

COMPARING DROUGHT MITIGATION INTERVENTIONS IN THE PASTORAL LIVESTOCK SECTOR

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This report is an attempt at a comparative evaluation of different sorts of drought mitigation interventions in the pastoral livestock sector, based primarily on interventions that were attempted in Northern Kenya during the drought of 1999-2001.

The interventions concerned had already been evaluated by Aklilu and Wekesa (2001) and the authors are indebted to their work. Our original intention was not only to complement their analysis with more in-depth participatory evaluations (see Stockwatch 2002a and b), but also a more formal cost-benefit analysis. Despite efforts to collect quantified data from implementing agencies, this second aim was only partially successful, for reasons that throw light on the need for more co-ordinated monitoring and evaluation of drought mitigation.

This report will present: firstly some elements of a comparative cost: benefit analysis and lessons therefrom; secondly the most important cross-cutting lessons from the participatory evaluations; and thirdly lessons learnt about each of the major types of drought mitigation intervention.

1. Cross-Cutting Issues from the Participatory Evaluations

Four projects (see Table 4) were subject to participatory evaluation using semi-structured interviews and established PRA tools. In Marsabit District, interviews were held in seven locations over two weeks, and in Samburu in three locations over one week. Separate group interviews were held for male and female pastoralists. The participatory evaluations focused both on the *processes* of drought mitigation, and in particular the extent to which there had been meaningful community participation in planning interventions, and the *impact* of interventions on different strata, including those without livestock.

Table 4: Projects Subject to Participatory Evaluation

Marsabit District	Samburu District
<ul style="list-style-type: none">• ACK Destocking Programmes• ACK Programmes of Supplementary Feeding of Livestock• COOPI/CIFA Emergency Veterinary Programmes	<ul style="list-style-type: none">• COOPI/Ramati Development Initiative Emergency Veterinary Programme

Generally, the evaluations revealed a greater dissatisfaction about the processes of intervention than was portrayed by Aklilu and Wekesa. Pastoralists felt that the interventions had either been implemented without consultation, or that the

¹ The authors would also like to acknowledge the contributions of Isaac Kamau Wamugi and Anna Daki Joseph (Marsabit), and Lucas Lembara and Sophia Kututi ole Sambu (Samburu), field researchers on the participatory evaluations.

committees formed had not functioned (in three of the four communities benefiting from destocking). They would have preferred *elected* community committees, an element of training for community members, and more integration of emergency projects with long-term development. Men were better informed than women about the projects, and women seem to have been a lot less actively involved in implementing the projects.

In terms of impact, there was a concern that the interventions evaluated had not helped households with small livestock holdings, who would need alternative forms of assistance such as income-generation projects. There was even a suggestion that by insisting on the exchange of livestock for services or cash, some projects may have reduced food security for the poorest households.

In comparing the different interventions, pastoralists felt that destocking projects maintained their purchasing power during the drought. Supplementary feeding of livestock and veterinary interventions were more important in allowing rapid recovery after drought.

2. Findings on Specific Drought Mitigation Interventions

Destocking and Transport Subsidies for Emergency Livestock Purchase)

The most important drought mitigation intervention tested so far is emergency livestock purchase. One form of this is where the implementing agency directly buys weak animals at above the market price. Animals are usually slaughtered and the meat distributed locally to schools, hospitals, orphanages or poor households. Alternatively, transport subsidies are offered to traders to encourage them to purchase stock thereby strengthening livestock markets.

Destocking has several purposes. It allows pastoral households to liquidate some of their capital assets (livestock) before they are lost and increases the purchasing power of these households. Some value is therefore salvaged from animals, which may otherwise have died and meat or stock can be redistributed to needy households. In theory protecting herders' purchasing power by buying animals where markets are absent creates two categories of beneficiary: those who sell animals to the intervention/project at subsidised prices, and those who benefit from the general rise in prices on local markets caused by the extra demand created by the intervention/project.

Destocking can also:

- create a market for weaker animals, thereby enabling herders to keep stronger animals in their herd, preserving a key household capital asset for post-drought recovery
- impact on the nutritional status of poor households and contribute to school and other feeding programmes
- support the trading activities of women's groups
- reduce overstocking around village settlements.

