

DISASTER REDUCTION INITIATIVES FOR ZAMBIA

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1.0 INTRODUCTION:

Zambia, a country of approximately Ten million people with 47% of them living in urban centers is mainly afflicted by two types of disasters – drought and flooding. The urban centers are affected in a different way from the rural areas. For example, floods through poor health and sanitation affect the urban population while those in rural areas are either displaced or their food crops are destroyed resulting in food insecurity. Most people in Zambia (87%) live below the poverty datum line (\$80)¹. National poverty stands at 69%, with rural poverty at 83% and urban poverty at 46% (Central Statistics Office [CSO] 1999).

During the one party system of government, the Contingency Planning Unit (CPU) in the Office of The Prime Minister was responsible for coordination of responses to emergencies, mobilization of resources, and delivery of relief using the party's local structures. With the advent of pluralism and change of government in 1991, the post of Prime Minister was abolished and replaced with that of Vice President and the CPU was abolished. During the same period, 1991/92 Zambia experienced severe drought, which out-stripped the capacity of government to respond effectively. The government set up Program to Prevent Malnutrition (PPM) structures at national, provincial and district levels. The objectives of the PPMs were to 1) to prevent the increase in levels of malnutrition among vulnerable groups particularly children 2) to maintain viability of rural communities by providing food assistance during disasters. The Program Against Malnutrition (PAM) was established to provide technical support and serve as a secretariat. In 1996, PAM was transformed into a non-governmental organization and ceased to function as a secretariat for the PPM.

In 1994, the Government of the Republic of Zambia instituted the Disaster Management and Mitigation Unit (DMMU) in the Office of the Vice President to coordinate disaster mitigation and relief management. The DMMU assumed the responsibility of providing technical support as well as that of a secretariat. The unit is meagerly staffed with seven technical staff that are expected to cover the nine provinces of Zambia.

High-level collaboration between DMMU, other government ministries, and the non-governmental organizations (NGOs) has made it possible to respond to the disasters that have befallen the country since the early 1990s. The NGOs have participated in conducting vulnerability assessments and needs assessments as well as in ensuring targeting of relief resources to the affected populations. The task of targeting is vital in disaster response however, it is usually influenced by political motives resulting in poor coverage and less than adequate

¹ This is estimated from the Household Budget Survey CSO, 1994. The mean monthly expenditure for the high and low incomes was \$148.

intervention. To effectively respond to the recurrent droughts that occurred in the sub-region, a committee of stakeholders was formed to share information about the food situation and the potential disaster areas. This committee is called the Vulnerability Assessment and Mapping (VAM) Committee. The VAM allows harmonization of vulnerability assessment methodologies among the different stakeholders. Due to divergent ways of collecting and conducting vulnerability assessments, there were equally divergent levels of vulnerability reported. This brought about uncertainty and lack of confidence in the vulnerability assessment data by different stakeholders. Donors in particular, were wary about figures that over estimated the extent of a disaster resulting in over supply of relief food. The over supply of relief food distorted the market and ultimately discouraged private sector participation in the maize sector.

2.0 RISK ASSESSMENT

Understanding vulnerability to disasters like floods and drought presents a major challenge to policy makers in Zambia due to the absence of established vulnerability indicators. The challenge is exacerbated by the presence of divergent vulnerability assessment methodologies and the lack of funds to implement these exercises. The absence of mitigation strategies renders the country vulnerable to disaster occurrences and escalates the cost of responding. In the absence of the mitigation strategies, responses to disaster are reactive making it difficult to effectively target the affected communities. The DMMU are in the process of reorganization to enhance coverage and effectiveness.

2.1 Hazard Mapping

Hazard mapping has not been deliberately conducted in Zambia. However, there are areas that have been categorized as prone to disaster based on previous occurrences of a particular disaster. For example, Southern province of Zambia receives less than 600mm annual rainfall and periodic in-season droughts qualifying it to be drought prone. On the other hand, areas along the Zambezi River are prone to flooding because the Zambezi River breaks its banks in high rainfall years.

The DMMU has plans of conducting hazard mapping for drought, floods, epidemics/pandemics, refugee influx, industrial accidents, fires, pest infections, water hyacinth, transport accidents (air, road, and marine) and mining accidents. The parameters for this mapping will include rainfall data from the meteorological department; crop forecast data from the ministry of agriculture, and other information from industry and institutions.

