



Pastoral Livestock Systems: Opportunities and Challenges as a Livelihood Strategy

**Proceedings of the 15th annual conference of the
Ethiopian Society of Animal Production (ESAP)
held in Addis Ababa, Ethiopia, October 4–6, 2007**

Part I: Plenary Session



**Ethiopian Society of Animal Production
P.O. Box 80019, Addis Ababa, Ethiopia**



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ESAP (Ethiopian Society of Animal Production) 2007. *Pastoral Livestock Systems: Opportunities and Challenges as a Livelihood Strategy*. Tamrat Degefa and Fekede Feyissa (Eds). Proceedings of the 15th Annual conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia, October 4–6, 2007 Part I Plenary Session. ESAP, Addis Ababa. 82 pp.

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Welcome Address

Dr. Tadelle Dessie (ESAP President)

H.E.Dr. Abera Deressa,
State Minister, Ministry of Agriculture and Rural Development (MOARD)
Dr. Solomon Assefa
DDG, EIAR,

- Distinguished invited Guests,
- Representatives of:
 - Farmers
 - Pastoralists
- Development practitioners,
- Entrepreneurs,
- Think-thanks,
- Conference Participants,

Ladies and Gentlemen:

On behalf of the executive committee of the Ethiopian Society of Animal Production (ESAP) in particular and the ESAP family in general, I feel deeply honored and overwhelmingly pleased when I welcome each and every one of you to this robust gathering of the 15th Annual Conference of our Society.

Ladies and Gentlemen:

Ethiopia is endowed not only with large but diverse livestock resources. However, Ethiopia is using its rich endowment to little advantage. For many years' livestock production in Ethiopian-and indeed agriculture more generally was seen as a poor investment for development. But after years of being ignored, livestock issues are beginning to be put back on Ethiopia's development agenda. Livestock are being recognized as essential assets for livelihoods; as key to moving out of poverty; as a way into lucrative markets;

as a source of foreign exchange; as well as it serves as an important cultural resources, social safety nets and means of saving.

Today, however, a new ‘livestock revolution’, fuelled by a massive growth in global demand for food of animal origin (milk, meat, eggs), is being hailed, with important development implications for developing world including Ethiopia. Market is in the center of this new revolution as it is demand driven.

Distinguished Guests and Participants

It was with the intension of helping to address some of these questions more specifically in the pastoral settings, in light of experiences from the national and global environment that this years’ conference theme has bee committed to the “Pastoral Livestock System: Opportunities and Challenges as a Livelihood strategy”.

The trusts of this conference include:

1. Current and emerging livelihood strategies in pastoral areas
2. Examine the implications of national development policies and strategies as they pertain to enhancement of livelihood in pastoral areas in the third millennium
3. On-going global debate on future of Pastoralism as a livelihood strategy as related to Ethiopian context
4. Challenges and Opportunities in service delivery and human capacity building in pastoral areas to improve human welfare in the third millennium
5. The role of the private sector in enhancing livelihood strategies in pastoral areas in the third millennium

Ladies and Gentlemen:

The future of the pastoral livestock systems in particular and Ethiopian livestock industry in general lies greatly on the commitment of all of us, professionals, serving in the research, development and education system, private sector, policy makers, CSOs to change the above challenges into opportunities and benefit through utilization of resources in a sustainable

manner to the benefit of the economic development of the nation in general and pastoralists in particular.

Ladies and Gentlemen:

After analyzing the Strength, opportunities, weaknesses and challenges we in the livestock sector development is facing, the EC committee of ESAP raised pertinent questions. Such as should we continue as we are or do we need to transform our selves as a society that contribute more in the livestock sector development supporting other stakeholders?

Ladies and Gentlemen:

ESAP is the transformation process with the vision to actively involve in

- Knowledge management to be a national and regional warehouse of development/research information
- Public-private partnership that is to play a role in establishing the link amongst major stakeholders and help bridge the weak link between academia/experts and policy makers, and also between producers and marketers.
- Working on advocacy and networking etc

If ESAP is to do the above, it needs huge support from public institutions, the privates sector and NGOs that should make significant investment in assisting ESAP and members should also be engaged in formulating and implementing the new visions of ESAP.

Let me mention very few of the achievements of ESAP this year that are worth mentioning:

1. Development of knowledge management system for programs and projects in the country.
2. Livestock Policy recommendations were prepared and presented to the concerned bodies at MoARD and other stakeholders,
3. ESAP was able to organize a workshop on Animal Genetic Resources in

Africa at Institute of Biodiversity (IBC) together with League of Pastoral People (LPP) an NGO based in Germany IBC, PFE; this conference was funded by FAO and LPP. Country focal points on AnGR from the whole of Africa gathered to prepare an output which was used as an input to the Interlaken Conference held just a month ago.

4. ESAP was also able increase its financial status almost six times from what it was just two years ago.
5. Four newsletters, each issue focusing on a pertinent topic were published, of which three of them were funded by different NGOs which showed interest on the pertinent issue.
6. On top of this all, ESAP was also able to publish Amharic livestock production and management manuals, again each focusing on pertinent topics intended to benefit the farmers and development agents at the low level were prepared in a very simplified language.
7. ESAP has also been able to be a registered member of world Animal Association and the DAD Net of FAO.

Are very few to mention:

More presentations and discussions are to come on this issue in the courses of the conference.

Last but by no means not least, I would like to thank all organizations and individuals that in one way or another contributed to the success of this conference organization and help us to undertake our mission as a professional society. Special thanks go to the management of EIAR for allowing us to use this hall with its facilities.

I thank you all for your attention

Directions in Pastoral and Agro-Pastoral Research and Development in Ethiopia

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Abstract

In the lowlands of Ethiopia pastoralism is a mode of production, best suited to an arid and unstable environment, where livestock sector development has the potential to improve the welfare of the poor rural communities. It also contributes significantly to the national income. However, population pressure, the droughts and famine have exceeded the ability of traditional strategies to cope, resulting in widespread animal death, food insecurity and conflicts. The solution of poverty in pastoral areas, however, is not simply a matter of increasing livestock production. Pastoral households also suffer from poor access to socio economic services. In the past, pastoralist areas development has received little attention from government policy makers, and pastoral people continue to be marginalized economically, socially, and politically. However, the severity of their plight in recent years has promoted new interest on the part of the Government of Ethiopia and its development partners to search for a solution. The Government of Ethiopia with its new Pastoral and Agro-Pastoral Development Policy and Strategy recognizes the need for holistic multi-sectoral and participatory approach in pastoral areas. This is very much in line with the development partner priority of formatting Community-Driven Development (CDD) and the holistic approach of the Compressive Development Framework (CDF). This paper explores the sectoral issues faced by pastoralists, government policy and strategy, previous investment in pastoral areas, lessons learned, opportunities and forward directions in Pastoral and Agro-Pastoral Research and Development to promote a holistic multi-sectoral, people-centered and action-oriented approach to social and economic development.

Key words: Directions, Pastoral and Agro-Pastoral; Research and Development

Introduction

The lowlands of Ethiopia account two-thirds of the national land area and 12% of the population of Ethiopia. Their primary livelihood is the management of livestock-cattle, goats, sheep and camels-. Ethiopia has by far more domesticated animals than any other country in Africa. Out of the total livestock population in the country, 28% of cattle, 26% of sheep, 66% of goats and 100% of camels are found in the low lands. Livestock are critical to the well-being of lowland household in terms of income, savings, food security, employment, fertilizer, and fuel. This sector is also important to the national economy, contributing 16% of the GDP, one-third of agricultural GDP, and 8% of export earnings. Improvements in the sector, therefore, have the potential to contribute significantly to national income and to the welfare of many poor rural families. (Alemayehu. M, 1998, 2004)

The nomadic or transhumant way of life of pastoralist is the mode of production best suited in an unstable environment, enabling strategic exploitation of seasonally available water sources and pasture. The arid climate in the lowlands is characterized by periodic droughts that may be increasing in frequency, with the period 1997-2000 subject to successive drought years. Large number of people remained in food insecurity in 2001, having failed to recover from the loss of livestock assets and income opportunities. A substantial portion of the pastoral populations face food insecurity even in normal rainfall years. Environmental degradation, water scarcity, increasing human and livestock population, and expanding areas under cultivation have contributed to a substantial reduction in the extent and quality of productive rangeland, which, combined with poor animal and human health, placed enormous stress on the traditional pastoral and land management practices. These tensions increasingly result in conflicts between groups competing over scarce resources.

However, population in the lowland area suffers not only with food insecurity. They also suffer from poor access to health and education facilities, and few opportunities to engage in income-generating activities other than livestock. This situation, in part, relates to the fact that most development investment and development strategies have been devoted to the highland populations. Pastoralists are thus not only marginalized geographically, but also socially, economically and politically.

The severity of the problem in these regions and the need to find ways to promote sustainable livelihood based on pastoralism and agro-pastoralism prompted a request by the Government of Ethiopia to its development partners for funding to search for solutions.

This paper describes the sectoral issues faced by pastoralists, government policy and strategy, previous investment in pastoral areas, lessons learned, opportunities and forward directions in pastoral and agro-pastoral research and development to build sustainable livelihood, which can be achieved only through holistic social and economic development.

Description of Pastoral and Agro-Pastoral Areas

Population

Pastoralists and agro-pastoralist constitutes 12% of the total Ethiopian population. The pastoralists and agro-pastoralist are from 29 different ethnic groups (Coppock, 1994).

The pastoralists are rich in indigenous knowledge. The majority of pastoralists are made up of Somali, the Borena Oromo and the Afar living in Eastern, Southern and North Eastern rangelands, respectively. In addition to these, there are groups such as the Omo and Nuer, who lead a semi-pastoral existence along the Omo and the Baro River in the South-West and West respectively, and Kereyu Oromo, who live near Awash National Park situated in the Central part of the country. Out of the total population inhabiting the lowland 92% are pastoralists and the remaining are agro-pastoralists.

Area

Pastoral and agro-pastoral areas occupy the arid and semi-arid part of the country (Plate 1). The pastoral and agro-pastoralist areas of Ethiopia are divided into five, viz. North-eastern, Eastern, South, South Western and West. These areas are estimated to cover about 60% of the total land area of the country, and are below 1500 meters of elevation.

Using rainfall and temperature regimes, the climate is broadly categorized as follows: arid (64%), semi-arid (21%) and sub-humid (15%). Soil series types are cambisol, xerosols and vertisols and are low in organic content with low fertility. (Alemayehu, M. 2004)

Land cover and vegetation types are dominated by: Acacia-commiphora woodland, combretum-Terminalia woodland, Desert and Semi-desert scrubland and lowland semi-ever green forest around Abobo in Gambela. (Alemayehu, M. 2004)

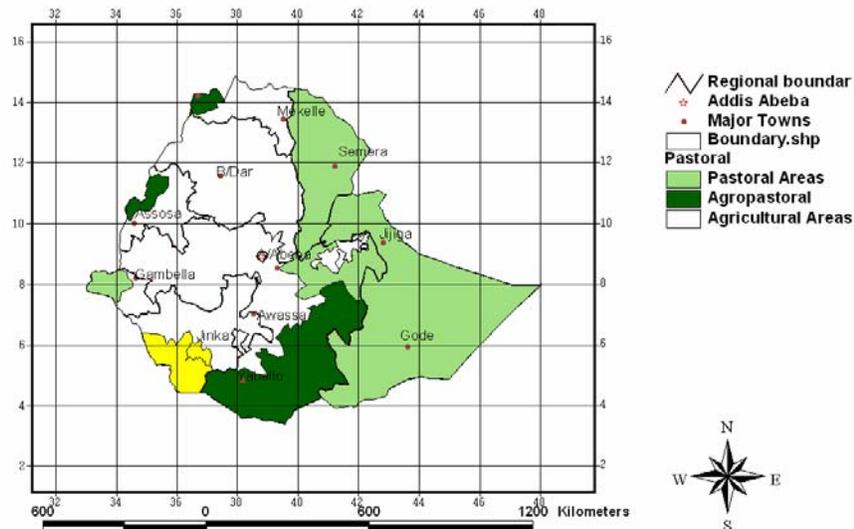


Plate 1: Pastoral and Agro pastoral Areas of Ethiopia (EIAR, 2007)

Resources

The pastoral and agro-pastoralist areas are rich in livestock share of 28% cattle, 26% sheep, 66% goats and almost 100% of camels of the country.