A number of small agencies solicited funds for destocking in northern Kenya during the 1999-2001 drought. For example the Anglican Church of Kenya (ACK) used donor funds to purchase over 6000 sheep and goats from local pastoral households in Marsabit District in exchange for cash and high protein energy feed. Purchased animals were slaughtered and the meat distributed to needy households. Some animals were retained for restocking and 30 animals were given to households who had lost all their animals during the drought. Pastoral household purchasing power was maintained allowing beneficiaries to purchase feed and drugs to maintain their remaining animals, buy food for the household and pay school fees. There is some evidence that the purchase programme also stabilised livestock market prices (Oxfam 2002).

VSF-Belgium facilitated the purchase of 13,000 smallstock by women's and youth groups in Turkana District. The groups purchased the animals themselves and the agency bought the dried meat from them for distribution in schools and hospitals. Many of these animals would not have been slaughtered without the intervention of VSF. The purchasing power of livestock owners was improved, the groups slaughtering animals increased their incomes and the nutrition of hospital patients and school children improved.

ALDEF assisted poor women's groups with micro-credit to purchase more than 9,000 smallstock, 95 cattle and 194 camels in Wajir District. ALDEF purchased the meat from the groups for redistribution to needy households and organisations. Meat was made available to 17,000 beneficiaries (mostly urban poor) and 7000 pastoral households improved their purchasing power. The total cost of this intervention was \$US193,000 and total benefits (cash transferred to pastoral households for animals purchased and the value of the meat distributed) were estimated to be \$US260,000.

As animal condition declines during drought, livestock traders become reluctant to risk purchasing animals for which there may be limited demand in terminal markets (e.g. Nairobi). A transport subsidy had been successfully used in Isiolo District during an earlier drought to assist pastoral households market stock and resulted in increased offtake as traders risks were reduced (Barton and Morton 2001, Morton and Barton forthcoming). It also increased pastoral household purchasing power as many of the beneficiaries inhabited remote areas and would not have been able to market stock without this intervention (it was not possible to trek animals to market as water and pasture were scarce on stock routes).

NORDA, an NGO based in Mandera District offered traders a subsidy to the value of one third the cost of transport (by truck) to Nairobi. Subsidies provided were for a total of 22,000 sheep and goats. It is not clear however, how many of these smallstock would have been marketed without the subsidy. A similar operation in Turkana (VSF-Belgium) provided subsidies for both movement to terminal markets and movements within the district but was beset by fraudulent claims for subsidy.

It is clear that the *modus operandi* for transport subsidies should be carefully planned to avoid fraud. A transport subsidy might however be more cost effective than a destocking/animal purchase programme in very remote locations. The end result from the pastoral household point of view is the same (i.e. improved purchasing power and salvaging of some capital). A subsidy should therefore be targeted at those locations

not normally visited by traders. Under these conditions it is much easier to assess impact, where marketing normally takes place a subsidy may not be required as many of the animals purchased may have been bought and sold without the subsidy.

Veterinary interventions

During drought as animals weaken in the face of pasture and water shortages they become more susceptible to disease and parasitic loads. The objective of veterinary interventions is therefore to assist pastoral communities combat these diseases, particularly in their most valuable animals (breeding stock and loading camels). Improved survival of breeding stock will allow the rapid recovery of herds and livelihoods post drought.

For example COOPI/RAMATI and CIFA provided veterinary assistance in three Districts, Samburu, Marsabit and Moyale. Payment for drugs was in the form of goats, which were slaughtered, and dried meat distributed to schools to strengthen the school-feeding programme during the drought. Between 5-6,000 households benefited from animal health provision on a monthly basis and over 40,000 smallstock, 2,500 cattle, 3,700 camels and 72 donkeys were treated. Services were delivered by 100 community animal health workers (CAHWs) employed by the implementing agencies. Although the number of animals saved by this intervention is not known it was estimated that it may have contributed to the survival of 20% of the animals treated (Aklilu and Wekesa 2001).

