



**Office of the President**

**GUIDELINES FOR EMERGENCY  
LIVESTOCK OFF-TAKE  
HANDBOOK**

**Dickson M. Nyariki, Boniface F. Makau,  
Wellington N. Ekaya, Joseph M. Gathuma**

A Publication of the Arid Lands Resource  
Management Project



**Office of the President  
Arid Lands Resource Management Project**

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## ACRONYMS/ABBREVIATIONS

<b>ACK</b>	Anglican Church of Kenya
<b>ADB</b>	African Development Bank
<b>AHA</b>	Animal Health Assistant
<b>ALDEF</b>	Arid Lands Development Focus
<b>ALRMP</b>	Arid Lands Resource Management Project
<b>AMREF</b>	African Medical Research Foundation
<b>ASAL</b>	Arid and Semi-Arid Lands
<b>AU</b>	African Unity
<b>CAH</b>	Community Animal Health
<b>CAHWs</b>	Community-based Animal Health Workers
<b>C APE</b>	Community-based Animal Health and Participatory Epidemiology
<b>CARE</b>	Cooperative Agreement and Relief Everywhere
<b>CBO</b>	Community Based Organisation
<b>CBPP</b>	Contagious Bovine Pleuropneumonia
<b>CCPP</b>	Contagious Caprine Pleuropneumonia
<b>CDA</b>	Community Development Assistant
<b>CDPO</b>	Community Development Project Officer
<b>CDTF</b>	Community Development Trust Fund
<b>CEC</b>	Community Education Concern
<b>CIFA</b>	Community Initiatives Facilitation Assistance
<b>CRS</b>	Catholic Relief Services
<b>DAO</b>	District Agricultural Officer
<b>DC</b>	District Commissioner
<b>DDC</b>	District Development Committee
<b>DDVO</b>	Deputy District Veterinary Officer
<b>DFID</b>	Department for International Development
<b>DFMO</b>	District Farm Management Officer
<b>DFO</b>	District Forest Officer
<b>CDC</b>	Community Development Committee
<b>DIE</b>	District Irrigation Engineer
<b>DLMC</b>	District Livestock Marketing Council
<b>DLPO</b>	District Livestock Production Officer
<b>DMO</b>	Drought Management Officer
<b>DO</b>	District Officer



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<b>DPA</b>	District Pastoral Association
<b>DPIRP</b>	Drought Preparedness, Intervention and Recovery Programme
<b>DRMO</b>	District Range Management Officer
<b>DRO</b>	District Range Officer
<b>DSG</b>	District Steering Group
<b>DVO</b>	District Veterinary Officer
<b>DVS</b>	Director of Veterinary Services
<b>DWO</b>	District Water Officer
<b>ECHO</b>	European Commission Humanitarian Organisation
<b>EDRP</b>	Emergency Drought Recovery Programme
<b>ENDA</b>	Ewaso Ng'iro Development Authority
<b>EPAG</b>	Emergency Pastoral Assistance Group
<b>ERP</b>	Emergency Rehabilitation Programme
<b>EVRP</b>	Emergency Veterinary Rehabilitation Programme
<b>EWS</b>	Early Warning System
<b>FAO</b>	Food and Agricultural Organisation
<b>FGD</b>	Focus Group Discussions
<b>FHI</b>	Food for the Hungry International
<b>GDP</b>	Gross Domestic Product
<b>GIS</b>	Geographical Information System
<b>GTZ</b>	German Technical Cooperation Agency
<b>HS</b>	Herd Size
<b>IBAR</b>	Inter-African Bureau for Animal Resources
<b>ITDG-EA</b>	Intermediate Technology Development Group-Eastern Africa
<b>IVP</b>	Indigenous Vegetation Project
<b>JAHA</b>	Junior Animal Health Assistant
<b>KARI</b>	Kenya Agricultural Research Institute
<b>KFSM</b>	Kenya Food Security Meeting
<b>KFSSG</b>	Kenya Food Security Steering Group
<b>KLMC</b>	Kenya Livestock Marketing Council
<b>KMC</b>	Kenya Meat Commission
<b>KWS</b>	Kenya Wildlife Service
<b>LDO</b>	Livestock Development Officer
<b>LMA</b>	Livestock Marketing Association
<b>LMC</b>	Livestock Marketing Council
<b>LMD</b>	Livestock Marketing Department
<b>LU</b>	Livestock Unit
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MET Leader</b>	Mobile Extension Team Leader
<b>MLFD</b>	Ministry of Livestock and Fisheries Development
<b>MSF-S</b>	Medicans Sans Fronteers (Doctors Without Borders)

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<b>MUAC</b>	Mid-Upper Arm Circumference
<b>NEMA</b>	National Environmental Management Authority
<b>NGO</b>	Non-Governmental Organisation
<b>NORDA</b>	Northern Region Development Agency
<b>NRM</b>	Natural Resources Management
<b>OAU</b>	Organisation of African Unity
<b>OXFAM GB</b>	Oxfam of Great Britain
<b>PAS</b>	Pastoral Associations
<b>PRA</b>	Participatory Rural Appraisal
<b>PRP</b>	Pastoral Recovery Programme
<b>PSC</b>	Pastoral Steering Committee
<b>RACIDA</b>	Rural Community Integrated Development Agency
<b>RAE</b>	Rehabilitation of Arid Lands Trust
<b>RO</b>	Range Officer
<b>RoK</b>	Republic of Kenya
<b>SADVS</b>	Senior Assistant Director of Veterinary Services Centres of Kenya
<b>SALTLICK</b>	Semi-Arid Lands Training and Livestock Improvement Centres of Kenya
<b>SLDO</b>	Support to Local Development Officer
<b>SNV</b>	Netherlands Development Organisation
<b>SWOT</b>	Strengths, weaknesses, opportunities and threats
<b>TERA</b>	Turkana Environmental Resources Association
<b>TLU</b>	Tropical Livestock Unit
<b>TUDEF</b>	Turkana Development Focus
<b>TUDOF</b>	Turkana Development Organisations Forum
<b>TUPADO</b>	Turkana Pastoralist Development Organisation
<b>UNDP</b>	United Nations Development Programme
<b>UNICEF</b>	United Nations Children's Fund
<b>USAID</b>	United States Agency for International Development
<b>VO</b>	Veterinary Officer
<b>VSF-B</b>	Veterinaire Sans Fronteers (Veterinarians Without Borders)
<b>VSF-Suisse</b>	Veterinaire Sans Fronteers-Switzerland (Veterinarians without borders)
<b>WARDA</b>	Wajir Peace and Development Agency
<b>WASDA</b>	Wajir South Development Association
<b>WFP</b>	World Food Programme

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## **EXECUTIVE SUMMARY**

Kenya's agricultural sector accounts for 20–30% of the gross domestic product (GDP). Of this, the livestock sector alone makes a contribution of about 50%. Thus, livestock contributes heavily to the GDP and food security of its population. It also provides the necessary thrust for other forms of development in the country. Recent statistics indicate that currently over 50% of the country's livestock population is based in the arid and semi-arid lands (ASALs), which form about 80% of the country's land area. However, comparative international statistics show that livestock contributes 88% of the total agricultural output in Botswana even though the country has half Kenya's livestock population and is of less agricultural potential. Thus, there is a huge potential contribution that livestock can make to the Kenyan national economy. Unfortunately, this sector receives only 10% of the government's agricultural expenditure and less than one per cent of total spending, yet it is estimated that Kenya's potential to export livestock products if adequately exploited would earn more than the earnings from tea and coffee combined. This then calls for new thinking about livestock development strategies to harness the arid lands.

The livestock sector accounts for 90% of employment and more than 95% of household incomes in the ASALs. Most of the livestock slaughtered in major urban centres originates in these areas, with an annual slaughter of about 1.6 million Tropical Livestock Units. Kenya's livestock from the ASALs is worth Kshs 60 billion (US\$800 million). The internal livestock trade in the pastoral areas alone nets in about 6 billion shillings (US\$80 million) a year.

In the arid areas of the ASALs, arable crop production is not possible without some form of irrigation; while in semi-arid areas rainfall may be sufficient for certain types of crops, requiring special management techniques. Therefore, except for the areas under cropping, the rest of the arid areas is used for livestock

production. Thus, livestock are one of the most important resources of the arid areas, because pastoralists rely on them directly for their subsistence and income generation. However, available statistics on the nature and amount of livestock off-take, and how the potential off-take during drought can be tapped to avoid excessive losses and benefit the pastoralists, are inadequate and unreliable. This situation exists because most of the production from arid areas is for subsistence, and data on the quantity produced and marketed are rarely collected.

Livestock off-take is the percentage of the current year's herd that is removed through sales, deaths, gifts, home-slaughters or theft. This is an important measure of herd dynamics and therefore a means for estimating output from a pastoral production unit. Although non-commercial transactions contribute significantly to the total livestock off-take in a traditional pastoral household, commercial livestock off-take forms the main form of pastoral off-take today. Commercial livestock off-take has increasingly become important with the breakdown of traditional drought coping strategies as pastoralism slowly evolves from solely subsistence to a commercial economy, and as the frequency and severity of droughts increase.

Drought is one of the most detrimental disasters distressing African pastoralists. Droughts are known to have short-term and long-term effects on pastoralists. The short-term effects are the shocks caused by the heavy losses of animals due to a drastic and abrupt decline of grazing resources, thereby exposing the pastoralists to severe transient food insecurity. Thus, pastoralists find themselves with excess animals in relation to land resources and with limited options for disposing of them, direct consumption or finding extra grazing and water. The effect of the drought of 1999/2000 provides a good example of how obvious the lack of appropriate advice to pastoral communities led not only to the loss of property in animals but also to the rise in political tensions due to the movement in search of pasture into inappropriate private lands. To avoid this, assistance must be given to find market outlets or any other means of disposing of the drought-induced extra livestock well before droughts strike. This can be achieved through close communication with the pastoralists.

The long-term effects of droughts on pastoralists are through decreased food security and lost bargaining power. In addition to loss of livestock, distress sales of livestock cause an abrupt decline

in livestock prices, making it increasingly difficult for pastoralists to recover from such shocks, therefore rendering them more vulnerable to future disasters, and ultimately promoting poverty and hindering development.

It is important to facilitate emergency livestock off-take so as to minimize losses during droughts and ensure that pastoralists get reasonable prices for their animals, thus enabling the pastoralists to remain viable during and after the droughts. The focus here, therefore, is on the animal units that are available for the market during pre-drought periods as a requirement to guide the planning of emergency off-take in response to a looming drought.

A timely response with adequate lead time to impending drought requires a reliable forewarning developed from in-depth understanding of the focus and means of monitoring environmental changes.

This study sought to develop guidelines for enhancing livestock off-take in response to impending emergency through the following processes, among others:

- Carrying out informal interviews with stakeholders—government officials, professionals, relevant institutions.
- Carrying out a thorough review of the literature (desk study) on past experiences.
- Collecting information through participatory means, by using focus group discussions (FGDs) in the arid districts, on past experiences and to solicit ideas for more proactive strategies for increasing off-take in response to drought warnings.

Off-take rates from the pastoral herds are currently estimated at 6–14% for cattle, 1–3% for camels and 4–10% for sheep and goats. These rates then translate into 220,130–513,630 head of cattle, 9,250–28,000 camels, 231,960–597,000 goats, and 156,600–391,500 sheep, which are removed from pastoral herds annually. If values are attached to this off-take, the total annual marketed value both locally and nationally is close to Kshs 5 billion. In terms of meat supply, the pastoral herds produce in the order of 71,118 tonnes of meat from the various livestock species annually.

Using the 1999 population census figure and a growth rate of 2.9% per year, the Kenyan population is estimated currently at 32

million. Since the per capita consumption of meat is estimated at 12 kg, the amount of meat consumed annually is about 384,000 tonnes. To this total, the pastoral areas contribute about 71,118 tonnes or 19% of the total national consumption. Using the same method to estimate the current population of the pastoral districts, we obtain a figure of about 3.8 million persons. These would consume 45,600 tonnes of meat. Thus, it implies that out of the total meat off-take from pastoral herds about 60% is consumed locally while the rest is a surplus which goes to support the rest of the country's population. In other words, pastoralists are net meat 'exporters.' At an average price of Kshs 120 per kg of meat, the total amount of money equivalent to 71,118 tonnes of meat is over Kshs 8.5 billion. About 40% of this accrues as direct monetary income that goes to meet pastoral household requirements—clothing, shelter, health, fees, etc.

Pastoralists adopt a number of strategies in order to cope with or manage droughts and other related hazards. These have relevance to emergency livestock off-take. These coping mechanisms can be grouped into two: established and recently adopted. Whilst the details of these may differ from community to community, the principles are generally the same. Among others, the broad categories of established strategies are movement of livestock to areas with better water and grazing resources, sale of livestock, prayer and payment to a rainmaker, resort to hunting and the use of wild foods, and the moral economy.

A number of opportunities for reducing the vulnerability of pastoral populations have been created in the recent past as a result of deliberate actions taken in response to past experiences of deficits due to drought and socio-economic changes due to national and international forces. External forces have also contributed to socio-economic changes. These include immigration, improvements in the transport system, liberalisation of most aspects of the economy, education, development, and change of policy on tourism. The result has been diversification of the herding economy to include farming (where this is possible), trade such as running stores in small rural shopping centres, an increase in returns from tourism, especially eco-tourism, and migration into towns in search of salaried employment.

Responses to droughts by government and other stakeholders have differed from one drought to another. In the 1999–2000 drought, for example, the Government of Kenya, mainly through the ALRMP,

was involved in a proactive rather than reactive manner in the response process. This was by making a deliberate effort in terms of contribution of resources and coordination to reduce the drought-induced suffering of the pastoralists. Among the lessons learned from past assessments of the implementation of drought programmes by the ALRMP and DPIRP is that an effective drought management system must include all major stakeholders. Some of the major stakeholders to be involved together with government are pastoral communities, donors, UN agencies, NGOs, and local institutions, including civil society organizations and pastoral associations. Prior to the 1999–2000 drought, decisions for intervention by the government were made based on reasons other than technical information available from the EWS. It is only during this drought that substantial attention by the government was given to information generated from the EWS, for example. This was demonstrated by the government's decision to base targeting and intervention decisions on available technical information. The previous food-aid distribution was mainly done without proper targeting.

EWS must, however, be combined with a strategy to enable the government and donors to respond to, and mitigate the effects of drought. If there is no capacity to respond to the information gathered by the EWS, then the investment is wasted. The rationale behind early warning is that it allows the government and donors to respond rapidly and avert humanitarian crises by early intervention to mitigate the impact of drought.

The Turkana example in northern Kenya has developed effective drought contingency plans that are decentralized to the district level. The main components of the Turkana plan included an overall drought policy, setting out the plan's objectives of minimizing the impact of drought and a set of preparedness measures; creation in advance of necessary physical infrastructure, a bureaucratic structure to manage the plan across line ministries, plans to negotiate with donors at an early stage of drought, agreed procedures and information provision and training about them; a definition of warning stages to be generated by the EWS and to trigger responses from government; a set of plans for specific mitigation, relief and rehabilitation measures; and a commitment to the general promotion of drought resilience.

Most northern Kenyan districts now have a Strategic Drought Management Plan with a set of contingency shelf plans to be



activated at ‘alert,’ ‘alarm,’ ‘emergency’ and ‘recovery’ warning stages. These plans have yet to be fully tested. Some of the major issues for drought contingency planning include the need to involve communities in drought contingency planning, through well-constituted and supported pastoral associations; the continuing difficulties in guaranteeing a flow of funds from donors (at issue here is the continuing reluctance of donors to mobilize funds or food aid in the light of early warning, hard evidence of famine and the donors’ own appraisal being preferred, by which time it is too late for mitigation); the administrative difficulty in Kenya of keeping contingency funds anywhere other than the central treasury; the need for a national-level body to interact with district drought planning, and the tension between the ideas of national drought planning and national disaster planning; and the need to generate a broad national consensus that drought mitigation and a last resort drought relief are worthwhile activities.

Specific to livestock off-take, and depending on the situation on the ground, contingency plans may consist of emergency animal purchase or the provision of subsidy to transport animals to the market to enable herders to realize some cash for their animals before prices collapse; maintaining the water supply for animals and humans, or opening new water supplies; provision of emergency grazing, including ‘cow-calf camps’ or other special arrangements to protect breeding stock; a rapid increase in the availability of livestock health service provision; flexible taxation systems that do not tax pastoral populations during drought; support for the private sector including pastoral associations in the provision of relief food and other services, either directly or by ensuring that pastoral household purchasing power is maintained; and providing fodder for drought-affected stock. In most of the districts visited, and based on the benefit-cost analysis of livestock interventions, the most supported are emergency animal purchases and slaughter for consumption by pastoralists, subsidies to livestock transport, and water supply through trucking for severe emergencies.

A method for estimating the desired level of off-take depending on the severity of drought is presented. It is further recommended that the EWS be strengthened by incorporating the traditional early warning systems in the districts using elders’ committees or Pastoral Associations where they exist to feed information to the DSG. The EWS itself should be a tool to bring about consensus among different stakeholders on the action to be taken at different

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stages of the warning system and to reduce the time lag between the approval of interventions and their implementation.

The handbook notes the need to generate accurate statistics on livestock populations and their distribution to facilitate better estimates on required off-take. It also notes the unanimous call by pastoralists for the rehabilitation of livestock marketing infrastructure and the development of outlets such as abattoirs as the long-term solution to effective emergency livestock off-take.

# 1

## INTRODUCTION

### 1.1 General

Livestock contributes heavily to Kenya's agriculture with respect to gross domestic product and food security of its population. It also provides, in part, the necessary thrust for other forms of development in the country. Most of the livestock are raised in the arid and semi-arid lands (ASALs), mainly involving pastoralists and agro-pastoralists who for the most part depend on livestock for their living. The statistics on livestock and their contribution differ according to the source of information. But recent government sources indicate that currently over 50% of the country's livestock population is based in the ASALs, which form about 80% of the country's land area (RoK, 2003).

Kenya's agricultural sector accounts for 20–30% of GDP. Of this, the livestock sector alone makes a contribution of about 50% (RoK, 2001). The livestock industry comprises mainly dairy, meat production, and hides and skins from cattle, sheep, goats and poultry (RoK, 2003).

In the ASALs, the livestock sector accounts for 90% of employment and more than 95% of household incomes. Most of the livestock slaughtered in major urban centres originates in these areas (RoK, 2003), with an annual slaughter of about 1.6 million Tropical Livestock Units (Omiti, 2003). Kenya's livestock from the ASALs is said to be worth Kshs 60 billion (US\$800 million). The internal livestock trade in the pastoral areas alone nets in about 6 billion shillings (US\$80 million) a year. However, comparative international statistics show that livestock contributes 88% of the total agricultural output in Botswana even though the country has half Kenya's livestock population and is of less agricultural

potential. Botswana does better per livestock unit than Kenya by producing US\$70 million worth of meat exports annually (Daily Nation, 29 March 2004; Omiti, 2003). Thus, there is a huge potential contribution that livestock can make to the Kenyan national economy.

The livestock sector should therefore receive adequate attention as happens in other countries. Unfortunately, this sector receives only 10% of the government's agricultural expenditure and less than one per cent of total spending, yet it is estimated that Kenya's potential to export livestock products if adequately exploited would earn more than the earnings from tea and coffee combined. This then calls for new thinking about livestock development strategies to harness the arid lands.

The arid districts are areas of low or undependable rainfall in which the average precipitation is deficient in relation to water requirements. They have harsh and complex environments, with fragile ecosystems quite susceptible to destruction under increased human population.

Arid areas are found mainly in the northern, eastern and coastal parts of the country. (Figure 1 shows the arid and semi-arid districts covered by Phase II of Arid Lands Resource Management Project (ALRMP).) In these areas of the ASALs, arable crop production is not possible without some form of irrigation; while in semi-arid areas rainfall may be sufficient for certain types of crops, requiring special management techniques. Therefore, except for the areas under cropping, the rest of the arid areas are used for grazing.

Rangelands are, by definition, inferior lands by reason of their physical and socio-economic limitations such as low rainfall, high temperatures, poor soils, and long distances from market outlets and supply centres (Musimba and Nyariki, 2003). They have been variously defined by others (cf. Stoddart and Smith, 1955; Pratt and Gwynne, 1977). In general, these are lands that carry natural vegetation that provides forage for both domestic and wild herbivores. They may also be a source of other products, including water, minerals, and services such as recreation. The rangelands of Kenya, for example, receive less than 750 mm of rain per year and have average temperatures that occasionally rise to above 40°C. These are extensive lands covering more than three quarters of the total land area of 583,000 km<sup>2</sup>.

This expansive area ranging from semi-arid, arid to semi-desert is home to 25% of the total human population which is estimated to be 32 million (RoK, 2003). The density is as low as two persons per km<sup>2</sup> in the arid districts.

As already shown, livestock are an important resource of the arid areas, probably the most important, because pastoralists rely on them directly for their subsistence and income generation. However, available statistics on the nature and amount of livestock off-take, and its contribution to the national economy are unreliable. Information on how the potential off-take during drought can be tapped to avoid excessive losses and benefit the pastoralists is inadequate and unreliable.

This situation exists because most of the production from arid areas is for subsistence, and data on the quantity produced and marketed are rarely collected. This handbook explores the livestock off-take from arid districts and provides guidelines for emergency off-take.

## **1.2 Livestock Off-take**

*Livestock off-take is the percentage of the current year's herd that is removed through sales, deaths, gifts, home-slaughters or theft.* This is an important measure of herd dynamics and therefore a means for estimating output from a pastoral production unit. Although non-commercial transactions contribute significantly to the total livestock off-take in a traditional pastoral household, commercial livestock off-take, i.e., animal units that leave the herd for cash sales, form the main form of pastoral off-take today. Commercial livestock off-take has increasingly become important with the breakdown of traditional drought coping strategies as pastoralism slowly evolves from solely subsistence to a commercial economy, and as the frequency and severity of droughts increase.

Besides political insecurity, drought is the most detrimental disaster distressing African pastoralists. Droughts are known to have short-term and long-term effects on pastoralists. The short-term effects are the shocks caused by the heavy losses of animals due to a drastic and abrupt decline of grazing resources, thereby exposing the pastoralists to severe transient food insecurity. Thus pastoralists find themselves with 'excess' animals in relation to land resources and with limited options for disposing of them (often with little return), direct consumption or finding extra grazing and water. The

effect of the drought of 1999/2000 provides a good example of how obvious the lack of appropriate advice to pastoral communities led not only to the loss of property in animals but also to the rise in political tensions due to the movement in search of pasture into inappropriate private lands. To avoid this, assistance must be given to find market outlets or any other means of disposing of the drought-induced 'extra' livestock well before droughts strike. This can be achieved through close communication with the pastoralists.

The long-term effects of droughts on pastoralists are through decreased food security and lost bargaining power. In addition to loss of livestock, distress sales of livestock cause abrupt decline in livestock prices, making it increasingly difficult for pastoralists to recover from such shocks, therefore rendering them more vulnerable to future disasters, and ultimately promoting poverty and hindering development.

Within the wider framework of poverty alleviation, improved livelihoods and sustainable development, it is imperative to facilitate emergency livestock off-take so as to minimize losses during droughts and ensure that pastoralists get reasonable prices for their animals, thus enabling the pastoralists to remain viable during and after the droughts. The focus in this handbook, therefore, is on the animal units that are available for the market during pre-drought periods as a requirement to guide the planning of emergency off-take in response to a looming drought. A timely response with adequate lead time to impending drought requires a reliable forewarning developed from in-depth understanding of the focus and means of monitoring environmental changes. However, the ability to track the environmental changes in a predictive manner alone is not adequate if not used to institute timely and appropriate coping mechanisms that permit resilience and recovery after drought.

**Figure 1. Arid and semi-arid districts in Kenya covered by Phase II of ALRMP**

*Source:* ALRMP

### **1.3 Objectives of the Study**

Several reports were written about emergency off-take in arid lands, including a review and impact assessment in 2001 of emergency interventions implemented during the 1999–2000 droughts. However, many of these studies lack financial and economic/social impact analyses to give comprehensive proactive interventions. Therefore the objectives of this project were to:

- a) review activities that have been undertaken in the past to increase livestock off-take in response to impending and ongoing severe drought, and carry out a more detailed study that collates all available information, including financial analyses of the interventions carried out;
- b) conduct consultations with the various District Steering Groups and come up with proactive emergency livestock off-take guidelines for responding to future emergencies; and
- c) develop a handbook on guidelines for interventions to be used to mitigate the effects of severe drought.

### **1.4 Approach and Methodology**

#### ***1.4.1 Scope of Work***

The scope of this work was to develop guidelines for enhancing livestock off-take in response to an impending emergency. The following was required in the process:

- Conducting a thorough review of literature on past experiences and carrying out a detailed financial analysis of past interventions, their ability to target the worst-off amongst the communities, and their achievements and shortcomings.
- Facilitating a one-day stakeholders' workshop to deliberate on past experiences and solicit ideas for more proactive strategies for increasing off-take in response to drought warnings.
- Drawing up draft guidelines that are proactive in responding to future emergencies, and providing recommendations on how to include effective monitoring and evaluation (M & E) to allow better information for



evaluation of effectiveness in the future, based on the review of the results of the first stakeholder workshop and interviews.

