

## **Restocking: A Critical Evaluation**

Claire Heffernan<sup>1</sup> and Jonathan Rushton<sup>2</sup>

### **Abstract:—**

In recent years restocking programmes have been widely promoted by NGO's and governments across Africa as a method of rehabilitating destitute pastoralists. Well planned restocking projects are advocated as environmentally, economically and culturally beneficial. The paper examines the evidence for the claims, along with the role of restocking in drought recovery.

### **Introduction:—**

In the development community, restocking is often viewed as the best means of reversing the trend toward the increasing impoverishment of pastoralists. The ecological and socio-economic advantages of restocking are generally cited. However, the short-term success of many projects has prevented a critical assessment of the long-term impact. Much of the literature concentrates on the technical issues of project design and implementation. The social, economic and environmental complexities of rehabilitating the small-scale pastoral sector are often ignored. The objective of the paper is not to argue against restocking but rather to expose issues which require greater consideration. By analysing current assumptions, the intention is to provoke a debate on methods to improve the overall sustainability of restocking.

The paper is divided into three sections. Section one examines restocking with regard to the physical and socio-political environment. In section two, the role of restocking in the drought cycle and current recommendations for pastoral rehabilitation are considered. The final section reviews the economic impact of restocking at the community and household level and the need to identify a minimum viable herd size.

### **Section One: Restocking and the Environment**

Arguments against restocking are based on the premise that adding more animals to already stressed environments, will further increase degradation and overgrazing. However, proponents believe restocking is environmentally beneficial, as it allows families to leave overcrowded settlements and exploit under-utilised rangelands (Oxby, 1994; Moris, 1988; Fry, 1988; Hogg, 1985). As Oxby (1994) states:

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<sup>1</sup> Veterinary Epidemiology and Economics Research Unit, Department of Agriculture, University of Reading, Reading, Berkshire, UK RG6 6AT

<sup>2</sup> UNIVEP, Av. Ejercito Nacional No. 141, Casilla 486, Santa Cruz, Bolivia

More remote areas, less visible to road bound visitors often are under-grazed. This is particularly so in areas of political instability, from which livestock may be withdrawn due to their vulnerability to raiding....Restocking may thus reduce pressure on the environment around centres, and at the same time reduce wastage of more remote grazing resources.

The potential ecological benefits of restocking appear obvious. However, as Oxby acknowledges, under-utilised rangeland is often uninhabited due to 'political instability'. Civil unrest in many pastoralist areas is a major constraint to production and in many regions insecurity is increasing, not decreasing. Such socio-political conditions mean that there is limited potential to reduce environmental pressure around "safe" settlements.