VSF-Belgium working with local communities in Turkana facilitated the treatment of 74,000 animals and the vaccination of 97,000 smallstock against Contagious Caprine Pleuropneumonia (CCPP) on a cost recovery basis. The vaccination was designed to assist the recovery of the livestock population post-drought as animals become very susceptible to CCPP when the rains return. It is not known how many animals were saved by this intervention.

Supplementary feeding

If pastoral households lose valuable breeding stock during drought it can take many years for their herd to recover. There is a danger that poorer households will never be able to rebuild their herds and as a consequence fall out of pastoral production. It is also important for pastoral households to maintain some stock to be able to take advantage of the, often good, grazing conditions which follow a drought. There is widespread anecdotal evidence that pastoralists sometimes use relief grain intended for human consumption to feed their herds.

ACK-Marsabit integrated a supplementary feeding intervention with their de-stocking activities. Feed was exchanged for livestock which were slaughtered and the meat distributed to needy households. 180 tonnes of high energy, fat and protein concentrate feeds was purchased which was sufficient to maintain 8,000 smallstock for a period of 3 months. Total costs of this intervention were USD 48,000 and benefits were estimated to amount to USD128,000.

This sort of linkage of supplementary feeding to destocking may help avoid one of the major drawbacks of supplementary livestock feeding when it is scaled-up: that it artificially maintains herd levels and thus exacerbates environmental degradation. This has been a controversial issue in Middle Eastern and North African countries (with middle or high per capita average incomes) where feed distribution during drought is practised massively and increasingly delinked from objective meteorological drought (see for example Oram 1998 or Morton and Sear 2001). There is little likelihood of either donor or domestic funds being available in Kenya for intervention on this scale, but the environmental implications of maintaining herd numbers through drought, and selective procedures to mitigate them, must be borne in mind.

A related set of interventions which has been discussed in Kenya is that of cow-calf camps and drought-time use of commercial ranches by pastoralists. These options are reviewed by Heath (2001).

Water provision

Assistance with the provision of water for humans and livestock includes borehole maintenance as well as the drilling of emergency and contingency boreholes. An example is given by the drilling of the emergency borehole at Harakhotkhot in Wajir in 2000 by Oxfam. The emergency borehole enabled fifty families, previously using another borehole 70 km away, to water their animals locally. Estimated reduced mortality from the reduction in watering stress was valued at \$US 64,300, compared to a construction cost of the borehole of \$US 38,000. This does not take into account considerable additional benefits, including reduced animal mortality in later years, and reduction in women's time spent fetching domestic water (Oxfam 2002). Provision of boreholes approximates to a public good.

Borehole repair and maintenance shows similar positive returns. Analysis of borehole maintenance in Wajir suggests that each unit of Ksh 1 million (\$US 13,300) spent on maintenance or rapid repair of a particular borehole will be justified if it substantially reduces the risk that 125 cattle (estimated price Ksh 8,000 each), or 1,250 sheep or goats (estimated price Ksh 800 each), or some combination of these, will die following borehole failure (Oxfam 2002). Given that in a drought the average borehole is serving several thousand cattle and several tens of thousand of sheep and goats, these are plausible assumptions. As before, this ignores further benefits to women in terms of reduced time spent collecting domestic water. Borehole repairs and maintenance may be considered a private good. If so, micro-finance products could be designed to allow pastoralists to contribute to the cost.

In addition to saving animal lives, secure water provision can reduce labour time spent watering animals and walking animals between water and pasture, as well as increasing the quality of pasture available. We were unable to find examples to quantify this. These are private goods.

Emergency water interventions such as borehole maintenance and repair, contingency borehole drilling, and water tankering have a further important benefit in terms of women's time spent fetching domestic water. In conditions of water shortage, women

spend many hours each day collecting water, with negative consequences for their own health, income earning opportunities, household survival and child care. Analysis of the water tankering around Wajir town suggests that six months tankering to a particular site, at a cost of USD 7,700, resulted in savings in woman's time fetching water of USD 27,600, in addition to reduced animal mortality valued at USD 12,300 (Oxfam 2002).