- Presenting the findings for discussion and review at a second stakeholder workshop convened for this purpose.
- Preparing final guidelines incorporating stakeholder comments.

#### **1.4.2 Methodology**

Methodology is in two forms: literature review and fieldwork.

##### *Literature review*

The literature survey focuses on the review of previous experiences and interventions in specific districts, relevant studies, and previous work by ALRMP. Detailed literature review on the key themes was used to complement the field reports, and guide informed recommendations. Information was gathered on the following issues:

- Experiences of the past and recent droughts.
- Past drought-related emergency interventions—such as de-stocking, re-stocking, animal health, animal nutrition, their strengths and weaknesses.
- Traditional and recent developments in early warning systems.
- Pastoral livestock herds.
- Livestock off-take by districts.
- Markets available for pastoralists and trends in marketing of livestock from arid districts.
- Marketing channels and networks for livestock from arid districts.
- Group dynamics in marketing.
- Major bottlenecks in livestock marketing in the arid districts, e.g., infrastructure.
- Pricing of pastoral livestock.
- Financial and economic implications of annual and seasonal off-takes for each arid district.
- Options available for increased off-take before drought to avoid losses.
- Livestock marketing policy affecting pastoral districts, e.g., taxation.

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- Comparison of interventions by different agencies (government, non-governmental, churches, etc.).
- Conventional versus traditional methods of monitoring, forecasting and mitigating effects of drought.
- Effects of droughts on the pastoralists' well-being.

### *Fieldwork*

This handbook covers primary data collected from eleven (11) arid districts—Baringo, Turkana, Isiolo, Samburu, Garissa, Ijara, Mandera, Wajir, Tana River, Marsabit and Moyale. West Pokot, which is a semi-arid district, was also covered.

A combination of data collection methods was employed, including personal interviews using a structured questionnaire, focus group discussions (FGDs) using a checklist of issues to be addressed, and key-informant interviews with stakeholders (pastoralists, extension workers and non-governmental agencies). The interviews were on critical factors that influence livestock off-take such as the ecological condition of the range, climatic factors, household attributes and herd characteristics.

The participatory approach was used as a focus for community involvement and empowerment as well as a means of exploiting the complementary relationships of the conventional and traditional weather forecasts, and mitigation strategies that can enable the stakeholders to translate the indicators into early warning signals.

The information obtained from field work was used to enrich that generated from literature review for a comprehensive analysis.

### **1.4.3 Expected Output**

This exercise was expected to generate the following:

- Information on livestock off-take by district for the previous droughts and normal years.
- Information on pastoralists' opinions on the previous interventions, and their suggestions on future responses.
- Evaluation of the previous interventions and recommendations.
- A handbook on guidelines for emergency livestock off-take.

## 2

### **PASTORALISM AND LIVESTOCK OFF-TAKE**

#### **2.1 Pastoralism: Concept and Practice**

Pastoralism is a production as well as a socio-cultural system consisting of an interaction between herders, animals and a given mode of resource management (Salih, 1990; Swift, 1977; Widstrand, 1975). A pastoralist is, therefore, any person whose means of livelihood is mainly tending grazing (and or browsing) animals (Nyariki and Ngugi, 2002).

Pastoralism sets a unique relationship between people, livestock and land. The strong ties existing among the three make pastoralism different from other forms of livestock production. As the main components of land—such as grass, shrubs, and water—vary both in time and space, mobility is an important aspect of pastoral production (Swift, 1977). The seasonal variation of resources necessitates relatively large land areas in which some parts may be set aside to be used during seasons of scarcity. Mobility does take place too to take advantage of situations.

These include exploitation of some specific resources (e.g., available water or salts) or because of increased incidences of disease. Pastoralists thus adapt nomadically to their environment when this requires movement beyond their home base or when alternatively there is a greater advantage in maximising mobility (Spooner, 1973).

Pastoralism can be categorised into nomadism, semi-nomadism or transhumance, depending on various characteristics of production. Nomadism or nomadic pastoralism (or pastoral nomadism), implies both subsistence herding and wide spatial mobility, often in cyclic

movements (Widstrand, 1975). This form of migratory pastoralism is characterised by non-cultivation.

People are involved in seasonal movements with broadly defined territory. They are particularly characterised by high mobility. Semi-nomadic pastoralism (also referred to as agro-pastoralism) is, on the other hand, a practice that involves unspecialised herd farming. People move back and forth from arable agriculture to herding or deliberately mix the two.

Transhumance is the most common form of pastoralism in Kenya nowadays (Nyariki and Ngugi, 2002). Transhumant semi-nomads move perhaps once or twice a year, usually in the dry season, from a base camp to a place where water and grazing are available. Many groups are not even full-time pastoralists, but supplement their pastoral economy with some kind of agriculture or trade. The term 'transhumance' originated in central Europe and Scandinavia to describe movements of livestock by peasants between lowland pastures and summer pastures in the mountains. It is now also used to describe short, seasonal movements of animals, under the care of herders, between permanent homesteads and permanent outlying summer pastures (Widstrand, 1975).

'Pure' pastoralism excludes two modes of production: small numbers of animals kept on farming agricultural lands and those herds that form part or all of artificial, specially organised, commercial enterprises (ranches). Thus, what makes pastoralism a particularly unique system of production is that, as a way of life, pastoralists are in continuous movement from one ecological niche to another. However, the expansion of the market economy and the emergence of new consumption patterns among pastoralists reveal that pastoral societies are more and more interlocked into regional and national trade (Nyariki and Ngugi, 2002).

A traditional pastoralist is a seasoned manager who employs sound livestock and land management that ensures his survival under the episodic environmental vagaries such as recurrent droughts, famines, disease outbreaks, hazardous pests and other man-made disasters (Herr, 1992; Tadingar, 1994; Wilson, 1986).

In Kenya and the adjacent parts of Eastern Africa, droughts occur in five out of every twenty years (Pratt and Gwynne, 1977). Such droughts are associated with famine and feed shortages for domestic animals. In such occurrences, the pastoralists, by virtue of

their local knowledge and experience, use their large diverse herds of livestock to move not only within the territorial reach but also across political boundaries to meet the livestock and animal requirements, i.e., feed and water (Oba and Lusigi, 1987; Herr, 1992). Though large numbers of animals would die in a serious drought, the herds, which are shared among tribal and non-tribal members by way of intertribal alliances in adjacent good pasturelands, would not take long to recover.

The small ruminants (sheep and goats) being highly prolific would be the first to recover to normal levels (Musimba and Nyariki, 2003). In some parts of West Africa, for example, the interrelationship between pure pastoralists and agro-pastoralists has proved to be a sustainable land use system and is a source of livelihood. The agro-pastoralists also lease their farmlands to the nomadic pastoralists so as to utilize crop residues as well as clean up the land under crops (Payne, 1976).

There has been shrinking land and a concomitant decline in the pastoralists' welfare and long-term survival as a result of the 'invasion' of the ASALs by cultivators and failure of development projects meant to support the pastoralists (Musimba and Nyariki, 2003).

## **2.2 Pastoral Herd Off-take: A Review of Literature and Analysis of Secondary Data**

There are various forms of livestock-related off-take. These include live animals, milk, meat, hides and skins, manure, among others. Off-take may be seen as removal of live animals or their products from the herd to within the household, mainly for consumption, or to outside destinations such as other households, for various reasons, or to markets for sale. The most important of the livestock-related off-take is in the live form. Livestock off-take is, thus, defined as the percentage of the current year's herd that is removed through sales, deaths, gifts, home-slaughter or even theft. This kind of off-take is calculated from the total herd size kept in a year (Nyariki and Munei, 1993).

Pastoralists are sometimes reluctant to sell stock, because they have to maintain a certain level of production for subsistence. They must also hedge against the vagaries of the highly uncertain climate, epidemiological conditions and an equally uncertain political environment (Bonfiglioli, 1992). For example, in Ethiopia the

Borana accumulate animals as social and economic assets rather than as a source of income (Coppock, 1994; Bekure *et al.*, 1991). In this way they also protect themselves from perturbations which are part and parcel of pastoral production (Pratt and Gwynne, 1977). As mentioned elsewhere in this text, large herds act as a guard against a drought. The larger one's herd is at the beginning of drought, the more likely one is to have a viable herd at the end of the drought (Grandin and Lembuya, 1987; Nyariki and Wiggins, 1999).

The commercial strategies pursued by pastoralists, although suited to their particular situation, have not been successfully understood by modern economists. For example, a herder prefers to restrict off-take to the non-productive categories of animals of his herd. These include old and/or barren cows, cows with insufficient milk production or with atrophied teats, cows which refuse to be milked or to give milk to their calves, those with physical features considered harmful, those which continually abort, sterile males and females, males which are not good reproducers, weak animals which are not resilient to dry season conditions, and animals handicapped by diseases or birth defects. These factors enter into the marketing decisions that are taken according to the three main criteria for evaluating an animal by pastoralists, namely physical resistance and milk production (Bonfiglioli, 1992; Mugarura, 2001; Orre, 2003; Sutter, 1982).

The Maasai pastoralists of Kenya, for example, often delay selling stock as long as possible, with the result that animals are sold in poor condition, fetching low prices (Bekure *et al.*, 1991). Oversupply of such animals to markets exceeds the capacity of the markets to absorb them. Consequently, many animals die despite pastoralists' belated willingness to sell (Grandin and Lembuya, 1987). This causes a considerable economic loss both for producers and the nation. The solution to this is to increase sales of animals during favourable periods.

A pastoralist's decision rule to sell any animal now or keep it for sale in the future depends on the implicit value of animal products consumed by the pastoral family, the value of the progeny, liquidity, security, prestige, power, and aesthetic pleasure. The decision will thus depend on a comparison of the gain from keeping the animal one more period versus the costs of doing so (Mugarura, 2001; Nyariki and Munei, 1993; Orre, 2003). By keeping an animal one more period, a pastoralist may benefit from the increase of the animal's sale value due to its increased weight and the additional

value flowing from the animal as a living resource. The cost of keeping an animal one more period includes the cost of herding, feeding, watering, maintaining good health, and the risk of mortality; and the one period's gains foregone by not selling the animal and investing the proceeds in another (presumably younger) animal or some other assets. Thus, the animal will be sold if the cost of keeping it one more period outweighs the benefits.

The flow of benefits from a live animal is a function of, among others, price and age (Ariza-Nino and Shapiro, 1984). To the extent that the animal is valued as currency, or is held as insurance, prestige and power, these values are enhanced if the potential sale value of the animal is increased by a price increase or by its greater size. The value of the progeny part of a female's flow of benefits is increased if the progeny's potential sale value rises because of a price increase.

A study carried out on the Borana from the southern rangelands of Ethiopia showed that the Borana sell animals to satisfy their cash needs (Dahl and Hjort, 1976). They do so at sub-optimal times of the year with respect to the seasonal terms of trade, and prefer to sell certain classes of cattle (older males) that tend to be different from those sold in developed animal production systems (Sandford, 1983). This occurs when milk production drops and food is needed; and this is why herd owners always wait until the dry period to sell animals even though they are aware that the terms of trade are less favourable compared to other times of the year. Their attitude may, therefore, be best described as 'optimistic gambling'—they hope that the unfavourable weather or economic difficulties will break before they have to sell an animal.

As a strategy to avoid cattle sales, the Borana of Ethiopia tend to diversify into small ruminants and crop cultivation to help them endure increasing population pressure and maintain household viability (Coppock, 1992). Thus, the main objective of pastoralists is not acquisition of maximum returns in terms of money from cattle sales, but the maintenance of a maximum number of cattle (Ngumi, 1976). This is supported by Coppock (1994) who suggests that the Borana prefer not to sell cattle in favour of the need to accumulate them. They are increasingly being forced to sell cattle to procure grains for food and tend to sell in the dry season when they are in acute need of money. They prefer to sell mature male cattle because income received is sufficient to procure goods as well as replacement calves, thus satisfying several objectives. The

Borana seek higher prices precisely to reduce the number of cattle households have to sell over a long period. The poor are forced to sell immature cattle because of a low number and species diversity of the animals held. Should cattle prices increase and the prices of consumer goods remain constant, the ultimate result would be to lower throughput of cattle through the market.

The flow of livestock through marketing channels fluctuates rapidly between different seasons of the year and between years. It is difficult, therefore, to separate the impact of price on supply from the influence of weather on the abundance of grazing, and on the ability of pastoralists to retain their animals (Sandford, 1983). For example, according to Bekure and Chabari (1991), in Maasailand, the supply of cattle to the market increases as long as the long dry season progresses. In the past, prices of cattle also fluctuated seasonally but generally increased, in keeping with the higher prices gazetted by the Kenya Government. Following the rains in March–May, the Maasai cattle tended to put on weight and improve their body condition so that during June and July they commanded higher prices. During the long dry season, however, cattle lost condition and fetched low prices. The cycle was repeated again following October–December rains. Further, Evangelou (1984) reported that there was a negative correlation between annual rainfall and level of cattle sales among the Maasai in Kajiado District over the period of 1956–1977. This indicates that with improved range condition, the supply of livestock to the market declined during this period.

Without ways to control supply, pastoral systems are plagued by market disequilibria. Significant shifts in supply following the cycle of drought and recovery cause instability in livestock prices, market surplus, producers' incomes, and consumption patterns of livestock products (Holtzman and Kulibab, 1995). Pastoral systems are more commonly characterised by high seasonal annual fluctuations in the number of livestock marketed.

The rate of livestock off-take from pastoral herds in Kenya has been estimated at 10% per annum (Evangelou, 1984), compared to that from ranches of 25% (Coppock, 1994; Nyariki and Munei, 1993). Among the pastoral households, the status of poverty affects livestock marketing patterns. A poor herd owner does not have a choice but to wait for an animal to reach optimum weight before selling if he has to buy grain to survive (Coppock, 1994). It is usually the poor pastoralist who has to sell an immature animal. If



more immature cattle appear on local markets, it means, therefore, that households are getting poorer.

Studies in Somalia and Botswana by Behnke (1983) revealed that increased commercialisation of cattle keeping led to increased off-take of stock for slaughter but at the same time led to a weakening of traditional insurance systems (e.g., animal loans), lower milk off-take, less intensive herd management, and social stratification resulting in a few rich herd owners and many impoverished herders.

With few animals to sell without endangering their herd capital, poor pastoralists have no viable alternative to selling milk in order to raise money to buy cereals. Indeed milk is sold even when there is no surplus (Behnke, 1987; Swift, *et al.*, 1996). This had also been considered earlier by Dahl and Hjort (1976) as being symptomatic of increasing poverty. Dairy marketing among pastoralists is expected to increase over the long term, especially from pastoralists in the pool of encampments within reach of marketing towns (Coppock, 1994).

The so-called ‘cattle complex’ is another recurrent paradigm, which proposes that pastoralists are passionately and emotionally attached to their cattle such that they cannot part with them under any circumstances. This is to say that pastoralists are irrational and practise ‘contemplative livestock raising,’ which is useless, archaic and environmentally destructive.

The main issue here is the negative response of pastoralists to prices—they appear to hold on to their animals even when market prices are favourable for profitable sales. The cultural significance emphasised by this paradigm has led to subsequent observers to downplay or overlook the subsistence role of cattle.

The quantity, nutritional value and seasonality of food produced by cattle has a major influence on the herd size and structure, demand for non-animal food, and the patterns of sale of milk and animals (Shapiro, 1979). If it occurs, the negative response of off-take to price does not, therefore, necessarily demonstrate irrationality or unfamiliarity with a market-oriented economy, but rather point to another rationality aimed at survival and security (Herbeson, 1992; Bonfiglioli, 1992). The seemingly perverse supply response has also been observed among commercial ranchers (Nyariki and Munei, 1993); and means that the throughput of marketed animals could decline over time in response to higher prices. It implies that

pastoralists only need a certain amount of income per year and manage herd assets in a manner which minimises sales. This is because herd assets have other traditional, social and economic functions besides income generation. Thus marketed livestock (slaughter) off-take from pastoral herds is not necessarily driven by profit maximisation.

### 2.3 Analysis of Slaughter Off-take

The last livestock census in Kenya was done more than 30 years ago. The livestock numbers are only provided as rough estimates. Livestock populations from Kenya's pastoral herds are estimated at 3.7 million cattle, 926,000 camels, 5.8 million goats and 3.9 million sheep. A breakdown is given for the 13 main pastoral districts in Table 1.

The total monetary value of the livestock from the pastoral sector is estimated at Kshs 60–70 billion. Off-take rates from these herds are estimated at 6–14% for cattle, 1–3% for camels and 4–10% for sheep and goats (RoK, 2000). These rates then translate into 220,130–513,630 head of cattle, 9,250–28,000 camels, 231,960–597,000 goats, and 156,600–391,500 sheep, which are removed from pastoral herds annually. If values are attached to this off-take, a 'conservative' total annual marketed value both locally and nationally is close to Kshs 5 billion (Table 2). Some reports have given figures as high as Kshs 8 billion (see RoK, 2000).

**Table 1. Human and livestock populations ('000) in Kenya's 13 pastoral districts**

District	Human Population	Cattle	Camels	Sheep	Goats
Tana River	180.9	342.6	70.0	180.0	400.0
Garissa	392.5	390.0	56.0	40.0	271.0
Mandera	250.4	203.6	300.0	216.0	162.0
Wajir	319.3	200.0	260.0	250.0	300.0
Isiolo	100.9	140.0	30.0	180.0	205.0
Marsabit	121.5	50.0	78.0	300.0	425.0
Moyale	53.5	50.0	7.0	3.0	12.0
Baringo	265.0	296.0	4.3	233.0	876.2
Kajiado	406.1	170.0	0.0	500.0	449.0
Narok	365.8	801.0	0.0	436.0	423.0
Samburu	143.5	217.6	3.7	696.0	53.1
Turkana	450.9	200.0	115.0	687.0	2,062
West Pokot	308.1	608.0	1.0	190.0	120.0
Totals	3,358.4	3,668.8	925.0	3,749.0	5758.3

Source: RoK (2000; 2003).

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In terms of meat supply, if the average off-take in Table 2 and the average carcass weights of livestock as shown in Table 3 are used, the pastoral herds produce in the order of 71,118 tonnes of meat from the various livestock species annually. Whilst the exact amount of what the pastoralists require for their own meat needs is not known as they subsidise meat with milk, blood and grains, this figure is beyond what they consume.

Using the 1999 population census figure and a growth rate of 2.9% per year, the Kenyan population is estimated currently at 32 million (RoK, 2003). Since the per capita consumption of meat is estimated at 12 kg (RoK, 1995), the amount of meat consumed or ‘demanded’ annually is about 384,000 tonnes. To this total, the pastoral areas contribute about 71,118 tonnes or 19% of the total national consumption (Table 3). The rest comes from ranches and ‘large farms,’ and smallholders (see Figure 2). Using the same method to estimate the current population of the pastoral districts, we obtain a figure of about 3.8 million persons. These would consume 45,600 tonnes of meat. Thus, it implies that out of the total meat off-take from pastoral herds about 60% is consumed locally while the rest is a surplus which goes to support the rest of the country’s population. In other words, pastoralists are net meat ‘exporters.’ At an average price of Kshs 120 per kg of meat (RoK, 2003), the total amount of money equivalent to 71,118 tonnes of meat is over Kshs 8.5 billion.

**Table 2. Estimated values of pastoral herds and annual slaughter off-take**

Species	Total number	Value (million Kshs)*	% average off-take	Average off-take (numbers)	Average value (million Kshs)
Cattle	3,668,800	36,688.0	10	366,880	3,668.8
Camels	925,000	9,250.0	2	18,500	185.0
Sheep	3,749,000	5,623.5	7	262,430	393.6
Goats	5,758,300	8,637.5	7	403,081	604.6
Total	—	60,199.0	—	—	4,852.0

\*Average prices per animal: Cattle = Kshs 10,000; Camel = Kshs 10,000; Sheep = Kshs 1,500; Goat = 1,500.

Source of data: RoK (2000).

This is what may be regarded as annual income both in monetary terms and in ‘kind’ from slaughter. About 40% of this accrues as direct monetary income that goes to meet pastoral household requirements—clothing, shelter, health, fees, etc.

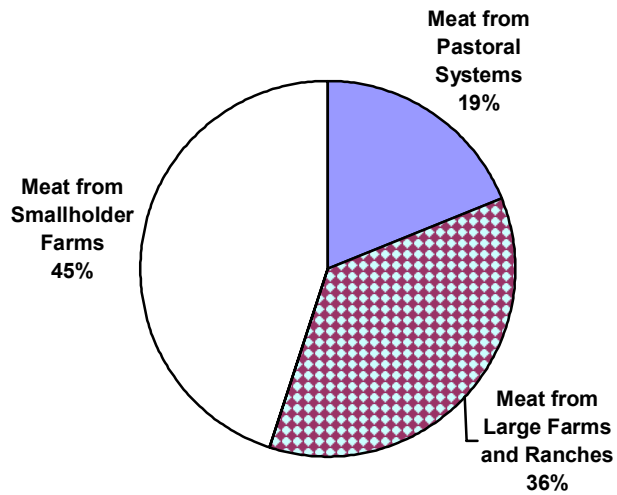
**Table 3. Average annual meat off-take from pastoral herds**

Species	Average live weight (kg)	Average carcass weight (kg)	Average annual off-take (numbers)	Average annual off-take (tonnes)
Cattle	250	150	366,880	55,032
Camels	250	150	18,500	2,775
Sheep	30	20	262,430	5,249
Goats	30	20	403,081	8,062
Total	—	—	—	71,118

*Source of data:* RoK (2000), Thompson *et al.* (2000).

The ‘income’ from pastoral slaughter has implications on food security, personal security, poverty and environmental health. In the absence of pastoral beef/meat production, the pastoralists will be forced to look for alternative sources of food, including relief food, cattle raiding/rustling, or rural to urban migration. Of course, other than provisions from donors, the government must find money to purchase relief food, causing budgetary problems in turn.

Pastoralists may also resort to other means of exploiting range resources such as charcoal burning and cultivation, which may cause environmental degradation. Cattle raiding leads to serious consequences related to insecurity, which include loss of property, lives and impoverishment. Without seeking alternatives to food insecurity will mean imminent hunger, starvation, and death. When people feel insecure, they will not be involved in productive engagements such as herding, but will spend time and resources trying to protect themselves—leading to loss of production, which cannot be easily quantified. Insecurity will curtail pastoral movements. Mobility, being a central tenet of pastoral production, if curtailed will mean reduced production of livestock and productivity of pastoral herds. It will also mean that pastoralists will be concentrated in limited range areas, leading to loss of livestock due to starvation and degradation.



**Figure 2. The contribution of pastoralism to the national meat output**

*Source of data: RoK (2000, 2003).*

To maintain the food security status and living standards of the pastoralists associated with slaughter off-take, the government will be required to raise Kshs 8.5 billion every year. This is money that could support other areas of development such as building roads and providing services such as free primary education or security. Migration to urban centres by pastoralists in search of alternative employment, which is usually unavailable, impacts the pastoral economy negatively because it leads to loss of labour for herding, thereby reducing pastoral production. Another major problem is that related to congestion of towns by the unemployed, making it impossible for government and the private sector to adequately provide services such as housing, water, transport and food, in turn causing increased insecurity.

# 3

## EMERGENCY LIVESTOCK OFF-TAKE

A discussion of emergency off-take will not be complete without first understanding the strategies pastoralists adopt in order to cope with or manage droughts and other related hazards. Below is a presentation of these strategies.

### 3.1 Coping with Drought by Pastoralists

A predominant objective of pastoralists is to minimise the risk of failure in their major sources of livelihood—livestock. Risk management is interpreted as a deliberate household strategy to anticipate failure in individual streams of income by maintaining a variety of activities. It is a before-the-event (ex-ante) management strategy. On the other hand, coping is the involuntary response to anticipated failure in major sources of survival; it is thus an after-the-event (ex-post) management strategy. For example, ex-ante income management is viewed as a risk response, while ex-post consumption management in the wake of livestock loss or crop failure is interpreted as coping (Walker and Jodha, 1986; Carter, 1997). Coping includes strategies for maintaining consumption such as using up food stores, falling back on savings, selling of livestock, soliciting gifts and remittances from neighbours, relatives and friends, and liquidating assets. Thus livestock alone can fall under the category of savings, produce to be sold or liquidated assets (Nyariki and Ngugi, 2001).

Unplanned responses to or coping with crises may initially involve looking for new income sources, and disposing of assets may be seen as a last effort to try and cope. This then implies that households that have more assets, which in pastoral households are mainly composed of livestock, may find it less difficult to cope with the effects of drought.

Thus, in these environments, pastoralists who diversify are less vulnerable to livelihood collapse in the wake of disaster such as drought that results in livestock loss or crop failure (Campbell, 1990; Nyariki and Ngugi, 2001).

Vulnerability is therefore a high degree of exposure to risk, shocks and stress and proneness to food insecurity. The concept may also refer to resilience (ability to withstand change) and sensitivity of livelihood systems following human interference (Swift, 1989; Chambers, 1983; Davies, 1996).