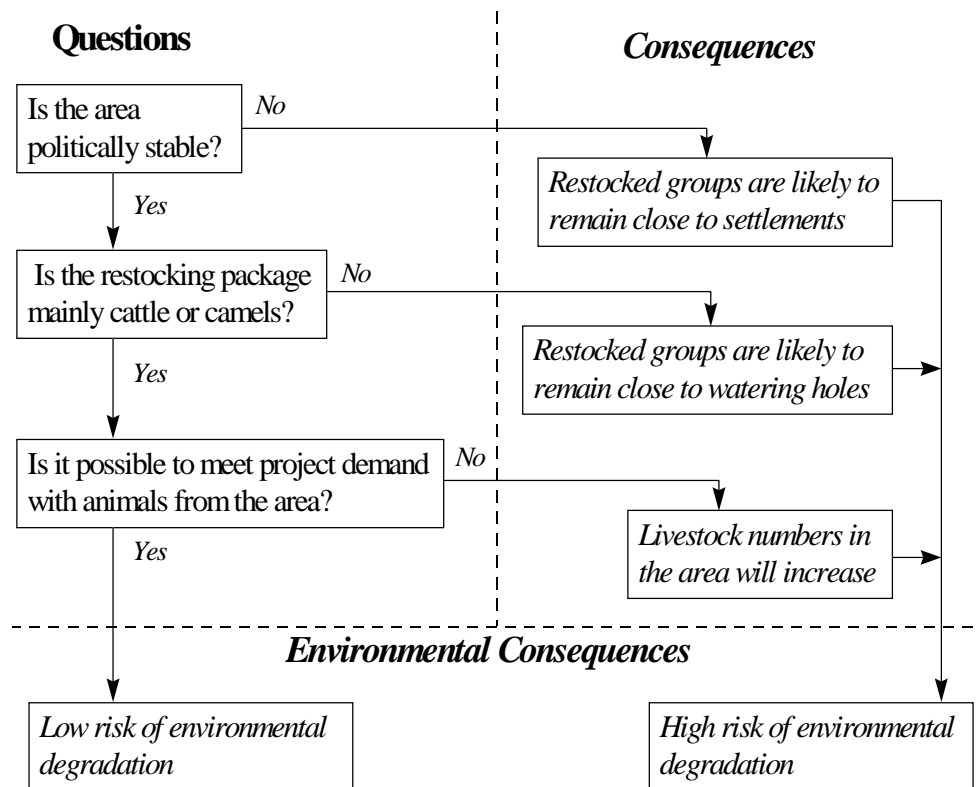
In addition, there is little evidence of restocked herders leaving settlement areas permanently. A number of reasons may be offered for this lack of true mobility. In some instances, such as for restocked Turkana herders, drought and other stress has forced many recipients to return to towns and Food for Work programmes (Bush, 1992). Most restocking programmes have also distributed small stock due to faster reproductive rates and easy offtake (Kelly, 1990; Oxby, 1994; Toulmin, 1995). However, the daily walking distance of sheep and goats is only a half of cattle and a third of camels (Oba and Lusigi, 1987). By necessity small stock need to stay close to sufficient water supplies, which may result in overgrazing at sources of water rather than around towns and settlements. Therefore, the distribution of small stock packages may reduce the ability of beneficiaries to utilise remote grazing and potentially increases competition (Burke, 1987) for resources.

Proponents of restocking also claim that projects maintain the livestock population by redistributing animals locally (Kelly, 1990; Oxby, 1994; Toulmin, 1994). The absence of an increase in livestock numbers is reported to have a positive environmental effect. Evidence to support this view is scanty and raises two important issues. First, are there sufficient animals in the area to meet the demand of a project? Second, is the maintenance of livestock numbers always environmentally desirable?

The first issue requires information on the type of animals used in restocking programmes and those preferred by recipients. In a post-drought environment, most herders are buying livestock to replenish herds. Restocking projects require large numbers of breeding age females, which often are unavailable in a local area. Hogg (1982) writes of the inability to fulfil project quotas using only local sources. Livestock traders from neighbouring districts were required. Other, more recent projects illustrate the risk of importing animals from external sources. For example, at present, a project in Mozambique is experiencing high mortality rates in animals imported from Zimbabwe (Hanks, 1998). Restocked animals may lack resistance to local diseases and often have difficulty acclimatising to local conditions. Another issue that few project have considered, is the impacted of imported stock on the local bio-diversity.

Figure 1 provides a series of questions to determine if a project is likely to have a high or low risk of environmental degradation. The flow chart illustrates a simple decision support system which determines the risk of environmental degradation from restocking.

**Figure 1. Potential environmental consequences for a restocking project.**



Prior to examining the environmental impact of maintaining the existing livestock population, a brief background on the concepts of carrying capacity is required. Critics of restocking believe the carrying capacity of many arid areas has been reached and interventions should concentrate on decreasing the livestock population. However, the premise of a saturated carrying capacity for pastoralist areas is now considered flawed.