The pastoral areas are also rich in natural resources, including: surface and under ground water, minerals, fish and natural gas. The rich deposit of natural gas, geothermal energy and metallic and non-metallic minerals are a clear indication of the rich wealth potential of the pastoral areas. Another important resource in the pastoral areas is the biodiversity for different flora, fauna and microorganisms. The presence of more national park and wildlife sanctuaries is a clear indication of existence of large numbers of wildlife habitats. Pastoral areas are also prime interest of archaeological and socio-anthropological studies.

The pastoral and agro-pastoralist areas, therefore, must not be taken as areas only fit for producing livestock, but rather as a land mass with

untapped potential, such as providing food for human, feed for livestock and wildlife, human and animal medicines, fossil fuel, minerals, rivers, lakes, underground water, irrigation, eco-tourism and culture heritage.

Sectoral Issues

Most of Ethiopia's pastoral people live in the Somali, Afar regions, and in the Borana zone of the Oromia region. Because of the low and erratic rainfall, their survival depends on surface and groundwater resources. Access to water during the dry season ultimately determines access to and control of grazing areas. Rangeland resources are threatened by increase in human and livestock populations, resulting in soil loss, deforestation, bush encroachment, and depletion of biodiversity. In addition, competition for productive resources has created new levels of insecurity, and violent conflicts are thus facing new pressures that may require modified institutions and technologies to redress. (Coppock, 1994)

Animal health problems are exacerbated by drought, as herds become concentrated around remaining water sources, and the supply of veterinary services and drugs is generally inadequate. Although criticized for increasing herds beyond carrying capacity of the land, improving animal can result in productivity gains and speedy herd recovery.

Markets are poorly developed for livestock, with notoriously poor road and communication net works. Pastoralists prefer to accumulate livestock, and tend to sell them during droughts, precisely when the terms of trade (*vis-à-vis cereal prices*) are at their worst. Market development, through establishing market centers, improving access through roads, and providing better market information, will provide a way to sell animals, improve access to consumer goods, and facilitate integration into the market economy (Ayele, 2000 and Belachew, H, 2003).

Because of the location, and movement of pastoralists, there exist a few opportunities for livelihoods other than livestock. The major exception is crop production, which is typically part of an "*agro-pastoral*" system that includes livestock. However, lowland cropping tends to take place in marginal areas and with technologies that are unsustainable. Agro-pastoralists probably have less knowledge of agriculture than their highland counterparts, a result of little research and extension devoted to semi-arid crop production. However, there exist several opportunities to increase productivity and

reduce risk, such as water harvesting, conservation, tillage, and use of drought-resistant varieties.

The health of pastoral people is generally no worse. However, when droughts strike, their health status deteriorates dramatically, and many lack poor access to clinics and hospitals. Family planning services are inadequate. Water supply, which is of fundamental importance in ensuring human health and resistance to disease when droughts occur, is very poor for many communities. Although the incidence of AIDS among remote pastoralists is not well quantified, anecdotal evidence suggest that they are increasingly exposed to infection. Like the health sector, education services in pastoral areas are seen as being difficult.

Pastoralists use a variety of traditional coping strategies to mitigate against drought. These include: movement and sale of animal, diversifying herds and selecting for hardier breeds, use of traditional ethno-veterinary practices, changes in human diets, and seeking alternative employment. Increasingly, however, these strategies fail to provide a minimum level of food security. Traditional safety nets, which are based on recognition of the importance of mutual interdependence, are unraveling. Although there may be opportunities to reinforce and support traditional social protection mechanisms, the scale of need requires innovative solutions.

Past Government Policy and Strategy

Past Government Perceptions of Pastoralist

Prior to the 19th century, there was no state structure in most pastoral areas. The early 19th century shows the pastoral areas coming under state controls and they were considered by the state as “**no-man’s land.**” The 1955 revised constitution of Ethiopia stated: “**All property not held and possessed in the name of any person, including all grazing lands, are state domain.**” This laid the ground for the establishment of large commercial farms, agro-industrial complexes and game parks in pastoral areas; resulting in the eviction of the pastoralists from their land and they were marginalized from economic, social and political reform (Mohammud. A, 2003)

Previous Investments in Ethiopian Rangelands

Previous investments in Ethiopian Rangelands were based on World Bank Four Phases of Rangeland Development Thinking. The four distinguishable phases include:

- **The Ranching Phase (mid sixties and early eighties):-** involves ranch development involving pastoral groups and group owned ranches. Water and pasture development, animal health and market services were also included.
- **The Rangeland /Livestock Phase (mid seventies to late eighties):-** focused on communally grazed area with strong emphasis on water, road development and market services with a view to integrating pastoral areas into the main stream economy.
- **The Pastoral Association Phase (in the late eighties and early nineties).** The phase, with its attention to pastoral organization and policy reform program.
- **The Integrated Natural Resource Management Phase:** - which was evolved from the Pastoral Association Phase and which took a more community approach to resource management.

From the initial investments in the mid-sixties to late eighties and early nineties, Five Rangeland Development Projects were designed and executed in the different pastoral areas of the country. The five projects include:

Pilot Rangeland Development Project (PRDP)

Although the project initiated in the 1950s, large scale efforts were not made until it was funded by USAID in 1965 with the aim of improving range land use efficiency through pond construction and control grazing. The subsequent drought in the central and south of Ethiopia lead to the migration of the pastoralists in the project area and collapse the pilot project program.

Second Livestock Development Project (JLDP)

The project funded by the World Bank, was implemented between 1973 – 81, aimed to develop a marketing and infrastructure network to promote the sale and processing of livestock, with feed lot components. The Ethio/Somali conflict (1977/78) interrupted the project in mid-stream and led to the destruction of most project infrastructure in eastern part of the country.

Third Livestock Development Project (TLDP)

The project was co-funded by the World Bank, IFAD and Africa Development Bank (ADB). It targeted infrastructure development, resource management programs to support livestock production and marketing. Civil disturbances hampered the effectiveness sustainability of the over all program.

Fourth Livestock Development Project (FLDP)

The World Bank and IFAD funded it. Though the focus was on highland livestock systems; it also included some linkage to pastoralist and agro pastoralist areas.

The components of the project included: Forage testing, adaptation and seed multiplication, animal health service, livestock credit program, capacity building etc. One component linked pastoralists with highland farmers and service cooperative for the supply of cattle for fattening and subsequent slaughter. It also explored forage development in few low land areas for supplementary feed during drought. The FLDP though promising collapsed as a result of Ethiopian Political turmoil in 1990 and was not revived.

South East Rangelands Project – (SERP)

The project was a follow up of Jijiga Rangeland, Development Unit (JIRDU). It was initiated in 1991-92 with finance from ADB. The project area included Eastern Hararghe Zone (Oromiya Regional State) and the Ogden rangelands (Somali National Regional State). The major activities of the project included: rangelands and water development, infrastructure and capacity building. The project has phased out soliciting for finance. An effort to enhance veterinary services was coupled with better management of range resources and securing fodder to curb pastoral and agro-pastoral risks in critical dry periods. Subsequent insecurity in the project area has seriously limited its long-term impact.

Lessons Learned

A series of Rangeland/ Livestock Projects since the 1960s most of them involving World Bank have received widespread criticism. Some of this criticism is justified. Past interventions were downers driven, top-down and largely failed to provide sustainable technical, institutional and financial support. On the other hand, they made considerable progress in water development, road development, disease control and accumulating a wealth of

knowledge on pastoral and agro-pastoral society and economy. Success or failure of the past investments must also be viewed in the context of several constraints including the almost total lack of social and economic infrastructure in the rangelands, massive shifts in the political climate, the absence of NGO support, and insecurity from civil conflict and war.

While perhaps more positive in their impact than they are credited for, the past investments in Ethiopia rangelands nonetheless had a number of serious shortcomings. These included:

- Little attention and late consideration to infrastructure development and services maintenance or sustainability.
- Insufficient consultation with pastoral communities' administration and agricultural offices.
- No attention paid to research, training and the emergence of agro-pastoralism
- Insufficient attention to drought early warning systems, risk identification and disaster mitigation strategies.
- Failure to accept the adverse impact of local and regional conflict and propose ways for its mitigation etc.

Present Government Policies and Strategies

Major

The Federal Democratic Republic of Ethiopia (FDRE) has developed different policies and strategies and programmes geared towards agriculture development and food security initiatives. The major ones include: **Food Security Strategy, Rural Development Strategy, Pastoral and Agro-pastoral Strategy, The five-year (2000 – 2004) Development Plan and the Poverty Reduction Strategy** etc...

Others

On the other hand other existing government policies and strategies include: Decentralization of Power and Regional Government Formation to empower each nationality, National Population Policy, National Policy on Women, Environment Policy and National Water Policy (FDRE 1998 - 2004) etc.

The elements related to the present Government-policies and strategies includes: Constitutional Recognition, Policy and Strategy for Institutional Reform, Institution of Pastoral Affairs Standing Committee in Federal Parliament and establishment of Inter-Ministerial Board comprising nine ministries.

Present Research, Training and Development Programs

Research

In the Ethiopian Institute of Agriculture Research (EIAR), the Pastoral and Agro-Pastoral Directorate runs research in different areas of the country. The Haramya and Mekelle Universities and the Institute of Ethiopian Studies (IES) and Social Science, AAU, conduct research studies in pastoral areas. Most of the achieved and on pipeline activities are released on various progress report, journal and student thesis and will be helpful in future studies.

Training

- Diploma Middle level (TVET) mainly pastoral training that offer diploma by MOARD on three years training at lowland institutes.
- Range Management and Ecology for M.Sc with Haramya University has graduated many students. Other universities like Hawasa and Mekelle are following the same trend.

Development

Pastoral and Agro-Pastoral Extension Team, Pastoral Community Development Project at Federal, Regional and Wereda level and the Regional Pastoral Commission Bureaus are involved in development programs. All the above mentioned offices are dealing with alternative approach of the pastoral and Agro-Pastoral livelihoods, risk management and policy reforms.

On the other hand, NGOs are working directly with communities with relief and development programs and support advocacy forums etc.

Gaps

Past Governments in Ethiopia have not addresses the Pastoral and Agro-Pastoral system in research and training agenda because of low understanding of the system and its perception was as low and non-viable.

The present scenario has shown that, there are research and training institutes that are involved in Pastoral and Agro-Pastoral areas of the country.

The present research, training and development programs lack a holistic multi-sectoral approach and resulted with many gaps for development.

The gaps are many of which the most significant ones are the followings:

- Lack of multi-sectoral integration approaches
- Conceptual problems
- Lack of understanding of the pastoral and agro-pastoral systems and the interaction of society and ecology.
- Lack of coordination on community-centered and action oriented research, training and development programs

As a result of the above and others, the following Directions in Pastoral and Agro-Pastoral Research and Development in Ethiopia is forwarded.

Directions in Pastoral and Agro-Pastoral Research and Development

Food security is a persistent problem in pastoral and agro-pastoral areas. These areas are proven to drought; it gets more difficult for pastoralists and agro-pastoralists to rebuild their herds, so they can less able to take advantage of the more abundant grazing when it does rain, and they are less able to withstand the next drought. The number of cattle and other animals has fallen. As a result, many pastoralists and agro-pastoralists are short of food and feed and depend on food and feed aid. This paper offers a series of Directions (Focus Areas) in pastoral and agro-pastoral research and development where government, training, research and development organizations NGO's may consider when designing, and implementing research and development interventions. These include:

Water

Water is the most critical resource in pastoral and agro-pastoral areas. It needs due emphasis on different approaches to developing water supplies and on how these managed.

Livestock

Livestock is the mainstay of the pastoral economy. Major focus areas identified include: Genetic resources conservation, improving feed security, destocking, restocking, animal health services and marketing.

Natural Resources Management

Rangeland provides almost all of feed for pastoralists' livestock, but they are under increasing threat from degradation, erosion and encroachment. Ways to conserve and manage soil and water, rangeland, biodiversity, forest wild life and prevention of bush encroachment should be studied. Attention must also be given to drought early warning systems, risk identification and disaster mitigation strategies.

Crops

Crops are increasingly important part of pastoralist areas. Agro-pastoralists grow crops in favorable areas, as do pastoralists themselves if they think it is worth it. Crops have various important interactions with pastoralism; they contribute: to food security, provide feed for animals, and benefit from dung of animals grazed on crop residues/ stubble. Crop stress and alkaline resistance (food and forage crops), crop and water requirement and integrated pest management practices should be researched and developed.

Alternative Food

Survival foods used during drought include: various forms of food made from grains, vegetables, fruits and roots gathered from wild plants and also preserved meat in some areas. These emergency food types need due-consideration and attention for further investigation.