Uncertainty is said to result in sub-optimal economic decisions by pastoralists (absence of profit maximisation), unwillingness or resistance to change (conservatism), and a reinforcement of social differentiation by impacting the poor and the rich differently (Ellis, 1993). Pastoralists, who live in unstable production conditions, are likely to be risk averse. They try to avoid risk by adopting production and or marketing strategies that assure an adequate food supply for the household throughout the season or year. As a result of unpredictable circumstances under which they operate, they have developed various risk management strategies and coping mechanisms. One of the major strategies is to keep a variety of livestock. Livestock enhance risk management and coping capacity as sales are increased during drought to purchase grains (Nyariki and Ngugi, 2001).

### **3.2 Established Drought-Coping Strategies**

Discussions on how pastoralists in Africa cope with drought or other hazards and disasters abound in literature. Campbell (1999) and Swift (1977), for example, provide detailed discourses of these strategies. Campbell specifically reports the strategies adopted by the Maasai pastoralists of Kajiado in a study that compares the droughts of 1972–76 and 1994–96.

Coping mechanisms can be grouped into two: established and recently adopted. Whilst the details of these may differ from community to community, the principles are generally the same. Among others, the broad categories of established strategies are movement of livestock to areas with better water and grazing resources, sale of livestock, prayer and payment to a rainmaker, resort to hunting and the use of wild foods, and the moral economy.

*Prayers*

Praying is a common feature not only in the pastoral communities but also among politicians, and has assumed a national outlook recently where it is organised by the government from time to time to pray for rain when droughts seem to loom large. Although praying for rain is a universal response, paying a rainmaker, which is common among the Maasai, involves an investment and therefore is related to the severity of the circumstances.

*Movement of livestock to areas with pasture and water*

Movement (mobility) of both livestock and herders occurs for two main reasons: resource exploitation and escape. The latter involves long distance migration to escape drought. Pastoralists reduce livestock losses by utilising mobility. Movement of livestock to areas with water and pastures is thus the principal means of coping with drought among the pastoralist (Thompson *et al.*, 2000). The number of movements undertaken during any year depends on environmental conditions, the state of available resources and the livestock types owned (Swift, 1977). Depending on the severity of droughts, moving takes place within districts, across districts and provinces, and even across international borders. For the Maasai of Kajiado (Campbell, 1999), the main drought-retreat destination is now mainly to Chyulu Hills since alternatives have become unavailable because of the expansion of other land uses. There is also some limited movement across the border to Tanzania during the dry seasons.

*Liquidation of assets*

Liquidation of assets is a common feature among the pastoralists to cope with the effects of drought and the concomitant food insecurity. This is normally in the form of livestock sales. As alternative sources of income increase, however, liquidation of assets is becoming less significant.



*Hunting and gathering*

Hunting and gathering wild plants to supplement food supplies is noted among most pastoralists. The more severe the conditions of drought the more intense do these activities become. However, with stringent measures to curb illegal hunting of wildlife by Kenya Wildlife Service (KWS), this option has diminished in importance.

*Moral economy*

The 'moral economy' (Scott, 1976; Campbell, 1999), which has also been described by Hyden (1986) as the 'economy of affection,' denotes networks of support, communications and interactions among structurally defined groups that are related by blood, kin, community or other affinities (Hyden, 1986). In most parts of the African continent, productive and reproductive processes at the household level, more especially those involved in pastoralism, are still embedded in the moral economy (Nyariki and Ngugi, 2002).

The pastoralists maintain a variety of social linkages both within their own society and between themselves and adjacent communities. This is done through livestock transfers to friends and kin as loans. These are designed to reduce the effect of adverse environmental conditions, disease or external threats. So, families whose herds were lost during drought could approach their affine for support to rebuild their herd. Social relations are particularly useful when one considers the fact that no insurance facilities or banks are readily available to pastoralists.

In communal grazing societies, without well developed markets on which to sell surpluses as found in most parts of Africa, emphasis on sharing among members of the group tends to discourage accumulation contrary to what many people believe. The communities cope with increasing population density through customs and traditions that regulate marriage and other forms of behaviour. The importance of the moral economy has, however, declined over time as capitalistic economic influences continue to influence pastoral societies, thereby instilling individualistic behaviour (Nyariki and Ngugi, 2002).

It is argued that as the local economies become incorporated into the market economy, and as the extended family structures are replaced by nuclear family structures, the reciprocal rights and obligations associated with the moral economy will alter.

Those based in family and communities are increasingly being replaced by those dependent on institutional structures such as pastoral associations, NGOs, and government for financial support and access to food relief.

#### *Keeping large herds*

To assure their basic subsistence requirements throughout the year plus those for trade, social obligations and drought losses, pastoralists require sufficient numbers of livestock (Campbell, 1981). Even though many social scientists have argued that nomadic pastoralists keep large numbers of animals, far beyond what the range can support, which then are unable to survive drought periods of low vegetation production, nomadic pastoralists believe that large numbers of animals are vital to get through the drought periods. Thus, pastoral communities in Kenya own large herds as insurance against drought losses. The more animals someone keeps the better the possibilities that more of the herd will survive the dry spell. Also, whereas livestock as capital (see Jarvice, 1974; Nyariki and Munei, 1993; Nyariki and Wiggins, 1999) have a value out of proportion to the labour input, it is also true that in a traditional system, where the herds are large, a large number of people are dependent on each herd.

It is being suggested that the solution to this problem is to develop new ideas of capital that will substitute cattle as a cash and savings bank so that increases in herd sizes are matched with available forage, and other resources. However, it may be useful to point out that despite the relative profusion of data now available, the pastoral economies are only dimly and patchily illuminated, and it would be rash to base too confident and dogmatic conclusions on the data which exist.

#### *Livestock raiding*

Cattle raiding is a livelihood-enhancing act through redistribution. Re-distributive raiding is a traditional means of reallocating pastoral resources between rich and poor herders, and has been an equally common feature of both intra- and inter-tribal relations (McCabe, 1990; Hendrickson *et al.*, 1998). Raiding serves to rebuild herds after livestock have died because of drought or have been taken away by other communities through raids. The incidence of raiding is thus closely tied to climatic vagaries and tribal traditions.

It is also believed that raiding is governed by intricate rules within the context of an indigenous perception that livestock are a collective property.

In pastoral societies, without government intervention, raiding served to maintain separate identities and regulated relations between different groups. We should be careful, however, not to moralise raiding as positive tradition and ignore the negative impact it can cause.

### **3.3 Recently Adopted Coping Strategies**

A number of opportunities for reducing vulnerability of pastoral populations have been created in the recent past as a result of deliberate actions taken in response to past experiences of deficits due to drought and socio-economic changes due to national and international forces. For example, the experience of the 1972–76 shortage demonstrated that pastoralists in Kajiado wanted to save cash, but were unable to do so because there were no banks. Appropriate institutions have so far secured some of these facilities.

External forces have also contributed to socio-economic changes. These include immigration, improvements in transport system, liberalisation of most aspects of the economy, education, development and change of policy on tourism. The result has been diversification of the herding economy to include farming, where this is possible, trade such as running stores in small rural shopping centres, an increase in returns from tourism, especially eco-tourism, and migration into towns in search of salaried employment.

### **3.4 Past Responses to Droughts by Government and other Organisations**

#### ***3.4.1 Government Programmes and Interventions***

Responses to droughts have differed from one drought to another. In the 1999–2000 drought, for example, the Government of Kenya, mainly through ALRMP, was involved in a proactive rather than reactive manner in the response process. This was by making deliberate effort in terms of contribution of resources and coordination to reduce the drought-induced suffering of the pastoralists.

Drought-related programmes are implemented under the Office of the President. Among the lessons learned from past assessments of the implementation of drought programmes by ALRMP and DPIRP is that an effective drought management system must include all major stakeholders. All the key stakeholders must act together, but for proper coordination the government should take the lead. Some of the major stakeholders to be involved together with government are pastoral communities, donors, UN agencies, NGOs, and local institutions including civil society organizations and pastoral associations.

So far, ALRMP has been able to marshal support through relevant government ministries and departments so as to influence appropriate decisions and actions with respect to the use of Early Warning Systems (EWS) information to target relief assistance as a means of drought response. The enhanced relationship by key government ministries, e.g., Office of the President and Ministry of Finance, with relief and development partners has provided the necessary support and leverage with which the ALRMP has established good rapport with other government ministries, donors and NGOs. This has in turn played a pivotal role in the coordination and management of food security and drought-related issues. The ALRMP-DPIRP-EWS/Drought response model and the involvement of stakeholders such as the World Bank and World Food Programme (WFP) saw the need to use technical information to target food relief.

Prior to the 1999–2000 drought, decisions for intervention by the government were made based on reasons other than technical information available from the EWS. It is only during this drought that substantial attention by government was given to information generated from the EWS. This was demonstrated by the government's decision to base targeting and intervention decisions on available technical information.

In the early 2000, a WFP-supported food-aid targeting initiative recommended a change from the previous distribution system, which was mainly done without proper targeting. This recommendation was adopted by the government. It was also agreed that government contribution of food relief (mainly maize and beans) would be put together with that of other contributors and distributed through one system agreed on by all stakeholders. This was a major departure from the system used in the 1996-drought, where two parallel systems existed. The new system was first tried

in Turkana District in mid-2000 and was found to be effective. It was then implemented in four arid districts in northern Kenya. By the end of 2000, the system was being applied countrywide.

In contrast to the 1996–1997 drought, the government shared information freely with other stakeholders during the 1999–2000 drought, especially on what it was doing in terms of funding relief activities. The ALRMP and the KFSSG were given the responsibility to prepare drought emergency appeal documents. In so doing, the government recognised the need for appeals for assistance to be based on technical and verifiable information. For this reason, the estimates were more credible and more acceptable to international donors.

#### ***3.4.2 Participation of UN Agencies, Donors and NGOs***

Experience has shown that efforts and processes that support pastoralists to try and cope with the debilitating effects of drought cannot have an impact without the involvement of government as the major stakeholder. Because of poor governance and especially suspected financial impropriety by the past Kenya Government, donors and other agencies tried to implement drought-related programmes at the exclusion of the government but most of the programmes were unable to create an impact.

Except for the 1999/2000 drought, most donors and NGOs adopted a parallel relief assistance provision system to that of the government. This led to the development of parallel institutional structures such as NGO and donor forums, at the exclusion of government. One such bilateral donor that stopped cooperating with the government and funding assistance for pastoral food security programmes was the Royal Netherlands Government, which has supported such programmes for over 15 years through the DPIRP, and is reputed to have contributed immensely to the current drought monitoring system in country.

Many stakeholders have now recognised the importance of working alongside the government and trying to influence its decisions and policies from within as opposed to establishing unsustainable parallel institutional structures. The main idea behind this is that government should be responsible for its citizenry's food security and general welfare.

The benefit of this approach has been improved dialogue between government and other stakeholders. Some of those involved in this approach have been FAO, OXFAM-GB, UNDP, WFP and DFID.

### **3.5 Past Experiences and Lessons Learned: Emergency Livestock Off-Take Activities**

#### ***3.5.1 Emergency Livestock Off-take Programme in Isiolo District, 1996–7***

##### *Linking early warning system information to response*

The experiences discussed here are based on the interventions in Isiolo District by ALRMP together with the Drought Preparedness Intervention and Recovery Programme (DPIRP), a community based drought management programme of the Government of Kenya, which was supported by technical and financial assistance from the Netherlands.

The semi-arid to arid district of Isiolo covers an area of 25,605 square kilometres and is one of 10 districts of Eastern Province in Kenya. Rainfall patterns are bi-modal with the long rains falling between March and May and the short rains expected between October and December. Isiolo town is the 'gateway' to the north and as such is home to a diverse population from the Borana, Somali, Turkana, Samburu, Meru and Kikuyu ethnic groups. The majority of Isiolo, however, is home to the Borana people. The district has an estimated population of 90,000 people with a growth rate of 4.8% per year, which is among the highest in Kenya.

Nomadic pastoralism remains the dominant livelihood for the people of Isiolo. Dairy farming and limited crop production are also practised on a small scale. A long history of insecurity in the region and the resulting loss of livestock and declining herd sizes characterises the high levels of vulnerability in the district.

A drought was experienced in the district from mid 1996 to 1997 with three successive droughts. By the first quarter of 1997 the divisions of Merti, Garba Tulla and Kinna were already categorised as being in the alert/alarm stage of the Drought Preparedness Intervention Recovery Programme (DPIRP) early warning system. Overuse of grazing reserves and boreholes had resulted in inadequate pasture and an acute water shortage for livestock. An estimated 40,000 people (7,000 households) were at risk.

Early warning signals like livestock mortality, low birth rates and weakening of livestock continued to show widespread and substantial deterioration in Isiolo. The deterioration eventually began to adversely affect human health and welfare by the beginning of the first quarter of 1997 when malnutrition amongst children had risen to 35–40% as measured by mid-upper arm circumference (MUAC) surveys; a MUAC of less than 135 mm is taken to indicate malnutrition.

In March 1997, the Boran community in Merti Division requested assistance to dispose of their livestock in the face of depleted grazing and water resources in the area and in view of impending crises in the coming months.

In May 1997, the District Steering Group, a sub-committee of the District Development Committee, sent out a rapid assessment team to the drought stricken areas to ascertain and verify the magnitude of the crisis. The team reported that high livestock mortalities particularly in cattle were already evident, while livestock prices were falling by as much as 50% compared to normal seasonal prices. The team also reported that despite the low prices, approximately 40% of the remaining cattle, were in moderate condition and could still be marketed and fetch reasonable prices. The pastoralists believed that of this 40%, about half could survive even if the expected short rains later in the year failed, as there would be enough pasture to support this population of animals. Thus, the DPIRP estimated that 5,000 head of cattle would need to be purchased (removed) from the community. This type of intervention is what is referred to as an emergency livestock off-take programme. In this intervention, the selling of livestock considered at risk by the community is facilitated by subsidising the traders' costs. This makes it more cost-effective for traders to buy livestock while stabilising prices for the pastoralists. Pastoralists are experienced in selecting which animals to sell during a stress period and which ones to retain as breeding stock for the future. The timing of the intervention is therefore crucial as the programme should aim to stabilise prices and locate livestock that are still in a fair and saleable condition.

Loss of livestock by pastoralists among the Boran community is equivalent to loss of identity. A pastoralist family that loses its animals loses its sense of cultural self as well as becoming destitute.

Hence the success of a relief operation for this type of community should not just be measured in terms of declining levels of malnutrition but also in terms of preserving the buoyancy of the pastoralist community.

*The objectives of the intervention*

The main objectives were to:

- provide assistance to pastoralists who still owned livestock by providing an emergency off-take outlet thereby reducing drought related losses of cattle.
- support the purchasing power of households through stabilisation of prices.

Although it is often necessary to complement livestock off-take programmes with cereal price stabilisation, this was not necessary on this occasion as aggregate production of cereals in the country was stable so that cereal prices were affordable during the crisis.

*Intervention procedure*

A number of steps were taken as listed below:

- A rapid needs assessment of the drought situation.
- Discussion, agreement and eventual contracting out of the intervention to two competent NGOs to facilitate effective implementation.
- Community decisions on livestock market day schedules and organisation and provision of services for screening cattle for contagious bovine pleuro-pneumonia, foot and mouth disease and rinderpest by the divisional veterinary officers and the issuance of livestock movement permits to facilitate movement to the Isiolo market and beyond.
- Agreement on the transport subsidy between DPIRP and willing traders.
- Formation of livestock off-take community committees consisting of community elders.
- Publicising planned market days by the community elders and the DPIRP.
- Provision of security arrangements by DPIRP to traders from Isiolo to market centres 250 km away. Traders needed security since they carried cash to pay for livestock.



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- In order to inject cash into the economy immediately, purchase of the livestock on credit was not allowed.

### *Implementation*

The implementation involved DPIRP's provision of a 40% transport subsidy to every trader who went out to market centres with a lorry to buy livestock. The subsidy amounted to Kshs 20,000 per lorry. This subsidy was given to the implementing agencies to administer. The participating NGOs discussed with the community when livestock market days would be held, venues and the data to be collected for monitoring purposes.

Livestock off-take committees consisting of elders from the communities were established to:

- discuss general pricing of animals for each market day.
- record all transactions taking place during the market days.
- authorise by co-signing the letter for payment of the subsidy to ensure that only eligible traders received the subsidy.
- collect a levy of Kshs 100 from traders for each animal bought. The respective communities used this levy to fund community projects.

The district veterinary officer provided livestock movement permits at the site once the screening for various livestock diseases was complete. The two NGOs arranged to pay traders the agreed subsidy at their respective offices. Two elders and one officer assigned by the NGOs at the market site followed the transactions during market days in order to confirm the validity of subsidy claims. The officer paying the subsidy had to physically see the animals loaded onto a lorry before making the payment. This was to avoid recycling of animals already bought for purposes of claiming the subsidy.

### *Limitations of the programme*

Limitations included the following:

- Pre-prepared plans like the livestock off-take programme were not available during this drought, so that prior

implementation arrangements were inadequate and took time to be agreed upon.

- Most agencies operating in the area had no budget for disaster mitigation activities; DPIRP was the only agency with funds at district level at the time.
- Because of increased pastoral mobility in search of pasture and water, those households that moved far away from the market centres did not benefit from the intervention.

#### *Impact and lessons learned*

Listed below are the major impacts of and lessons learned from the interventions:

- The DPIRP EWS proved invaluable as it signalled the need for drought mitigation activities.
- Contingency plans are vital as they reduce the time lag between approval of the intervention and the actual start of the programme.
- Involvement of community groups like elders proved invaluable in certain activities, e.g., scheduling market days, monitoring the transactions and endorsing subsidy payments.
- Cereals were bought with the money raised through the sale of 2,913 cattle valued at over Kshs 9.5 million.
- Malnutrition rates (based on MUAC measurements) fell from 35% to 25% during the intervention. Although cause and effect could not be proven, there was a consensus amongst those involved that the reduction in malnutrition was at least in part due to the improved food security brought about by the livestock off-take programme.
- The selection of animals to be sold by households ensured that strong breeding stock remained, which maintained the integrity of the pastoralist community and prevented eventual famine.

#### **3.5.2 Emergency Livestock Off-take Programmes in Northern Kenya**

##### *Drought early warning and response*

Kenya has pioneered district-based drought Early Warning Systems (EWS) as part of a national policy to reduce the risk of famine and food insecurity in the arid districts of the country. These attempts to

mitigate the effects of drought have combined the resources of government, NGOs and donors (Swift, 2001).

Kenya is the only country in the world to have designed and implemented EWS targeted on drought in the pastoral livestock sector, as EWS around the world overwhelmingly concentrate on staple crops. The Kenyan EWS are efficient and effective in terms of identifying the various stages in the run up to emergency. However, they are expensive to run and cannot be justified unless funds are immediately available to enact contingency plans.

The principles are well established, in particular:

- the importance of collating local and national information and indicators.
- the range and type of indicators (weather, natural vegetation, crop production and storage, animal disease, nutrition, animal production and mortality, unusual movements by herders, livestock sales and prices, cereal prices, herders taking unusual jobs, human health and nutrition).
- aerial survey where resources permit.
- warning stages and phased responses.

Some of the most important issues for EWS in the pastoral sector in (northern) Kenya are as follows:

- The need to create systems based on socio-economic as well as technical data, which is broadly equivalent to Sommer's (1998) distinction between entitlement-based and endowment-based systems.
- The issues of cost-effectiveness and institutional capacity raised by intensive monitoring of complex indicators. EWS must be evaluated to determine whether all the data collected are necessary.
- The concept of technical monitoring triggering more intensive socio-economic monitoring at certain stages is worth considering.
- Pastoralist involvement in collecting monitoring information may be a means to reducing the costs of GIS, but is unlikely to be sustainable unless there is a direct

benefit to pastoralists, for example, as users of information on range quality.

- The need to incorporate new technical possibilities of vegetation monitoring by remote sensing and climate forecasting, given the very complex conceptual and institutional issues involved in disseminating and using such forecasts (Sear, 2001; Blench, 1999).
- The need for decentralized systems based on an understanding of locally specific factors, and the problems of standardizing such data for wider-scale analysis and triggering action from central governments and donors.
- The link between early warning and response; the need to bridge gaps between different levels of government and donors, and to ensure that information is transmitted in a user-friendly form across those levels.

Given the detailed information required, ongoing donor assistance and political commitment are essential for the sustainability, at least in the medium term, of the types of EWS that are currently in use in northern Kenya.

#### *EWS and contingency planning*

EWS must be combined with a strategy to enable government and donors to respond to, and mitigate the effects of drought. If there is no capacity to respond to the information gathered by the EWS, then the investment is wasted. The rationale behind early warning is that it allows government and donors to respond rapidly and avert humanitarian crises by early intervention to mitigate the impact of drought.

Following the example set by Turkana (Swift, 2001), northern Kenya, more than any other part of the world, has developed effective drought contingency plans that are decentralized to district level. The Turkana plan had the following main components:

- An overall drought policy, setting out the plan's objectives of minimizing the impact of drought.
- A set of preparedness measures; creation in advance of necessary physical infrastructure, a bureaucratic structure to manage the plan across line ministries, plans to negotiate with donors at an early stage of drought, agreed procedures and information provision and training about them.

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- A definition of warning stages to be generated by the EWS and to trigger responses from government.
- A set of plans for specific mitigation, relief and rehabilitation measures.
- A commitment to the general promotion of drought resilience.

Most northern Kenyan districts now have a Strategic Drought Management Plan with a set of contingency shelf plans to be activated at ‘alert,’ ‘alarm,’ ‘emergency’ and ‘recovery’ warning stages. These plans cover the following sectors:

- Food security.
- Water.
- Infrastructure/strategic access (roads).
- Human health.
- Livestock health.
- Livestock marketing.
- Human displacement.

These plans have yet to be fully tested and it will be interesting to observe the speed of response when an emergency occurs.

Some of the major issues for drought contingency planning are:

- the need to involve communities in drought contingency planning, through well-constituted and supported pastoral associations or elders’ committees.
- the continuing difficulties in guaranteeing a flow of funds from donors; at issue here is the continuing reluctance of donors to mobilize funds or food aid in the light of early warning, hard evidence of famine and the donors’ own appraisal being preferred, by which time it is too late for mitigation.
- the administrative difficulty in Kenya of keeping contingency funds anywhere other than the central treasury.
- the need for a national-level body to interact with district drought planning, and the tension between the ideas of national drought planning and national disaster planning.
- the need to generate a broad national consensus that drought mitigation and as a last resort drought relief are worthwhile activities.

*Elements and impacts of contingency plans*

Contingency plans consist of the following elements:

- The provision of credit or cash/food for work to prevent the collapse of the purchasing power of poor people.
- Emergency animal purchase or the provision of subsidy to transport animals to market to enable herders to realize some cash for their animals before prices collapse.
- Maintaining the water supply for animals and humans, or opening new water supplies.
- Provision of emergency grazing or supply of livestock feedstuff, including 'cow-calf camps' or other special arrangements to protect breeding stock.
- Maintaining cereal availability.
- Rapid increase in the availability of human and livestock health service provision.
- Flexible taxation systems that do not tax pastoral populations during drought, or submit them to other charges (e.g., for services).
- Support for the private sector including pastoral associations in the provision of relief food and other services, either directly or by ensuring that pastoral household purchasing power is maintained.
- Providing fodder for drought-affected stock.

There are several examples in (northern) Kenya which demonstrate the impact of contingency planning in terms of mitigating the impact of drought on pastoral populations. The two successful ones are:

- provision of cash for work. This has proved to be relatively successful in Wajir (Buchanan-Smith and Barton, 1999), although it is important to have a range of public type works planned in advance.
- intervention in marketing of livestock. This places cash in the hands of vulnerable households. It is essential that livestock are removed from the range before they lose too much condition (Barton and Morton, 2001). The most effective means of intervening in markets is to subsidize the transport and leave the purchasing and selling to the private sector. It may be worth experimenting with various forms

of animal mortgage against advance payment which can be used to buy feed.

Some of the interventions considered less successful include the following:

- Contingency funds and cereal reserves; as Kenya government financial management rules do not allow government funds to sit unused anywhere except the treasury (Swift, 2001) and donors rarely respond to EWS or pleas for assistance until central government declares an emergency.
- Provision of human and veterinary assistance; suffers from the same problem as contingency funds and cereal reserves.
- Support for the private sector has never been an explicitly stated policy, although cash for work and livestock marketing interventions have ensured that local shopkeepers and traders have more business as a result of cash circulating within communities.
- Provision of emergency grazing and cow-calf camps has been limited and *ad hoc* (Hendy and Morton, 2001; Heath, 2001); cow-calf camps and similar institutions elsewhere have had very limited success (Scoones, 2001).
- There is little experience of the provision of fodder; elsewhere in the world (and under different macro-economic conditions) provision of free or subsidized feed has been criticized strongly on environmental and other grounds (Morton and Sear, 2001).