Recent research contests the idea of a ‘single optimum carrying capacity’ (Cullis, 1992). De Leeuw and Tothill (1992) state that carrying capacity for pastoralist areas depends on species variability, the mobility of herds and the production goals of producers. Therefore, carrying capacity is influenced both by the physical environment and human objectives. The physical environment of arid and semi-arid rangeland varies both over time and space. The temporal aspect follows the rainfall pattern of the area and is

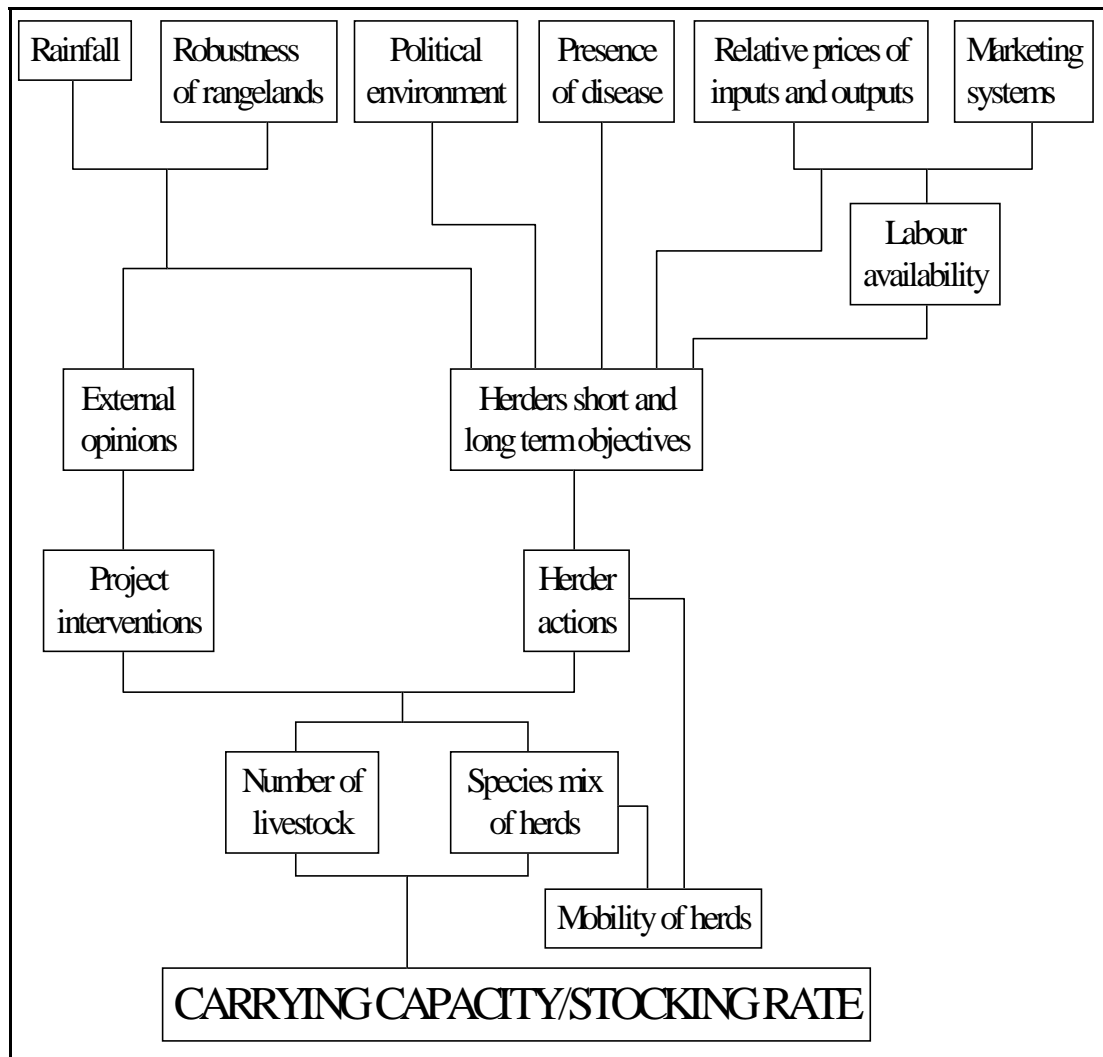
considerably reduced during times of drought. However, the spatial aspect is influenced by a variety of factors which include: political stability; presence of livestock disease; migratory patterns of herders; availability of labour; and the type of livestock.