2.2 Vulnerability Assessment

In collaboration with government ministries (Agriculture, Health, Development and Social Services, Local government and Housing etc), NGOs, DMMU and the private sector, the Vulnerability Assessment Committee conducts annual risk and vulnerability assessments and mapping to identify communities that are vulnerable to hazard and establish their capacity to cope. Although vulnerability analysis can be done at national, district and community levels, the smallest unit for which current and reliable data is available in Zambia is the district. Therefore, VAM is considered as a geographic targeting tool to determine districts, and NOT

households or communities that are food insecure and the likely degree of food insecurity being faced by an average household in the district. Follow-up food needs assessments are needed to target appropriate interventions at the household or community. The vulnerability Assessment report is distributed to donors, government, private sector, and NGOs for planning purposes.

The methodologies employed include use of 1) use of checklist 2) crop forecasting data, 3) rainfall data, and per capita income.

- ***Checklist/Questionnaires***

A checklist is administered to District Administrators (politician), District Agriculture Coordinator, traditional leaders (Chiefs and Headmen), local health providers, churches and individual households. The checklists include questions concerning crop planted, area planted, rainfall data, crop performance and the prevailing major cattle diseases (i.e. East Coast Fever, Contagious Bovine Pleura Pneumonia (CBPP), Anthrax, and Foot and Mouth disease). The questionnaire is administered to provincial level staff (usually government staff), district, and community level.

In addition, a visual assessment of a range of parameters is conducted and supplemented by secondary information from local communities. The parameters include food security/ crop situation, health, water and sanitation and infrastructure. The assessment is reported qualitatively with quantities reported as estimates. For example, "crop damage is estimated at 80% of production." The eighty percent is not based on quantitative analysis but visual estimation. The assessment teams come up with recommendations based on these assessments. In the example cited above, the team recommended relief food distribution.

The vulnerability assessment findings are aggregated and reported at district level similarly, recommendations to intervene are made at district level.

- ***Crop Forecasting:***

The crop forecasting exercise is conducted yearly just before crop harvesting period (March-April). The Ministry of Agriculture Food and Fisheries (MAFF) usually conducts the crop forecasting survey in collaboration with the Central Statistics Office (CSO). The crop forecasting report reviews the meteorological conditions that prevailed during the season under review, presents the input supply and distribution situation (mainly as relates to crop seeds and fertilizer) at the beginning of the season, it presents the crop synopsis, the national food balance sheet for that year, and the household food security situation. This information is vital to the government, NGOs involved in provisioning of agricultural inputs and relief distribution, private sector especially traders, and donors for strategic planning and decision making.

The survey covers the whole country and yields district-wise estimates on the area planted, expected production and sales of major food crops namely; maize, sorghum, millet, sunflower, groundnuts, beans, Soya beans, rice, castor, cassava and paprika. The survey covers three types of farmers - small-scale medium and large farmers distinguished based on area planted by each

type of farmers. The small-scale farmers cultivate below 5 ha, medium scale farmers cultivate between 5 and 10 Ha, and large-scale farmers cultivate above 10 Ha.

The sampling frame was constructed by creating crop clusters in each district using Census Supervisory Areas (CSAs) and Standard Enumeration Areas (SEAs) as geographical boundaries of the crop zones. There are 9,000 SEAs in Zambia, derived from the 1990 Census of Population, Housing, and Agriculture out of which 405 SEAs are used in the crop forecasting exercise.

The crop forecasting report categorizes drought as follows:

Meteorological drought, which occurs when rainfall is well below what is expected in a large area over an extended period:

Hydrological drought, which represents sustained deficits in runoff below normal condition or when there is depletion of ground water levels;

Agricultural drought, which occurs due to the combined effect of erratic rainfall amount and distribution resulting in the drastic reduction in crop or livestock yields.

The crop forecasting report describes the rainfall pattern in each province relating the planting dates to rainfall performance and available soil types. This gives an impression of the water holding capacity of the soil and expected crop performance. The report also gives Global Indicators (Sea Surface Temperatures (SST), Southern Oscillation Index (SOI)), and the implication of the two global indicators on rainfall performance in a specific year.

