automatic stations along the Mozambique Channel;
- Improve the network of observations;
- Improve the system of telecommunications;
- Establish a regional computer network;
- Create a solid training programme .

These actions were established at the level of the Committee of Tropical Cyclones for the Indian Ocean, like those which constitute, among others, the Regional Cooperation Project.

### III.1.11 Training

In this chapter efforts are being made in order to adapt the staff linked to the management of natural disasters, both in the DCLM as well as in other sectors, with the technical knowledge necessary to carry out their functions at their level best. In this context, specific training programmes on prevention have been underway since 1990, whose themes include the principal elements of prevention and mitigation of calamities, namely:

- Evaluation of risk;
- Definition of strategies of prevention and/or reduction of disasters;
- Inventory of the capacity of response to the foreseeable risks (human resources and material);
- Planning of measures of prevention and mitigation of natural disasters;
- Education and training of the communities and the society on the vulnerability to natural disasters;
- Evaluation of the necessities;
- Post-disaster reconstruction.

The greater part of the themes which constitute the curriculum of the courses are always, as much as possible, based on the local reality (at regional, provincial, or district level), consulting the types of natural disasters to which each zone is vulnerable.

In many cases the practical exercises take into consideration the previous calamity which occurred in the zone and a critical analysis of the way how its response by the involved institutions was driven.

### 11.1.111 Coordination and Regional Exchange

At regional level establishment mechanisms of coordination and exchange of information are under process in the area of prevention and mitigation of natural disasters. It is worthy to note that through the Regional System of Early Warning for Agriculture there is an exchange of information between the SADC countries on the perspectives of the agricultural season and creation of food reserves in the region.

At bilateral level a communication and early warning system has been mounted in case of eminent floods which can affect another country (in the rivers which cross various countries) in consequence of rains or opening of the flood gates.

Still in the sphere of SADC and in light of the terrible drought which affected nearly all of the countries in Southern Africa, there was a regional conference held for the coordination of the joint efforts to encounter the drought, namely better utilization of existing infra-structures for the handling of importations of food stuff, joint formulation of the emergency needs and definition of a strategy of creation of food reserves.

In September 1993, a regional conference was held to evaluate the experience and the acquired lessons in each SADC country in the ambit of aid actions to encounter drought and in the combat of epidemics so as to allow for an improved efficiency in identical operations in the future.

### III PERSPECTIVES FOR THE FUTURE

Having secured funds for the elaboration of the legislation and for the implementation of the National Plan of Management of Natural disasters (in 1994 and the 1st half of 1995), it is forecasted that in future each sector creates in its sectorial activities mechanisms to incorporate the inherent requirements to prevention through the inclusion of the elements of the National Plan of Management of Natural disasters.

On the other hand, efforts will be done in view of disclosure of the National Plan to the provincial, district and community levels. To this effect, the DPCCN will reinforce qualitatively its human resources in order to improve its role of organ coordinator of all the actions inherent to the prevention and management of natural disasters.

Other foreseen actions for the future include educational campaign of the communities and the civil society in general about the vulnerability to the natural disasters, formation of base structures on practical methods of preventing and reducing the impact of disasters, with the participation of the communities themselves, and holding multi-disciplinary talks and seminars on prevention.

In developing countries, like in the case of Mozambique, there is need to sensitize the leading organs on the benefits that could be derived from actions and investments in the area of prevention of disasters. It was in this spirit that the General Assembly of the United Nations made a decree that the 1990s be an **International Decade for Natural Disaster Reduction**, assuming that in each country be created a coordinating organ responsible for the diverse programmes of reduction of the effects from natural disasters.

In Mozambique this organ, still in the phase of creation, is composed of the following sectors: meteorology, agriculture, water affairs, and the DPCCN (Department of Prevention and Combat to Natural Calamities), which could also be counselled by specialized personnel in other areas, having as specific tasks the following:

- To coordinate the activities of the sectors and of the institutions in charge of prevention and management of natural disasters;

- To call the public's attention to the problem of natural disasters, trying to show that it is possible with concrete actions to achieve satisfactory results in diminishing of the effects of natural disasters;
- To encourage the prevention of natural disasters through an appropriate legislation, logistic support and the creation of a National System of Early Warning during and after the occurrence of calamities;
- To integrate the donor international community in the activities of the National Committee for the IINDR so as to facilitate the execution of the projects.

#### III.I Perspectives for Post-war

Mozambique, due to the intensification of the war, was obliged to institute an Emergency Programme in order to assist thousands of persons strongly affected by the conflict. Now that the war is over and the effects of natural calamities (essentially the drought) reduced substantially, the country is doing its best to pull out from the Emergency Programme to the national rehabilitation, sine-qua-non condition for the establishment of development programmes. The government of Mozambique considers extremely important the incorporation of preventative measures and management of natural disasters for national reconstruction and sustainable development. In this context a series of actions have already been defined to view the transformation of the present DPCCN structure, a government organism responsible for emergency aid, to accommodate the necessities in the area of prevention.

These actions include the reformulation of the personnel structure of the DPCCN, giving emphasis to the elaboration of rules of procedure in as far as prevention, development and implementation of the National Plan of Management of Natural Disasters are concerned.

It is hoped that with the end of the war, the DPCCN will be the guide to all the actions concerning the prevention. Creation of an inter-sectorial nucleus (involving meteorology, water affairs, DPCCN, and agriculture) is under process to facilitate a greater inter-connection in case of an eminent calamity.

So, a greater part of the present actions in course has in mind the rehabilitation of infrastructures destroyed during the war and the reinsertion of the displaced and repatriated population. This process of reintegration of the population should aim at re-establishment of practicable social relations and respond to the objectives of long term development, having to secure the socio-economical viability at medium and long terms, and not simply at the immediate necessities of the population.

In the post-war picture within the government policies to the socio-economical insertion of the population, it is necessary to recognize the psycho-social impact of the war and of the asylum for the population and, also recognize that the experience of war, displacements, refuge and emergency aid affected the population deeply, both in terms of psycho-social and economical. As a result, what was considered as their house, their community, the conception of their relationship with the state, their attitudes in relation to their previous leaders and their ideas and economical capacities were permanently changed. For this reason, the reintegration of the population will be a very dynamic process which will demand the involvement of all the sectors of the society.