Income Diversification

Diversifying incomes is one way to reduce the risk of over-reliance on livestock. Alternative source of income from transport services to handicraft that could be developed further. It also further investigates ways to help pastoralist and agro-pastoralists exploit these income opportunities, such as: improving markets, supporting savings and credit schemes petty trading, involvement in handy crafts and promoting cooperatives.

Institutions

Developing institutions, but at the same time respecting traditions, is key to ensuring food security. Research training and development programs should

address traditional institutions among the pastoralists and agro-pastoralist areas and the issues of gender and the role of women.

Services

Food security is closely related to the availability of services such as health and education. Where population is highly mobile alternative approaches to providing health, education, marketing and other services should be explored. Few basic approaches as an example are listed below:

- Adoption of the normal static services at fixed location – practiced to girls' education.
- Mobile outreach camp staffed by livestock and extension specialists.
- Community – based services – approach used to literacy training and health provision.

Conflicts

Conflicts have a major impact. They disrupt productive activities, destroy livelihoods, and injure and kill the most productive people in the community. Ways to mitigate conflicts, with emphases on using traditional conflict resolution mechanisms should be developed and adapt.

Policies and Advocacy

Research and development interventions depend on appropriate policies of national governments, local administrations, donors, NGO's and development agencies. Interventions can be successful only if the policy environment is right. Nevertheless, much still need to be done on policies. In order to change policies, it is first necessary to bring about other changes e.g. it is necessary for policy makers first to understand the pastoralist and the agro-pastoralists way of life, only then will they be able to revise policies and strategies accordingly.

Pro-pastoralist and agro-pastoralist advocacy efforts should aim to keep key policy makers and even development partners to achieve this understanding.

Opportunities

There are many opportunities and potential to facilitate the livelihood of Pastoralists and Agro – Pastoralists. These include:-

People

Pastoralists and Agro – pastoralists

- The only people engaged in predominant production system in the arid

and semi – arid areas of the country.

- Different 29 ethnic groups to work with. They have strong traditional institute/ form of Social Organization, to govern behavior of their members, handling crises and managing mutual help.
- They are listed as the highest users of land under the different land use in the lowland areas. E.g. grazing and browsing 63% and irrigation/ cropping 8.7% (MOA. 2000)

Land

Resources Base

Rich in Biological Resources:-

- Different vegetation cover, different plant species for livestock and wildlife feed, human and animal, medicines, gums, resins, free seeds and aesthetics.
- Livestock – primary economy, for domestic use, export and foreign exchange etc...
- Areas of diversity for flora, fauna and microorganisms and center of origin and variability for many rare life

Rich in Physical Resources:-

- Water sources for domestic consumption, irrigation and hydropower
- Solar and wind energy, as well as geo – thermal and fossil fuels such as gas.
- Minerals – limestone, marble, salt, potash, sulphur, gold etc.
- Archeological/ landscape – center of human evolution (e.g **Lucy** and **Omo-man**); place like **Dalole** and active volcano e.g. **Alta a'are** are important areas for eco – tourism etc.

Involvement of Government and Non Government Organizations (Appendix 1)

Government Organizations

- **Organizations at both Federal and Regional** - The Ministry of Federal Affairs, The Pastoralist Permanent Standing Committee in the Parliament and Regional levels and the Regional Pastoral Commission Bureaus.
- **Pastoral Community Development Project and Programs**

- **Ethiopian Institute of Agricultural Research** – with its Pastoral and Agro – Pastoral Research Directorate
- **Ethiopian High Learning Institutions** etc

Non – Government Organizations

- NGOs -

- Works directly with communities.
- They are involved in relief and development programs
- Focus on information exchange and advocacy; good opportunity for raising the profile of pastoralist and agro pastoralist through national fora in collaboration with government organizations, donors and UN agencies.

The Way Forward

This paper attempts to show directions /focus areas/ in pastoral and agro-pastoral research and development in Ethiopia. The paper concludes /way forward/ with the following comments:

- The directions of research, training and development in pastoral and agro-pastoral areas must be to build sustainable livelihoods, which can be achieved only through holistic social and economic development;
- The process must be community driven in fully exploiting indigenous knowledge and land management systems;
- The process must be interactive, must involve attitudinal and institutional changes and acknowledge that will take time;
- The Ethiopian Government, NGOs, civil societies, bilateral organizations, donors and United Nation agencies have a key role to implement these ideas. This role poses, to all of us a challenge; however, if we have a role to play, we have to work out carefully the best entry points so that our role would be as constructive and productive as possible.

References

- Alemayehu, M. 1998. The Borana and The 1991 - 1992 Drought: A Rangeland and Livestock Source Study. Institute of Sustainable Development and French Catholic Committee Against Hunger and for Development. Berhane Selam Printing Press. Addis Ababa, Ethiopia.
- Alemayehu, M. 2005. Country Pasture Profiles. Pasture and Forage Resource Profiles of Ethiopia. FAO. <http://WWW.fao.org/ag/grassland .htm>
- Ayele, GM. 2000. NGOs Grass Roots Strategies and Experiences in Pastoral Development. National conference on Pastoral Development in Ethiopia. Addis Ababa, Ethiopia.
- Belachew, H. 2003. Livestock Marketing. Proceeding of the Third National Conference on Pastoral Development in Ethiopia. Pastoral Forum of Ethiopia. Addis Ababa, Ethiopia
- Coppock, L. 1994. The Borena Plateau of Southern Ethiopia, Development and Challenge. ILRI. Addis Ababa, Ethiopia.
- Ethiopian Institute of Agriculture Research (EIAR). 2007. Pastoral and Agro-Pastoral Directorate Report. Addis Ababa, Ethiopia.
- The Federal Democratic Republic of Ethiopia (FDRE). 1998 – 2005 Policy and Strategy Addis Ababa, Ethiopia.
- Ministry of Agriculture and Rural Development (MORD) 2000. Land Use Study. Land Use Department. Addis Ababa, Ethiopia.
- Mohammed, A. 2003. Pastoral Development Policy and Strategy. Proceeding of the Third National Conference on Pastoral Development in Ethiopia. Pastoral Forum of Ethiopia. Addis Ababa, Ethiopia

Appendix 1– Government Organizations, Non Organizations and Donor Agencies Involved in Pastoral and Agro-Pastoral Areas in Ethiopia

Federal ministries	National-level agencies	Donor agencies
<p>Determine policies and overall strategies, coordinate among regions</p> <ul style="list-style-type: none"> ▪ Ministry of agriculture, Pastoral Extension Team ▪ Ministry of Education ▪ Ministry of Federal Affairs, Pastoral Development Dept - Coordinates pastoralist development in Ethiopia, disburses funds to regions ▪ Ministry of Finance and Economic Development ▪ Ministry of Health ▪ Ministry of industry, Trade and Tourism – plans agro-based industries, etc ▪ Ministry of Infrastructure ▪ Ministry of Rural Development ▪ Ministry of Water Resources – plans and builds water collection and storage facilities 	<ul style="list-style-type: none"> ▪ Environmental Protection Authority ▪ Ethiopian Parliament, Pastoralist Standing Committee ▪ Ethiopian investment Authority ▪ Ethiopian privatization Agency ▪ Livestock marketing authority- collects data on prices, etc. ▪ Pastoral Development Commission ▪ Cooperative Promotion Bureau <p>State and local governments</p> <p>Provide services such as extension, water resources, veterinary services, etc.</p> <ul style="list-style-type: none"> ▪ Zone administrations ▪ Woreda administrations ▪ Kebele administrations 	<ul style="list-style-type: none"> ▪ Multilateral donors ▪ Bilateral donors ▪ Foundations ▪ UN agencies <p>Research organizations</p> <ul style="list-style-type: none"> ▪ Ethiopian Agricultural Research Organization ▪ Regional Agricultural Research Institute ▪ International Livestock Research Institute <p>Non-government</p> <ul style="list-style-type: none"> ▪ Local non-government organizations ▪ International non-government organizations <p>Private Sector</p> <ul style="list-style-type: none"> ▪ Input supply firms ▪ Livestock marketing ▪ Livestock health ▪ Traditional authorities ▪ Community groups

Source: Alemayehu M. 2004 and Pastoral Form of Ethiopia 2003.

Review on practices of Livestock restocking as a post disaster recovery intervention in pastoral areas

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Abstract

Restocking is taken to mean the set of interrelated activities designed to provide productive livestock to those pastoral households who have lost most of their livestock during drought, flood, conflict or other forms of disaster and have no means of their own to recover from aftermath of the disaster. In the past two to three decades, livestock restocking has been increasingly suggested and tried as one way of rehabilitating destitute pastoralists in the post-disaster period. Restocking as post-disaster intervention has been implemented in various parts of the world. Available literature indicated that the design and implementation as well as the impact of restocking on the livelihood of pastoral society varied considerably. It is necessary to draw up issues relevant to understanding of the practices of restocking in response to disaster to help in the design and implementation of the operation. This paper reviews the practices of livestock restocking in Pastoral areas of Ethiopia.

Introduction

Drought is a recurrent phenomenon among the pastoral societies of Ethiopia. It has been occurring frequently and affecting the livelihood of the livestock keepers in pastoral areas. In the 1960's and 1970's, efforts at pastoral development focused upon settling nomadic pastoralists into a more sedentary lifestyle with alternative livelihood strategies. The intention was to decrease the apparent uncertainty in livelihoods when these are mainly based upon livestock, and to decrease vulnerability of households to drought. The majority of projects and programs supported crop farming. Irrigation projects, in particular, became popular interventions. Historically, crop cultivation activities are a fallback alternative for destitute pastoralists after drought. Thus, aid for agricultural projects was often justified as a means of supporting the traditional livelihood strategies of the communities. Although well intentioned, most efforts at sedentary crop agriculture among pastoralists

were expensive failures (Hogg, 1986). Projects were unsustainable from a number of standpoints. First, crop production in semi-arid and arid environments, like livestock rearing, is a risky venture and the boom and bust cycle of rains and the subsequent influences of droughts on pastoral livelihoods could not be avoided. Second, projects required large amount of external inputs to the extent that these continue to require some further input so that by the end of the project cycle, few schemes could exist without external support (Hogg, 1986).

In recent years, to mitigate the impact of drought, several interventions were instituted, which include emergency food relief aid, supplementary feeding for vulnerable groups, emergency human health care, veterinary interventions and water trucking. These interventions helped the displaced and vulnerable pastoral households to recover from drought to some extent. But the big question remained: what can be done to support these populations after this, given that they have experience and skills to survive in the same environment but without their livestock? Many development practitioners and policy makers with special interests in pastoral development and drought management have and are still testing technologies and models in search of viable and effective solutions to this question.

In the past two to three decades, livestock restocking has been increasingly suggested and tried as one way of rehabilitating destitute pastoralists in the post-disaster period. Restocking as a post-drought intervention has been implemented in various parts of the world. In spite of the substantial experiences in the design and implementation of livestock restocking schemes in both pastoral and highland areas, there is still lack of well-documented practices to follow or adapt. It is, therefore, necessary to draw up issues relevant to understanding of the practices of restocking in response to disaster to help in the design and implementation of the operation. This paper reviews the practices of livestock restocking in Pastoral areas of Ethiopia.

Relevant indigenous mechanisms and coping strategies

Historically pastoral societies have tried to employ their own strategies to reconstitute herds and minimize disaster-induced losses. Such strategies include extended search for better pasture in more distant locations outside

the usual transhumance circuit; out-migration of some household members to earn additional income; undertaking supplementary income generating activities in conjunction with herding; conversion of large stock (cattle, camels) into rapidly reproducing small stock (goats, sheep); gift from relatives clan members to most affected members of the society (like the Hirpha or Busa Gonfa of the Borana and the Zeka of the Somali pastoralists). External support is needed when the disaster is so severe that traditional coping mechanisms cannot provide sufficient support to the community. External restocking interventions should be seen as complementary to relevant indigenous mechanisms and coping strategies, as these indigenous practices would help restocking activities in various ways. These include decision on selection of target communities, selection of recipients, purchase of stock, mode of delivery and supervision of implementation.

Livestock restocking

The term restocking covers various types of interventions, all of which aim at providing either individuals or groups of people with livestock. Restocking interventions vary from the provision of oxen-on-credit in highland areas, to the provision of large numbers of small ruminants plus pack animals to pastoralists in lowland areas. Program context can vary from long-term development projects to short-term rehabilitation, and various types of repayment and credit systems have been used. Despite all these variations, restocking when applied to pastoralists, most commonly takes place as a part of a post-disaster recovery effort.