The input supply and distribution is explained in detail to include the quantities of each type of fertilizer distributed by the fertilizer marketing channels as well as the coverage and landed costs in the major distribution centers. The seed situation is analyzed on per crop basis of the major crops (maize, sorghum, millet, soybean, paddy rice, sunflower, groundnuts, beans, and "other crops". Other crops include cassava, sweet potatoes, cotton, tobacco, paprika castor beans, and wheat and barley grain. The report include the area planted, estimated production, estimated sales and quantities retained (expected production less sales).

Per capita Income

Secondary information is collected on crop yields; livestock numbers (including fish) wages, remittances, and available wild fruits. Total per capita income is calculated by expressing the above parameters in money terms. This total income is compared with the threshold income – calculated using a linear programming model called "Lindo." The threshold income is based on the cost of the food basket, which is the value of the basic food requirements of a household with six members. If the total per capita income is lower than the threshold income, then that household is vulnerable. The level of vulnerability depends on how low the total income is from the threshold and is categorized as severe, moderate, and vulnerable. This vulnerability assessment provides information on the potentially vulnerable areas.

Food Basket Indicator

The Food Balance Sheet indicates the opening stocks of the major crops, estimated production and staple food requirement. The difference between total food available (production plus opening stock) and the total requirement will determine a surplus or deficit. If the net difference is negative, food aid imports are required and may either come in as food relief (mainly for rural areas) or commercial imports or both.

The Household Food Security parameter is broken down into 'food prices', 'food availability' and 'availability of food for purchase and participation of private traders'. Maize (staple food) grain prices are highlighted indicating the highest and lowest districts and provinces and the nutritional status of children. The nutritional status is measured using the Mid Upper Arm Circumference (MUAC), which is a crude indicator of wasting or acute malnutrition. The results of the VAM are presented in terms of food insecurity levels. Districts are classified as either food secure or food insecure (Fig. 1) using the following definitions (VAM Report, 1999/200):

- **Extremely Food Insecure** – populations that are now or which will soon be unable to meet their consumption needs. They have already exhausted their strategies for acquiring food.
- **Highly Food Insecure** – populations that will not be able to meet their consumption needs during a given consumption period. They will be forced to reduce consumption and dispose of their productive assets, thereby under mining their future food security.
- **Moderately food Insecure** – populations that can meet their consumption needs during the given consumption period only by intensifying their normal coping strategies.
- **Food Secure** – populations that can meet their consumption needs during the given consumption period using income derived from strategies that do not compromise food security.
- **Needs Assessment**

Ideally, VAM committee conducts vulnerability assessment annually to establish potentially vulnerable areas.

In the event of a disaster (flood or drought), Needs Assessment (NA) is conducted in the potentially vulnerable areas using the above-mentioned methods. The needs assessment determines the quantities of food required to avert a hunger situation. This report acts as a check to ensure that food relief is distributed in areas of need to the affected communities.

PUBLIC COMMITMENT AND NETWORKING

A Vulnerability Assessment and Mapping (VAM) Committee is a multi-sectoral body comprising of NGOs, World Food Program (WFP), Famine Early Warning Systems (FEWS), Central Statistics Office (CSO), DMMU, Meteorological department, the Early Warning Unit under the Ministry of Agriculture, Food and Fisheries (MAFF).

Amongst all the above named institutions, only DMMU and FEWS project have the sole responsibility of collecting and disseminating information related to early warning as well as disaster management.

The FEWS project in Zambia started in 1992 and has since been producing reports on food security situation, as well as updates of the rain season. FEWS/Zambia make contributions to the FEWS – Southern Africa bulletin produced dekadally during the rainy season and monthly during the rest of the year. The main issues covered include 1) updates on rainfall patterns and growing conditions 2) crop conditions 3) rainfall forecasts 4) food stocks updates 5) maize and maize meal price fluctuations 7) pest and disease out breaks and 8) household food stocks position. FEWS/Zambia participate in a collaborative effort with WFP, DMMU, NGOs and government line ministries to conduct the vulnerability assessments, relief food requirements estimates and crop forecast summaries (preliminary and final crop forecasts).

DMMU as a government institution is designed to be responsible for disaster management initiatives and recommendation of national disaster policy to the National Disaster Management Committee (NDMC). The unit is undergoing restructuring and reorganization to try and make it to be more responsive to disasters beyond drought and flooding. Ideally, the unit is expected to be involved in a range of activities including coordination, monitoring and evaluation of disaster management programs, management of information system, research and development, capacity building, resource mobilization and disaster relief programs. Most of these activities are either not implemented or are inadequately implemented due to low level staffing and erratic flow of funding.