The true success of contingency boreholes may not be known for some years. Future management of these resources will be crucial before they can be claimed to be a success. In areas where drought-time grazing was opened up by the provision of water it will be essential that boreholes are closed (capped) during periods of average rainfall otherwise environmental degradation is likely to occur, such as that around boreholes elsewhere in northern Kenya. There is a danger that these areas of drought time grazing can become an open access resource if water is available year-round. To date it appears that communities have agreed to close contingency boreholes and to reserve use for future emergencies (for a Kenyan example see Meigh, Robins and Calow 1999, Box 18). Whether this commitment will be sustainable in the longer term is unclear.

Free generator sets and borehole equipment were donated to community groups in several arid districts. This is an example of donor activity distorting local markets for fuel and spares that could lead to further dependency of pastoral communities and is counter to the principle of cost recovery pursued by other interventions. It could be argued that good drought preparedness on the part of communities, donors and local governments would include functioning boreholes with spares and fuel in place ready for any emergency.

Movement of livestock and people

Movement is critical to pastoral household survival during drought. Allowing some movement of people and livestock across international borders can yield important benefits for pastoral communities, particularly when drought does not affect a whole region. Mobility is an important indigenous coping strategy and should be integrated with other mitigation interventions. Cross-border and other peace initiatives are therefore an important contributor to the mitigation of drought impacts.

OAU-IBAR had been working in border areas of NE Uganda, SE Sudan, SW Ethiopia, and NW Kenya as part of the PARC programme for a number of years and therefore had established contact with drought-affected communities in Kenya and those pastoral groups less affected by drought in Uganda and Ethiopia. The objective was to use animal health to facilitate peace and reconciliation meetings between different antagonistic pastoral communities (ethnic groups) in order to create an environment conducive to the development of the livestock sector. The purpose of the meetings was to use animal health as an entry point to begin discussions about decreasing raiding and banditry among the Karamojong and Turkana tribal groups and to improve access to critical water and pasture resources.

The project facilitated meetings between elders of the respective groups by arranging transport, food and accommodation. The elders would be allowed to discuss the

issues of livestock keeping under one roof for a period of two to three days without the interference of politicians or civil servants, who could have influenced the outcome.

Accessibility to critical water and pasture resources for Kenyan pastoralists was facilitated by this project. It is estimated that nearly 100,000 cattle from Turkana were in Uganda at the height of the drought in Kenya. The cost of the project was US\$ 72,000 and it was conservatively estimated that this led to savings of US\$ 93,000 in terms of livestock that may have otherwise died due to drought. This estimate takes no account of the value of likely future trade and movement in livestock or of the under-utilised natural resources used by moving livestock and people.

3. Findings and Lessons from the Cost-Benefit Analysis

For the following projects, data additional to that given by Aklilu and Wekesa (2001) was obtained from the implementing agencies and others and used for a summary cost-benefit analysis. The costs and benefits of projects in each intervention type were aggregated for the analysis.

Table 1: Drought Mitigation Interventions Targeted for Cost:Benefit Analysis

Type of intervention	District	Donor/Implementing Agency
Destocking ^a	Mandera	NORDA
	Narok	World Concern
	Garissa	CARE Kenya
	Marsabit	CEC
	Wajir	ALDEF
Transport Subsidy	Mandera	NORDA
	Turkana	VSF Belgium
Veterinary	Samburu, Marsabit, Moyale	COOPI
	Marsabit	ITDG/Lutheran World Relief
	Mandera, Garissa, Wajir	VSF Switzerland
Supplementary Feeding	Marsabit	ACK
Conflict Resolution	Turkana	OAU-IBAR
Water	Wajir	Oxfam

a) The terminology follows Aklilu and Wekesa (2001). "Destocking" refers to the purchase of animals by an external agency which then distributes the meat as relief food. "Transport Subsidy" refers to the provision by external agencies of additional incentives to private traders to buy livestock - which was referred to as destocking in earlier work of two of the current authors (Barton and Morton 2001, Morton and Barton forthcoming).

Even after collection of supplementary information, quantitative data on costs and benefits remained very partial, and required a number of assumptions.² The data as obtained allowed a summary comparison as in Table 2.