Restocking can also mean supplying livestock, through credit, to people who do not currently own them. This is a very attractive way for a donor-assisted project to make an immediate and significant impact and help some of the poorest to take a step out of poverty. Such an approach has been implemented by FARM-Africa in different parts of Ethiopia (Peacock, 1996). The interventions by the regional governments of Tigray and Amhara using restocking as one of the main components during the reconstruction and rehabilitation programs right after the fall of Derg regime in 1991 could also be taken as an example (source ...). In addition, FAO's intervention as rehabilitation program right after the 2002/03 drought in Tigray, Amhara and Afar Regions.

More explicitly, restocking is here taken to mean the set of interrelated activities designed to provide productive livestock at reasonable and agreed cost to those pastoral households who have lost most of their livestock during drought, flood, conflict or other forms of disaster and have no means of their own to recover from aftermath of the disaster.

Advantages and concerns in restocking

Advantages of restocking

The case for supporting restocking when large numbers of pastoralists have become destitute rests upon several arguments:

- The primary underlying justification of any external restocking assistance is to ease difficulties of subsistence, although related issues are raised in environmental (rangeland) protection, conservation of animal genetic resources and social equity to the whole pastoral production system at large.
- After severe drought there is a surplus of grazing available. This should be put to good use before it deteriorates in quality, often leading to bush encroachment or the 'green desertification'.
- The costs of alternative development interventions in pastoral areas, such as irrigation agriculture, are extremely high and experience has shown that these are often unsuccessful. These are unlikely to offer realistic emergency measures after disaster.
- It is a waste of human resources for destitute pastoralists to languish in famine relief camps. They have particular skills which could be put to use back in the pastoral sector.

Concerns

Some of the major concerns of restocking, particularly if it is not properly designed and implemented, include:

- If the carrying capacity does not match with the number of animals you restock there will be overgrazing;
- Disease transmission particularly in cross-border areas;
- Inflation of market price during the restocking period, particularly when external support is being used;
- There will be a shift in the livestock species composition because cattle

and camel lost due to disaster are not replaced, as restocking is more likely to focus on sheep and goat;

- Restocking can potentially erode the traditional coping mechanisms particularly if restocking interventions are not based on traditional coping mechanisms;
- If livestock are not available in local market and stock have to be imported from distant places, the original pool of indigenous animal genetic resources will be endangered;
- Most restocked families may reside in remote areas and become difficult to access;
- Although economically feasible compared to other post drought interventions, initial investment could be relatively high;
- Tremendous yearly variation in rainfall makes planning of restocking interventions very difficult; and
- Restocking is time consuming, labor intensive and tiresome compared with other post-drought interventions.

Documented experiences in livestock restocking in Ethiopia and elsewhere

Restocking is initiated in most projects as part of disaster-relief operations. This type of support is mostly offered by charity organizations and non-governmental organizations (NGOs) (Oxby, 1994) and has shown mixed degrees of success and failure. The following review outlines experiences in design, implementation and impact of restocking interventions in Ethiopia and elsewhere. Much of this literature is based on experience of restocking in northern Kenya and Ethiopia.

The advocacy of a restocking approach by Richard Hogg and Brian Harley, both former Oxfam consultants, had a great deal to do with popularizing the concept in East Africa. Northern Kenya was hit by repeated and severe droughts over many years. Government and donor interventions intended at providing a viable alternative to pastoralism have failed to achieve their objectives; irrigation agriculture especially has proved to be a costly mistake (Hogg, 1985). It was against this background of failed development projects, and increasing inequality in access to resources, and permanent impoverishment that Oxfam launched a pilot restocking programme in Isiolo

at the end of 1983 and in Turkana in mid-1984 (Hogg, 1985). The main objective of the programme was to re-establish the pastoral sector through the provision of grain for one year, a viable flock (50 to 70 small stock), baggage animals and camping equipment (water containers, cooking pots, pangas) to destitute Boran and Turkana families. Initial indications have shown that most families survived the 1984 drought with most of their flocks intact. In Isiolo some men who returned home from Nairobi to receive stock have since gone back 'down-country' to look for work, leaving the care of their stock in the hands of relatives or wives.

Subsequently, Moris (1988) evaluated four similar Oxfam projects aimed at restocking destitute pastoralists in the very dry areas of northern Kenya: in Wajir, Isiolo, Samburu and Turkana districts. The approach adopted in the restocking program was to supply each recipient household with a nucleus herd of small stock (70 - 100, mostly female goats) sufficient it was hoped for each family's continued livelihood. To ensure donated animals would not be sold or eaten immediately, recipients continued to receive food rations for varying periods of up to one year. At assessing the impact of the programs it was learnt that the project recipients visited were at various points in the degree of their recovery. Only a few have been unable to resume a livelihood based mostly on livestock, and in this regard the projects can be viewed as a "success".

Evaluation result (Arasio, 2004) of a restocking program in Mandera and Wajir districts of North-eastern Kenya implemented by NORDA (in Mandera) and ALDEF (in Wajir) following the drought of 1999/2001, however, indicated a strong case for positive effect of restocking on the livelihood of pastoralists. The program was experimental aimed to identify and assist those poor households that had not completely dropped out of pastoralism but were in danger of becoming one unless they were restocked, and to test if reinforcement of traditional support system - *gargar*, *irb*, *eima* - could sustain the initiative. 400 families (200 in each district) were restocked. The results indicated that the program substantially contributed to increased herd/ flock sizes and access to food and cash income among the restocked families. The community's willingness to support the restocked families was widely appreciable.

There are few reports and consolidated lessons on the experiences of restocking in Ethiopia. The restocking work in Fik zone of the Somali region could be cited as one example. An external consultant evaluated Save the Children UK's (SCUK) restocking project targeting drought affected pastoral households in Fik Zone of the Somali Region of Ethiopia (SCUK, 2005). The one-year project, implemented between March 2002 and August 2003, had an immediate objective of re-integrating 500 vulnerable internally displaced people (IDPs) in Fik Zone into their home communities through improved capacity to build assets for a pastoral life. The package comprised of 30 small stock, 1 donkey, 1 plastic sheet, 1 blanket, 250 kg of maize and provision of animal health services through the training of 10 animal health workers. The results of the evaluation revealed that the project has made significant contribution to household food security and incomes of targeted households.

The Ministry of Agriculture, Ethiopia, restocked the herds of 30 families in 4 villages in Ogaden with 3-5 small stock and one heifer. Pastoralist Concern Association Ethiopia (PCAE) also restocked the herds of 80 families with 3 small stocks each in Afder. The long-term impact and success of these restocking projects is yet to be measured (ICRC, 2005). There is also an ongoing restocking program in Dollo Ado, Dollo Bay and Hargelle districts of Somali Region by SCUS and Shinile, Dembel, Fik and Hamero districts of Somali Region by SCUK (Melaku, 2006). For example, in restocking program in Dollo Ado/Baya districts of the Somali region the beneficiary received 40 shoats and one donkey (20 from Save the Children and 20 from community contribution). The report emphasized the importance of active involvement of the community in the selection of beneficiary, purchase of the stock, contribution of shoats, as well as the benefits of the traditional coping mechanisms. The overall achievement of the project is yet to be assessed.

Much of the literature concentrates on the technical issues of project design and implementation. Indeed, the short-term success of many projects has prevented a critical assessment of the long-term impact. Methods to analyze the long term impacts of restocking programmes are poorly developed. 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. As has been alluded to, although experiences reviewed

above were all implemented as post disaster intervention strategy, they varied considerably in program design and implementation as well as degree of impact.

Operational structure/implementation practices:

The approach taken by restocking programmes has varied greatly, according to the circumstances and the experience of the implementing agency. However, the following practices could be considered when designing restocking operations.

Scale of restocking

Restocking can be set to operate at community, village or household level. There are also differences of opinion about who and how decision is made on the scale of operation. Without doubt these decisions need to involve target beneficiary communities as well as other stakeholders. Experience and operational logic suggest that for restocking to succeed the focus of scale should be individual households within selected communities. However, the possibility of targeting the community at large, particularly if implementation is designed to complement traditional support mechanisms, should not be ruled out. Financial capacity and size as well as severity of the disaster would determine the proportion of the community to be restocked. However, the cost of restocking operation should justify the scale of operation.

How many villages and which villages to restock

The number and distribution of supported villages can be determined by the scale and severity of the disaster. Obviously local communities, possibly through their leaders, and public services at district level need to be consulted as part of the decision making process. The expressed needs are then matched against available financial resources. Local levels of government administration (districts, Kebeles) need to be directly involved in the decision making.

How many households and which households

The proportion of the needy households to be targeted in a community depends, to a greater extent, on vegetation condition of the area, resource and livestock availability and supportive role of the community. Additionally, the total number of affected households determines the number of households to be supported per affected community. Where a very large number of

pastoralists have been badly hit by drought, a choice must be made between distributing the number of stock afforded by available finances over a large number of households and providing sufficient animals for the complete reconstitution of a lot fewer households. Experience shows that most projects tend to opt for the former policy, basing their decision on the desire to have an impact, albeit low, on as large a number of households as possible. The underlying assumption is that those households receiving a smaller set of animals must continue to pursue a wide range of income-earning activities, a strategy which will be easier for large extended family groups than for smaller households.

Numbers and type (species, sex, age) of livestock for restocking

Determining the appropriate number, species, sex and age of animals to be given out is critical for success in restocking. Reproduction of restocked livestock is vital for continued support services by livestock; hence breeding restock livestock are to be given to beneficiary families only if they are to stay and reproduce. The available market also determines the scope (species, breeds, prices). The whole purpose of restocking is to accelerate the natural course of events in livestock production for a faster rehabilitation of pastoral households to sustain their livelihood. A rule of thumb is to follow and learn from the indigenous restocking patterns as they are likely to reflect local interests. Logically, animals with the lower requirements for space, feed and water soon after restocking are to be given priority. Small ruminants often come first in the natural restocking schemes for reasons of low feed availability, easy market access and rapid reproduction. They can therefore become adapted and productive soon after restocking to support pastoral livelihoods. This should not, however, rule out the possibility of restocking with large ruminants when ever there is a demand by the community and adequate resources to support the livestock are available, for example in flood and conflict areas where pasture availability is not a major concern. Provision of pack animals could also be considered if there is request from the community. Pastoral families would tend to opt for combinations of sheep and goat. In many pastoral societies, however, more numbers of goats than sheep are preferred because of the following reasons:

- Goat produce more milk than sheep;
- Sale prices for goats are often higher than those of sheep;

- Goats are more drought-tolerant than sheep;
- Although sheep have more social and cultural values they are not needed in large numbers; and
- Sheep are preferred than goats for slaughter as sheep meat has more fat.

The flocks to be distributed should consist mainly of mature or young breeding females in order to support herd growth and household milk supplies. Young kids without their mothers should be avoided as they are likely to suffer high mortality before reaching maturity, and the family will have to wait longer before they gain benefits. Pregnant females may be desirable if available and if they are not to be trekked long distances. To allow good reproduction in goats and sheep, a practical ratio of breeding males to breeding females is 1:20.

Any restocking scheme is not expected to be so generous as to replenish the whole stock lost to the disaster, because resources (finance, livestock in markets, household labor) are likely to be limited, and feed availability is unlikely to be sufficient to support a major increase in stocking density. A realistic strategy would be to focus on reinstating the minimum number of animals required to initiate normal reproduction of animals in the beneficiary households that ensure enough supply of 'food' in the next season. The minimum number should also allow the pastoral society to split their flocks and continue normal mobility after restocking. If this can not happen, the pastoral households are likely to remain in their settlement areas with subsequent over-utilization of rangeland resources around settlements. Although variable from place to place, it has been indicated that restocking per household of breeding small stock equivalent to 4 Tropical Livestock Units (TLU¹), or about 40 heads of mature goats and sheep, is the minimum to support pastoral way of life of an average household. Because of the high cost of providing a minimum viable herd size, systems such as "cost sharing" with the community could be tested. The SCUS project in Dollo where the community provided 50% of the livestock could be taken as a good approach and tried in other projects too (Melaku, 2006).

¹ small ruminant (sheep or goat)=0.1TLU

Source of animals for restocking

As a general rule, restocking interventions should use local/indigenous types of livestock because:

- These animals are likely to be well-adapted to local feed sources, climate and disease challenges;
- Beneficiaries are already familiar with these animals and are expected to properly take care of them;
- They are readily available, easier to purchase than introduced genotypes, and hence they are less expensive;
- Local purchase also helps to inject money into the local economy, and
- Focus on the merit of local livestock serves the global concern for conservation of indigenous livestock genetic resources for current and future generations.