Since 1991, the government of the Republic of Zambia has declared five disasters and the current one is under discussion. Table 1 indicate the type of disaster, number of people affected across districts and the quantities of relief food that was distributed.

Table 1. Number of disasters and people affected per district in Zambia since 1991.

	1999/92	1994/95	1995/96	1998/99	1999/2000	2000/2001 ²
Type	Drought	Drought	Drought	Drought	Drought/Flood	Drought/Flood
Pop. affected	2,000,000	1,000,000	1,400,000	1,200,000		
Quantity (MT of food)	250,000	8,500	8,000	54.9		

Zambia's infrastructure particularly in rural areas is in a state of disrepair making disaster response almost impossible. The impassable roads make it difficult for heavy trucks to deliver and distribute relief food and other essentials. The poor state of roads limit accessibility of assessment teams to visit some areas and obtain hands-on information. Due to limited accessibility, estimates are used to determine extend of a disaster and consequently response is limited or misplaced.

The DMMU, which is a coordinating unit, does not yet have expertise in Geographical Information System (GIS) or the use of aerial photography. The use of GIS and other technological packages will enable mapping of vulnerability and will allow for development of trends.

² Still being assessed and discussed by VAM committee.

The different stakeholders mentioned above, produce a range of reports i.e. vulnerability assessment reports, crop forecasting reports, disaster impact assessments etc. These reports are targeted at the government, donors, NGOs, and private sector in order to influence or inform for decision-making. However, the at-risk communities are not intended as end users. These communities, particularly in rural areas, who are the focus of this assessment, have little opportunity to study their situation and use the information for their own planning. The community involvement ends at the information extraction level during needs assessment.

Land Use Information:

One of the major contributing risk factors to the severity of both drought and flood shocks is progressive land degradation. Zambia has a total land area of 75, 185, 000 Ha categorized as 'Crop land', 'Forest land' (forest reserves and National parks) and Other. Cropland covers 15,037,000 (20%), forestland covers 45,111,000 (60%), while other land uses covers 15,037,000 (20%). The forestland consists of forest reserves, national parks and land on customary area covering 9.1%, 8.4%, and 42% of Zambia's area respectively.

Land degradation has been increasing since the 1930s; attributed to deforestation, soil degradation, over grazing, low agricultural production, industrial pollution, and loss of biodiversity (Nsofwa Mulenga, 1999). Some of these parameters have been scored and ranked as follows (Chiti, R.M., et al., 1989):

Province	Erosion	Over grazing	Deforestation Cultivation	Deforestation Charcoal	Total Score	Rank
Eastern	8	8	9	5	30	1
Lusaka	6	7	7	9	29	2
Southern	5	9	8	6	28	3
Central	7	6	6	7	26	4
Northern	9	3	4	3	19	5
Luapula	3	2	5	4	14	6
Copperbelt	2	1	3	8	14	6
N/Western	4	4	1	1	10	7
Western	1	5	2	2	10	8