Carrying capacity can also be differentiated between the economic and ecological (Bartels *et al.*, 1993). The 'economic carrying capacity' refers to the livestock population which can sustain the maximum amount of offtake (Caughly, 1979). Whereas, the 'ecological carrying capacity' is the total number of livestock that can be supported by the available plant biomass (Behnke and Scoones, 1993). 'Economic' and 'ecological carrying capacity' are closely related and follow similar patterns, but the 'ecological carrying capacity' is higher than the economic (Behnke and Scoones, 1993). As many pastoralist grazing systems are considered to be 'non-equilibrium' or 'event driven' it is logical for pastoralists to try to optimise productivity by maximising stocking rates. Herding communities also have long-term objectives. The productive capacity of the rangeland must be maintained for future use. However, longer-term aims regarding pastoralist production are the most negatively impacted by changing socio-economic conditions such as increasing commercialisation, population growth etc.

Behnke and Scoones (1993) claim that due to environmental factors such as drought or disease, the 'ecological carrying capacity' is never reached. However, Toulmin's (1994) description of the three phases of drought indicate that the ecological and the economic carrying capacities will be drastically reduced and possibly exceeded. In the initial stages of drought, Toulmin (1994) states that fodder supplies are dramatically decreased, reducing the capability of pastoralists to feed their animals. Surplus animals are sold and mortality rates increase among the most vulnerable. Such a scenario is more likely, if as reported, the pastoralist stocking densities pre-drought are close to the ecological carrying capacity (Behnke and Scoones, 1993). In phase two, livestock offtake is severely impacted and families nutritional and economic needs cannot be met by their herds. The 'bottom' of the drought cycle is reached and terms of trade for pastoralists are very unfavourable. In phase three, the supply of fodder increases with the return of the rains and the livestock population slowly begins to recover.

The complexities of human and environmental interactions that influence the stocking rate and the potential carrying capacity of an area are summarised in Figure 2.

**Figure 2. The potential determinants of carrying capacity and stocking rates.**



Despite the difficulties of determining what carrying capacities are or should be, the measures are a starting point for the evaluation of the environmental impact of restocking projects. Given that a majority of projects have restocked with small stock, the area needed for assessment is considerably reduced and could be centred on watering points or settlements. Combined with the knowledge of the risks of environmental degradation (Figure 1), monitoring could be targeted and potentially reduced in scope. Thus, the suitability and timing of a restocking project could be evaluated by estimating the local carrying capacity or stocking rate determined by forage limitations of the area.

For larger scale projects it would be necessary to monitor rangelands for: species shifts; changes in the amount of plants not utilised by livestock; and possibly soil quality and frequency of erosion. Coppock (1994) and Bartels (1993) also recommend livestock 'production monitoring' for long term trends in weight gain, mortality and milk production. Collection and analysis of the parameters is vital to making accurate conclusions regarding the environmental impact of restocking.

Determining the type and level of monitoring needed to assess the environmental impact of restocking requires the consideration of the scale of the project, socio-political situation and the objectives of the recipients. Monitoring can also be assisted by the development of decision support systems for restocking projects. In conclusion, some aspects of monitoring will be beyond the scope of some small scale projects, and it may be necessary for international and national agencies to fulfil this role. Provision of a general environmental monitoring system will be more critical in an area or country which has a large number of donors and NGOs implementing restocking projects.