#### *Lessons for relief and rehabilitation*

For pastoralists today, drought almost inevitably brings destitution for the poorer members of society. It is, therefore, essential that governments and donors are prepared for the provision of famine relief during periods of drought. Donors and NGOs in Kenya have become expert at providing famine relief to all sections of society. However, the response has often been 'too little, too late.' Unfortunately, the provision of food relief almost inevitably results in settlement for those who are no longer able to provide for their subsistence from pastoralism; hence the importance of also seeking to support the diversification of income-generating opportunities in these settlements (towns).

The suspension of direct taxes and the variety of some of the other charges, levies and service fees pastoralists pay to the government can be considered a form of relief. The difficulty of paying such charges, and in particular school fees, during drought is frequently mentioned by pastoralists. It can be argued that these fees have to be paid at some level in the system, and suspending them is both paternalistic and inefficient compared with other ways of increasing pastoralists' purchasing power.

Nevertheless, school fees at least would seem to present a special case, where drought can be prevented from having an impact on the education of the next generation. In this regard, the recent introduction of free primary schooling will significantly boost the government's mitigation against the impact of drought in the arid areas on a long term basis.

Governments and donors should also be prepared to support post-drought rehabilitation, of which, for pastoral economies, the most important form is re-stocking. Re-stocking is not only an important form of activity in itself, but it is also argued that a credible promise of re-stocking will make the task of emergency livestock purchase measures easier. However, no mechanisms for linking purchase and re-stocking have emerged. With re-stocking other than on a pilot scale there are problems of sourcing large numbers of livestock of appropriate (drought-resistant) breeds, and of devising purchasing systems that are transparent and yet not supervision-intensive, which have yet to be solved.

Relief and rehabilitation measures have not been covered in detail in literature but there is copious literature on re-stocking such as Oxby (1994) and Heffernan and Rushton (2000), and more general works on relief and rehabilitation by Van Brabant (1994). However, it is the nature of drought contingency planning that they need to be considered as a part of the web of long-term and short-term measures to manage drought.

### **3.6 Findings from Visits to Districts**

A number of observations were made during visits to eleven arid districts, i.e., Baringo, Turkana, Isiolo, Samburu, Marsabit, Moyale, Mandera, Wajir, Garissa, Ijara and Tana River, and one semi-arid district, i.e., West Pokot. These observations were made through discussions and informal interviews with the staff of various



ministries, ALRMP, NGOs, and pastoralists. The results of these discussions and interviews are outlined below.

### ***3.6.1 Findings from Baringo District***

In Baringo district, it was confirmed, as shown in the literature, that pastoralists are generally reluctant to sell their livestock during the wet season when pastures and water are readily available and animals are in good body condition. When drought strikes, pastoralists normally respond by:

- moving livestock to dry season grazing areas.
- migrating with their livestock to neighbouring districts in search of pasture and water.
- sending large numbers to markets.

It was noted that markets outlets are inadequate; they cannot absorb the large volumes of livestock offered for sale during drought. Furthermore, the animals are in poor condition during such periods. This, coupled with the large supply, results in depressed prices. During severe drought, the livestock owners lose large numbers of livestock, resulting in an economic loss to the individuals and the national economy as whole.

### ***Suggested interventions***

To increase off-take in the face of an impending drought, the following interventions were suggested:

- Extension education of the livestock owners on the need to sell their livestock as a response to drought.  
The money obtained could be used to re-stock when environmental conditions improve.
- Establishment of a fund to absorb money from emergency livestock sales to be used for re-stocking.
- Introduction of mobile banks to enable the pastoralists to access banking services after selling livestock.
- Improvement of infrastructure to make it possible for traders to access remote areas of the districts.
- Improvement of watering by constructing water facilities such as dams and pans at appropriate locations.
- Reduction of relief food distribution to encourage people to sell livestock to buy food.

- Improvement of marketing by opening up more market outlets.

### **3.6.2 Findings from West Pokot District**

The pastoralists indicated a number of strategies to cope with hazards, especially drought. They include the following:

- Migration in search of water and forage.
- Use of dry season grazing reserves. The pastoralists indicated that reserving highland areas for dry season grazing was strictly observed in the past.

The main issues identified in the district were as follows:

- Livestock sales are low during the wet season. Therefore prices are good due to low supply and because animals are in good condition.
- Pastoralists indicated their willingness to sell livestock during the dry season, but they are unable to do so because of increased supply of livestock in poor condition, resulting in a glut in the markets (supply in excess of demand) and low prices.
- Pastoralists complained of lack of assistance from any source during emergencies, e.g., severe drought.

### *Suggested interventions*

A number of interventions were identified:

- Conflict resolution and peace building initiatives to reduce conflicts when pastoralists cross into neighbouring districts or Uganda in search of pasture and water.
- Extension and outreach for the pastoralists to appreciate the importance to sell their animals before drought strikes.
- Strengthening disease screening processes to facilitate livestock sales through out the year.
- Revival of the KMC or other intervention to create a viable livestock market outlet to go along with a government-guaranteed re-stocking programme.
- Improvement of water facilities, e.g., construction of subsurface dams along riverbeds and repair of boreholes.

### 3.6.3 *Findings from Turkana District*

Turkana pastoralists adopt many coping mechanisms to ameliorate the effects of drought. These mechanisms involve the following:

- Many animals are driven to the markets; this results in a glut and therefore depressed markets.
- Livestock are moved to dry season grazing areas.
- Herders migrate with the livestock to neighbouring districts and even to neighbouring countries (Uganda and Sudan).
- Livestock owners split their herds to spread risks.
- As relief food supplies are made available, many people start moving to relief centres.
- Home slaughter increases and some of the meat is preserved by drying.
- 'Payment' of dowry increases when drought approaches, forecast through traditional early warning systems.
- People resort to eating wild fruits.

#### *Previous and on-going interventions*

Interventions have been instituted in the past to improve livestock off-take from Turkana and reduce the impact of drought on herders. A few of these interventions are on-going. Some of these are listed below:

- VSF-Belgium has assisted in buying and slaughtering weak animals, which are then dried and given back to the pastoralists for consumption.
- The same NGO has organised subsidised transport of livestock to markets.
- The animal health component of the SNV NGO has provided veterinary drugs at highly subsidised prices.
- The CAPE unit AU-IBAR has assisted in organising cross-border peace initiatives.
- OXFAM-GB (an NGO) assists in the provision of water to reduce stress on people and livestock.
- OXFAM-GB also organises cash for work activities as a drought mitigation strategy.
- As the lead agency, OXFAM-GB is also involved in peace initiatives.
- There is an abattoir under construction in Lokichogio in Turkana District financially supported by AMFREF and

Terranova and it is likely to have an impact on emergency off-take.

*Suggested improvements*

A number of improvements were proposed. They are as follows:

- Encouraging the sale of livestock through out the year.
- Investment in alternative enterprises.
- Integration of traditional early warning systems with modern technologies to improve drought forecasting.
- Improving livestock marketing by strengthening the Livestock Marketing Councils (LMCs) and Livestock Marketing Authorities (LMAs).
- Educating the pastoralists through extension on the need to sell animals before droughts.
- Revival of the traditional system of reserving dry season grazing areas.
- Supporting peace initiatives to allow for judicious utilization of grazing and water resources by different communities.

**3.6.4 Findings from Isiolo District**

In Isiolo District, discussions in a District Steering Group (DSG) meeting suggested that because KMC is not in operation, one of the best options is to carry out emergency purchase of animals during drought, slaughter them and feed the pastoralists with the meat; instead of giving relief food in the form of maize. Taking off animals from the herds this way would ease pressure on grazing/browsing and water resources during droughts.

It was observed that relief food in the form of meat is better than maize, which requires much more to be done to make it ready for consumption compared to meat. Meat was also considered nutritionally superior. It can be fed to school children and pregnant mothers.

The money derived from emergency purchases can then be used to purchase animals for re-stocking after the drought. However, a number of questions remain unaddressed:

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- How will the numbers to be removed from the herds be determined each year? If it is random and haphazard, the there would be too few removed, thereby making no impact or too many, creating the danger of depleting the herds.
- How would the pastoralists be convinced to sell their animals? Many pastoralists find it morally wrong to sell their animals even when they (animals) are on the brink of death.
- If the drought is widespread, where would the animals for re-stocking be sourced from?
- How will it be made sure that the money pastoralists obtain from emergency sales is kept, especially because there are limited banking services in pastoral areas, so that it is available during re-stocking?
- Who or what would be the source of funds for emergency purchases?
- How sustainable would be the source of these funds?
- How do we ensure that the need for emergency off-take is reduced or done away with, and replaced by sustained buying and selling all the year round, and particularly before droughts strike?
- Since droughts will always be droughts of different magnitudes, how do we make sure that we are always prepared so we can reduce their impacts?

#### *Suggested interventions*

In a meeting with stakeholders in livestock marketing, the feeling was that there is still scope to revive the KMC, so that it can serve as a central collection point. However, it should no longer serve the purpose of receiving live animals for slaughter trekked there from far-off arid districts, but should be used for slaughter of livestock from nearby districts, and for processing of meat products for local consumption and export. It was noted that the KMC has advantage of its proximity to the City of Nairobi, and can serve as storage facility for meat(s) brought in from various satellite slaughter houses and even abattoirs, proposed to be located in various parts of the country.

It was suggested that Isiolo is a suitable location to build an abattoir because it is centrally placed in the pastoral areas and has the advantage of a holding ground. The holding ground should be revamped to serve as a screening point for animals within the

district and those coming from other districts, and even from outside the country (Somalia, Ethiopia), before being moved on either for slaughter or to ranches in Laikipia and other districts. In other words, Isiolo holding ground could be developed to serve as a disease-free zone.

The stakeholders reported that the African Development Bank (ADB) plans to support livestock marketing by funding the building of satellite abattoirs in livestock catchments. The ADB wants to use Kshs 30 million per abattoir but it was noted that these funds are too little for an abattoir; they can only support putting up of a slaughter house. It was estimated that a reasonable abattoir would cost upward of Kshs 300 million.

It was noted that after the collapse of KMC and LMD, there was no organised markets for pastoral livestock, and this became a recipe for the spread of livestock diseases. Therefore, establishing abattoirs in production areas (satellites) would be one way of controlling the spread of diseases. It would also be a source of employment for the local school leavers.

An appropriate size of abattoir should be able to handle at least 100 head of cattle per day. There were suggestions that private entrepreneurs should be encouraged to support the establishment of these abattoirs in pastoral areas. There were, however, concerns that these abattoirs may not meet international standards, and that the country may not have adequate numbers of animals to supply all the satellite abattoirs. Infrastructure and transportation may not be adequate.

It was observed that the holding ground in Isiolo, which has a size of 124,000 ha and five stations within it, was still in good repair, with most of its facilities still intact. It has a capacity of holding 11,000 Tropical Livestock Units (TLU) per year. To reactivate the use of the holding ground as a livestock collection point and disease-free zone, entrepreneurs rather than government should be facilitated to participate.

### **3.6.5 Findings from Samburu District**

Response to drought (coping mechanisms) include the following:

- Migration to areas with pasture and water. It was, however, pointed out that the traditional dry season grazing areas

have been encroached on by human settlements. Insecurity has also interfered with grazing management, making some good pasture unavailable for grazing.

- Provision of hay to their livestock by a few people.

#### *Pasture interventions*

A few local NGOs (e.g., RAMATI, which took over FARM-Africa's activities in Samburu District after the latter's withdrawal) have been undertaking emergency interventions in the past. One of the interventions involved livestock treatment and vaccination in an attempt to save people's livelihoods. The community contributed to the effort by paying in kind (e.g., one goat/sheep for every 10 head of cattle treated/vaccinated). These animals were slaughtered and the meat given out to school children. The organization worked closely with the Department of Veterinary Services which provided technical support.

This intervention had great socio-economic impact in the community. However, there were some delays in some areas (e.g., procurement of vaccines) due to bureaucracy. The entire operation was said to have been expensive, but no figures were given.

#### *Issues of concern*

A number of issues were raised. These include the following:

- Insecurity is working against livelihoods. Its effects are felt most during drought emergencies.
- Provision of relief food was viewed as creating a dependency syndrome. Re-stocking with even as few as 10 goats was considered more beneficial by some key informants.
- Provision of free drugs during emergencies tends to work against the policy of privatisation. It has led to the collapse of some drug users associations as well as some emerging small private drug businesses.

*Suggestions for improvements*

The following are the suggested interventions:

- The intervention undertaken by RAMATI of treating and vaccinating livestock, with the community paying in kind (goats/sheep) and the goats/sheep being slaughtered to feed school children has several advantages:
  - It involves excess weak livestock from the range, thus reducing overstocking.
  - It saves the treated/vaccinated cattle from high morbidities and mortalities.
  - It provides school children with nutritious food.
  - It creates community pride due to the community's participation through paying in part for the intervention.
- There is need to analyse and develop this intervention further since it shows promise for future application
- Improvement of water resources—dams, water pans and boreholes—where appropriate, to facilitate judicious use of grazing resources during drought
- Improvement of security.
- Keeping more camels and goats than the other livestock species will assist in drought mitigation.

**3.6.6 Findings from Marsabit District**

Responses to impending drought include splitting of the herds and migration in search of pasture and water. Although some people would be willing to sell some of their livestock, market outlets are inadequate.

ALRMP coordinates drought monitoring activities through the DSG. It has two monitoring sites per division which were inherited from DPIRP. These sites, however, are not uniformly distributed. The drought situation is monitored from normal–alert–alarm–emergency. Emergency off-take takes place at the emergency stage.



*Past drought emergency interventions*

Emergency interventions in the past have involved the following:

- Provision of relief food, started in the 1970s.
- Purchase, slaughter and provision of meat to the community. This intervention was implemented first by the Catholic Church in 1984.
- During the 1999–2001 drought, CEC (now PRIDA), a local NGO, participated in emergency off-take involving purchase and slaughter of 1260 head of cattle and 3,364 sheep/goats at a cost of Ksh.13 million.

Twenty two thousand (22,000) families benefited from the meat from the de-stocked animals. Local committees at various centres identified the families from whom animals were to be bought and the people to be fed, mainly school children, the sick, the elderly and those facing starvation (i.e., the vulnerable groups). The ACK was also said to have participated in the emergency off-take at a cost of Kshs 17 million but no details were given. The ALRMP and MLFD assisted in re-stocking after the drought. Members of the community interviewed during FGDs were happy with the mode of intervention.

Livestock traders were also encouraged to buy livestock by provision of subsidised transport. It was felt by some key informants and stakeholders that this type of intervention is more beneficial to the livestock traders than the livestock producers.

During the 1991/92 drought SALTICK participated in awareness creation among communities in an effort to stimulate off-take through sales. Some people took their livestock to the Nairobi market, but prices were low.

Other previous emergency interventions include the following:

- Supplementary feeding. Supplementary feeding using hay and commercial concentrates was found useful for maintaining high value animals, lactating animals and loading camels. It was successful around the mountain. It is difficult to implement in far-flung areas, with poor road infrastructure. Hay making around the mountain, Kolacha and Hurri Hills merits serious consideration.

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- Emergency veterinary interventions. This involves provision of free or highly subsidised veterinary drugs and vaccines and mass treatment of livestock. In a Focus Group Discussion (FGD) session at Maikona the consultancy team was informed that payment of one goat catered for the treatment of 50 goats or 20 head of cattle or 15 camels. The goats were slaughtered and dried meat given to school children.
- Rehabilitation of water structures including gensets, water tanks, boreholes, dams, water pans.
- Water trucking for human and livestock use.

### *Suggestions for improvement*

Stakeholders suggested the following as a means of improvement:

- Local NGOs and CBOs should be used to identify those to be targeted for livestock purchase as well as for meat distribution. They could also be used to undertake the buying, slaughtering and distribution of meat to the most needy in the community. This should, however, be done with community participation.
- The Maikona community representatives identified supplementary feeding, emergency veterinary drugs (if goats used to purchase the drugs are also paid for partially in cash), and buying their livestock using money, as the most preferred emergency interventions in that order of ranking.

### **3.6.7 Findings from Moyale District**

The Borana community has, over the years, developed an elaborate grazing management system, with dry and wet season grazing reserves. When drought intensifies or prolongs, thus putting people and livestock under serious stress, migration into Ethiopia and Somalia takes place. Livestock owners are unwilling to sell even during the dry season because society puts pressure on people not to do so.

Lack of water and insecurity are the major causes of problems during drought. Prices of livestock also fall as drought approaches.

### *Drought interventions*

The following are the intervention instituted during drought:

- Provision of veterinary drugs in exchange for goats. This intervention was undertaken by CIFA in collaboration with the Department of Veterinary Services. The goats were slaughtered, the meat sliced, salted and dried and then given to the community as food.
- De-stocking. Weak animals were bought, slaughtered and the meat salted, dried and given back to the community.
- Distribution of relief food (i.e., maize, beans, oil or porridge). Food-for-work (e.g., construction of water pans in exchange for food) was used.

The first intervention was preferred by the community at Bori. Provision of relief food was said to have interfered with the traditional coping mechanisms. In the past, at a given time during drought, every household was required to slaughter a bull, dry the meat and preserve it in fat. Family members would be given pieces of the meat daily.

### **3.6.8 Findings from Mandera District**

Traditional drought coping mechanisms in the district include the following:

- Migration into Somalia.
- Increase in watering intervals.
- Buying of hay for high yielding animals (only for a few rich people).
- Slaughtering of calves to save mothers.
- Moving animals to dry season grazing areas. This is, however, not as common as in the past as it has been interfered with by the inter-clan conflicts.

### *Interventions in the 1999–2001 drought*

A number of interventions were instituted by various organisations. They included the following:

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- Water trucking for lactating cattle by EPAG, supported by USAID.
- Mass livestock treatment funded by ECHO. Administration of multivitamins and vaccines (rinderpest and CBPP).
- De-stocking undertaken by NORDA with support from the AU/IBAR-Tufts University Pastoral Livelihoods Project, involving purchase and slaughter of livestock.
- Emergency operation for relief-distributed maize was also used by the community as animal feed although it had targeted humans.
- Training of CAHWs by VSF-Suisse and MSF-Suisse; these were used in the mass treatment and vaccinations.
- Fuel for borehole generators and gensets provided by UNICEF.

### *Ranking of interventions*

Key informants (the Livestock Group) ranked the following three interventions as the most preferred (in order of preference):

1. Mass livestock treatment.
2. Provision of fuel for gensets.
3. De-stocking.

### **3.6.9 Findings from Wajir District**

In Wajir District, responses to impending drought are as follows:

- Migrations in search of pasture and water.
- Splitting of herds—the weak, lactating, pregnant and very young are left behind while the others are taken far away to areas with pasture and water.
- Slaughter of newborns.
- Slaughter of the weak ones.
- Scavenging for *Acacia* and *Prosopis* spp. pods, and bird nests.
- Large numbers of livestock are offered for sale, but with few buyers.
- Increase in watering intervals due to long distances to grazing areas.

*Emergency interventions during the 1999–2001 drought*

Interventions to mitigate the effects of drought were as follows:

- Mass livestock treatment with subsidized drugs, initially targeting the reproductive herd to reduce stress by massive de-worming, but eventually covering all livestock.
- Water trucking for the old, sick, lactating, pregnant, very young and loading camels. This proved to be a very expensive exercise.
- Distribution of relief food.
- De-stocking of sheep and goats, undertaken by OXFAM-GB, involving buying and slaughtering the weak ones and giving meat back to the community.
- Transport subsidy, undertaken by ALDEF, in an effort to increase off-take.
- Provision of hay to very weak animals in 2001 by OXFAM-GB and the Department of Livestock Production.

The de-stocking intervention by OXFAM-GB was carried out during the 1992 and the 1999–2001 droughts. ALDEF implemented the same intervention in 2000–2001. The intervention availed some income to livestock producers while at the same time providing animal protein to school children and vulnerable members of the community.

Provision of hay was found not to be cost-effective and was subject to abuse. The hay arrived at the onset of rains, which was too late.

*Stakeholders' suggestions for improvement*

The following were the views given by the stakeholders for improvement:

- Water trucking should target weak animals at the *boma* level for pastoralists in areas with pasture but without water.
- De-stocking (buying and slaughtering animals) should target the under-five children, the old and the sick people, for feeding.
- There is need to strengthen local institutions (local NGOs, CBOs, Pastoral Associations) to enable them establish emergency funds for responding to drought.

- There is need to set up district emergency funds into which the government, donors, NGOs and well-wishers can contribute for use during drought emergencies.
- There is need to encourage pastoralists to sell their livestock all-year-round to avoid disasters during drought.

### ***3.6.10 Findings from Garissa District***

Responses to impending drought in the district include the following:

- Splitting of herds.
- Migration of herds to areas with pasture and water, such as Isiolo, Wajir, Ijara or Somalia, leaving the weak and lactating ones behind.
- Slaughter and preservation of meat by drying or in oil.
- To a small extent, selling animals.

### ***Interventions during the 1999–2001 drought***

The main interventions were as follows:

- CARE and MLFD bought goats (at Kshs 1,000 each), slaughtered them and gave the meat to the community. Each community produced 50 goats, giving a total of 2,500 goats for the entire district. CARE intended to buy hay from Ijara for supplementary feeding, but this did not materialise.
- Mass livestock treatment (mainly de-worming), using subsidised or free drugs.
- Training of Community-based Animal Health Workers (CAHWs) to assist in livestock treatment.
- Distribution of relief food.

The pastoralists were not satisfied with intervention of buying and slaughtering of goats and giving the meat to the community. The impact was minimal considering the number of goats involved. It was felt that scaling-up would enhance the impact. Furthermore, it was reported that the pastoralists were unwilling to sell their livestock, even in the face of impending drought. There is need therefore for extension education to create awareness on the value of selling livestock before they are decimated by drought.

It was also noted that dealing with the current drought (2004) through de-stocking is not likely to succeed because the funds (2 million Kenya shillings) set aside for the purpose are inadequate.

### ***3.6.11 Findings from Tana River District***

#### *Response to drought*

The pastoralist communities reported the following methods of responding to drought:

- Ordinarily, de-stocking is not a popular strategy for dealing with impending drought. Most pastoralists will sell their stock only for a specific purpose such as school fees, hospital bill, food, cultural activities, etc.
- Pastoralists at Wayu Boro, Bangale Division in the north of the district claimed that, other than sell their cattle due to drought in 1999/2001, they reacted by starting to farm in the laager Galole.
- However, there are many who will sell on a selective basis if the markets are good to avoid deaths during an on-coming drought. They will select the less favoured stock on an individual basis and sell, for example, those that are weak or poor in milk production.
- Fall back areas: A number of *laga* areas, the Tana delta and some parts of the riverine areas are endowed with good pastures. These are the traditional dry season fallback areas. During the dry season, most of the livestock are to be found in the Tana delta, an area covering the lower part of the district from Mnazini to Kipini.

#### *Suggestions on the way forward*

The pastoralists suggested the following:

- Heavy investments in the livestock marketing infrastructure and outlets, including revival of KMC or building of abattoirs in the production districts.
- Development and proper management of water resources in the dry season fall back areas.
- Elimination of *Prosopis* which has rapidly been colonising the riverine and laager areas and occluding pastures.

- Development of crop farming in the laager areas as an alternative source of livelihood to complement livestock keeping.

### *3.6.12 Findings from Ijara District*

Generally, pastoralists in the district sell their livestock to meet specific needs, e.g., school fees, weddings, food, drugs, etc. many animals are offered for sale during the dry season. At the onset of rains, pastoralists are unwilling to sell their livestock. As a result, prices increase since supply is lower than demand.

#### *Pastoralists' response to impending drought*

Pastoralists use three strategies to respond to impending drought. These are as follows:

- Splitting herds. The weak animals are sent to Boni forest which has plenty of pasture.
- Some animals are sold to meet urgent needs such as food and drugs.
- Migration with the rest of the herd to areas with water and pasture.

As part of the food security strategy, meat is preserved either in oil (*nyiri nyiri*) or is sun-dried. Milk is preserved up to three months.

The pastoralists are unwilling to sell animals as drought approaches, with the aim of re-stocking the herds later when conditions become favourable. The reasons given for this include attachment to the livestock, ensuring food security and social security since livestock are regarded as a measure of wealth and capital.

#### *Past emergency interventions*

Hay harvesting: During the 1999/2000 drought, CARE Kenya harvested hay in Bothai area and sold it in northern Garissa with the aim of establishing a revolving fund. This intervention was perceived as unsuccessful because there was inadequate sensitisation of the community. The majority of the community members preferred those in need to use the grazing resource without paying any charges.



De-stocking: This intervention was funded by WFP and implemented by CARE Kenya. It involved buying of livestock from the community, slaughtering and distributing the meat to the most needy as identified by the community. It targeted poor households. This intervention was viewed as highly beneficial to the community. It had double benefits. Needy people were fed and the community received money in exchange for their livestock. It was suggested that in future, religious organisations could undertake such interventions.

Emergency relief programme: During the 1999/2000 drought, Terra Nuova provided highly subsidised veterinary drugs for mass treatment of livestock. The drugs were sold at 10% of the normal price, thus making it possible for pastoralists to afford them. The DSG was responsible for deciding on the use of the money raised through the drug sales. Although this intervention was viewed by the pastoralists to be beneficial since it availed affordable drugs to them, it interferes with the establishment of sustainable drug systems (e.g., privatisation) as well as Drug Users Associations.