Purchase of restocking livestock from cross-border markets should be avoided to ward off the risk of disease outbreak and spread at the time when the livestock population is highly vulnerable. There were recent cases of cross-border movement of livestock for restocking in Dollo Ado district of Somali Region, and pastoralists expressed concern on disease risk (Melaku, 2006). Ideally, the actual purchase of livestock should involve either the recipients themselves or their representatives. Local people usually know which type of animal best suits their situation. In a given community, recipients may elect some members, traders or elders to represent them.

Selection of recipients

Successful selection of the right beneficiaries has been recognized not only as key to success of community-based programs, but also as a major challenge in restocking projects. Traditional restocking mechanisms should provide a useful tool to use or adapt in selecting recipients. Community leaders and as much of the target community as possible should be involved in the selection process. It is important that the criteria for selection of beneficiaries be set and applied in public to ward off any operational concerns of the community. The actual selection should take place in public and be transparent. Application of clear selection guidelines and active involvement of community are needed to manage potential discontent and even displeasure about the whole process. In some communities disabled and marginalized members, the elderly and women headed families may justifiably be given priority in selection of

recipients. Traditional systems provide priority support to disabled and elderly members, particularly from their relatives.

Modality of delivery

Diverse systems of credit, repayment and further distribution of stock have been used in restocking projects. Repayment systems vary from cash repayments to the provision of offspring from “first-level” beneficiaries to “second-level” beneficiaries. A general agreement is needed with the recipients not to sell any of the animals they have received at least for a period of one year. The mode of delivery should also be agreed before delivery of animals. Restocking projects tend to be of a very short time horizon, which is expected. This means that any credit repayment or redistribution system will be difficult to manage within the project period. Therefore, any form of repayment or redistribution of animals within a restocking scheme should be kept as simple as possible. The more elaborate the system, the more administrative and monitoring support required. A more plausible and realistic solution to the difficulty is to transfer the responsibility to the community.

Management and supervision of restocking operations

For restocking operations to succeed, the beneficiary pastoral communities should be directly involved in the design, implementation and supervision activities. Traditional restocking mechanisms rely on indigenous knowledge and skills developed over many years of testing and learning processes. In these systems, community leaders play key roles. The same key players should take responsibility in management of external restocking schemes. These include: deciding on the number and type of livestock, purchase of livestock, decision on mode of delivery and overall management of the program. Implementing organizations (both government and NGOs) should oversee the whole restocking program. Particular focus should also be placed on monitoring and studying the impact of restocking. In view of the scale of the drought problem in the country, emergency interventions like restocking should be part of the local development agenda. Government institutions should take active interest in the emergency effort for recovering livelihoods of affected pastoral societies.

Necessary complementary support services

For restocking programs to succeed, they need to be linked with other drought response interventions including early warning systems, destocking,

supplementary livestock feeding, emergency veterinary input delivery, transport services and market linkages.

Early Warning Systems

Numerous early warning systems are in place throughout the developing world to warn of imminent or upcoming drought, floods, and other disasters. The technology is in place to improve prediction capabilities, and, in the case of drought, to warn that seasonal patterns of forage unavailability are to be disrupted and that forage quality will deteriorate. Readiness to respond to early warning is critical in order to intervene timely.

Destocking

Destocking programs involve the intentional removal of animals from the affected areas in times of drought and other calamities, before the animals die or become debilitated. It should occur during the early phase of drought.

Supplementary livestock feeding

Nutritional supplementation is the provision of feed or nutrient blocks for improving energy and nutrient intake of drought-affected livestock. This should be well planned and particularly linked with restocking programs to avoid unnecessary loss of livestock that would be needed for restocking afterwards.

Emergency veterinary programs

In times of drought, livestock mortality is often associated with diseases. During drought, large numbers of animals congregate around diminishing feed and water resources, and the combination of stress and close proximity encourages the spread of transmissible diseases. Restocked livestock also need a well planned veterinary intervention. Veterinary inspection at the time of purchase should be given much attention. Based on epidemiological conditions of the specific area, vaccination and/or treatment options should also be considered.

Transport services

One contributing factor to the inefficiencies of livestock markets in pastoralist areas is the high cost of transportation. The purpose of transport support is to increase the removal of animals from the pastoral areas to external markets or to abattoirs. This support often take the form of transport subsidies for those who are directly involved. Such programs can also serve to open up new markets for sellers, and can serve as a strong linkage to

development programs in the area. Beyond their far-reaching benefits during periods of drought, successful transport subsidies could in fact be justified to continue even after the drought to strengthen off-take of livestock from pastoralist areas during normal times.

Market linkages

Market linkages are designed to improve the ability of farmers and herders to sell their commodities and to purchase other necessities. As emergency measures, livestock could be sold out in large numbers in various markets before drought strikes. When planning restocking, livestock purchase could also be carried out if such market linkages are already in place. Trade subsidies can also help to facilitate movement of animals from one site to another, or to a market for slaughtering. International market linkages can be important in maintaining economic solvency for pastoralists forced to sell their herds in times of crisis.

Monitoring and evaluation

In contrast to the short period needed for giving out livestock, a relatively long period is required to monitor the degree of success achieved by recipients. Indicators of success include: (i) whether the household is, in fact, surviving without further food aid; (ii) the gross size of the household's herds/flocks; and, (iii) if they have been able to resume a nomadic existence by moving away from the initial restocking base. Since this process may take three or four years to achieve, some type of monitoring of restocked families is desirable. The information desired relates both to operational difficulties and to evaluating socio-economic impacts. Operationally, somebody must monitor animal health to alert outsiders and perhaps organize assistance if large numbers of animals are lost from disease, drought, or raiding.

Impact assessment

Detailed analysis should be carried out of the long term sustainability as well as impact of the restocking scheme on the livelihood of the community. Indeed, indicators need to be identified and applied to measure progress and impact also during implementation. Some of the indicators to study impact of a restocking scheme include, herd growth rate, household well-being, impact on children, impact on women, potential for family re-integration to pastoral life style, socio-economic impact and implications on policy issues. Perhaps the most important impact of restocking projects, however, is the demonstration

that such an approach is operationally feasible and is cost effective in comparison to alternatives. For an accurate impact assessment, baseline information and terminal report should be made accessible through the government responsible body. This could be more easily facilitated if the government body is involved from the onset of design and implementation of the restocking program.

Feasibility of restocking

Costs of livestock restocking schemes could vary depending on scope (components) and location. The main cost components in restocking are the following:

1. operational costs of managing the scheme, including salary, transport and accommodation of personnel;
2. cost of procuring the animals;
3. cost of supplementary feeds and veterinary inputs;
4. any other provisions or equipment given out (some projects provide equipments like plastic jerry cans for carrying water, an axe, etc. (Morris, 1988)
5. overhead costs, including transport, holding facility, expected losses of animals due to mortality and other causes, and
6. cost of monitoring progress and impact.

Cost items under numbers 1, 5 and 6 can become very variable and difficult to handle, and need good control. Literature reports on observed costs are quite variable. The Isiolo pilot project (Moris, 1988) in Kenya for example, which provided 50 small stock and 1-2 donkeys per family, was estimated to have costed £792.50 (Birr 3352.3) per family. Another project reported a draft budget for a six month project for a family to receive 70 small stock each to be £863 (Birr 3650.5) per family at 1986 prices (Hogg, 1986). Both estimates omitted supervisory costs of higher level management and cost of technical consultancies. In the Fik zone of Somali region of Ethiopia, cost for restocking (30 small stock and 1 donkey) a household was estimated at Birr 5,200 (SCUK, 2005).

Cost comparisons of restocking projects with alternatives generally favor restocking. Irrigation is vastly more expensive as a means of rehabilitating pastoral families (Oxby, 1994). Furthermore, irrigation schemes have tended to fall into disrepair and be abandoned, following the end of the project

input, because of high maintenance costs and difficulty in obtaining spare parts to replace worn out equipment. By contrast, at the end of the restocking scheme, successfully restocked families are left with a viable herd. When, on the other hand, restocking is compared with famine relief costs per family are roughly the same over a 3-4 years period (Toulmin, 1986). At the end of the scheme, however, the situation is radically different: the family on food-for-work has nothing, whereas the restocked family has a breeding herd.

In terms of cost, restocking compares favorably with alternative development initiatives, particularly when the duration of the benefit to the recipients is taken into account. Furthermore, non-livestock agricultural initiatives may in fact entail at least future maintenance costs to pastoralists. In addition they run the risk of making a major departure from pastoral way of life, with inevitable consequences of letting down skills and knowledge needed to support pastoral livelihoods in fragile environments, to utilize rangeland resources (grazing, water), and to produce milk and meat production from these areas. Failures will then mean increased dependency of the affected communities on external assistance. The communities end up becoming additional heavy burden to public support services instead of operating as viable productive members of society.

Programming and policy considerations

Policy implications

1. As a measure to ameliorate the possible effects of drought, there is need to develop an institutional capacity to generate accurate early warning and monitoring data at different levels; these data enable timely intervention early during the drought crisis, and also better manage drought responses.
2. Drought has become a normal phenomenon. Thus, restocking should be part of the local development agenda. Government institutions should plan for livelihood recovery of pastoral societies after any drought. Relief should also consider the food habit of the pastoral society; for example, for pastoral societies milk instead of grain should be provided.
3. Community consultation is vital even at times of plenty, at least to capitalize on the potential contribution of existing indigenous institutions.

4. Indigenous micro-financing institutions can provide for a larger scale conversion of live banks (livestock) into safer cash, and hence, they need to be strengthened.

Other considerations

Conservation of indigenous livestock genetic resources

Practically, locally adapted animals (breeds) offer the best chance of success in livestock restocking. Moving genotypes across agro-ecological zones and breed home areas can cause unintended genetic dilution, which, in fact, is a secondary issue given the human lives at stake. An important issue when considering local stock would be the availability of sufficient numbers of animals in the area to meet the demand for restocking. Restocking projects require large numbers of breeding females, which often are unavailable locally. Livestock may then be called for from external sources. Where this practice should be followed, it is advisable to look for stock from a similar agro-ecology. The conservation of genetic resources should be taken care of by appropriate government institutions (for instance, EIAR, Biodiversity Institute). But this can be linked to active destocking schemes that can be tailored to address issues like sanctuaries and safe heavens for calves and breeding stock.

Effects of restocking on natural resources

The focus of livestock restocking programs should be on sustaining an essential nucleus of breeding animals rather than whole herds. Recovering rangelands will not be in their most productive state, so will only be able to support small populations of livestock. Therefore, full scale restocking should be avoided as this exercise can cause environmental damage. Restocking scheme should consider the effect that restocked animals will have on current stocking densities. To avoid environmental degradation, the stocking rate of a region should be directly related to the carrying capacity of the rangelands to avert further unintended complications. If sufficient rangeland resources are not available to support these additional animals, not only will there follow worsening environmental degradation, but the animals themselves will eventually succumb to grazing and water scarcity. In most cases, restocking projects have been limited to a small number of beneficiaries and, unless the process involves massive importation rather than redistribution, no major concern may be raised with regard to the environmental impact (Pratt, Le Gall and de Haan, 1996).

Integration with other development and relief activities

Restocking programs should be integrated with other development projects like Safety Nets, pastoral development programmes (e.g. PCDP) and NGO projects in the area. The problems and constraints facing pastoral communities are complex and inter-woven. Development interventions that follow a piece-meal approach put sustainability at risk. Thus, it is of paramount importance to follow a holistic development approach for sustainable development of pastoral areas, necessitating program integration and co-ordination. Additionally, all forms of assistance, including food aid, until the restocked families become more self-sufficient require good coordination between agencies.

Conclusions

Restocking destitute pastoralists can be a means to a successful post-disaster recovery intervention. There are many cases where restocking was implemented, indeed with various degrees of success. To have any meaningful impact with restocking operations, it is imperative that the practices involved in the design and implementation of restocking should be fully understood. Restocking operations also need to base on traditional coping mechanisms of the community in question and need to involve the community from the design to implementation of the scheme and later in the monitoring and evaluation. Additionally, it should be well understood that restocking programs have to be flexible to meet the differing requirements and environments of each pastoralist community.

References

- Arasio, R.L. 2004. Rebuilding Herds by Reinforcing *Gargar/Irb* Among the Somali Pastoralists of Kenya: Evaluation of Experimental Restocking Program in Wajir and Mandera Districts of Kenya. Nairobi, Kenya.
- Hogg, R. 1985. Re-Stocking Pastoralists in Kenya: A Strategy for Relief and Rehabilitation, Pastoral Development Network Paper 19c. London: ODI, 12 pp.
- Hogg, R. 1986. The New Pastoralism: Poverty and dependency in Northern Kenya. *Africa*, 56 (3).
- ICRC, 2005. Livestock Study in the Greater Horn of Africa - Ethiopia Country Profile. International Committee of the Red Cross (ICRC), Nairobi, Kenya.