## **Section Two: Restocking and Drought**

Restocking is advocated in the early phases of drought recovery (Oxby, 1994, Toulmin, 1994). Toulmin (1994) also recommends a more proactive development initiative which she terms a 'tracking strategy'. The overall objective is to balance the livestock population with the amount of available fodder. Thus, early in phase one, pastoralists should be encouraged to destock. Recommendations for destocking include supporting the price of livestock during the early phases of drought and promising to restock herders who sell with greater numbers of livestock post-drought. Although Toulmin acknowledges that determining when a drought begins or ends is 'unpredictable', little attention is paid to the difficulties of estimating carrying capacity. A potential consequence of the 'unpredictability' may be the inability to destock at the appropriate time. During the second phase of drought, Toulmin advocates pastoralist communities are supported by the provision of emergency food aid, credit to fund grain purchases and support for the price of livestock. In the final phase, restocking is recommended.

The proactive strategy of destocking and restocking appears plausible and Toulmin is careful to qualify any possible problems. However, prior to implementation, the likely impact of such as policy must be ascertained. A careful assessment of the following must be performed: the cultural acceptability of destocking and restocking; support mechanisms required for destocked pastoralists; and the means of disposing animals from destocked herds. Furthermore, if the drought does not materialise, the project will have to bear the costs of destocking herds and placing households in relief camps. This creates the need to support large numbers of people on emergency food aid and the environmental consequences of settling pastoralists has been previously acknowledged. Thus, socially and environmentally the costs of such a programme may be prohibitive.

In addition, the practicalities of destocking herds must be acknowledged. During the drought cycle when the terms of trade are the lowest for pastoralists, a destocking project would act to support the price of livestock. However, often animals are in very poor condition and immediate resale is not feasible. Thus, destocking projects must consider the means of providing nutritional support to animals for some months prior to resale. During a major drought, access to fodder and water is poor for all producers. The importation of feed and water may be required to sustain destocked animals. Under these conditions, destocking programmes would not be cost-effective. Therefore, the long-term sustainability is questionable.

Finally, the proposed policy appears to be based on the experiences of using such strategies in the ranching zones of Australia. Much has been written about the lack of similarity between ranching and pastoral systems. Therefore, basing pastoral policies on ranching management techniques is questionable. It is also interesting to note that the Australian government has recently abandoned its drought support mechanisms for livestock farmers. The government claims that drought support has reduced the ability of livestock farmers to plan drought strategies themselves. Furthermore, the major beneficiaries of the policy have been livestock traders and transporters (Australian Agricultural Economics Society, 1993).

What does become clear from Toulmin's proposal is the need for a more participatory approach in developing drought strategies for pastoralist areas. Outsiders may provide information and infrastructure, but are not in position to decide what is best for local communities. Bayer and Waters-Bayer (1994) suggest that early warning systems for pastoralist producers would be useful, and that support for the livestock marketing infrastructure is vital. Allowing pastoralists greater access to both regional and national markets could aid in counteracting the falling terms of trade during drought. Therefore, it is suggested that destocking and restocking strategies would be best put into practice by local communities themselves with the facilitation of outside agencies.

### **Section Three: Economic Impact**

Many authors claim that at the community level, restocking is justified as a means of counteracting trends in economic polarisation (Oxby, 1994; Kelly, 1993; Toulmin, 1994). In theory, wealthy herders sell surplus livestock to the project and poor herders benefit. Thus, inequalities in access to livestock between rich and poor are addressed. However, inherent in the assumption is that the duration of the benefits to restocked herders is lasting. Evidence from projects in Kenya suggests that the economic benefits to restocked families may be primarily short term (Heffernan, 1997). In addition, the small-scale nature of most projects makes it questionable that the number of individuals affected could reverse overall trends in wealth distribution (Heffernan, 1995).

On a cost comparison basis, projects are also viewed more favourably than other means of post-disaster rehabilitation. To examine the issue, the following section presents a method to calculate the true costs of restocked animal. The methodology also traces the likely destination of project money utilised to purchase livestock.