#### *Recovery*

Re-stocking: After the 1999/2000 drought, the ALRMP assisted some members of the community to re-stock. The community contributed 10 goats and/or sheep while the ALRMP contributed 20 to re-stock a household. In total, 30 households were re-stocked.

De-silting of dams and pans: Dams and pans were de-silted in readiness for the collection of water as soon as the rains started. This helped the speedier recovery of the livestock.

#### *Suggestions on the way forward*

While the communities appreciated the above interventions, they suggested that as a long-term solution, there was need to:

- improve livestock markets.
- introduce alternative livelihoods such as beekeeping, poultry production and crop farming.

### **3.7 Financial and Economic Analysis of Emergency Livestock Off-take Interventions**

#### ***3.7.1 Economic Loss from Droughts***

Table 4 gives an indication of the magnitude of economic loss due to livestock deaths resulting from the 1999–2001 drought. The table shows that if the losses incurred every time there is a severe drought can be avoided through effective interventions, Kenya can save close to 13 billion shillings or 100 million US dollars.

#### ***3.7.2 Emergency Livestock Intervention through De-stocking: The Example of VSF-Belgium in Turkana District***

In the past few years, a total of seven de-stocking projects valued at approximately US\$ 977,000 have been implemented in Turkana, Mandera, Garissa, Narok, Wajir, Marsabit and Samburu. These have varied in type and in approach; some of the de-stocking projects have produced dried meat while others have distributed fresh meat.

The de-stocking programme in Turkana was funded by the Community Development Trust Fund (CDTF). The funds availed for this activity were US\$ 120,000. The CDTF planned to purchase 18,000 kg of dried meat. The main reason why dried meat was chosen as opposed to fresh meat was that schools, which were the main beneficiaries of this intervention, close by mid-November and it was wise to dry the meat and distribute it when they re-opened.

#### *Purpose*

The programme planned to:

- salvage some of the capital in the animals at risk by providing the opportunity for livestock owners to sell the stock before they die.
- support relief efforts through provision and distribution of dried meat to vulnerable groups such as schools, and feeding centres.
- increase cash available to the pastoralists to enhance their livelihood.
- relief pressure on the scarce water and pasture resources.

**Table 4. Estimated economic loss (current prices) from livestock deaths caused by 1999–2001 drought\***

Livestock Species	Small stock	Cattle	Camels	Total loss (all livestock)
Northern Kenya rangelands	43.0 % of total	35.2 % of total	18.0 % of total	
Southern Kenya rangelands	16.0 % of total	25.0% of total	Negligible	
% Average mortality	29.5% of total	30.1% of total	18.0 % of total	
Total animals at risk in 1999-2000 drought (peak time)	8,000,000	3,000,000	80,000	
Likely number lost = (% average mortality X total number at risk)	2,360,000	903,000	14,400	
Average price/ animal during the drought year (Kshs)	1,500	10,000	10,000	
Total loss in Kshs/species	3.54 billion	9.03 billion	0.14 billion	12.71 billion

\*Livestock mortality rates of the 1996–7 drought have been used to and have been assumed to be similar to the losses during the 1999–2001 drought.

Sources: Ndikumana *et al.* (2001).

### *Implementation*

The CDTF allocated Kshs 9 million for the purchase of 18,000 kg of dried meat and Kshs 20,000 for the purchase of polythene bags set aside in addition to overhead and administrative costs. Implementation was carried out between November 2000 and January 2001.

The SNV was also involved in the implementation of this programme. The targeted areas included Kaaleng, Kaikorr, Lodwar, Lorugum, Kalokol, Lokori and Lokichar.

Workshops were organised to sell the idea of slaughtering small stock and drying the meat to the community. Experimentation with a few sheep and goats was done in order to determine the workload and costs involved. Women groups were then contracted to carry out the slaughtering and drying of the meat. Initially, a price of Kshs 500 was agreed upon for each kilogramme of dried meat. The implementation strategy was to use women groups, youth groups, individual men and women to slaughter the animals and dry the

meat. These groups and individuals would purchase small stock from their own money, slaughter them, have the meat inspected by the Public Health Technicians, then dry the meat for at least 3 days in the sun. The implementing agency would then come to weigh and buy the meat.

### *Outcome*

The results of the intervention in Turkana were as follows:

- The intervention was implemented in Central and Southern Turkana and realised a total of 5,951 kg of dried meat and 1,702 kg of fresh meat from a total of 13,000 small stock.
- The project paid a total of Kshs 7.4 million for purchasing both the dried and fresh meat. This gave an average of Kshs 569 for each of the 13,000 small stock slaughtered. No cattle were slaughtered because most of them had moved to the hills and into Uganda in search of pasture. (Camels are seldom slaughtered as they are considered too precious.)
- The exercise of producing dried meat showed that a carcass of 6.5 kg gave 4.3 kg of boneless meat. This amount of boneless meat gave 0.95 kg of dried meat. However, most sheep and goats in Turkana are small and only produced between 0.4 kg to 0.9 kg of dried meat per animal.

From this experiment, it was discovered that the budget of Kshs 500 per kg of dried meat was too low. Negotiations between VSF-B and those contracted arrived at Kshs 1,200/kg of dried meat. An analysis of the costs involved in purchasing, slaughtering and drying the meat from one average sheep or goat totalled to Kshs 950 per animal. Those who slaughtered the animals would also sell the liver, intestines, skin and head and this earned them an extra Kshs 150, bringing the total earnings from one animal to Kshs 1,350. The margin per animal was therefore Kshs the difference between Kshs 1,350 and Kshs 950, which was Kshs 400.

- The overhead cost of this intervention was calculated at 19.3%.
- The intervention ended prematurely as fraudulent transport subsidy claims were discovered, in a separate intervention. The three-month intervention was shortened to two months, resulting in a number of unsold livestock.

### *Impact*

Drought-related de-stocking, if well implemented, has a number of advantages. It increases the availability of markets both in product quantity and space; it provides markets right at the doorsteps of the beneficiaries; it generates income for families, which may be used to support the surviving livestock (paying for water fees and veterinary drugs) and to meet various domestic and other needs; it provides a cheap source of protein to the hungry pastoralists; it promotes business in the local community (for example, women use the income to set up tea shops); and it provides linkages to long-term development.

In the Turkana case, women and youth groups benefited in terms of business and employment, with a total of Kshs 7.14 million being injected into the economy. A locally available protein-rich meat source was utilised to supplement feeding programmes that benefited schools and hospitals. A total of 9,036 school children in 41 schools benefited while TB patients in the district hospital were provided with the meat in their meals, thereby boosting their health. Furthermore, the intervention created cohesiveness in community groups and caused them to feel proud that meat from their animals could be used to feed their own children in boarding schools. However, the impact on saving the scarce water and pasture resources as initially envisaged was negligible.

### *Lessons learned*

The following are the major lessons learned from the drought-related de-stocking intervention:

- Implementing agencies should ensure that interventions are culturally acceptable to the communities.
- Each intervention should have a separate budget although a group of interventions may be implemented by one agency with funding from one source. This will avoid the poor performance of one intervention affecting another.
- Funding agencies should work out simpler and faster reimbursement procedures for emergency interventions.
- De-stocking as a form of food relief should be planned for the distribution of fresh rather than dried meat, unless certain conditions prevail that would negatively affect this kind of intervention.

- The ‘pilot’ de-stocking operation in Turkana District can serve as the basis for the planning and implementation of larger de-stocking programmes, thereby saving significant economic value to the nation when droughts recur in the future.

Government, UN, NGOs and donors should, therefore, recognise the significance of de-stocking as a good relief measure both in terms of providing food and income to the needy population and in salvaging some value from stocks that are likely to be lost without such interventions. The incorporation of de-stocking as an appropriate relief measure in emergency national appeals should be viewed as a logical drought mitigation tool, perhaps with more benefits than the conventional interventions. It is time to consider, in pastoral areas at least, to substitute protein supplements in the relief ration such as beans and chickpeas, usually bought and transported at a much higher cost, with locally meat made available through de-stocking interventions. Further financial and economic analysis of this and other interventions is addressed in the following sections.

### 3.7.3 *Estimation of Financial Cost-Benefit Ratios*

As already reviewed, a number of emergency off-take interventions have been undertaken in the country during previous droughts. Some attempts have been made to assess the impact of these interventions. For example, Barton and Morton (2001) have assembled a substantial amount of data on the costs of drought time livestock marketing and famine relief interventions in Marsabit and Moyale Districts for the years 1979 to 1998, from which it is possible to compute some cost-benefit relationships. The Barton and Morton data show that during the drought years of 1980, 1984, 1991, and 1996, a total of 88,269 cattle and 156,192 goats and sheep (shoats) were removed from livestock populations in those two districts as part of drought emergency interventions. Based on the 1998 prices, these livestock were valued at Kshs 423,359,976 and were removed at a total cost of Kshs 105,839,995. This gives an average financial benefit cost ratio of 4.0 over the four years.

In another effort, Morton *et al.* (2003) have computed overall financial benefit-cost ratios for the various interventions undertaken by various NGOs in a number of districts during the 1999–2001 drought. The results of their estimates are presented in Table 5. All the interventions have implications on off-take in the sense that

they either remove livestock from the pastoralists or enable them to keep and maintain livestock which would presumably have been either wholly or partly destroyed or weakened (and therefore made less valuable) by the drought. All the interventions except the transport subsidy show positive returns. However, it is pointed out that the negative impact obtained in the transport subsidy is surprising given the overall satisfaction of the stakeholders in this type of intervention. It is further pointed out that the relationship between costs and benefits such as the number or value of animals saved could be non-linear or more complex than otherwise thought. Indeed, in another analysis below, the transport subsidy in Turkana is shown to have had a positive impact with a large benefit-cost ratio of 2.

A further analysis has been undertaken using the data presented by Aklilu and Wekesa (2001) on the two interventions specifically aimed at emergency off-take, i.e., de-stocking and transport subsidy. The results of the analysis on de-stocking are presented in Table 6. As shown in Table 6, two approaches are used in estimating costs and benefits resulting in two types of financial cost benefit ratios—one public and the other private. The difference is that in the former the costs are those incurred by the implementing agency in buying and feeding the meat to the people and the benefits are the famine relief costs foregone. In the latter, the costs are those of buying the animals, slaughtering them and drying the meat while the benefits are the selling price of the meat plus the value of the meat which is fed back to them after the agency buys it from them. So the pastoralists as a community are double beneficiaries. Results show that both parties had a positive benefit-cost ratio of 1.2 for the public and 2 for the pastoralists. There are other economic benefits of these interventions listed below.

In the case of the transport subsidy, the subsidy funded by USAID and executed by NORDA in Mandera District is considered. A total of 21,940 shoats valued at Kshs 22 million were transported to Nairobi at a cost of US\$ 26,388 which translates to Kshs 1,979,100 at a rate of Kshs 75 per dollar. Assuming that these shoats were saved from perishing, the benefit-cost ratio works out to 11.2. Even if we were to assume that only 43% (the mortality rates for small stock during the 1999-2001 drought as given in Table 4) of these shoats would have died and therefore 57% survived and recovered on resumption of favourable climatic conditions, the estimated benefit-cost ratio would still be as high as 4.8.

**Table 5. Summary of benefit-cost analyses of drought mitigation interventions**

Type of intervention	De-stocking	Transport subsidy	Veterinary	Supplementary feeding	Conflict resolution	Water trucking
District and implementing agency	Mandera (NORDA), Narok (World Concern), Garissa (Care Kenya), Marsabit (CEC), Wajir (ALDEF)	Mandera (NORDA), Turkana (VSF-B)	Samburu (COOPI), Marsabit (COOPI, ITDG, Lutheran), Moyale (COOPI), Mandera, Garissa, Wajir (VSF-S)	Marsabit (ACK)	Turkana (OAU-IBAR)	Wajir (Oxfam)
Total value of meat distributed	738,515	—	2,484	—	—	—
Total cash received by households	632,485	—	—	—	—	—
Total value of animals saved	—	—	8,092,583	74,667	93,333	217,867
Total value of live weight gain	—	—	—	53,333	—	—
Total value of extra animals marketed	—	84,758	—	—	—	—
Other benefits*	1,040	—	—	—	—	217,200
Total cost	863,407	97,253	1,515,507	48,000	72,646	168,000
Total benefits	1,372,040	84,758	8,095,067	128,000	933,333	435,067
Benefit/cost ratio	1.59	0.87	5.34	2.67	1.28	2.59

\*Other benefits were sale of hides and the opportunity cost of water collection.

Source: Morton *et al.* (2003).



**Table 6. Estimated public and private financial benefit-cost ratios of VSF-Belgium de-stocking intervention in Turkana District in the 1999–2001 drought**

<b>Public</b>	Public (VSF-B) expenditure (Kshs m)	Direct (A)	7.4
		Overheads (B)	1.8
		Total (A)+(B)=(C)	9.2
	Number of meat beneficiaries (D)		9,036*
	Length of intervention (months) (E)		2
	Estimated equivalent of famine relief saved (Kshs m) (F)		10.8**
	Public financial benefit/cost ratio (F)/(C)=(G)		1.2
<b>Private</b>	Value of meat fed to the pastoralists (Kshs m) (H)		7.4***
	Pastoralists' trading benefits (Kshs m) (I)		17.6****
	Total financial benefits to pastoralists (H)+(I)=(J)		25.0
	Costs incurred by pastoralists (Kshs m) (K)		12.4*****
	Private financial benefit/cost ratio (J)/(K)=(L)		2.0

\*9,036 school children and TB patients in hospitals were the main beneficiaries.

\*\*Beneficiaries (9036) x intervention period in months (2) x average cost of famine relief per person per month (600/-). (In the government's famine relief programme about 2.5 million people were supplied with famine relief for 10 months at a total cost of Kshs 15 billion which comes to Kshs 600 per person per month).

\*\*\*13,000 shoats slaughtered x 500/-, i.e., price per shoat.

\*\*\*\*13,000 shoats slaughtered x 1,350/-, i.e., the price paid by VSF to the women for the meat of one slaughtered shoat. (Includes the proceeds/benefits to the owners of the livestock and labour).

\*\*\*\*\*13,000 shoats slaughtered x 950/-, i.e., the cost of buying, slaughtering, drying and delivering one shoat.

Source: Estimates computed from data in Aklilu and Wekesa (2001).

### **3.7.4 Socio-Economic Costs and Benefits**

It is clear from the high financial benefits vis-à-vis costs obtained above from virtually all the drought interventions, any one of these approaches is highly desirable. A mere ranking of the benefit-cost ratios against the available funds would be able to point to the most desirable interventions to take. However, there are many problems in the implementation of these programmes. Such problems are related to social, cultural, infrastructural, logistical, educational, institutional and even political conditions. On the other hand, there are benefits and costs which may not be easy to quantify in a straight financial analysis. Thus the financial benefits estimated above cannot be complete without a discussion of the socio-economic costs and benefits of the interventions in order to facilitate more rational decisions on whether specific interventions are desirable or not. The best way to present the various socio-economic benefit and cost considerations would appear to be in the form of a SWOT analysis. This analysis is presented in Table 7.

The strengths and opportunities listed in Table 7 basically outline the actual and potential socio-economic benefits of the various interventions. The weaknesses and threats basically reflect the costs or foregone opportunities and indicate the ways in which action should be taken to improve the impact of the interventions as well as reduce their costs. Using the analysis of the financial and socio-economic costs and benefits, a way forward in the choice and implementation of emergency off-take interventions is proposed in Chapter 5.

**Table 7. SWOT analysis for the various drought mitigation interventions impacting directly or indirectly on off-take**

Type of intervention	Strengths	Weaknesses	Opportunities	Threats
De-stocking (including buying, slaughtering and feeding the people with the meat)	<ul style="list-style-type: none"> <li>Has very high returns when combined with feeding the meat to the people</li> <li>Highly preferable to the communities compared to traditional famine relief</li> <li>The community, especially children and youth, benefited from employment and business</li> <li>The communities feel proud in being fed with their own animals</li> <li>Because of its popularity, has high possibility of stimulating acceptance of emergency off-take among the communities</li> <li>Injects immediate cash into the economy</li> <li>Meat is easier to prepare than cereals famine relief</li> <li>Better nutritionally for children &amp; pregnant mothers</li> <li>Money obtained can be used for re-stocking</li> </ul>	<ul style="list-style-type: none"> <li>Potential for spoilage of the meat and hygiene/handling problems</li> <li>Although not as expensive as traditional famine relief, requires fairly substantial financial outlays</li> </ul>	<ul style="list-style-type: none"> <li>Can widen business opportunities in the area</li> <li>Restores livelihoods and ability to pay for essentials such as drugs, school fees, etc.</li> <li>Has the potential to strengthen and blend in with the local mutual assistance networks and the 'moral' economy</li> </ul>	<ul style="list-style-type: none"> <li>If not properly done, re-stocking difficulties may arise, thereby killing community enthusiasm for the system</li> <li>Lack of banking system may enhance squandering of the proceeds and leave some people more destitute</li> <li>May be undermined by vested interests in famine relief operations such as transporters and suppliers of famine relief goods and services</li> </ul>

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<p>Transport subsidy</p>	<ul style="list-style-type: none"> <li>• Engenders a more self-reliant way of pastoralists' management of their own lives</li> <li>• Less demanding in public financial resources than the other interventions</li> <li>• Promotes pastoralist marketing structures and skills, thereby lessening dependency</li> <li>• Money obtained can be used for re-stocking</li> <li>• Injects immediate cash into the economy</li> </ul>	<ul style="list-style-type: none"> <li>• Tends to concentrate traders benefits in the hands of a few traders</li> <li>• Administration of the subsidy could be subject to fraud. Consequently, may require frequent change of controllers to avoid bribes</li> <li>• Does not guarantee relief to the poor, i.e., those who do not have much or anything to sell</li> <li>• May need a loan facility to empower traders to purchase and move large volumes of livestock and to reduce dependency on a few externally based traders</li> <li>• Those far away from trading centres may not benefit from this intervention</li> </ul>	<ul style="list-style-type: none"> <li>• Has the potential for making a major impact especially if security, physical and marketing infrastructure are improved, including the setting up of the proposed regional abattoirs or revival of KMC or both, thereby translating managed emergency off-take into market based off-take</li> </ul>	<ul style="list-style-type: none"> <li>• Security and infrastructure problems for traders may threaten continued participation by traders</li> <li>• Likewise, lack of banking system may mitigate against continued development of the system</li> <li>• The limited number of traders could form a cartel</li> <li>• May be undermined by ethnicity and lack of trust especially if steps are not taken to contract out local traders</li> <li>• Threatened by ban on night movements, police harassments at roadblocks and, to a certain extent, the disease screening and certification system</li> </ul>
<p>Veterinary</p>	<ul style="list-style-type: none"> <li>• Has very high returns</li> <li>• Blends in well with other interventions and increases their success and impact, e.g., farmers can pay with livestock which is then slaughtered and distributed as famine relief; remaining</li> </ul>	<ul style="list-style-type: none"> <li>• Requires a large outlay of professionals (vets and paravets)</li> <li>• Requires substantial financial resources</li> <li>• May seriously compromise the development of private</li> </ul>	<ul style="list-style-type: none"> <li>• If well designed and implemented, has the potential to improve the disease surveillance and drug delivery systems in the area, including the building up of associated infrastructure as well as locally based human</li> </ul>	<ul style="list-style-type: none"> <li>• In some cases, the professionals may simply ignore the involvement of other stakeholders in the design and implementation of the intervention, thereby</li> </ul>

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	<p>animals a after off-take are better off in withstanding drought</p> <ul style="list-style-type: none"> <li>Maintains critical breeding stock in good health and greatly improves the potential for quick recovery after drought</li> </ul>	<ul style="list-style-type: none"> <li>Requires substantial logistical resources for implementation in a large area almost similar to distribution of famine relief</li> <li>Potential for deterioration of feed if good storage infrastructure is not available</li> <li>Requires good water supplies and veterinary inputs such as deworming, which are usually in short supply among pastoralists, for it to make a good impact</li> </ul>	<p>drug delivery systems</p> <p>For maximum impact per shilling spent, requires implementation on a large scale or over a large area</p>	<p>capital and skills among the pastoralists</p> <ul style="list-style-type: none"> <li>It can give a boost to the development of the feed industry and induct pastoralists into this method of supporting their livestock through supplementary feeding</li> </ul>	<p>threatening its success</p> <ul style="list-style-type: none"> <li>The absence of good physical and veterinary infrastructure may undermine the success of the intervention</li> <li>May be subject to abuse and theft</li> <li>The endemic lack of water in the arid areas may seriously compromise its effectiveness</li> <li>The poor physical infrastructure in the arid areas may make it unsustainable</li> </ul>
Supplementary feeding	<ul style="list-style-type: none"> <li>Has fairly high returns</li> <li>Is preferred by some members of the communities in place of famine relief</li> <li>Is good for re-habilitating abandoned stock, i.e., the weakest of all animals left behind to die as they are too weak to go for watering or grazing (<i>af/o</i> stock in the Gabbra language)</li> <li>Strengthens the maintenance of good breeding stock which is useful for recovery</li> </ul>				
Conflict resolution	<ul style="list-style-type: none"> <li>Has very high returns in the long-term</li> <li>Access to good grazing lands and water under the control of other communities is assured or enhanced</li> <li>Has potential in long-term</li> </ul>			<ul style="list-style-type: none"> <li>Can be used for re-opening borders and the development of trade relationships</li> <li>Can enhance peace negotiation skills and improve institutions</li> </ul>	<ul style="list-style-type: none"> <li>The proliferation of small arms in the pastoralist areas and in the country in general is a big threat to this very useful instrument of development</li> <li>Ethnic chauvinism and</li> </ul>

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	<p>peace dividends not only in terms of drought management but also general development and the well being of the populations</p> <ul style="list-style-type: none"> <li>Has very high immediate returns as it saves human and animal lives which are in immediate threat of extinction</li> </ul>	<ul style="list-style-type: none"> <li>This is the most expensive of all interventions and the least sustainable</li> <li>Can only be applied in very limited areas</li> </ul>	<ul style="list-style-type: none"> <li>Highlights the need for development of long-term water supplies and emphasises the need for government and other development agencies to accord the matter high priority</li> </ul>	<p>cultural demands such as the need for dowry is always a constant threat to the success of this type of intervention, political instigation also has a potential to flare up and negate gains made</p> <ul style="list-style-type: none"> <li>Usually compromised by lack of finances</li> </ul>
<p>Water trucking</p>	<ul style="list-style-type: none"> <li>Has high returns</li> <li>Is complementary to off-take</li> <li>Has the potential to reduce income inequalities as targeting of vulnerable groups is easy</li> <li>Blends in well with and strengthens local mutual assistance networks and the culture of the 'moral' economy among the pastoralists</li> </ul>	<ul style="list-style-type: none"> <li>Has the potential to create dependency</li> <li>Can reduce the benefits of off-take especially where off-take interventions have not been judiciously planned and implemented</li> <li>Difficulties may arise in access or sourcing suitable re-stocking stock</li> </ul>	<ul style="list-style-type: none"> <li>Can be used for general herd improvement as well as the enhancement of the livestock markets in the area of operation</li> </ul>	<ul style="list-style-type: none"> <li>Can be subverted by lack of transparency in the distribution of resources</li> </ul>
<p>Re-stocking</p>	<ul style="list-style-type: none"> <li>Has high returns</li> <li>Is complementary to off-take</li> <li>Has the potential to reduce income inequalities as targeting of vulnerable groups is easy</li> <li>Blends in well with and strengthens local mutual assistance networks and the culture of the 'moral' economy among the pastoralists</li> </ul>	<ul style="list-style-type: none"> <li>Has the potential to create dependency</li> <li>Can reduce the benefits of off-take especially where off-take interventions have not been judiciously planned and implemented</li> <li>Difficulties may arise in access or sourcing suitable re-stocking stock</li> </ul>	<ul style="list-style-type: none"> <li>Can be used for general herd improvement as well as the enhancement of the livestock markets in the area of operation</li> </ul>	<ul style="list-style-type: none"> <li>Can be subverted by lack of transparency in the distribution of resources</li> </ul>

# 4

## **GUIDELINES FOR EMERGENCY LIVESTOCK OFF-TAKE**

### **4.1 EWS and Drought Preparedness**

Rainfall and remotely sensed fodder measurement are the earliest and most accessible indicators to impending drought. However, these are crude indicators of the impact of drought on pastoral areas. They should therefore be used as a rough basis for more detailed, local level participatory assessment of drought impact and its mitigation.

The initial action against drought is de-stocking. Private livestock markets can substantially reduce the early impact of drought. Sensitization of pastoralists with respect to the market economy and early warning of impending drought are the most cost effective de-stocking strategies. Early warning would also facilitate traditional coping strategies mentioned elsewhere in this handbook. At the early stages of drought, these preparedness strategies can be assisted by subsidies that reduce the cost (to pastoralists, private traders or NGOs) of removing certain pre-determined numbers and types of livestock from pastoral herds to terminal markets. Some form of moratorium on certain taxes may also be instituted to increase returns to pastoralists and traders so as to stimulate sales. Another early drought intervention may involve animal health, which has been shown to have a high benefit-cost ratio. This is mainly in the control of internal and external parasites and strategic vaccination dependent on the local epidemiological risk. These animal health services are best delivered through certified, private veterinary providers at market prices (subsidised for the beneficiary) and may involve an element of cost recovery from the beneficiary.