² To some extent, assumptions are always going to have to be made in such analyses. For example, it will never practically be possible to be sure that an animal that receives supplementary feeding would not have survived anyway.

Table 2: Summary Cost:Benefit Analyses of Drought Mitigation Interventions

Type of Intervention	Destocking	Transport subsidy	Veterinary	Supplementary Feeding	Conflict Resolution	Water tankering
Total value of meat distributed	738,515		2,484			
Total cash received by pastoral households	632,485					
Total value of animals saved			8,092,583	74,667	93,333	217,867
Total value of liveweight 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 in the case of destocking, and opportunity cost of water collection in the case of water tankering.

As can be seen, all the intervention types had positive benefit:cost ratios, with the exception of transport subsidies. The very positive ratio for the three veterinary interventions is however of greater interest.

The result concerning transport subsidies is surprising. Two of the current authors (Barton and Morton 2001, Morton and Barton forthcoming) studied an earlier transport subsidy scheme, and reported not only general satisfaction among all stakeholders but also an, admittedly unquantified, positive benefit:cost ratio.

The difficulties encountered in performing cost:benefit analyses point to the need for co-ordinated monitoring and evaluation of drought mitigation interventions. If government, donors and implementing agencies are going to learn the lessons of drought mitigation, both to choose between types of intervention and to improve the implementation of each type, there will need to be standardisation of monitoring indicators of both costs and benefits, and of the way they are collected. To be effective, monitoring and evaluation procedures will need to be integral to drought preparedness strategies, so that they can be launched simultaneously with the interventions and with minimum disruption. They should also be transparent so that those who have to implement them can see their worth.