The first step in estimating the true cost of livestock distributed by a project is to determine the individual animal price. The price usually includes a premium price above the normal market price. A number of factors contribute to the premium such as: the difficulty of obtaining suitable animals; the inexperience of project staff in procurement and the competition from viable herders buying livestock at the same time. Therefore, the equation for the individual animal price is as follows:

$$\text{Individual Animal Price} = \text{Market Price} + \text{Premium}$$

The total animal purchase costs for the project will be the number of animals purchased multiplied by the price per animal as demonstrated below:

$$\text{Total Animal Purchase Costs} = \text{Individual Animal Price} \times \text{Number of Animals Purchased.}$$

Livestock mortality must also be accounted for. Prior to distribution, animals may die during transport etc. In addition, some losses may occur soon after distribution. This will reduce the total number of animals distributed. Thus, the equation becomes as follows:

$$\begin{aligned} \text{Number of Animals Lost} = & \text{Animals Lost During Holding} \\ & + \text{Animals Lost During Distribution} \\ & + \text{Animals Lost at Early Stages On – Farm} \end{aligned}$$

The mortality losses will have a cost for the project, which may be calculated as follows:

$$\text{Mortality Losses} = \text{Number of Animals Lost} \times \text{Individual Animal Price}$$

Furthermore, some animals will be unsuitable and many projects give extra animals to meet the initial food needs of families. The provision of extra animals is questionable, as the transaction cost of obtaining and purchasing animals are lost when they are sold. The additional cost will be borne by the project, rather than by the recipient. In this manner, the only group to benefit will be the traders (see later).

$$\text{Other Animal Losses} = \text{Animals Unsuitable for Restocking} + \text{Animals Sold to Meet Food Needs}$$

The overhead costs for restocking projects, such as transport, holding facilities, quarantine and administration must also be considered. Included in the overhead costs include the resources required to assess the viable herd/flock size in a local area. A minimum viable herd is defined as that number of animals on which a family can subsist solely on livestock products. The value is frequently approximated with little explanation or evidence. Estimates in the literature range from 5-6 cattle to 200 smallstock (Oxby, 1994). It is unlikely that a consensus on minimum herd/flock size can be reached due to the variability of rangeland, climate and pastoralist notions of self-sufficiency. Therefore, estimating a viable herd/flock size is likely to be a fixed cost in all restocking programmes. The summary of the overhead costs is provided in the following equation:

$$\text{Overhead Costs} = \text{Transport} + \text{Holding Facility} + \text{Quarantine} + \text{Administration} + \text{Mortality Losses} + \text{Other Animal Losses}$$

The cost per animal distributed increases if overhead costs are included. The following equation details the calculation required to determine the cost per head.

*Cost of per Animal Distributed = Individual Animal Price*

$$+ \left( \frac{\text{Overhead Costs}}{\text{Number of Animals Distributed}} \right)$$