Even though there are difficulties in organizing a widespread implementation, supplementary feeding for breeding stock and immature females may be desirable in certain circumstances. As shown by the benefit-cost analysis and other reports, there have been successful feed interventions. The use of grain as a supplementary feed is likely to be cost-effective provided some local grazing or browse remains. However, the focus of supplementary feeding should be on survival, not production, with the primary benefit derived from accelerated post-drought recovery.

Water trucking is yet another useful intervention in preparedness planning. But it has been suggested that water transportation can be made more effective by: enabling the affected populations to move to water points; use of camels rather than trucks for water transport; and purchasing water locally from private suppliers if available.

In prolonged drought, animals at risk are unlikely to be suitable for commercial markets. Given such a scenario, local livestock slaughter and meat drying with its subsequent distribution as food aid appears to be the most effective intervention. In some cases such as in the proximity of large refugee camps or schools, fresh meat distribution may be more cost-effective. Pastoralists can be paid in cash or grain for their slaughtered stock. Cash-for-work (or food-for-work) programmes are another important drought mitigation strategy, particularly when the labour is used to enhance the livestock production, marketing or service base. Well and pond rehabilitation, bush clearing, road and track development and maintenance and water spreading structures are amongst those that can be constructed with public labour, together with social service infrastructure. The advantage of a cash-for-work approach is that it contributes to the formation of a capital base for re-stocking, does not unduly distort local grain markets and enables a measured contribution-in-kind from the participating communities.

In summary, post-drought mitigation interventions should best focus on animal health, strategic feeding of breeding stock and re-stocking. Re-stocking should not simply place emphasis on destitute pastoralists, but rather aim at strengthening the productive base of marginalized pastoralists.



## 4.2 A Guiding Model for Emergency Livestock Off-take

Livestock off-take can be determined by the numbers of animals this year and their rates of survival under average (normal) weather conditions. This information can be used as a guide to decide on the appropriate numbers to be removed from herds during emergency exercises, instead of carrying out *ad hoc* de-stocking. With information on the numbers of livestock (units) in each range area (or district) and the severity of drought from early warning systems such as the LEWS and other sources of climate predictions, an index can be assigned to come up with a proportion of animals that can be removed as emergency off-take, so that the remaining herd can survive through the drought on the available forage.

### 4.2.1 Production Traits and Measurement of Livestock Units

Livestock numbers are influenced by two main ‘production traits’—reproduction and mortality. Reproductive rates are generally associated with the number of mature females; e.g., the calving rate is the number of calves born per year as a percentage of the number of cows. This overall rate may be further separated into frequency of breeding (fertility) and the average number of young born at any parturition. For cattle, fertility is measured by the calving interval and usually only one calf is born at a time.

Mortality rates vary between age and cohorts, with young stock generally more vulnerable than older animals. In order to identify these differences, age specific mortality rates are often quoted. Similarly off-take of animals is concentrated on particular sex and age groups, often bulls and old animals (Upton, 1993). For illustration, a set of production traits for pastoral cattle are given in Table 8.

The total output produced (off-take) should be related to the level of ‘inputs’ used. The most important inputs in a pastoral setting are ‘capital’ in the form of animals and feed energy consumed derived from the natural range forage. Usually, even when considering a single species such as a herd of cattle, camels, or a flock of sheep or goats, the total number of animals is an unsatisfactory measure of input use because of variations in age and size. A more appropriate measure is in terms of livestock units (LUs), which are based on feed consumption requirements, with an adult milking cow treated as the standard and given a value of unity. Sheep, goats and young

stock are then represented by fractions of a LU, while bulls and camels generally count for more than one LU each.

**Table 8. Production traits for Boran cattle in a pastoral herd**

Trait	
Calving rate	75%
Age at first calving (mean)	4 years
Ratio of adult male to female	10%
Age at maturity for males (270 kg)	4 years
Pre-weaning mortality	25%
Mortality 12-24 months	13%
Mortality 24-36 months	5%
Mortality 36-48 months	2%
Culling (replacement rate) for breeding herd	15%

The conversion factors are based on relative feed energy requirements per head, and these can be derived from physiological studies. Energy requirements for maintenance of a ruminant depend on its metabolic weight, commonly defined as  $W^{0.75}$ , where  $W$  is the live weight in kilograms. This implies a non-linear relationship between live weights and conversion factors so that, for example, a heifer that is 40% of the live weight of a cow may have a metabolic weight which is 50% that of a cow. Thus, a heifer would represent 0.5 of a LU. Table 9 provides illustrative conversion factors and computed LUs from a hypothetical initial pastoral herd structure, to be used for developing a herd growth model and off-take (see further illustration in Annex I, Table 17).

**Table 9. Initial herd structure and livestock units**

Sex and age category	Weight (kg)*	Livestock unit conversion factor*	Number in herd	Livestock units (LU)
Cows (females aged 4 years and above)	250	1.00	400	400
Calves (males and females aged up to 12 months)	33	0.22	250	55
Heifers (females aged between 1 and 4 years)	100	0.50	150	75
Immature males (aged between 1 and 4 years)	129	0.61	140	54
Mature males (bulls and castrates)	320	1.20	40	48
Totals	—	—	980	632

\*Weights and conversion rates have been adapted from Upton (1993).

#### 4.2.2 Herd Projection

The structure of herd growth shown in the flow diagram (Figure 3) illustrates how animal off-take, together with the numbers of animals in each sex/age cohort next year, can be determined by the numbers of animals in each cohort this year, and their rates of survival, under 'normal' (or average) weather conditions. To construct a herd growth model, one needs to divide the herd into age/sex cohorts, as shown in Table 9. In order to project the development of the large herd given in the table, the production traits given in Table 8 are applied. To keep the calculation simple, we assume that mortalities represent total losses, that all culled breeding stock are sold or slaughtered (although some mortalities would occur among breeding stock), and that the only other off-take comprises animals reaching maturity (although calves and immatures may also be sold). In this case we assume that 75% of male cattle reaching maturity are sold or slaughtered. The structure of the calculations of the model is shown in Figure 3, and the changes in numbers over the first two years are projected in Table 10.

The results in these calculations have been rounded off to the nearest whole number. The numbers in each cohort next year (in column IV) are obtained as the sum of the retentions (column II) and net transfers (column III). In the same way, the numbers in the

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following year (column VII) are obtained as the horizontal sum of columns V and VI.

To explain, consider column II, which is derived from the data in column I. The number of cows retained until next year is 85% of the current number, since the culling rate is 15%. By next year none of the calves, currently under one year of age, will remain in this age class, so there is a nil entry. However, immature males and females range in age from one year to four years. Roughly two-thirds of the number in each of these classes will remain in the same class at the end of the year.

**Table 10. Herd growth projection in the first two years**

Classes	I Present numbers	II Retention (survival)	III Additions net of mortalities and off- take	IV Numbers next year	V Retention (survival)	VI Additions net of mortalities and off-take	VII Numbers in year after next
Cows	400	340	45	385	327	56	383
Calves	250	0	300	300	0	289	289
Heifers	150	94	94	188	118	113	231
Immature males	140	88	94	182	114	113	227
Adult males	40	34	10	44	37	14	51
Totals	980	556	543	1099	596	585	1181
<i>Off-takes</i>							
Culled cows			60			58	
Males at 4 years			32			41	
Old culled males			6			7	

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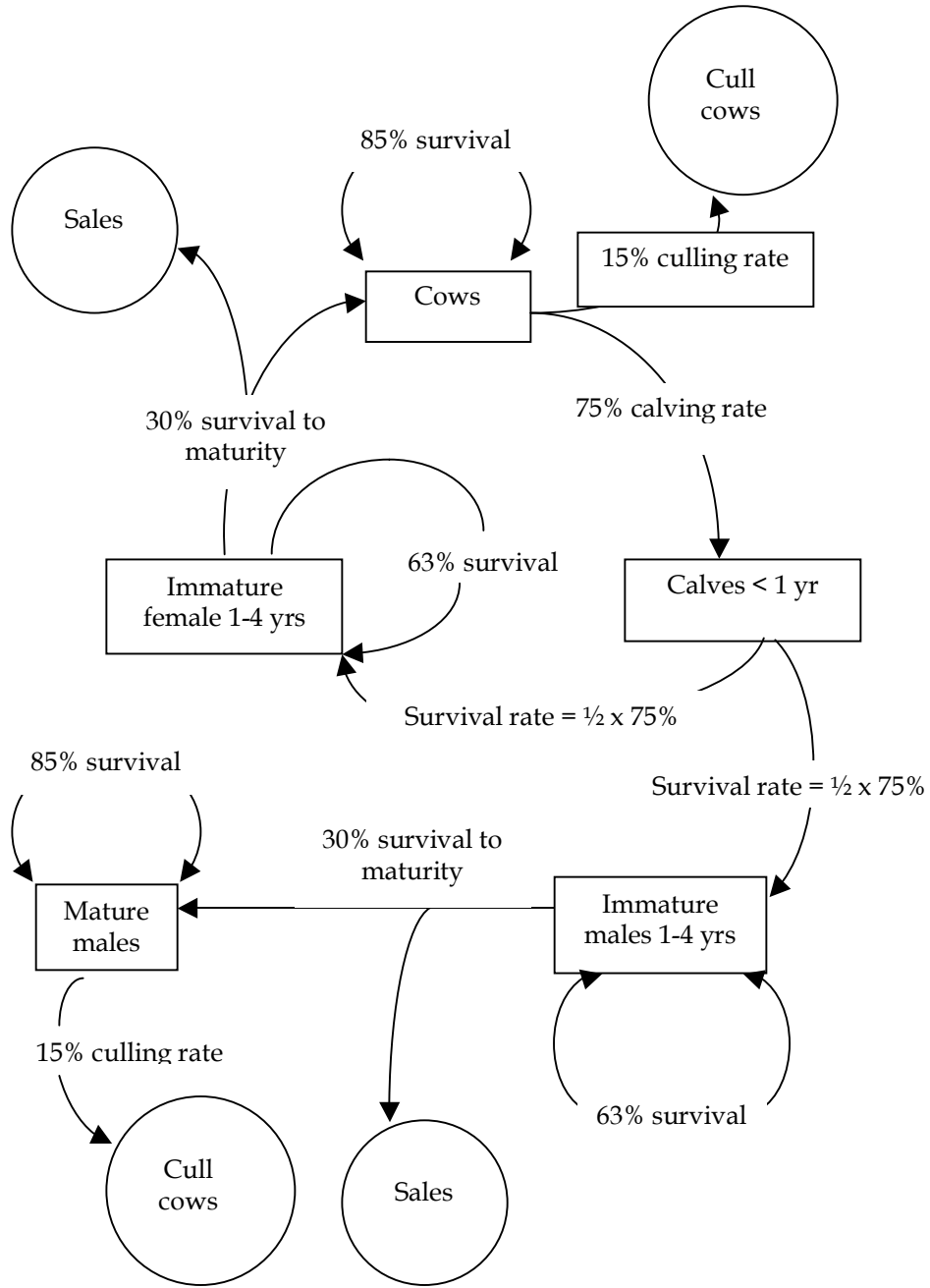


Figure 3. Structure of herd-growth model

To be precise, if 100 animals enter this cohort at one year of age, 87 will survive to the end of their second year, given the 13% mortality rate between one and two years). Of this 87, given the 5% mortality rate for 2–3 year old cattle,  $(1-5/100)87=82.65$  will survive to the end of their third year. Thus, if numbers remain constant in each age cohort from year to year, the total number between one and four years of age would be  $100+87+82.65=296.65$ . However, after a year has elapsed, the original 100 year-olds will be reduced to 87, the 87 two-year olds will decline to 82.65 and the three-year olds will have left this age category. Thus  $87+82.65=169.65$  will be retained, which make up  $(169.65 \times 100) / 269.5 = 62.9\% \approx 63\%$  of the total. The 94 immature females, which are retained, represent 62.9% of the original 150. Similarly, the 88 immature males represent 62.9% of the original 140. For the adult males a culling rate of 15% means that 85%, or 34, of the original 40 survive until next year.

The estimates of net additions (column III) are also derived from the animal numbers given in column I. The 300 calves born are 75% of the number of cows, since this is the calving rate. Given the mortality rate of 25% for calves below one year, 75% of the initial number of calves will be added to the 1–4 age category by the end of the year. Since 75% of 250 amounts to approximately 188, and we assume that half the calves are male and half are female, 94 are added to each category of immatures. The proportion of immatures added to the adult categories each year may be derived from the figures given in the preceding paragraph. Thus, from a total of 269.65 immatures,  $82.65(1-2/100)=81$  reach the age of four years annually. This represents  $(81 \times 100) / 269.65 = 30.0\%$ . This percentage of the 150 immature females amounts to 45 additions to the cow numbers. Similarly, 42 of the 140 immature males reach the age of four years. However, 75%, or 32, of these males reaching maturity are taken as off-take, leaving 10 additions to the herd.

Livestock off-take is readily calculated in the process of estimating the pattern of herd growth. Those given under column III for the first year are calculated as follows:

- Culled cows make up 15% of the number in the herd at the start of the year, i.e., 60 out of 400.

- Off-take of males reaching maturity is 75% of 30% of the number of immature males, which in this case is 140; thus  $0.75 \times 0.30 \times 140 = 31.5 \approx 32$ .
- The 6 culled males make up 15% of the 40 adult males.

The figures in columns V and VI are derived from those in column IV in the same way, to obtain estimates of livestock numbers and off-take after two years. Assuming that production traits and off-take remain constant, the same set of calculations may be applied repeatedly to project herd growth over any number of years.

#### ***4.2.3 Use of the Steady-State Herd Model to Predict Livestock Numbers***

Some assumptions have to be made regarding the ages at which male and female animals are slaughtered or sold in order to determine a steady-state herd structure and the corresponding off-take of animals. In the steady-state model, off-take rates are determined as residuals after the necessary replacements have been made to maintain a constant herd size structure. To illustrate the method of calculation we assume that off-take of both male and female cattle occurs at maturity (i.e., 4 years of age). The production traits shown in Table 8 are applied, and a steady-state herd structure is built up from a unit of 100 breeding cows. The calculations are shown in Figure 4. The number of calves produced annually is determined by the calving rate, while the number of adult males is determined by the male to female ratio. The off-take of culled animals—both male and female—and the numbers of replacements needed are given by the culling rate. If some mature animals were lost as a result of mortalities, the off-take and replacement rate could be adjusted appropriately.

Computation of the number of immature animals involves the pooling of three different age cohorts into one category. It is assumed that half the calves produced are female and the other half are male, and that the first-year mortality rate applies to both sexes, even though this often does not hold. (The mortality rate for male calves may be slightly higher than that for females because females are more valuable and therefore greater care is taken in raising them.) With these assumptions, of the 75 calves produced,  $0.75 \times 75 / 2 = 28.12$  enter the immature female category (yearlings). In the second year of life, the survival rate is 87%, since mortality is 13%, so  $0.87 \times 28.12 = 24.47$  survive into their third year. For the third year, the survival rate is 95% (5% mortality), hence

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$0.95 \times 24.47 = 23.24$  reach the age of three years. The sum of these three cohorts, i.e., 75.84, gives the total number of heifers aged 1–4 years. Same computations give the number of males as well. The survival rate for the fourth year is 98% (2% mortality), so  $0.98 \times 23.24 = 22.78$  reach the age of four years. Since this is assumed to be the age of off-take, the numbers needed as replacements are subtracted to leave the numbers for off-take. These results are summarised in Table 11, together with estimates of the number of livestock units, derived from the steady-state herd structure and the total output, derived from the off-take of animals.

It can be noted in Table 11 that, with the proportion of the various classes in a pastoral herd derived from the production traits given in Table 8, a basic unit of 100 cows reflects a herd of approximately 336.6 animals, equivalent to roughly 212.7 LUs. The off-take derived from the steady-state model (assuming ‘normal’ weather) is about 45.6 animals or 48.4 LUs. If we focus on LUs, the annual off-take rate is 22.7%.

**Table 11. Off-take (output) per livestock unit derived from the steady-state model for cattle**

Item	Number	Livestock units (LUs)	Off-take (number)	Off-take (LUs)*
Culled cows	100.0	100.0	15.0	15
Calves	75.0	16.5	—	—
Heifers 1-4 years	75.8	37.9	7.8	7.8
Males 1-4 years	75.8	46.3	21.3	25.6
Old culled males	10.0	12.0	1.5	1.8
Totals	336.6	212.7	45.6	48.4

\*Using conversion rates given in Table 9.

The preceding calculations serve to show those who may be interested how to derive the various figures in an average pastoral context. However, a field officer need not go through these derivations. Simple equations suffice to arrive at the off-take required. These equations are given below.

The major interest for a field officer is to determine the number of animals to take off a given cattle herd in an average year. If we deal with head of cattle, in a herd size of 336.6 animals, there will be an off-take of 45.6 animals. In general then,



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$$Q = 45.6 / 336.6HS$$

Or

$$Q = 0.135HS$$

Where  $Q$  is the off-take in cattle numbers and  $HS$  is the herd size. If we take the example of Garissa District which has roughly a total of 390,000 head of cattle (Table 1), off-take in a 'normal' year would be given by  $390,000 \times 0.135 = 52,650$  animals. For those who may wish to work with LUs, these would be derived using

$$LU = 48.4 / 336.6HS$$

Or

$$LU = 0.144HS$$

Thus, in Garissa, we would have 246,444 LUs and an off-take of 56,189 LUs.

The rates derived from the steady-state can now be used to estimate the number of livestock units needed to be removed from a herd in an area or district. We can attach indexes to indicate the severity of drought, assessed from climate predictions. If 'normal' weather conditions are likely to prevail, then an index of unity is used and the off-take rate is that given by the steady-state, i.e.,  $\approx 23\%$ . A mild drought could be given an index of  $1\frac{1}{2}$ , a severe drought an index of 2, a very severe one an index of 3, and so on. In which case, if the drought is severe, the off-take rate may be doubled.

A steady-state off-take for camels can be computed using the same approach as that used in the computation of cattle off-take. Let us consider 100 camels in a pastoral herd with the following traits: calving rate, 50%; age at first calving, 5 years; ratio of adult males to females, 20%; age at maturity for males, 5 years; pre-weaning mortality, 28%; mortality 12–24 months, 15%; mortality 24–36 months, 8%; mortality 36–48 months, 4%; mortality 48–60 months, 2%; and culling for breeding herd, 10%.

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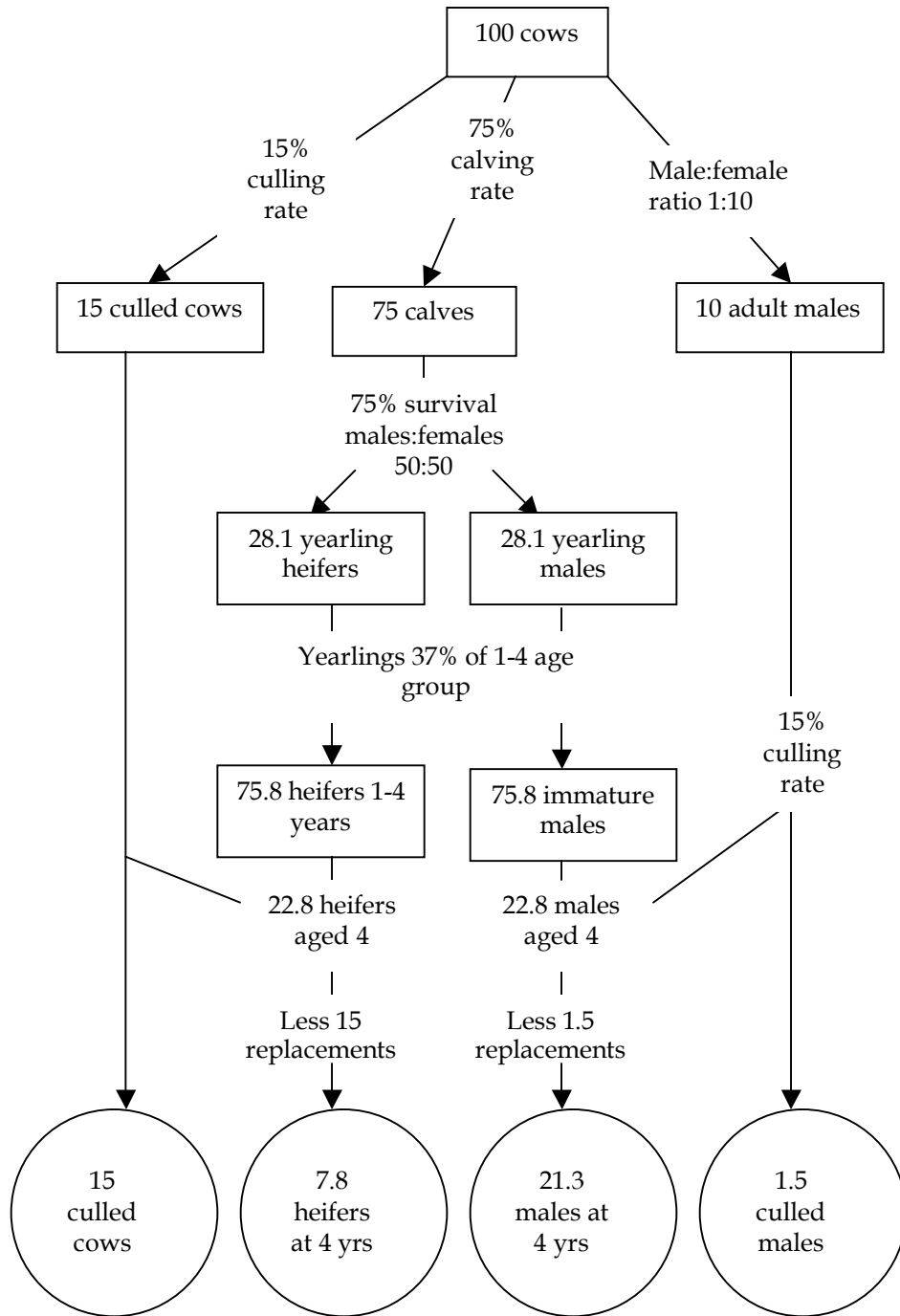


Figure 4. The steady-state herd model

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Of the 50 calves produced,  $0.72 \times 50 / 2 = 18$  enter the immature female category (yearlings). In the second year, the survival rate is 85%, since mortality is 15%, so  $0.85 \times 18 = 15.30$  survive into their third year. The survival rate in the third year is 92% so that  $0.92 \times 15.30 = 14.08$  reach the age of three years. For the fourth year, the survival rate is 96% so that  $0.96 \times 14.08 = 13.52$  reach the age of four years. The sum of the four cohorts, which is 60.9, gives the total number of immature females aged 1–5 years. The same applies to immature male camels. The survival rate for the fifth year is 98%, so  $0.98 \times 13.52 = 13.25$  camels reach the age of five years. Since this is assumed to be the age of off-take for camels, the numbers needed for replacements are subtracted to leave the numbers for off-take. Table 12 gives a summary of these computations, assuming a culling rate of both adult male and female camels of 10%.

Considering the figures generated in Table 12, in a camel herd size of 294.0 animals, there will be an off-take of 26.5 animals. This can be expressed as

$$Q = 26.5 / 294.0 HS$$

Or

$$Q = 0.09 HS$$

Where  $Q$  is the off-take in camel numbers and  $HS$  is the herd size. (Similarly, an equation can be derived for LUs.)

Again, if we take the example of Garissa District which has roughly a total of 56,000 camels (Table 1), off-take in a ‘normal’ year would be expected to be given by  $56,000 \times 0.09 = 5,040$  animals.

**Table 12. Off-take per livestock unit derived from the steady-state model for camels**

Item	Number	Livestock units (LUs)	Off-take (number)	Off-take (LUs)*
Culled female camels	100.0	142.0	10.0	14.2
Calves	50	15.0	—	—
Females 1-5 years	60.9	43.8	3.3	2.4
Males 1-5 years	60.9	55.4	11.0	10.0
Old culled males	22.2	34.4	2.2	3.4
Totals	294.0	290.6	26.5	30.0

\*See Annex I, Table 17, for conversion rates.

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To compute a steady-state off-take for small stock (sheep and goats) in a pastoral setting, let us again consider 100 of them and assume the following traits: kidding/lambing rate, 100%; age at first kidding/lambing, 2 years; ratio of adult males to females, 80%; age at maturity for males, 2 years; pre-weaning mortality, 15%; mortality 5–12 months, 10%; mortality 12–24 months, 5%; and culling for breeding flock, 25%.

Of the 100 kids/lambs produced,  $0.85 \times 100 / 2 = 42.5$  join the 5–12 month category. In the second year, the survival rate is 90%, so  $0.9 \times 42.5 = 38.25$  survive to join the 12–24 month female category. The sum of the two cohorts, which is 80.75, gives the total number of immature females aged 5–24 months. A similar number for males is obtained. The survival rate in the second year is 95% so that  $0.95 \times 38.25 = 36.34$  reach the age of 24 months (two years). For the small stock, this is assumed to be the age of off-take, and therefore the numbers needed for replacements are subtracted to leave the numbers for off-take. Table 13 provides a summary of these computations.