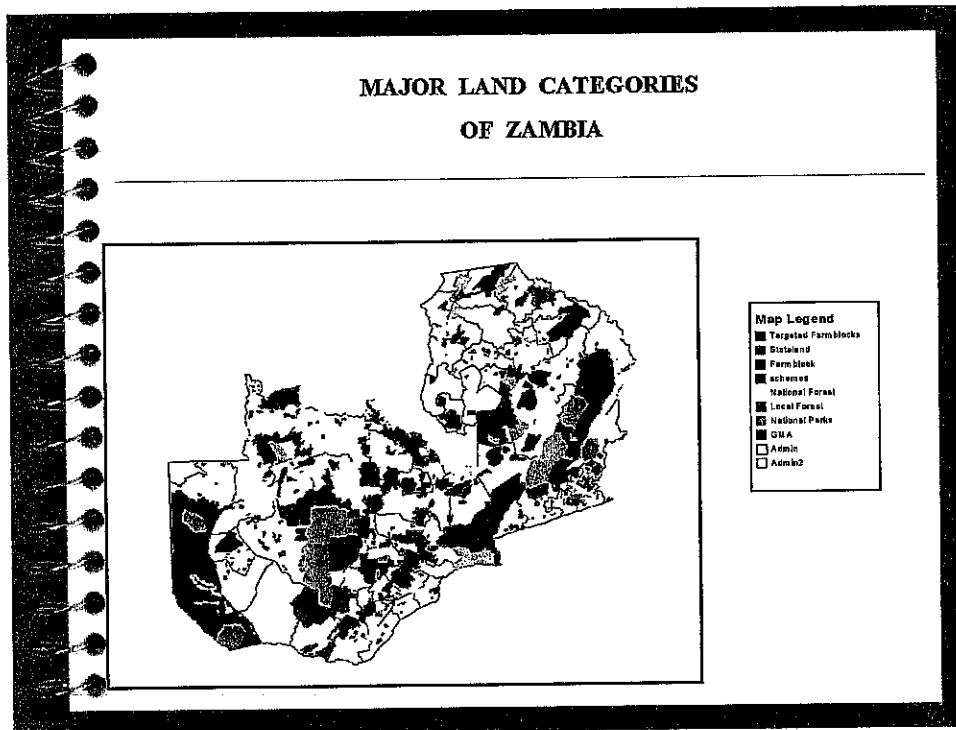
Annual deforestation estimates were 0.7 million hectares in 1980 and increased to 0.9 million hectares in 1990. The major contributor to this increase has been clearing for agriculture. Soil erosion by rainfall is the most prevalent form of erosion, occurring mainly on cultivated land, ranging from 5 tons 100 ton per Hectare per year (Grunder M. 1992). Maize mono cropping and continuous use of nitrogen fertilizers have exacerbated soil acidification without corrective liming. Inorganic fertilizer use increased from 35,00 tons in 1964, to 250,000 tons in 1984 and was 800,000 tons in 1999.

Overgrazing is caused by poor grazing management and over stocking usually in the communal areas. Small-scale farmers who constitute 90% of the farming community in Zambia inhabit communal areas. The small-scale farmers attain low crop yields due to inappropriate farming

methods, soil degradation, and drought. Conservation farming methods and agro forestry practices are being promoted in Eastern; Central and Southern provinces to mitigate further soil degradation.

At national level, government in 1985, updated through the National Environmental Action Plan (NEAP) in 1992, adopted the National Conservation Strategy for Zambia. In 1994, Zambia signed the Convention to Combat Desertification (CCD) and ratified it in 1996.

Map of Land categories/ Land use



Health Status

The health conditions of rural population have a significant impact on productivity. One of the major health problems Zambia is facing is the HIV/AIDS pandemic. The UNAIDS indicate a high HIV prevalence in the population among 15-49 years old age group³. In 1998, the average HIV prevalence rate for Zambia was estimated at 19.7%. The provincial prevalence rates are depicted in Figure 2.

These figures indicate the extent of the problem and obviously, the fact that such high rates among the most productive age group has a negative impact on productivity and their income-earning ability. In turn, this puts their dependents at risk, particularly children, and the elderly. It is also evident that HIV rates in Zambia are very high and the adverse effect should not be ignored when dealing with food security issues.

³ HIV/AIDS in Zambia, Ministry of Health/Central Board of Health Publication, September 1999

Some surveillance results have shown that HIV prevalence in Zambia has been largely stable at 19%-20% since 1994.

PUBLIC AWARENESS

Conclusion

While Zambia has successfully minimised the impact of a series of drought, flood and epidemic shocks during the past ten years, there is urgent need to strengthen mitigation efforts. This requires the participation of a wide range of stakeholders i.e. government, private sector, donors (multilateral and bi-lateral organisations) and the general populace. While in the past, the government has consulted extensively with the private sector and donors, there is an increasing need to better involve the affected citizens, themselves – rather than limiting their engagement to the extraction of information during vulnerability assessment or to better target relief assistance.

References:

1. Chiti R.M, Chidumayo E.N., Mukanda N., Bergman G., 1989. National Soil Conservation and agroforestry Needs Assessment. MAFF, Lusaka.
2. Grunder M., 1992. Soil Conservation in Zambia. A paper presented at a Natural Resources Use and Conservation workshop. Lusaka, Zambia.
3. Nsofwa M., 1999. Status of Desertification in Zambia.