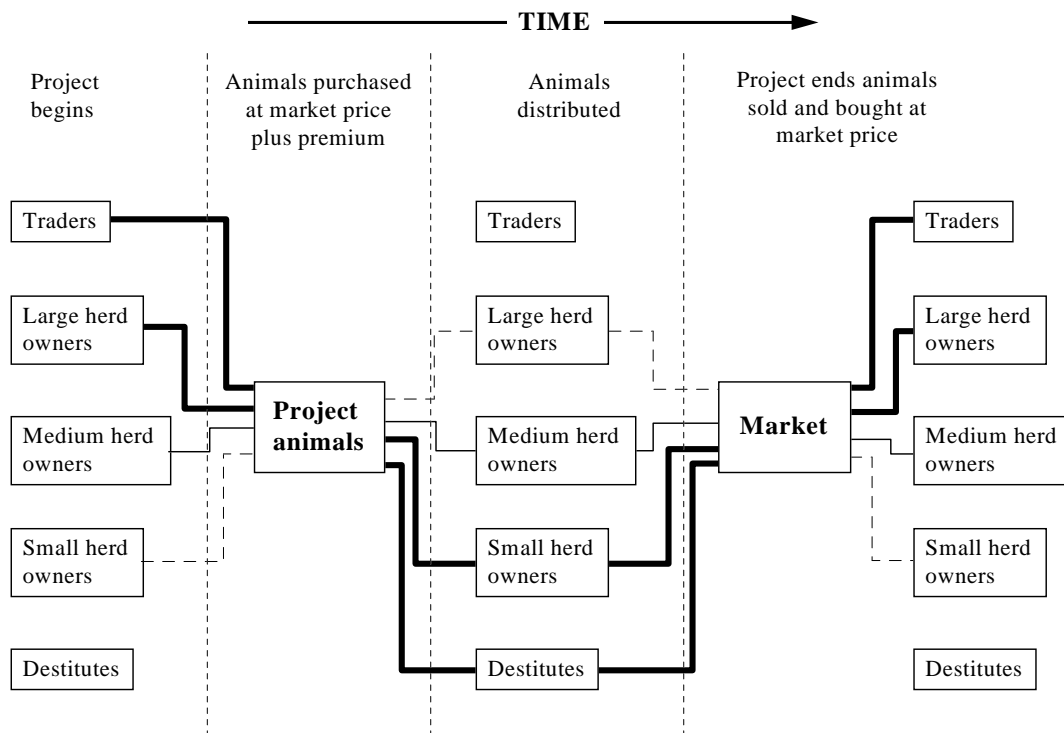
By developing a detailed cost analysis it can be seen that many factors affect the total number of animals distributed. However, the destination of the project money must also be considered. Administration and similar overhead costs will be taken by the implementing agencies. Thus, overhead costs are likely to be similar for all rehabilitation projects and will therefore be ignored for the remainder of the analysis. The destination of the money used for animals purchases, however, requires more careful analysis. The economic benefit to livestock traders is often ignored. An exception is the recent study by Scott-Villiers (1996) who acknowledges the role of traders in project purchasing for the EPAG restocking project in Northern Kenya:

While concentrating the capital injection benefit of the project in the hands of the already well-off (livestock traders), it had the beneficial effect of ensuring us an efficient, traditional, if somewhat exploitative system of acquiring stock ...the merchants used the profits they made in various economic interventions including slaughter stock export and some urban building projects. They also consolidated their possible excessive but stable economic powers in the region, continuing to inhibit access to market competitors.

Thus, further research is required on the community level to determine exactly who benefits from projects and how.

An assessment of the likely impact of animal purchased from local markets is also required. A potential scenario the impact of restocking on local markets is as follows. Large herders and traders will supply the majority of the animals for restocking at the agreed project purchase price. Once restocking packages have been distributed, households will have to sell a proportion of the animals to satisfy immediate food needs. This is a common phenomenon and many restocking projects supply extra animals to account for the need for early offtake. The animals will then be sold back to traders and large herd owners, at prices that are likely to be lower than the original purchase price. A summary of the potential transfer of livestock is shown in Figure 4.

**Figure 3. Flow of animals during and after a restocking project.**



Thus, there is need to view restocking as a market intervention that creates winners and losers of price increases caused by project purchases. The analysis above indicates that the traders and larger herd owners are likely to be the overall winners. The restocking recipients may benefit depending on project obligations, but the semi-viable or nearly-viable pastoralists who are attempting to rebuild herds after disaster will most likely be negatively impacted. Households remain vulnerable in the immediate period post-disaster. Any increase in livestock prices may affect the ability of the nearly viable to successfully return to a pastoralist lifestyle. Although the impact may not be long-term, it may prolong dependency on relief measures such as food aid. In a post drought environment, there is also a risk of projects purchasing livestock from ‘distressed’ pastoralists forced to sell remaining livestock (Toulmin, 1985). In this manner, restocking may accelerate the impoverishment of the most vulnerable.