The figures in Table 13 show that a flock of 441.50 sheep/goats will generate an off-take of 72.66 animals. In equation form, this means that

$$Q = 72.66 / 441.50FS$$

Or

$$Q = 0.16FS$$

Where  $Q$  is the off-take in sheep/goat numbers and  $FS$  is the flock size. (As in the case of cattle off-take, an equation can be easily derived for LUs.)

To illustrate using the example of Garissa District which has a total of 271,000 goats (Table 1), off-take in a 'normal' year would be given by  $271,000 \times 0.16 = 43,360$  goats.

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**Table 13. Off-take per livestock unit derived from the steady-state model for sheep and goats**

Item	Number	Livestock units (LUs)	Off-take (number)	Off-take (LUs)*
Culled does/ewes	100.00	20.00	25.00	5.00
Kids/lambs (up to 5 months)	100.00	9.00	—	
Does/ewes 5-24 months	80.75	11.31	11.34	1.59
Bucks/rams 5-24 months	80.75	12.11	16.32	2.45
Old culled bucks/rams	80.00	18.40	20.00	4.60
Totals	441.50	70.82	72.66	13.64

\*See Annex I, Table 17, for conversion rates.

# 5

## RECOMMENDATIONS

### 5.1 Early Warning System and Response

The early warning system should be co-owned by three major groups, namely, the government (Office of the President, Ministries of Agriculture, Livestock, Meteorological Department, etc), the donor community (including NGOs) and the ASAL communities. The three stakeholders should develop the system and its principles of application together so that it is agreed what action to take at every declaration of the various stages of the system, i.e., normal, alert, alarm, emergency and recovery. For example, such action could be structured as follows:

- *Normal Stage*: Continue monitoring the situation.
- *Alert Stage*: Declaration of various resources available.
- *Alarm Stage*: Mobilisation of resources for off-take interventions, relief assistance for the poorest of the poor and contingency plans for full mobilisation.
- *Emergency Stage*: Full mobilisation of resources, including famine relief operations.
- *Recovery Stage*: Re-stocking and veterinary interventions.

The above arrangement will enhance preparedness and efficiency in taking proactive interventions to mitigate the effects of drought. This collaboration should be able to reduce the time lag between approval of an intervention and its implementation.

The government and the donors have access to modern technological forecasts of climatic conditions while the communities have their traditional ways of foretelling weather conditions. Pratt (2001) has, for example, described in detail the traditional early warning systems among the people of North

Eastern Province that could be used to feed information from the pastoralists to the DSG in each district. This information would then be combined with information from ALRMP, Meteorological Department and NGOs to determine and agree on the EWS stage which a district has attained. The analysis is then fed to the Kenya Food Security Meeting (KFSM) and its sub-committee, the Kenya Food Security Steering Group (KFSSG). The KFSM then advises the government on the situation of the weather in the different districts and the stage of the EWS in that district. This should then trigger the agreed action among the stakeholders as outlined above.

The involvement of the traditional forecasting groups will enhance their preparedness and can be the entry point for the communities' eventual acceptance of emergency off-take as a desirable tool for mitigating drought. It will also keep the communities sensitised and in preparation for any operations that may be undertaken in their areas. That way, the community forecasting system will strengthen the EWS.

In order to streamline the forecasting inputs from the traditional communities, it is recommended that committees of traditional elders be formed in every district for the purpose of feeding the DSG with the community weather forecasts. In districts where pastoral associations exist, these can be charged with this task of forecasting among the communities using the relevant forecasting practitioners within the communities.

## **5.2 Off-Take Levels**

The above proposed institutional framework should be able to determine and advise the stakeholders, through the KFSM, on the expected severity of any impending drought. The DSG should then be able to use the steady-state model presented above to determine the desired level of emergency off-take to be undertaken. The logistics, distribution and timing of the required off-take intervention should be governed by the data available and the practice over the years in each respective district. In this regard, the collection of accurate information on livestock numbers in the districts and their distribution should be collected and updated on a continuous basis.

### **5.3 Development of Computer Model for Off-Take Levels**

It is possible to translate the formulae for offtake levels discussed in the handbook into a relatively simple computer model. All the DMO would then need to do is to input the size and composition of the herd and the drought index to get the desired emergency off-take as the output. Since all DMOs offices are computerised, it is recommended that ALRMP should engage an expert to develop such a model for use in the field.

### **5.4 Types of Intervention**

The type of intervention will depend on many factors, some of the key ones being the availability of finances and other resources, the expected severity of drought, logistics and terrain. If the drought is expected to be severe, full-scale de-stocking operations may be recommended, including feeding the population with the de-stocked livestock as this was seen to be cost-effective and to have more positive socio-economic benefits than the traditional famine relief. However, like in full-scale famine relief operations, substantial amounts of financial resources would normally be required for this option.

If the drought is determined to be mild and/or localised in pockets in an area, veterinary intervention, water and feed supplementation may arrest the situation. But better still, stimulation of voluntary sale of livestock would be a least-cost approach in such a situation. Incentives such as provision of security to traders, transport subsidies, waiver of taxes and relaxation of night movements may strengthen this approach.

In general, reference to the SWOT analysis presented in Table 7 will be very useful for the DSG, KFSSG and KFSM in determining the type of intervention to take, depending on the situation on the ground and the resource commitments available.

### **5.5 Pastoral Livestock Marketing**

The development of functioning livestock markets is the long-term and permanent solution to successful and efficient emergency livestock off-take. It is the strong belief of the pastoralist communities and many other stakeholders that this can only be achieved with the rehabilitation of the marketing infrastructure and,



in particular, the marketing outlets which include either the revival of KMC or the construction of abattoirs in the pastoralist districts. The marketing issues are the subject of another in-depth study which is being undertaken for ALRMP.

### **5.6 Strengthening Pastoralist Institutions**

It is essential to develop and support various pastoral institutions to assist in mitigating drought. Approaches that seek to build on traditional coping strategies are required. For example, assistance to further development of accountable institutions such as pastoral associations can result in positive developments in natural resource management, input supply, infrastructural development, water management and conflict resolution. Pastoral associations can be a good link between government, donors and the people.

The issue of supporting non-livestock-based savings (or pastoral banking) institutions was brought up in most of the discussions in the various districts. This was powerfully supported as an important intervention in pastoral areas, especially to absorb the sudden surge of cash obtained by pastoralists during emergency off-take (de-stocking), to be released during the stage of (re-) building up the herds (re-stocking). It was felt, however, that a number of obstacles—economic, cultural and practical—will have to be overcome to achieve this goal.

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## **ANNEX I: EMERGENCY LIVESTOCK OFF-TAKE GUIDELINES FOR USE IN THE FIELD**

The purpose of these guidelines is to serve as a quick reference material for the field officers involved in the implementation of the emergency off-take.

### **1. Definitions**

#### **1.1 General off-take**

Livestock off-take is the percentage of the current year's herd that is removed through any means, including sales, deaths, gifts, home-slaughters or theft.

#### **1.2 Commercial off-take**

These are animal units removed from the herd for cash sales.

#### **1.3 Emergency off-take**

These are animals removed from a herd in anticipation of a disaster such as drought or disease epidemic. They can be removed through sale, slaughter for consumption or for cultural activities such as dowry, gift, etc.

### **2. Reasons for Undertaking Livestock Emergency Off-Take**

It is desirable to reduce the number of livestock which a pastoralist has before a drought strikes for a number of important reasons. These include:

#### **2.1 To avoid livestock deaths**

During drought or other disasters livestock deaths are likely to rise significantly due to reduced availability of resources such as pastures and water. For example, while livestock mortality rates under normal conditions in the ASAL areas are estimated to be about 10%, these rates dramatically changed to 35.2% for cattle,

43.0% for small stock and 18.0% for camels in the 1996–97 drought. In the 1999–2000 drought, livestock losses alone were valued at Kshs 12.71 billion which was equivalent to over 6% of the Kenya Government budget that year.

## **2.2 To sell when prices are good**

It has been observed that pastoralists often delay selling stock as long as possible, with the result that animals are sold in poor condition when the drought sets in and the pastoralists are desperate to get what they can out of their dying livestock, thereby fetching low prices. Oversupply of such animals to markets exceeds the capacity of the markets to absorb them. Consequently, apart from dying, sale of animals when the drought is already in progress results in considerable economic loss both for the producers and the nation. The solution therefore is to increase sales of animals during the favourable period before a drought sets in.

## **2.3 To provide a more secure source of appropriate food during drought**

Livestock sold before drought can provide higher levels of income which can be used by the pastoralists to purchase and stock their preferred types of foods. As will also be seen later, livestock can be slaughtered while in still good condition and used for food. Some of the meat can also be preserved through traditional as well as modern techniques for use in the future. These scenarios provide a source of more nutritionally superior food supplies than the traditional famine relief supplies distributed when drought strikes.

## **2.4 To save breeding and other high value stock**

Emergency off-take results in the scaling down of herd sizes in relation to the anticipated reduction in the available pasture and water resources during the anticipated drought. Emergency off-take therefore gives the pastoralists an opportunity to protect their most valued animals such as breeding stock by reducing competition for resources during the drought from less valued stock. Pastoralists have developed highly skilled ways for identifying and removing the less desirable stock. In this regard, herders usually prefer to restrict off-take to the non-productive categories of animals of their herds. These include old and/or barren cows, cows with insufficient milk production or with atrophied teats, cows which refuse to be milked or to give milk to their calves, those with physical features



considered harmful, those which continually abort, sterile males and females, males which are not good reproducers, weak animals which are not resilient to dry season conditions, and animals handicapped by diseases or birth defects. The agency implementing emergency off-take will therefore find highly skilful help among the communities in identifying the stock that should be removed and sold or slaughtered before a drought.

### **2.5 Traditional methods for preserving stock during drought have broken down**

Pastoralists have over the years developed various ways of coping with drought. These methods include preservation of some areas for grazing livestock and rules for accessing such areas. Indeed pastoralism is by and large based on this concept of resource management. However, over the years, pastoralist mobility and the availability of resources has been reduced by increasing human populations and settlements. Access to the remaining resources has also become more constrained, thereby resulting in more and more resource based conflicts.

### **3. Reasons for Low Adoption of Emergency Off-Take by Pastoralists**

Despite the above compelling reasons for emergency livestock, pastoralists have been reluctant to take up emergency off-take as a way of managing their livestock in anticipation of droughts. It is important to try to understand the rationale which informs this low adoption of emergency off-take among the pastoralists. This includes:

#### **3.1 The more the livestock, the greater the chance that some will survive**

Pastoralists are sometimes reluctant to sell stock, because they have to maintain a certain level of production for subsistence. They must also hedge against the vagaries of the highly uncertain climate, epidemiological conditions and an equally uncertain political environment. In this regard, large herds act as a guard against a drought. The perception here is that the larger one's herd is at the beginning of drought, the more likely one is to have a viable herd at the end of the drought

However, the basis of these guidelines is based on the principle that the objective of maintaining a viable herd is best achieved through the judicious application of emergency off-take.

### **3.2 Livestock is an asset to be sold only for key cash needs such as school fees and food**

To the pastoralists, livestock is an asset similar to land and capital which should not be readily disposed of unless there are very pressing needs. The production or 'interest' generated by the livestock capital is seen as milk, sometimes blood and the animals that are taken off from the herd from time to time for slaughter and socio-cultural requirements. Apart from meeting these needs, the livestock capital has to be maintained and increased over time, not reduced, according to the pastoralists. According to them, this capital should only be 'liquidated,' i.e., sold for very pressing needs such as school fees, food, etc.

### **3.3 Availability of food aid or famine relief**

Despite its noble aims, availability of famine relief tends to mitigate against off-take as means of managing livestock in the dry season. As noted above, food being one of the compelling reasons why a pastoralist may sell his animals, it becomes not necessary to sell the animals since the food needs are expected to be taken care of through famine relief. This results in the maintenance of large herds right into the drought with the resultant consequences outlined above.

### **3.4 Poor markets**

Recent extensive discussions with pastoralists in the arid districts have shown that if they can be assured of good functioning markets, pastoralists will be less reluctant to sell their livestock in preparation for the drought. Therefore all stakeholders are now enjoined to continue to streamline livestock marketing in this country as a long term resolution of pastoralist economic problems. Within the context of emergency off-take as a livestock management tool, any marketing efforts being undertaken by development agencies should be vigorously encouraged and given high priority.

### **3.5 Lack of banks**

The sale of unusually high numbers of livestock in anticipation of drought means that the pastoralists receive surplus cash which may not necessarily be used immediately. There is also security risk keeping such money with the family. The lack banking infrastructure in the ASAL areas is also a disincentive to emergency off-take.

### **3.6 Risk of being unable to re-stock**

Many pastoralists rightly fear that once they sell their livestock, they may squander the money and be unable to re-stock once the weather conditions return to normal. This problem is magnified further by the absence of a banking infrastructure. They further fear that there may be no appropriate sources from which to stock. However, in a situation where emergency off-take is properly done, it is likely easier to re-stock from healthy herds than from stock which is already weakened by drought. It is therefore important that in undertaking an emergency off-take programme, this should be planned together with a re-stocking programme, especially targeted at the very poor. In this regard, traditional approaches to re-stocking should be taken into account when planning re-stocking.

### **3.7 Greater belief in the traditional drought coping mechanisms**

Most pastoralists believe that traditional coping mechanisms will see them through droughts. These mechanisms include reserve grazing areas, prayers, hunting and gathering, the moral economy and even cattle raiding for re-stocking. However, while these mechanisms have worked in the past and continue to have a place in modern day pastoralism, we have already seen that there are major constraints in continuing to rely solely on these mechanisms especially during major and extended droughts. Ultimately, emergency off-take must be seen as a method of strengthening the traditional methods of coping with drought, not a replacement of those methods.

### **3.8 Emerging modern drought coping mechanisms**

Emerging drought coping mechanisms such as salaried employment, trade, ecotourism and farming have also tended to

mitigate against emergency off-take. However, these should be seen to be complimenting one another with emergency off-take and the traditional methods.

### **3.9 Large livestock herds are a status symbol**

In any society, wealth is a powerful status symbol. Consequently wealth as symbolised by large livestock numbers among the pastoralists is a strong disincentive to emergency off-take. However, as noted earlier, if the markets are right, there are indications that pastoralists will not stick to livestock which is threatened by drought just for the sake of being seen with large livestock numbers. A strong sensitisation effort will also help rationalise pastoralist beliefs to the position that it is better to hold a smaller healthy herd than a large herd with weak emaciated numbers.

### **3.10 Concluding remarks: The pros and cons of emergency livestock off-take**

Emergency livestock aims at taking pre-emptive action before expected drought in order to avert massive losses in livestock, major downward shifts in prices, decimation of herds to the point of poor residual herds which later take long to recover, famine and general food insecurity, dependency on famine relief as well as long term poverty which results from sustained losses from successive droughts. Notably, emergency livestock off-take aims at strengthening existing traditional drought coping mechanisms. Modern emergency off-take can therefore succeed only when implemented with the grassroots communities as key participants in the conceptualisation, planning and implementation of the programmes.

## **4. Institutional Arrangements for Livestock Emergency Off-Take**

For a successful emergency off-take a number of well coordinated institutions should be developed. These include but are not limited to:

- An efficient early warning system.
- A district coordination mechanism.
- A responsive policy making mechanism at the national level.

- Highly accountable, transparent and experienced institutions that can be contracted to implement the off-take programmes such as government departments, NGOs, CBOs, churches and local community groups.
- Financing mechanisms and donors.

Each of the above institutions and their roles are discussed below.

#### **4.1 The Early Warning System**

One of the important functions of the office of the Drought Management Officer (DMO) in the district is the continuous collection of data to monitor various parameters with a view predicting in good time an impending drought: Hence the name early warning system (EWS). This system must be efficient in terms of predicting drought. Some donors are also involved in the implementation of EWS in their own right and the DMOs should always seek to compare notes with them on a continuous basis. The efficiency of the EWS cannot be overstated because an effective livestock off-take programme largely depends on it. The DMOs must therefore make sure that this activity is given a lot of weight in their day to day activities.

The EWS data and analysis feeds from the DMOs office into the DSG which in turns feeds into the national and decision making institutions which are described below.

In essence, the EWS is co-owned by four major groups in the country, namely, the government (Office of the President, Ministries of Agriculture, Livestock, Meteorological Department, etc), the donor community, NGOs and CBOs, and the ASAL communities (including local groups). The four stakeholders should develop the system and its principles of application together so that it is agreed what action to take at every declaration of the various stages of the system, i.e., normal, alert, alarm, emergency and recovery. For example, such action could be structured as follows:

- *Normal Stage:* Continuous monitoring of the situation and contingency planning.
- *Alert Stage:* Planning of possible off-take interventions and indication of various resources available.

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- *Alarm Stage:* Mobilisation of resources for off-take interventions, relief assistance for the poorest of the poor and contingency plans for full mobilisation.
- *Emergency Stage:* Full mobilisation of resources, including famine relief operations, if necessary.
- *Recovery Stage:* Re-stocking and veterinary interventions.

The above arrangement will enhance preparedness and efficiency in taking proactive interventions to mitigate the effects of drought. Collaboration between the key stakeholders identified above should be able to reduce the time lag between approval of an intervention and its implementation.

The government and the donors have access to modern technological forecasts of climatic conditions while the communities have their traditional ways of foretelling weather conditions. The DMOs should identify and document in detail the traditional early warning systems among the people of their respective districts that could be used to feed information from the pastoralists to the DSG in each district through the DMO. This information would then be combined with information from ALRMP, Meteorological Department and NGOs in the district to determine and agree on the EWS stage which a district has attained. The analysis is then fed to the Kenya Food Security Meeting (KFSM) and its sub-committee, the Kenya Food Security Steering Group (KFSSG). The KFSM then advises the government on the situation of the weather in the different districts and the stage of the EWS in that district. This should then trigger the agreed action among the stakeholders as outlined above.

The involvement of the traditional forecasting groups will enhance their preparedness and can be the entry point for the communities' eventual acceptance of emergency off-take as a desirable tool for mitigating drought. It will also keep the communities sensitised and in preparation for any operations that may be undertaken in their areas. That way, the community forecasting system will strengthen the EWS.

In order to streamline the forecasting inputs from the traditional communities, it is recommended that DMOs, in consultation with their DSGs, should form committees of traditional elders in their respective districts for the purpose of feeding the DSG with the community weather forecasts. In districts where Pastoral Associations exist, these can be charged with this task of

forecasting among the communities using the relevant forecasting practitioners within the communities. The number of the elders' committees should depend on the characteristics of each district and the resources available to keep a constant liaison with them throughout the year. However, whatever numbers are possible, they should be equitably distributed throughout the district.

As will be mentioned later, the same elders' committees and/or Pastoral Associations should be used for the planning and implementation of off-take programmes.

#### **4.2 District coordination mechanism**

The District Development Committee (DDC) is the main coordinating body for development in the district. Under the DDC, there are various sub-committees dealing with various issues. The District Steering Group (DSG) is the sub-committee of the DDC which has been formed in ASAL areas to deal with and coordinate drought issues. The DSG brings together various key groups operating in various parts of the district. In effect, it is the main technical advisory group on drought issues in the district.

It is the responsibility of the DSG, using analytical tools such as EWS, to advise the national policy institutions and their partners such as donors and NGOs on the conditions on the ground on a continuous and real time basis for timely decisions and actions.

#### **4.3 Policy making institutions at the national level**

At the national level, the Ministry for Special Programmes in the Office of the President is responsible for drought matters as part of its disaster portfolio. The Minister in charge of the ministry advises Cabinet on the drought situation in the country. His advice may, for example, result in a declaration by the President of an emergency drought situation in the country, thereby triggering concerted government and donor response to address the situation. Two important committees which feed advice to the ministry exist under the ministry. These are the Kenya Food Security Meeting (KFSM) and a sub-committee of KFSM, the Kenya Food Security Steering Group (KFSSG).

These committees bring information to bear on its advice from various sources including government, donor and NGO sources as these stakeholders are represented in the membership of both

committees. One of the important sources is the DSG which currently, channels its information through the Arid Lands Resource Management Project (ALRMP). In this regard, the EWS information is one of the key information items coming from the DSG.

Thus there exists a clear institutional framework through which critical information from the field can reach the Cabinet and other key stakeholders on a fast track basis for timely decision making and action. The DSG should therefore keep in touch with that system continuously and on a real time basis through the ALRMP.

#### **4.4 Livestock off-take implementation agents/institutions**

ALRMP, donors and other financiers do not have the capacity (or have limited capacity) to implement livestock off-take projects/programmes. They implement such programmes through contracts to other agents or institutions. Such institutions include government departments (e.g., the Veterinary Department, the Water Department), NGOs, CBOs, churches and local community groups. The key thing to note here is that such institutions should be transparent, accountable and experienced in undertaking such operations.

Strategies for identifying the appropriate institutions to undertake specific off-take projects/programmes are discussed later in these guidelines.

#### **4.5 Financing mechanisms and donors**

ALRMP annually allocates drought contingency funds to DMOs out of which some of the funds may be used for emergency livestock off-take if the need arises. This is the government (Office of the President) allocation for this activity. This arrangement is flexible and part of the drought contingency funds can be quickly shifted to off-take as the need arises. However, a great bulk of emergency livestock off-take has previously been borne by donors directly, usually through NGOs. The tricky part in the financing by donors is that donors' release of funds is dependent on EWS information from the field and formal government or NGO requests for funding. Critical delays tend to occur in the flow of the EWS information and in the donor decision mechanisms for requesting, authorisation, contracting and releasing funds. And even in the government where some prior allocation of funds is made in the



budget, some more re-allocations of funds into the drought kitty may have to be done from other votes depending on the magnitude of the disaster and this may also take time. By the time operations are initiated, the affected areas are often already deep into the drought situation. Hence the observation earlier on that all the stakeholders should get together and agree on what action to take at each stage of the EWS and that contingency planning should always be there even at the normal stages of the EWS in order to facilitate timely intervention.

It should indeed be kept in mind that by its very nature, emergency off-take must be taken before the drought sets in if its full benefits are to be felt by the beneficiaries. Hence, continuous and pre-emptive dialogue with the financing authorities for early mobilisation of resources is essential for the success of these operations. The national decision making institutions described above should be fully sensitised about this matter.

## **5. Types of Emergency Livestock Off-Take and Related Interventions**

There are a number of modalities for undertaking livestock off-take interventions. These include the following:

- De-stocking.
- Market facilitating interventions such as transport subsidy.
- Veterinary interventions
- Supplementary feeding.
- Water trucking.
- Conflict resolution.
- Re-stocking.

Any of the above types of interventions can be used singly or in combination with others. They are described below.

### **5.1 De-stocking**

De-stocking involves the purchase and disposal of animals by the implementing agency. The disposal has usually been slaughtering the animals and feeding the meat to the affected populations. Thus the communities benefit twice: they are able to sell their livestock at reasonable prices and at the same time receive free food. This type of emergency off-take is particularly desirable to the

communities because of the double benefits and because of the superior nutritional status of the livestock meat as compared to the famine relief of maize and beans usually distributed by government and donor agencies. Funds earmarked for the regular type of famine relief can be re-designated for this purpose. Psychologically, the communities derive satisfaction from being fed with their own produce. The method is also applicable during major drought disasters. The meat can be supplied to the communities for fresh consumption or it can be preserved using traditional methods.

This method of de-stocking has been used in the 1980, 1984, 1991 and 1996 droughts in Mandera (by NORDA), Narok (by World Concern), Garissa (by CARE Kenya), Marsabit (by CEC), Wajir (by ALDEF) and in the 1999–2001 drought in Turkana (by VSF Belgium).

## **5.2 Interventions which facilitate marketing of animals**

### *Transport subsidy*

Because of the poor infrastructure and lack of scheduled market days in the hinterland of the arid districts traders have not been keen on going beyond the major urban centres to purchase livestock. Security has also been a consideration. The idea of transport subsidy was mooted to entice the traders travel inland in the districts to purchase livestock at price guidelines which have been discussed with the communities. The facilitation is done by reimbursing the traders an agreed amount of money per number of livestock bought and transported. Security is also assured by government. The local communities have committees which work closely with the implementing agency both at the point of starting and at the terminal points to certify claims made by the traders and to ensure that the system is not abused.

Transport subsidy was used in the 1999–2001 drought in Mandera (by NORDA) and in Turkana (by VSF Belgium).

### *Purchasing livestock for fattening*

Another recent intervention to stimulate markets was introduced by CARE Kenya in Garissa. This involves buying the stock and taking it to one of the coastal ranches for fattening and eventual sale. This involves a much more complex operation on the part of the implementing agency than disposal by slaughter and may be

available only on a limited basis in terms of handling large amounts of livestock during a major drought. However, it is a highly commendable way of streamlining markets in the long run especially if taken up by traders.