- Melaku Gebre-Michael, 2006. Restocking: Rebuilding livestock assets (lost by drought), Field report. Addis Abab, Ethiopia.
- Moris, J.R. 1988. OXFAM'S KENYA RESTOCKING PROJECTS. Kenya.
- Oxby, C. 1994. Restocking: A guide. Herd Reconstitution for African Livestock Keepers as part of a Strategy for Disaster Rehabilitation. VETAID, Midlothian.
- Peacock, C. 1996. Improving goat production in the tropics: A manual for development workers. An Oxfam/ FARM-Africa Publication, UK.
- Pratt, D. J., F. G. Le Gall and C. de Haan, 1996. Best Practices in Natural Resource Management: Guidelines for Pastoral Development in the Middle East and Africa. The World Bank Review, Draft.
- Save the Children UK, 2005. Terminal evaluation of the restocking/rehabilitation programme for the internally displaced persons (IDPs) in Fik Zone of the Smali region of Ethiopia. Save the Children UK, Addis Ababa and Acacia Consultants, Nairobi, Kenya.
- Toulmin, C. 1986. Pastoral livestock losses and post-drought rehabilitation in sub Saharan Africa: policy options and issues. African Livestock Policy Analysis Network, Paper no. 8, ILCA, Addis Ababa, Ethiopia.

Geographic distribution of cattle and shoats populations and their market supply sheds in Ethiopia: Major findings²

Mohammad Jabbar, Asfaw Negassa and Taye Gidyalew

Background

The objective of this paper was to identify and map the geographical distribution of livestock populations, and domestic and export livestock market routes and their respective supply sheds in the main production areas in Ethiopia.

These maps are based on the latest digitized livestock population data from Ethiopia's Central Statistical Authority (CSA) and the International Livestock Research Institute (ILRI). Secondary data from the published and unpublished sources and key informant interviews were also used to identify key livestock market routes and map the major urban livestock markets, market routes and supply sheds.

Major findings

The maps showed that the highest numbers of cattle and shoats are to be found along a north-south transect covering parts of the central highlands of Tigray, Amhara and Ormoia regions, and the transect that connects Adama and Dire Dawa. Conversely, very low livestock numbers occur in pastoral areas like Afar, Ogaden, and Boran; this would be normally expected.

Although livestock population density indicates stocking rates, we could not ascertain whether these rates were optimal or non-optimal (in relation to carrying capacity of different areas) due to lack of data on various factors which influence carrying capacity and stocking rate. These factors include:

- Extent of available arable land
- Land-use (cropland, pasture, fallow, etc.)
- Biomass productivity of cropland (especially crop residues) and other land

² Detailed report and references for this summary is given in Jabbar, M.A., Negassa, A. and Taye, G. 2007. Geographical distribution of cattle and shoats populations and their market sheds in Ethiopia. Discussion paper 2. Improving Market Opportunities, International Livestock Research Institute, Nairobi, Kenya. 46pp.

- Combination of system of production (mixed farming, intensive specialized farming, extensive grazing, agro-pastoral or pastoral)
- Feeding systems (grazing, harvesting of feeds and stall feeding) and
- Combination of animals being raised

Generating data on these factors will be helpful for better analysis and targeting of livestock development efforts.

Maps showing the association between human and livestock population densities indicate that there is a positive relationship between the two up to a point. Increased numbers of rural households also lead to increased ownership of livestock for various livelihood purposes. But at much higher population densities, humans and animals start to compete for food and feed hence livestock numbers tend to decrease. This is also accompanied by a change in the combination of animal species kept, with numbers of large animals being reduced in favor of small ones. This phenomenon is described as “involution” in the context of production systems evolution. This pattern of livestock population dynamics implies that new livestock development strategies must adequately consider differences in ecological conditions and human and livestock population densities when targeting livestock species combinations for feed and health technologies and input and output marketing infrastructure.

The locations of recently-established abattoirs are perhaps based on current main supply hinterlands for exporting quality animals and feed resources. As this industry further expands, supply sources should be diversified and choice of abattoir locations guided by potential new supply sources that are currently not exploited. The maps showing the geographic distribution of breeds of animals will be helpful in that effort.

Market routes for Ethiopian livestock, especially those for live animal exports, are quite variable though domestic routes serving the various formal and informal and informal export routes have some degree of stability. There are also seasonal variations in routes, especially those originating in pastoral areas. As Ethiopia’s meat export industry grows stronger, it is likely to significantly influence the future shape of market routes and supply hinterlands as more smallholders get incentives to commercialize livestock production and pull their animals from different supply hinterlands. This

will also provide incentives to establish more specialized livestock production enterprises of varying sizes in areas endowed with better feed resources and good market connections. It is thus advisable for the meat export industry, with appropriate support from the Ethiopian government, to take proactive measures in these directions to assist longer term and sustained livestock development in the country.

Impacts of *Prosopis* invasion and experience on control in Afar region

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4th October 2007

Introduction

Afar National Regional State (ANRS) is part of the East Africa Great Rift Valley and characterized by patches of scattered dry forests, *Acacia* woodlands, bush land, wooded savannah and scrubland. Transhumance pastoralism through extensive grazing is the major production system suited to the environment. However, livestock production and productivity is declining through time primarily due to reduced feed availability. The indicative land use plan of the ANRS (2001) showed that 70.9% of the land cover is degraded and depleted lands. The major causes usually described were poor spatial and temporal distribution of rainfall, weakened rangeland management and improvement practices, reduced herd mobility due to farmland encroachment and intra/inter tribal conflicts. The situation is further worsened from invasion of the rangeland by introduced plant species such as *Prosopis juliflora*, *Parthenium*, etc. *Prosopis* was introduced to Afar in 1970s by the Ethiopian Ministry of Agriculture for conservation and shade purposes. It was wrongly introduced to high potential pasturelands and irrigable areas. Local people were not made aware of the invasive nature of the tree and not advised on the management practices to minimize further spread and optimize the benefits. As a result the shrub rapidly invaded vast areas of agro- and silvo-pastoral lands and affected the biodiversity and socio-economic environment. According to the USDA- technical assistance trip report to FDRE (2006) over 700,000 hectares of land is invaded or is at risk from *Prosopis* in ANRS. Both government and local communities declared the invasion as top priority problem and requested for external support to prevent further expansion of the invasion and restore invaded areas.

According to local communities (Dubale, 2006) *Prosopis* invasion has resulted in the following negative consequences in their livelihood and the ecology:

- Dry season pasture across the Awash River basin was lost

- Indigenous trees, a significant dry season fodder source, were threatened
- People and livestock suffer from mechanical injuries from sharp *Prosopis* thorns
- Access to roads and watering points were blocked
- Predator challenge both to livestock and humans have increased as predators, such as hyenas, hide in the thicket
- Livestock feeding on pods for extended periods, due to lack of pasture, show health problems such as constipation, dental disfiguration and reduced overall productivity
- Agro-pastoralists and private farms spend large amounts of money clearing *Prosopis*
- Malaria cases were increased due to water pond under the *Prosopis* tree which created favourable microclimate for multiplication of mosquito in invaded areas.

However, due to lack of alternatives local people uses *Prosopis* wood and products for different purposes which includes: pods for livestock feed fuel wood, charcoal production, fencing (both live fence and fence from cut trees) house construction and shading. Community members do also realize that *Prosopis* has positive contributions to the ecology such as improvement to the soil fertility, reclamation of salinity, control of soil erosion and cooling the environment. However, for the pastoralists and agro-pastoralists the losses outweighs the benefits for their livelihoods and agree on the control of the invasion and if possible to eradicate at least from key resource areas.

FARM-Africa started working in ANRS since 1998 on pastoral development and providing emergency livestock support during drought times. The *Prosopis* invasion and associated environmental and livelihood impacts were identified as priority community needs and control activities were piloted from 2004.

The primary strategies introduced for the control of *Prosopis* invasion were economic utilization of the tree and its products and utilizing the cleared land for crop and pasture to prevent re-invasion. The major components of the intervention were:

- Organizing local people into cooperatives to clear invaded areas, and using the cleared land for pasture and crop production.

- Introducing improved charcoal production techniques to reduce labour and time and support local communities to access sustainable markets for the charcoal and fuel wood products to increase incomes of local people.
- Collecting and crushing *Prosopis* pods to produce a livestock feed and to demonstrate that there is an economic value of the seed meal and can be run as viable micro-enterprise. Crushing and livestock feeding will also contribute for the control of the spread as it destructs the seed which otherwise passes the digestive system of the animals.
- Community mobilization to uproot seedlings emerging in newly invaded areas and germination in cleared areas.

Much has been learned about *Prosopis* utilization in the process through reviews and MSc research hosted by the project. Specifically the following were the key innovations and successes:

- *Prosopis* control has come to the attention of ANRS Government and Federal Government and a draft regulation was produced by ANRS through FARM-Africa support to strengthen the extension and regulatory service for control of *Prosopis* invasion through productive utilization. Moreover, *Prosopis* is identified as one of the major alien invasive species by the Federal Government of Ethiopia
- Small diesel-powered hammer mills were able to crush the *Prosopis* seed and there is substantial demand for the crushed pod by livestock keepers. However, the small hammer mills were not able to handle the volume needed. Normal grain mills, which have better capacity, were also proven successful to crush *Prosopis* pods. Therefore, there is potential to run for *Prosopis* meal production and marketing as a viable micro-enterprise.
- Households involved in charcoal production and marketing obtained good income and diversified their livelihood base to better cope food insecurity. Within one year (Oct 2004-Sep 2005) four cooperatives of 179 members were able to clear 406 hectares of invaded land, produced and sold 195,949 sacks of charcoal and obtained net profit of ETB 3,000,746 (Admasu, 2006). Poor households involved in the project obtained on average ETB 750 per month, which was sufficient to cover their household expenses such as clothes, medical service and food, and built their asset base by purchasing livestock (Admasu, 2006).
- Over 233,509 man-days of labour opportunities were created within a year

for daily workers. With £0.6 minimum daily wages, the job created by the four cooperatives was equivalent to £140,105 per year.

- From the field observations, cultivation of land cleared of *Prosopis* reduced the chance of re-invasion.
- Illegal charcoal production was reduced as the illegal charcoal burners started working under the cooperatives supervision.
- Indigenous trees, shrubs and grass which were lost due to the invasion recovered when *Prosopis* was removed and emerging seedlings were uprooted to allow the indigenous plants the space to grow.

Lessons and challenges encountered in the pilot intervention both at community and government level

- Seeking to gain similar benefits as the cooperatives, unauthorized individuals engaged in the production and marketing of charcoal which made the operation unmanageable. There was no legal framework to regulate the proper utilization of *Prosopis* that could contribute for the control of the invasion and also protect indigenous trees. Draft regulation was produced by ANRS PARDB with the support from FARM-Africa. There is a plan further refined and lobbied for approval of the regulation by the ANRS council. New project is under development to support ANRS PARDB to prepare guideline for the implementation of *Prosopis* management regulation.
- The pilot initiative was not supported with realistic land use plans for reclaimed pasture lands. Community members were not mobilized to protect re-invasion and to sustainably use cleared pastureland. In some cases, pasture lands cleared from *Prosopis* were reinvaded. Under the new with the new project under development local communities will be supported to prepare and implement participatory management plan for invaded pasture lands after clearance.
- Some communities failed to respect the by-laws such as: (a) people crossed local boundaries to harvest *Prosopis* and this became a source of conflict in some areas, (b) not removing stumps to 10cm below the soil, which allowed re-growth (c) buying illegal charcoal from other areas and pretending it was legal (d) misuse of pass permits so that illegal charcoal was legally traded. The regulation to be approved and implementation guideline to be prepared will help to control these limitations and create enabling

environment for the communities to be engaged in the management of *Prosopis*.

- There was almost no involvement of women in the charcoal production and marketing cooperatives. It is learned that awareness creation at the community level to develop ways for women to be involved in the cooperatives and contribute for the management of *Prosopis* invasion appeared basic.

Future involvements of GO and NGO institutions on *Prosopis* management should be informed from the lessons learned and challenges observed from the pilot interventions of FARM-Africa with the ANRS government in Gewane and Amibara Woredas.