Consequently, purchasing animals locally may exacerbate economic polarisation rather than address inequalities in access to livestock. Small scale restocking programmes probably have little or no impact on the overall wealth distribution trends. However, large scale programmes need to weigh the benefits to the restocked families against the costs to herders affected by livestock price increases. In light of these issues, analysing restocking as a market intervention may be beneficial.

Restocking is also economically justified on the basis of cost comparison with other rehabilitation methods such as irrigation or food aid (Oxby, 1994; Toulmin, 1994; Moris, 1988). In contrast to restocking, alternatives are cited as being unsustainable and expensive. Sustainability in this context presumably means that restocked families return to a pastoral lifestyle and do not return to food camps. Evidence to support the assumption is not provided. Two restocking projects reported by Oxby actually suggest that a high percentage of recipients remained in close contact with food camps. The scarcity of information on herd growth rates for livestock recipients also make it difficult to quantify restocking as a sustainable intervention. To improve the sustainability of restocking many NGOs have given either foodgrains or extra animals to meet the needs of the recipient families in the first year (Oxby, 1994; Toulmin, 1994; Kelly, 1990, Hogg, 1982, Moris, 1988). Recent evidence from Kenya indicates that many restocked families do not return to a nomadic lifestyle and are likely to return to destitution in a short period of time (Heffernan, 1997). Therefore, the same criticisms that have been applied to other rehabilitation methods appear to apply to restocking also.

Economic justification of restocking does not appear to be well founded. Theoretically it is unlikely that a project can address economic polarisation. The limited evidence on this subject from Kenya and Australia would also suggest that many of the project benefits are accrued by the traders and transporters. A comparison of restocking with other rehabilitation methods also does not appear to stand scrutiny. Again field evidence suggests that it is no more sustainable in giving destitute people a chance of returning to economic independence than other methods. Are we, therefore, being too ambitious in the setting of goals for restocking projects? If aims were modified to providing the recipients with an improved ability to meet economic needs many of the shortcomings and restraints listed above would be removed. For example, with this objective restocked recipients can be viewed as successes if they are obtaining a proportion of their income from livestock.

Finally, are programmes adaptable enough to meet the changing needs of pastoralist society? A more flexible approach increasing the availability of credit may be more effective and would allow recipients more choice in deciding income earning activities. Such an approach would also reflect the changing social reality of many pastoralist communities. Improved access to health services and education are part of the driving force behind the increased settlement of formerly nomadic communities (Heffernan, 1997). A flexible framework for the implementation of restocking programmes would better fit with current paradigms on project management and participatory development. Restocking, should be viewed as one component of pastoral rehabilitation. While the view may be held by many in the rehabilitation field, it is not adequately expressed in the literature. Furthermore, restocking remains the only viable option for pastoralists wanting to return to a nomadic or semi-nomadic existence and as such must be supported.

## **CONCLUSIONS:**

The intention of this paper is to raise issues regarding restocking that are not currently being examined. Restocking destitute pastoralists can be a means to successful rehabilitation (Heffernan, 1997). However, many aspects of restocking remain controversial. Despite the majority opinion, it is obvious that benefits are not as easily quantifiable as the literature suggests. Methods to analyse restocking programmes are poorly developed and evidence of the long term impact is at best conjecture. Development of decision support tools are required to assess the environmental, economic and cultural effects of restocking. The support systems could range from simple conceptual models of livestock life cycles to more complex computer models that can make predictions of socio-economic impact over time. Without a better understanding of the implications and impact of current programmes, restocking is at risk of becoming another development fad.

In conclusion, the underlying goal of restocking requires further examination, as it may constrain project management and responsiveness to emerging household needs. The paper recommends that the aim of restocking should be broadened. Rehabilitation programmes have to be flexible to meet the differing requirements and environments of each pastoralist group. Restocking should be run in conjunction with other forms of humanitarian assistance. Thus, restocking becomes a component of a comprehensive development programme rather than a panacea for pastoral rehabilitation.

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