### **5.3 Veterinary interventions**

The veterinary interventions involve strengthening the livestock to have a greater chance of withstanding and surviving the drought by vaccinations, de-worming and treatment for various ailments. The communities pay in kind, e.g., one goat per the livestock equivalent of 25 goats treated. These animal/treatment exchange rates are agreed with the community representative committees at the planning stages of the operations. Furthermore, the livestock surrendered as payment is slaughtered for consumption by the communities. Like the de-stocking interventions, this has been a highly preferred type of intervention among the communities. However, it is more effective in mild droughts where pastures may not be severely depleted, thereby making it possible to sustain the treated animals with the available pastures.

Veterinary interventions were used in the 1999–2001 drought in Samburu (by COOPI), Marsabit (by COOPI, ITDG and the Lutheran Church), Moyale (by COOPI), Mandera (by VSF Swiss) and Wajir (by VSF Swiss).

### **5.4 Supplementary feeding**

The impact of supplementary feeding is similar to veterinary interventions, i.e., strengthening the livestock to be able to live through the drought. Hay I bought and brought from other parts of the country for feeding the livestock. Where financially possible, this is fortified with mineral and vitamin supplements. However, this intervention is even more limited than veterinary intervention because the problem of cost, availability of large quantities of feed on a commercial scale, problems of storage of the feed and the logistics of transportation. The Anglican Church of Kenya (ACK) tried supplementary feeding in Marsabit during the 1999–2001 drought.

### **5.5 Water trucking**

Water trucking is an even more expensive way of sustaining livestock during drought. It can only be used in very limited cases to allow dying livestock to access a more permanent source of water. Moreover, very few institutions have water trucking vehicles.

The ALRMP has some bowsers which have been used for rescuing livestock in very critical condition. However, no extensive operations can be envisaged with this type of intervention. In the 199–2001 drought, Oxfam undertook some water trucking in Wajir.

### **5.6 Conflict resolution**

During drought movement of livestock in search of pasture and water is the commonest approach that the pastoralists for the survival of their livestock. This often results in conflicts. Investment in conflict resolution has high returns in the saving of livestock and human lives. Furthermore it enables emergency off-take programmes to be undertaken more effectively in a stable and peaceful atmosphere.

The Provincial Administration is often the fulcrum around which conflict resolution takes place. Other institutions are also participants in the promotion of dialogue. In the 1999–2001 drought, OAU-IBAR sponsored conflict resolution interventions in Turkana and certain benefits accrued to the livestock in terms of access to pastures negotiated for on the Ugandan side.

### **5.7 Re-stocking**

When making arrangements for off-take, a plan should be put in place for some publicly funded but limited and targeted re-stocking. The targeting should be on the more vulnerable and the poorest of the members of the society. This operation should be undertaken with close collaboration with the elders committees who know best the families to be assisted through their ‘moral economy’ operations. Wealthier farmers should be able to re-stock using the proceeds from their off-take sales. However, if the drought has been a major and extensive one, the DMOs may have to help the communities in general to identify sources of livestock nationally

for re-stocking. ALRMP and some NGOs have substantial experience in re-stocking operations.

## **6. Choosing the Type of Livestock Emergency Interventions**

Having discussed the types of interventions available for off-take programmes, the question arises as to what types of intervention should one use in a given situation. To answer this question we shall address three issues, namely:

- Planning an off-take programme.
- The financial and socio-economic evaluation of the off-take interventions discussed above.
- Resource requirements of the various interventions.

### **6.1 Planning the livestock emergency off-take programme**

In discussing the planning of an emergency off-take programme, three key assumptions are made, namely:

- That EWS system is already efficiently functioning as discussed above.
- That as stated before, there is in place elders' committees which work on a continuous basis with the DMOs office on drought issues.
- That the system of national institutional framework discussed above is in place and operational.

Once the DSG determines that an alert situation has been attained, the DSG work plan for the year must be immediately re-evaluated and priorities re-ordered towards preparing for the expected drought. The DSG, in close collaboration with the elders' committees, should assemble the following estimates:

- Areas affected.
- Size of human populations and number of households likely to be affected.
- Types and numbers of livestock in the affected areas.

The DSG should immediately transmit this information to ALRMP for dissemination to the various stakeholders and discussion at the KFSM and the KFSSG. At the same time, the DSG and the elders'

committees should continue to undertake a more detailed assessment to advise on:

- The anticipated severity of the drought.
- The type of interventions likely to be required (see item 6.2 below).
- The type and number of live livestock that may be required to be taken off the herds (see item 7 below).
- The likely financial requirements of the recommended interventions (see item 6.3 below).
- The capacity available in the district to undertake the interventions – government departments, NGOs, CBOs, local groups, the private sector and infrastructural capacities (see item 8 below). These institutions should be identified and given the go ahead to start making preliminary preparations for action.

This information should be channelled by the DSG to stakeholders in the districts and upwards to the national institutions. The KFSM and the KFSSG will continue to appraise their members to assess the likely available resources and to prepare for action. In the meantime, the DSG should continue to update the above estimates and recommendations on expected interventions so that these are confirmed as soon as possible. Note that the above two stages of preparing the estimates may in practice have to be undertaken as one operation to save time.

In order to ensure quick and standard action, ALRMP will prepare standard formats for the DSGs to provide the above information.

At this stage, the situation in the district should be approaching the alarm stage. The following should be happening at the DSG:

- Re-confirming that the alert was genuine: If the weather situation improves, the DMO and the elders' committees should advise accordingly and the alert withdrawn by the DSG which will inform the higher level decision making organs.
- The DSG should be getting feedback from KFSM on the resources likely to be available for action as the situation approaches the alarm stage.

- The DSG should mobilise the available capacity to start action with the most vulnerable groups and move to full mobilisation as quickly as possible.

By the time the emergency stage starts, emergency livestock off-take operations should be in full gear if its benefits are to be fully captured before the actual drought is in full swing.

## **6.2 Financial and socio-economic analysis of various types of off-take and related interventions**

During the planning stage outlined above the type of off-take intervention to take should start to emerge early in the process. These types of interventions have been discussed earlier with some indication of their strengths and weaknesses. A more in-depth analysis of these interventions has been undertaken to indicate which ones have higher returns than the others in order to assist in decision making on which ones to use.

### *Financial analysis*

The financial analysis of the off-take interventions previously discussed show that they all have high returns as measured by the benefit/cost ratio. They all have a ratio of greater than one, meaning that they have positive returns. The estimated benefit/cost ratios are presented in Table 14.

### *SWOT (socio-economic) analysis*

However, the above benefit/cost ratios derived from the financial analysis do not give a complete picture because there are many benefits and costs which cannot be quantified. There are also other considerations such as logistics of implementations, etc which have to be taken into account. When all these other un-quantified considerations are taken into account, the intervention with the highest benefit/cost ratio may not necessarily be the most desirable. For example, although de-stocking has a generally lower benefit/cost ratio, it was found to be more desirable than transport subsidy because the former benefits more pastoralists and has more advantages than the latter.

**Table 14. Benefit-cost analysis of emergency off-take and related interventions**

Type of intervention	Year	District	B/C ratio
De-stocking	1980, 1984, 1991, 1996	Marsabit, Moyale	4.00
De-stocking	1999-2001	Mandera	1.59
De-stocking	"	Turkana	Public: 1.2* Private: 2.0**
Transport subsidy		Mandera	4.80
Veterinary interventions	"	Samburu, Moyale, Mandera	5.34
Supplementary feeding	"	Marsabit	2.67
Water trucking	"	Wajir	2.59
Conflict resolution	"	Turkana	1.28

\* Derived from costs compared with famine relief costs saved.

\*\* Derived from costs compared with benefits to the pastoralists who sell and eat the meat.

The evaluation of the various interventions must therefore take into account both the financial and the socio-economic analysis in order to arrive at the desirable or most suitable intervention for the specific situation. In order to capture the various socio-economic considerations, this analysis is presented in Table 15 in the form a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis which in essence gives the advantages and disadvantages of each type of intervention.



**Table 15. SWOT analysis for emergency livestock off-take and related interventions**

Type of intervention	Strengths	Weaknesses	Opportunities	Threats
De-stocking (including buying, slaughtering and feeding the people with the meat)	<ul style="list-style-type: none"> <li>• Has very high returns when combined with feeding the meat to the people</li> <li>• Highly preferable to the communities compared to traditional famine relief</li> <li>• The community, especially children and youth, benefited from employment and business</li> <li>• The communities feel proud in being fed with their own animals</li> <li>• Because of its popularity, has high possibility of stimulating acceptance of emergency off-take among the communities</li> <li>• Injects immediate cash into the economy</li> <li>• Meat is easier to prepare than cereals famine relief</li> <li>• Better nutritionally for children &amp; pregnant mothers</li> <li>• Money obtained can be used for re-stocking</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for spoilage of the meat and hygiene/handling problems</li> <li>• Although not as expensive as traditional famine relief, requires fairly substantial financial outlays</li> </ul>	<ul style="list-style-type: none"> <li>• Can widen business opportunities in the area</li> <li>• Restores livelihoods and ability to pay for essentials such as drugs, school fees, etc.</li> <li>• Has the potential to strengthen and blend in with the local mutual assistance networks and the 'moral' economy</li> </ul>	<ul style="list-style-type: none"> <li>• If not properly done, re-stocking difficulties may arise, thereby killing community enthusiasm for the system</li> <li>• Lack of banking system may enhance squandering of the proceeds and leave some people more destitute</li> <li>• May be undermined by vested interests in famine relief operations such as transporters and suppliers of famine relief goods and services</li> </ul>

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<p>Transport subsidy</p>	<ul style="list-style-type: none"> <li>Engenders a more self-reliant way of pastoralists' management of their own lives</li> <li>Less demanding in public financial resources than the other interventions</li> <li>Promotes pastoralist marketing structures and skills, thereby lessening dependency</li> <li>Money obtained can be used for re-stocking</li> <li>Injects immediate cash into the economy</li> </ul>	<ul style="list-style-type: none"> <li>Tends to concentrate traders benefits in the hands of a few traders</li> <li>Administration of the subsidy could be subject to fraud. Consequently, may require frequent change of controllers to avoid bribes</li> <li>Does not guarantee relief to the poor, i.e., those who do not have much or anything to sell</li> <li>May need a loan facility to empower traders to purchase and move large volumes of livestock and to reduce dependency on a few externally based traders</li> <li>Those far away from trading centres may not benefit from this intervention</li> </ul>	<ul style="list-style-type: none"> <li>Has the potential for making a major impact especially if security, physical and marketing infrastructure are improved, including the setting up of the proposed regional abattoirs or revival of KMC or both, thereby translating managed emergency off-take into market based off-take</li> </ul>	<ul style="list-style-type: none"> <li>Security and infrastructure problems for traders may threaten continued participation by traders</li> <li>Likewise, lack of banking system may mitigate against continued development of the system</li> <li>The limited number of traders could form a cartel</li> <li>May be undermined by ethnicity and lack of trust especially if steps are not taken to contract out local traders</li> <li>Threatened by ban on night movements, police harassments at roadblocks and, to a certain extent, the disease screening and certification system</li> </ul>
<p>Veterinary</p>	<ul style="list-style-type: none"> <li>Has very high returns</li> <li>Blends in well with other interventions and increases their success and impact, e.g., farmers can pay with livestock which is then slaughtered and distributed as famine relief; remaining</li> </ul>	<ul style="list-style-type: none"> <li>Requires a large outlay of professionals (vets and paravets)</li> <li>Requires substantial financial resources</li> <li>May seriously compromise the development of private</li> </ul>	<ul style="list-style-type: none"> <li>If well designed and implemented, has the potential to improve the disease surveillance and drug delivery systems in the area,</li> </ul>	<ul style="list-style-type: none"> <li>In some cases, the professionals may simply ignore the involvement of other stakeholders in the design and implementation of the intervention, thereby threatening its success</li> </ul>

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	<p>animals after off-take are better off in withstanding drought</p> <ul style="list-style-type: none"> <li>Maintains critical breeding stock in good health and greatly improves the potential for quick recovery after drought</li> </ul>	<ul style="list-style-type: none"> <li>drug delivery systems For maximum impact per shilling spent, requires implementation on a large scale or over a large area</li> </ul>	<p>including the building up of associated infrastructure as well as locally based human capital and skills among the pastoralists</p> <ul style="list-style-type: none"> <li>It can give a boost to the development of the feed industry and induct pastoralists into this method of supporting their livestock through supplementary feeding</li> </ul>	<ul style="list-style-type: none"> <li>The absence of good physical and veterinary infrastructure may undermine the success of the intervention</li> </ul>
Supplementary feeding of livestock	<ul style="list-style-type: none"> <li>Has fairly high returns</li> <li>Is preferred by some members of the communities in place of famine relief</li> <li>Is good for re-habilitating abandoned stock, i.e., the weakest of all animals left behind to die as they are too weak to go for watering or grazing (<i>afto</i> stock in the Gabbra language)</li> <li>Strengthens the maintenance of good breeding stock which is useful for recovery</li> </ul>	<ul style="list-style-type: none"> <li>Requires substantial logistical resources for implementation in a large area almost similar to distribution of famine relief</li> <li>Potential for deterioration of feed if good storage infrastructure is not available</li> <li>Requires good water supplies and veterinary inputs such as deworming, which are usually in short supply among pastoralists, for it to make a good impact</li> </ul>	<ul style="list-style-type: none"> <li>May be subject to abuse and theft</li> <li>The endemic lack of water in the arid areas may seriously compromise its effectiveness</li> <li>The poor physical infrastructure in the arid areas may make it unsustainable</li> </ul>	
Conflict resolution	<ul style="list-style-type: none"> <li>Has very high returns in the long term</li> <li>Access to good grazing lands and water under the control of other communities is assured or enhanced</li> <li>Has potential in long term</li> </ul>	<ul style="list-style-type: none"> <li>The peace negotiation elders usually expect to be fully funded by the institution promoting the negotiations, and this weakens ownership of the intervention by the</li> </ul>	<ul style="list-style-type: none"> <li>Can be used for re-opening borders and the development of trade relationships</li> <li>Can enhance peace negotiation skills</li> </ul>	<ul style="list-style-type: none"> <li>The proliferation of small arms in the pastoralist areas and in the country in general is a big threat to this very useful instrument of development</li> </ul>

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	peace dividends not only in terms of drought management but also general development and the well being of the populations	communities	and improve institutions	<ul style="list-style-type: none"> <li>Ethnic chauvinism and cultural demands such as the need for dowry is always a constant threat to the success of this type of intervention; political instigation also has a potential to flare up and negate gains made</li> </ul>
Water trucking	<ul style="list-style-type: none"> <li>Has very high immediate returns as it saves human and animal lives which are in immediate threat of extinction</li> </ul>	<ul style="list-style-type: none"> <li>This is the most expensive of all interventions and the least sustainable</li> <li>Can only be applied in very limited areas</li> </ul>	<ul style="list-style-type: none"> <li>Highlights the need for development of long term water supplies and emphasises the need for government and other development agencies to accord the matter high priority</li> </ul>	<ul style="list-style-type: none"> <li>Usually compromised by lack of finances</li> </ul>
Re-stocking	<ul style="list-style-type: none"> <li>Has high returns</li> <li>Is complementary to off-take</li> <li>Has the potential to reduce income inequalities as targeting of vulnerable groups is easy</li> <li>Blends in well with and strengthens local mutual assistance networks and the culture of the 'moral' economy among the pastoralists</li> </ul>	<ul style="list-style-type: none"> <li>Has the potential to create dependency</li> <li>Can reduce the benefits of off-take especially where off-take interventions have not been judiciously planned and implemented</li> <li>Difficulties may arise in access or sourcing suitable re-stocking stock</li> </ul>	<ul style="list-style-type: none"> <li>Can be used for general herd improvement as well as the enhancement of the livestock markets in the area of operation</li> </ul>	<ul style="list-style-type: none"> <li>Can be subverted by lack of transparency in the distribution of resources</li> </ul>

### **6.3 Resource requirements for interventions**

Using the principles discussed in items 6.2 and 6.3 above, the DMO, in consultation with the stakeholders mentioned in the planning stage in 6.1 should come up with recommendations on a number of alternative interventions but which should be ranked according to the most preferred to the least preferred. These rankings should include individual as well as combinations of interventions where found desirable.

After ranking the interventions, the final deciding factor will be the resource requirement of each intervention. The DSG should nominate a small committee of professionals to prepare the costing of each envisaged intervention and its requirements of other resources such as manpower, equipment and other facilities. These considerations will be the final round of discussions that will recommend the intervention(s) to be undertaken, depending on the finances available by the government and other financing agencies and other available capacities which are available in the district or which can be feasibly sourced from outside the district.

Two considerations are expounded further below to assist in estimating costs and implementation capacities, namely, estimating number of livestock to be taken off the herds and identifying and sourcing agents to implement the programme. These are discussed under items 7 and 8 respectively.

## **7. Estimating Number of Animals to be taken off the Herd**

### **7.1 Simple estimation method**

The simplest method to estimate the number of animals to be taken off the herd is to use the mortality rates from previous droughts. For example, if the EWS shows that the expected drought will be as severe as that of 1999–2001 and assuming a herd of say 100 cattle, 200 small stock and 20 camels, the estimated livestock to be taken off the herd would be computed as shown in Table 16:

**Table 16. Estimating the number of animals to be taken off the herd using mortality rates from previous droughts**

Livestock type (a)	Number in herd (b)	Mortality rate in 1999-2001 Drought (c)	Emergency off-take (b) x (c)*
Cattle	100	35.2	35
Small stock	200	43.0	86
Camels	20	18.0	4

\*Rounded to the nearest unit.

In the above estimation, if the EWS indicates that the drought is likely to be half as severe as the 1999–2001 drought, then the mortality rates used are reduced by half on a pro rata basis.

## 7.2 Application of the steady-state model

Studies using the production and mortality rates have made it possible to develop formulae which can be used to determine the off-take rates of herds under normal weather conditions. For example, the formula for the normal off-take of a typical Boran herd is given as:

$$Q = 0.135HS \text{ or } LU = 0.144HS$$

Where  $Q$  is the off-take in cattle numbers in a ‘normal’ year,  $HS$  is the herd size, and  $LU$  is off-take expressed in livestock units (one livestock unit being about the equivalent of a mature cow of about 250 kg live weight). (Livestock conversion rates used to compute equivalents are given in Table 17.)

The EWS is used to give an index to the expected drought. The index is multiplied by the coefficient of herd size in the equations to compute the desired emergency off-take.

For example, in Garissa with an estimated head of cattle of 390,000, the off-take under normal conditions is  $390,000 \times 0.135 = 52,650$  head of cattle. If the EWS predicts that the expected drought will be twice as severe as under normal conditions, then the drought is given an index of 2. The estimated cattle emergency off-take in the district will be  $52,650 \times 2 = 105,300$  head of cattle.

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For those who would like to work with livestock units, the off-take under normal conditions would be  $0.144 \times 390,000 = 56,160$  livestock units. With a drought index of 2, this translates into an emergency off-take of  $56,160 \times 2 = 112,230$  livestock units.

A steady-state off-take for camels can be computed using the same approach as that for computing cattle off-take by applying a number of relevant production traits (Table 18). Considering the figures generated by applying these traits, the formula for camel off-take is given by

$$Q = 0.09HS$$

Where  $Q$  is the off-take in camel numbers and  $HS$  is the herd size. (Similarly, an equation can be derived for LUs.)

Again, if we take the example of Garissa District which has roughly a total of 56,000 camels, off-take in a ‘normal’ year would be given by  $56,000 \times 0.09 = 5,040$  animals.

**Table 17. Livestock conversion factors in a pastoral setting**

Species, sex and age category	Weight (kg)	Livestock unit conversion factor
<i>Cattle:</i>		
Cows (females aged 4 years and above)	250	1.00
Calves (males and females aged up to 12 months)	33	0.22
Heifers (females aged between 1 and 4 years)	100	0.50
Immature males (aged between 1 and 4 years)	129	0.61
Mature males (bulls and castrates)	320	1.20
<i>Camels:</i>		
Female camels aged 5 years and above	400	1.42
Camel calves (males and females aged up to 12 months)	50	0.30
Female camels aged between 1 and 5 years	160	0.72
Immature male camels (aged between 1 and 5 years)	220	0.91
Mature male camels (bulls and castrates)	450	1.55
<i>Sheep and goats:</i>		
Ewes and does aged 24 months and above	30	0.20
Kids and lambs aged up to 5 months (weaning weight)	10	0.09
Ewes and does aged between 5 months and 24 months	18	0.14
Rams and bucks aged between 5 months and 24 months	20	0.15
Mature rams and bucks aged 24 months (castrates and non-castrates)	35	0.23

**Table 18. Production traits for camels in a pastoral herd**

Trait	
Calving rate	50%
Age at first calving (mean)	5 years
Ratio of adult male to female	20%
Age at maturity for males (450 kg)	5 years
Pre-weaning mortality	28%
Mortality 12-24 months	15%
Mortality 24-36 months	8%
Mortality 36-48 months	4%
Mortality 48-60 months	2%
Culling (replacement rate) for breeding herd	10%

To compute a steady-state off-take for small stock (sheep and goats) in a pastoral setting, a number of relevant traits are assumed as well. Considering the traits shown in Table 19, the relevant equation is

$$Q = 0.16FS$$

Where  $Q$  is the off-take in sheep/goat numbers and  $FS$  is the flock size. (As in the case of cattle off-take, an equation can be easily derived for LUs.)

To illustrate using the example of Garissa District which has a total of 271,000 goats, off-take in a 'normal' year would be given by  $271,000 \times 0.16 = 43,360$  goats.

**Table 19. Production traits for sheep and goats in a pastoral herd**

Trait	
Kidding/lambing rate	100%
Age at first kidding/lambing (mean)	2 years
Ratio of adult male to female	80%
Age at maturity for males (35 kg)	2 years
Pre-weaning mortality (5 months)	15%
Mortality 5-12 months	10%
Mortality 12-24 months	5%
Culling (replacement rate) for breeding flock	25%



### 7.3 Using the computer model

It is possible to translate the above formulae into a relatively simple computer model. All the DMO would then need to do is to input the size and composition of the herd and the drought index to get the desired emergency off-take as the output. Since all DMO's offices are computerised, it has been recommended that ALRMP should engage an expert to develop such a model for use in the field.

### 7.4 Selecting animals to be taken off the herd

After the DSG, through the advice of the DMO, has decided on the number of animals to be taken off the affected areas, it is important that the households are given leeway to choose the animals that are to be removed from their herds. The following basic principles should therefore be followed:

- The DSG should brief the communities through sensitization *barazas* and elders committees. The communities should be briefed in the presence of the selected implementing agency (see the next section on this).
- Most of the operations of selecting the animals should be left to the communities to organise with the households. The role of the implementing agency and the DSG here will be to ensure a fair and transparent operation. The same groups should be used later for re-stocking decisions.
- The implementing agency should use as many of the local pastoralists as possible for whichever operation is chosen to remove the animals, e.g., handling animals, slaughtering, feeding the people with meat, keeping records, and authenticating the operation at every stage jointly with the implementing agency to ensure no cheating on the number of animals transported in the case of a transport subsidy operation. In other words, the communities must be made to feel fully involved in the operations.

## 8. Selecting the Implementing Agency

Most emergency off-take programmes under ALRMP are intended to be undertaken under contract to other agencies such as NGOs, CBOs, churches, local groups or private enterprises. Also many of the ALRMP off-take projects will be implemented through

sponsorship of government departments such as the Department of Veterinary Services and the Water Department.

In selecting the agency to undertake the off-take programme, it is important to ensure that efficiency, cost-effectiveness and experience of the agency is taken into account. Most ALRMP emergency off-take interventions are meant to be contracted to agencies such as NGOs, CBOs, churches and local groups. Others are undertaken on sponsorship basis, usually to government departments such as the Veterinary and Water Departments. Because of the emergency nature of drought operations, most of these contracts and sponsorships are procured on single sourcing without advertising or inviting bids or quotations. It is therefore necessary for the DMO to develop over time a profile of the relevant institutions in the district and their capabilities as well as networking ties with them.

Earlier in these guidelines we have indicated the emergency off-take work undertaken by some of the NGOs in the arid districts. The DMOs should be familiar with these interventions and be able to call on these institutions to undertake interventions on a contractual basis. In situations where local groups can undertake certain operations, they should be encouraged to do so and to continue to develop their expertise in these areas.

For example, it has been observed that small NGOs tend to respond faster and are more flexible in their financial management than the large international NGOs. The large NGOs tend to have more complex and less flexible and responsive financial procedures. Sometimes they have to seek authorisation to modify budgets from their headquarters outside the country. By the time authorisation is obtained, the drought is already deep into the emergency stage. Sometimes resources arrive when the drought has already done damage and gone. On the other hand, the large NGOs usually have greater capacity in human resources, transportation etc. to handle large programmes which would be too heavy for smaller NGOs. So the DSG must be familiar with the relative capacity of the NGOs and contract implementing agencies taking into account those capacities.

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The selection of implementing agencies should start as early as possible so that they can be brought into the planning and implementation process as early as possible. In the case of government departments, they should be part and parcel of the whole government drought mitigation effort. Therefore the DMO should maintain good working relationships with these departments as he/she needs their cooperation in the implementation of emergency drought operations.