Livestock ownership, commercial off-take rates and their determinants in Ethiopia: Major findings³

Asfaw Negassa and Mohammad Jabbar

Background

One of the major challenges facing the meat export abattoirs in Ethiopia has been the inadequate supply of quality live animals for meat processing. It has been observed that the live animal throughput is inadequate and, as a result, the existing meat processing facilities operate at less than 50% of their operational capacities. This has increased the fixed costs of operation thereby decreasing the export abattoirs competitiveness in the domestic and export markets. Overcoming the constraint of supply shortage of quality live animals requires, among other things, understanding the livestock producers' ownership patterns and marketing behaviour. This study is conducted with the main objective to assess the current commercial off-take rates for cattle and shoats in the highland and pastoral areas of Ethiopia. Both descriptive and econometric analyses are made using secondary data obtained from different sources for different years covering the highlands and pastoral areas of Ethiopia.

Major findings

In general, very low net commercial off-take rate is observed over different time periods for both cattle and shoats for smallholder farmers and pastoralists in Ethiopia. In 1999/2000, the average net commercial off-take rate of cattle, sheep and goats for smallholder farmers in the highland areas of Amhara, Oromia and Tigray is 8, 22 and 18%, respectively. In 2004/05, the average net commercial off-take rate of cattle, sheep and goats for smallholder farmers in highland and lowland areas of Ethiopia is 7, 7 and 8%, respectively. It is also observed that not only the net commercial off-take rates are considerably low, but also the bulk of this net commercial off-take is of low quality cattle such as culled animals. For example, in 1999/2000, in the highlands of Tigray, Amhara and Oromia regions, old draught oxen accounted

³ Detailed report and references for this summary is given in: Asfaw Negassa and Jabbar M. 2008. Livestock ownership, commercial off-take rates and their determinants in Ethiopia. Research Report 9. ILRI (International Livestock Research Institute), Nairobi, Kenya.

for about 75% of the net commercial off-take rate for cattle. In the case of Borana pastoral production system, the average net commercial off-take rate of cattle, sheep and goats for the three year period (2003–05) for cattle, sheep and goats is 9, 6 and 7%, respectively. Most of the off-take assessments are made on quantitative basis due to data limitations and in the future there is a need to determine the off-take rates by different quality dimensions (e.g. by age and weight of live animals).

The observed patterns of livestock ownership and the size of holdings indicate that even though there is presumably large livestock population in Ethiopia the size of livestock holdings at the household level is very small and does not support stable and sufficient commercial off-take. It is observed that about 80% of the smallholder farmers in Ethiopia own cattle while only about 31–38% and 21–33% of them own sheep and goats, respectively.

In the case of Borana pastoralists, about 78, 42 and 20% of them own cattle, goats and sheep, respectively. In terms of the herd size, it is observed that smallholder farmers own only few heads (usually less than or equal to three) of cattle and shoats while the pastoralists own relatively larger number of cattle and shoats. On average, the pastoralists own about 13, 5 and 2 heads of cattle, goats and sheep, respectively. In general, it is observed that smallholder farmers' and pastoralists' livestock holdings are barely self sustaining.

In terms of sex composition, about 46% of the cattle owned are male and 54% are female. If we consider classes of cattle owned, oxen and cows account for about 44 and 24% of the cattle herd, while bulls and young animals like heifers and calves altogether account for about 32% only. The higher proportions of oxen indicate that the main purpose of keeping cattle in the highland areas of Ethiopia is for draught purpose. The majority (66%) of the cattle herd kept by the smallholder farmers are aged 3 to 10 years, while about 16% of cattle are aged 1 to 3 years and about 3% are aged over 10 years. There are four main purposes for keeping cattle aged 3 to 10 years: about 39% of the households keep 3 to 10 years old cattle for draught purpose while 28 and 27% of the households keep cattle for breeding and dairy production purposes, respectively. However, it is interesting to note that only about 1% of the households gave beef production as the main reason for keeping 3 to 10 years old cattle. This indicates that there are

limited on-farm cattle fattening operation by the smallholder farmers in the mixed crop–livestock production systems.

The analyses of herd and flock dynamics indicate that the critical importance of reproduction rates of cattle and shoats owned by the farm households and pastoralists are for herd and flocks growth and maintenance since they generally rely less on the market to build herd and flocks. For the sample farm households in the predominantly crop–livestock systems in the highland areas, births and purchases account for 59 and 37% of cattle inflows, respectively. This highlights the importance of reproduction rates of cattle and shoats owned by the farm households and pastoralists for herd and flocks growth and maintenance since they generally rely less on the market to build herd and flocks. On the other hand, there are five components of cattle outflows: deaths, sales, slaughters, gifts and thefts. The deaths and sales are the major components of cattle outflows. In the highland areas of the three regions of Ethiopia, death and sales account for 36 and 50% of cattle outflows, respectively. The size of on-farm cattle slaughters, thefts and gifts are found to be very minimal. It is observed that there is low birth rate and high mortality rate for both cattle and shoats indicating very low herd and flock productivities. Thus, the major reason for low commercial off-take could be low fertility, high mortality and poor nutrition/weight gain. Given the low herd and flock productivity, the small herd/flock size does not provide a sustainable base for commercial supply of quality live animals. These indicate the potential of increasing commercial off-take of cattle by reducing cattle mortality and increasing the fertility rate. These require changes in the livestock production, extension and marketing systems. Similar herd and flock dynamics were also observed for Borana pastoralists.

Many smallholder farmers and pastoralists do not participate in the livestock market. Furthermore, for those smallholder farmers and pastoralists who participate in the market, the size of transaction (sale or purchase of cattle or shoats) is found to be very small. For example, in 1999/2000, about 61% of the smallholder farmers in the highland areas of Amhara, Oromia and Tigray neither sold nor bought cattle while only 23% sold cattle. In the case of shoats, about 49 and 55% of the smallholder farmers neither sold nor bought sheep and goats, respectively. The CSA data for 2004/05 also indicated that about half of the households neither sold nor

bought cattle while 43 and 50% of the smallholder farmers neither sold nor bought sheep and goats, respectively. The main purpose of keeping cattle in the highland areas of Ethiopia is for draught purpose. It is observed that about 47, 72 and 66% of Borana pastoralists neither sold nor bought cattle, sheep and goats, respectively during the period from 2003 to 2005.

It is observed that there are significant off-takes of cattle and shoats for national consumption.

For example, the off-take rate for cattle, sheep and goats for national consumption in 2005/06 is 3, 13 and 10%, respectively. Thus, national consumption absorbs a large share of the already observed overall low net commercial off-take rates or market supply from smallholder farmers and pastoralists leaving a small share of marketed supply for the live animal and meat export activities. Significant livestock transaction takes place among the livestock producers themselves for breeding, replacement and draught purpose. In the short run, there might be some degree of market segmentation regarding the demand for live animals for domestic and export markets due to different quality requirements in the domestic and export markets, e.g. domestic consumers demand animals of all age, sex, breed and body conditions but export abattoirs need animals with specific high quality attributes to meet importers' requirements. However, in the long run, with growing domestic supermarkets and increased demand for high quality meat, the demand for high quality live animals for domestic consumption is expected to increase, which increases the competitive pressure on export abattoirs.

Herd/flock size and land holdings are found to be the key factors determining smallholder farmers' choices to participate in the market. Herd size is positively associated with household's choice of participation in cattle market as a seller only and both as a seller and buyer. That is, the probability of the household's participation in cattle market as a seller only or both as seller and buyer increases with herd size while the probability of non-participation in cattle market decreases as the herd size increases. Thus, the smallholders' market participation and hence market off-take has been limited because they have low herd size.

Then, the important question is how to increase the herd size owned by smallholder farmers in order to increase their market participation. There is

negative effect of land holding on the household decision to participate in cattle market as a seller only while it has positive effect on household decision to participate in cattle market as a buyer only. That is, as the size of land holdings increases, the probability that the household participate in cattle market as a seller only decreases while the probability that the household participates in cattle market as a buyer only increases.

Conclusion and policy implications

It is observed that there are very low commercial off-take rates of cattle and shoats for smallholder farmers and pastoralists in Ethiopia. Furthermore, a large proportion of the few animals sold are also of such age and body conditions that many of them are unlikely to meet the needs of meat export abattoirs. One of the reasons for the low commercial off-take rate and limited market participation could be small herd and flock sizes accompanied by very low fertility and/or high mortality rates. The implication of limited market participation is that under the current production and marketing conditions, small-scale farmers and pastoral livestock production systems do not provide regular and adequate market supply of quality live animals at competitive prices, which adversely affects the efficient utilization of meat processing capacity of export abattoirs and hence their competitiveness in the domestic and export markets.

Options for strategic interventions

Improve the extension messages and functions. Extension messages should be designed to advise livestock producers that will result in improved productivity (increased fertility, reduced mortality, improved feed conversion ratio), quality of marketed animals (sell at optimal age, weight and body condition), and market orientation of smallholder producers so that they make purchase and sale decisions to maximize household returns. There is also a need to disseminate appropriate technologies for better feeding and health management practices, which will significantly increase the quantity and quality of off-take.

Public sector extension alone may not be able to achieve the above objectives to change producer behavior to increase supply. Since abattoirs are interested in the regular supply of better quality animals by smallholders and pastoralists, they should be active partners in this strategy. Currently there is inadequate information on the extent of supply hinterlands that

abattoirs use to procure animals, whether they offer competitive prices for similar animals demanded by alternative buyers such as formal and informal live animal exporters and domestic market traders, whether they use all possible purchase mechanisms or options to collect animals from different supply hinterlands especially areas not easily accessible either because of poor road connection or due to other risks associated with marketing. A detailed analysis of the current functioning and efficiency of the livestock supply chains and abattoirs' procurement policies and mechanisms will be required to identify entry points for the abattoirs to choose specific interventions from possible options and to recommend effective supply relationships.

Investment in animal health services is required to improve the productivities of smallholder farmers and pastoralists. From the supply side, the large numbers of non-participants need to enter the market for which improvement in fertility rate and significant reduction in mortality rate will be required so that herd/flocks sizes increase sufficiently to allow smallholders to sell more animals. This requires increased private and public investment in animal health services.

Encourage the emergence of commercial-oriented livestock production systems such as the development of commercial feedlot operations, improved pastures, small-scale fattening, large-scale ranching, and dairy and beef operations. However, the social and economic feasibilities of such commercially oriented production systems need to be carefully evaluated and there is a need to consider how to effectively and efficiently integrate smallholder farmers and pastoralists to the high value domestic and export markets value chains for live animals and meat through the development of appropriate institutions, policies and marketing infrastructure and support services.

Build a sustainable and demand-driven market data collection and information service that provides timely, accurate, reliable, secured, and affordable production and market information to different target beneficiaries. There is lack of reliable baseline data to monitor and assess the changes in the livestock production and marketing environments in Ethiopia. There is also lack of historical and current livestock production and

marketing related statistics to support the business and policy decision making in the livestock sub-sector.

Pastoral Livelihoods in Afar and Kereyu the Case of Pastoral Communities in and around Awash National Park ¹

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Abstract

A community focus group discussion and household level data from selected respondents in and around Awash National Park showed that there is pressure on the natural resources base in the areas as well as inability of the pastoral communities to better respond to shocks that arise as result of climatic factors and or resource competition.

Traditional coping mechanisms are under intense pressure and are not able to provide enough cushions to withstand system shocks. Pastoral communities in the surveyed area are therefore engaged in livelihood activities that are livestock and non-livestock based. There are also options for diversification of income and asset base. These however require a through investigation and capacity building as well as awareness raising programs before that could become tolls for enhancing livelihood in the pastoral communities in and around Awash National Park.

Key words: Afar Pastoralists/ Kereyu Pastoralists/ livelihood/diversification options

Introduction

Livestock production is predominantly the major sources of livelihood for the pastoral communities in and around the ANP (Awash National Park).

Given the variability of the risk factors the pastoralists are exposed to, pastoral communities in and around awash national park evolved a number of strategies which allowed them to maximize the probability of survival as well as the number of people that can be supported on the land by livestock. These strategies include, but were not limited to a milk based diet, high mobility, livestock diversity, herd splitting, and social security systems of stock loan and re-distribution.

However, several conditions have changed in recent times that limit effective response-this includes population growth and associated resource use constraints. The deterioration of traditional institutions and social responsibilities on both the Afar and Oromo sides, has also contributed in part to the vulnerability of the pastoral communities. The system that provides a livelihood for these communities has become increasingly unstable, and highly vulnerable to minor climatic shocks. External factors like repeated drought, demographic pressures, negative effect of wrong development projects and policies were considered responsible to many problems associated with the pastoral system. Looking at the issues internal to the pastoral communities in and around ANP, however, three major development factors are considered to be driving factors-expansion of plantations and other state development ventures; decline in mobility; and escalation of resource related conflict between and among herders and state plantations and the Park. Pastoral communities in the study area are, also becoming 'out-ward' looking, and are getting involved in non-pastoral activities. There is also open-mindedness to respond to appropriate interventions. In the following section some of the major survival strategies employed by the Afar and Oromo pastoral communities will be examined in brief, and also we shall present other options for asset and income diversifications. As will be noted some of the activities the communities are involved in are limited in scope, and some also require proper guidance through appropriate extension program.