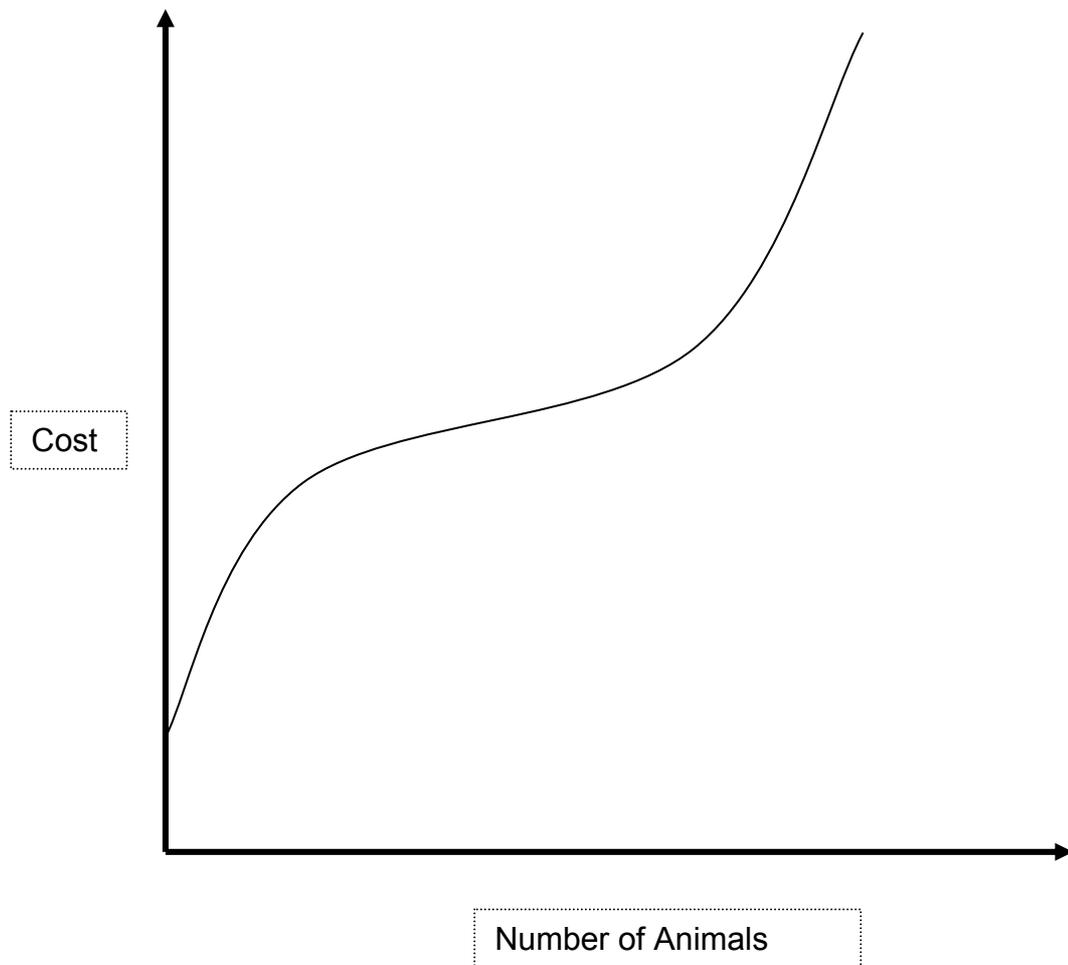
					Type of Intervention			
		Destocking	Transport Subsidy	Supplementary Feeding	Veterinary Drugs			
C O S T S	• Purchase of animals • Slaughtering and rendering • Collection and distribution (may be marginal if meat is used locally) • Spoilage • NGO “fixed costs” (seem to be fixed percentages of total costs)	• Transport subsidy to private sector traders • NGO “fixed costs”	• Cost of feed delivered to local warehouse • Handling and storage • Distribution • Training of pastoralists? • NGO “fixed costs”	• Cost of drugs • Cost of administering drugs • NGO “fixed costs”				
B E N E F I T S	• Pastoralists able to use revenue to maintain their purchasing power during the drought and to restore their post-drought livelihoods. In effect, this shortens the quantity and duration of food aid. • Vegetable protein in the relief ration can be replaced to some extent by meat (but at what cost advantage?) • Reduces the cost of restocking because: a) More animals survive the drought b) Post-drought live animal price rises are not so severe	• Increase in market value of live animals leads to higher returns to pastoralists, which helps to reduce negative impacts on livelihoods and thereby reduces the quantity and duration of food aid.	• Liveweight gain (may be marginal) • Minimal disruption to livelihoods, and therefore significant reductions in quantity and duration of food aid • Substantially reduces the cost of restocking because: a) Many animals survive the drought b) Post-drought live animal price rises are minimised	• Enhanced animal survival rate reduces harm to livelihoods, and reduces the quantity and duration of food aid • Some cost recovery through payment in kind (live animals) • Boosts the impact of supplementary feeding • Reduces the cost of restocking because: a) More animals survive the drought b) Post-drought live animal price rises are not so severe				

Table 3: Potential Costs and Benefits of Different Drought Mitigation Interventions

A first step towards such an approach will be to clarify logically the sorts of costs and benefits we can expect from different types of drought intervention. A first attempt at such a table, for four of the intervention types, is given in Table 3.

A final issue with regard to cost:benefit analysis is that of upscaling. We strongly suspect that the relation of costs to benefits (such as number of animals saved) over different scales of intervention is not linear, but complex: perhaps as illustrated in Figure 1.

Figure 1. Likely Relationship Between Cost and Total Number of Animals Saved



4. Conclusion

Evidence is accumulating that participatorily-planned, well-managed and timely measures to mitigate the impacts of drought on pastoral livestock production can be both successful and cost-effective - both in terms of overall superiority of benefits over costs, and in terms of greater cost effectiveness than the food relief alternative. Quantifying cost-effectiveness, and comparisons between sorts of mitigation, remains elusive, and this report has only been able to sketch some of the issues involved.

Four major conclusions stand out:

- Implementing agencies should not be complacent about participation: communities interviewed after the intervention generally felt that consultation had not been thorough enough, or that local committees set up for the projects had not functioned properly
- More attention needs to be paid to gender equity, and involving women as active participants, not just as beneficiaries
- Livestock-focused interventions need to be complemented by other interventions specifically targeted at the increasing numbers of households without livestock in pastoral communities
- It will be increasingly important to build in, at the planning stage, monitoring and evaluation procedures that allow real learning and comparability between interventions.

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