The Study Area

The Awash National Park (ANP), a subject of this study was established by proclamation No. 54/1969 as a strict conservation area in which all forms of human land use are prohibited. The Park legally covers around an area of 752 km² and located East of Addis Ababa some 225 km away from the Addis Ababa-Dire-Dawa/Djibouti highways with altitude ranging between 750 and

2007 meters (Fig 1). It is connected to Addis Ababa and Dire-Dawa/Djibouti by rail and all weather roads (one of the best connecting link in the country). Awash National Park has extra ordinary interesting feature from both the physiographic and geological point of view.

The area has been protected as a private hunting reserve for His Majesty Emperor Haile Selassie I, and there was an abundance of game in the area (Petrides, 1961). The establishment of the park placed it within the classification of a "strict conservation area" defined as excluding all kinds of human use in the area like settlement, exploitation of natural resources, and grazing (Moore, 1982). More than 81 species of mammals, 453 species of birds (6 of them endemic) have been recorded from the park. Several species of reptiles and amphibians and unknown number of invertebrate species are found in the park. In addition, the existence of wild animal species adds beauty to the Park. Consequently, the park remains one of the high potential tourist areas in the central Rift Valley of Ethiopia, because of its proximity to Addis and road access for tourists. The diverse culture of people, the abundance of wildlife and plant resources, scenic value and the existence of archeological sites, have made the area a tourist attraction.

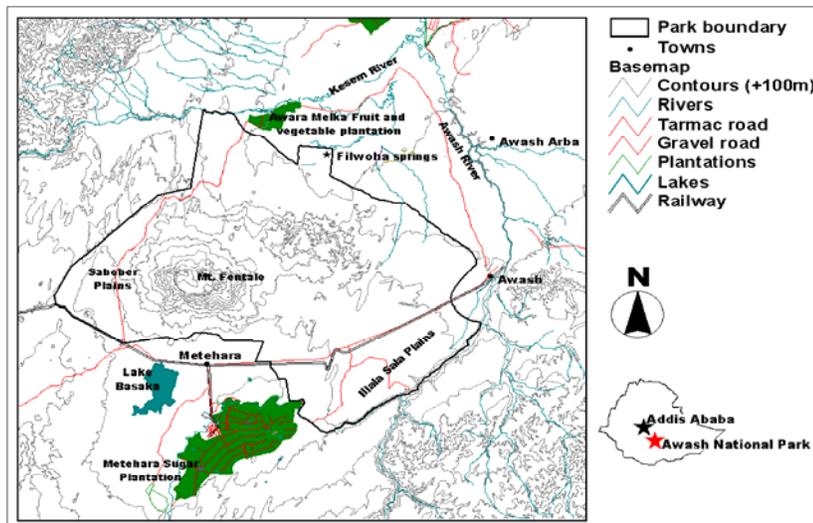


Figure 1: Awash National Park and Its Environs

The Study Techniques

To examine the status of livelihood diversification and options, a PRA-community perception assessment and household level interviews, supplemented by intensive key informants discussion helped to gather and analyze information on the existing livelihood alternatives, and to suggest the way forward to improve the living condition of pastoralists in and around Awash National Park.

Results and Discussion

Prevailing Livelihood Strategies

Cropping

Crop production is the 2nd major sources of livelihood particularly on the Oromo side. Survey results showed that there are several reasons for the pastoral communities for starting cropping. The outstanding reason for cultivation is to increase income (figure 2). Drought and subsistence needs are also driving factors to increased cropping.

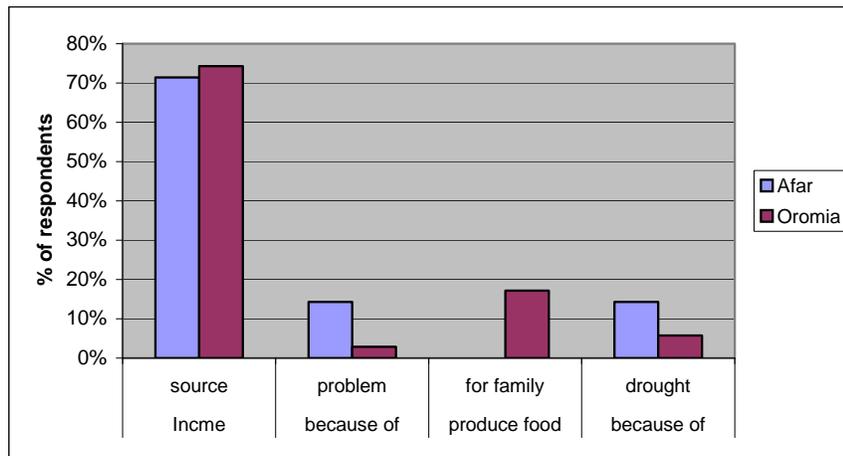


Figure2. Reasons for Starting Cultivation

There were variations in response amongst the pastoral groups. The household survey therefore showed that most have started cropping in response to the need for an alternative to fill the shortfalls in milk production created by the loss of cows during drought. Though the Oromos started cropping earlier than the Afars, the Ituu Oromo pastoralists coming from Harerge highland have been cultivating since the first drought in

1972/73. Cropping, therefore, is becoming a permanent means of livelihood to Ittu pastoralists. It was also observed that cropping is an option adopted by especially poor members of the community who do not have enough livestock to sell and buy grain. Added to that, one discouraging event in crop farming in and around Awash National Park, however, is the erratic rainfall condition, which is one of the risk factors faced by the community. The crucial factor here is not only the amount but also the distribution of the rainfall across seasons (Figure 3). Consequently, because of the rainfall pattern, pastoralists, carry out opportunistic cropping. In many cases, it is not only the rainfall, but also the inability of those involved in cultivation, to access crop cultivars that are drought tolerant and adaptive to the local conditions. Although the research in dry land agriculture has human and physical resources limitations, there are some research results on drought tolerant cultivars such as sorghum, maize, chickpea in Melkasa, and Melka Werer Research Centers. There is, however, a need for a strong extension program that can help the transfer of proven technologies to improve crop production in the study area. There is also an opportunity for researchers to carry out participatory on-farm research on fields currently managed by the agro-pastoral communities.

Irrigation efforts underway must be technically supported too. For instance, Afar Pastoralists have already started vegetable production using irrigation, and irrigation based cultivation is more in the Afar communities, however, the majority of Oromia respondents depend on rain-fed agriculture. Overall, there is a growing tendency, although variable, on the Oromo and Afar side towards cropping. Cropping is a natural response of the pastoral communities in the study area to per capita milk production declining below a minimum survival threshold. Because some of these cultivated areas will be closer to towns, communities closer to towns can be more amenable to social and economic changes. This situation may offer special opportunities to introduce new technologies and management concepts that could facilitate development of agro-pastoralism.

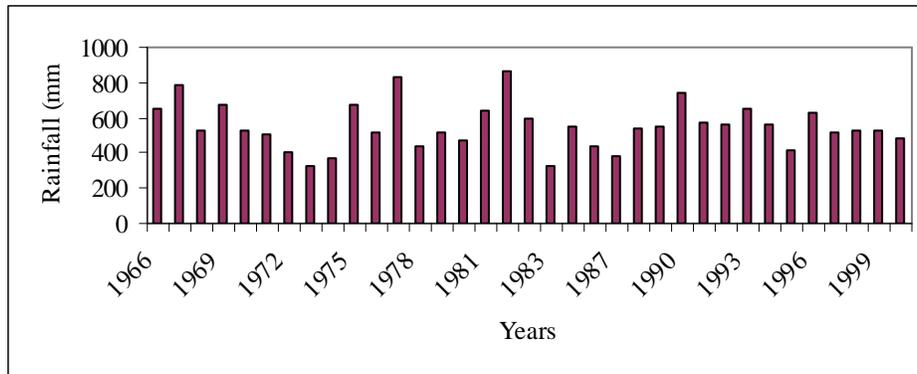


Figure 3. Rainfall at Awash National Park, 1966 – 2000, Source: Abule, 2003

It must be noted also that people in cultivation less favorable landscape, will continue to crop, but with frequent failures. Households located in these areas need to be looking into alternatives to cropping. Advocating for cropping, however, has to be done with caution as it should not compromise mobility, and also it should not favor encroachment of key grazing and browsing areas, which are reserved for the dry season spell.

Mobility

Mobility is an inherent strategy of the pastoralists to efficiently utilize the spatially and temporary distributed grazing and water resources. It is one of the means of livelihood strategies in a heterogeneous landscape under a precarious climate. These strategies ensured the persistency of pastoralism over centuries. Decline of mobility, either due to expansion of state development interventions, expansion of cultivation, physical insecurity or politics of ethnic boundaries, make the pastoralists in the study area more vulnerable to external shocks and the rangeland to degradation. 75% of the Oromo pastoralists and 98% of the Afar respondents, move their livestock from place to place in search of feed and water. The Oromo pastoralists indicated the most frequent place of migration in the study district were Bulga riverside, Harole, Kara, Haleme, Fentale, Churcher, Gaba and Aleka. In case of camels, 90% of the Oromo pastoralists move their animals to other districts inhabited by other Oromos, and trek camels as far as 250 km away from their center. The Afar ethnic groups migrate to Samayu, Madal, Fentale, Bulga riverside, near hot spring. However, 90 % of the Oromos and 60 % Afars pointed out that mobility as a strategy has been posing concerns around security of their

animals and their life, death of animals en route, incidence of disease, and predators.

Herd dynamics

Knowledge of livestock population dynamics is important to better understand functional attributes and development potential of pastoral production systems. Based on the key informant interview, we predicted that the pastoralists livestock population trend would consist of a “boom and bust” cycle with long periods of gradual herd growth punctuated by drought induced losses as experiences in Borana of Southern Ethiopia (Desta and Coppock, 2002). However, some researchers are saying that in the last few decades, the trend is a continuous decline rather than 'boom and bust'. The boom and bust cycle has been characteristics of pastoral production system, although the frequency and magnitude of the effects are different. Overall, therefore, the existing situations in pastoral areas are often “vicious cycles” of herd growth followed by drought induced livestock losses.

According to the household survey, during the drought of 2001/2002, in the region, average holding livestock dropped from 60 to 26 for Afar and 26 to 11 head of cattle/household for Oromos between 2001 and 2003, respectively. Drought resulted in 58% of cattle losses during this crisis period. Sheep mortality was 38% and 34 % for Afar and Oromo, respectively. Goat mortality was 29% and 38% for Afar and Oromo, respectively. Camel mortality was 29% and 10% for Afar and Oromos, respectively. The low camel loss for the Oromos may be because the camels of the Kereyus travel along range of distance in refuge for browsing. Generally the intra species comparison of mortality shows that during drought the most affected animals is cattle while browser are the less affected animals. One message from the pattern of herd loss is that people are getting poorer. Improving human welfare under such circumstances should focus on creating a virtuous cycle based on more timely livestock sales, alternative investment of revenues, and sustainable economic diversification. Efforts to regain some measure of system stability in response to drought could also involve rehabilitation and management of key resources and thus restoration of traditional mobility patterns. This would help communities to be able to respond to crisis in adaptive, traditional ways.

The community can better manage the resources if the traditional coping mechanisms are restored and strengthened. Restoration of traditional management needs the full participation and willingness of all stakeholders working in the area, including the willingness of political and administrative units. It is also understandable that the traditional administrative units are weak in some areas and they are usually nominal and non-functional, while the modern administrative units are powerful and government supported. The challenge is, therefore, creating harmony and developing agreed modalities on how the traditional and government institutions can work together. Failure to follow-up on that can result in further weakening of traditional institutions.

According to the PRA report, the widely used traditional coping mechanism to maintain the cattle population is adapting of small size and drought tolerant cattle breeds such as the Arsi cattle. Exchange of animals between members of different communities in the form of livestock loans and for cultural reasons frequently serves to introduce fresh blood. Estimate of the level of genetic introgression of highland Zebu cattle in Afar/Kereyu is 45% in the north of the region and 73% in the south. This was largely a result of the restocking program following the 1972-74 droughts. Restocking programs carried out by any party (government agency, non-governmental organization, private enterprises) may have an impact on the genetic constitution of the native breed population, particularly when the restocking scheme fails to reinstate the original breed or when it disregards community preferences (Nigatu and Getachew, 2002).

It is, therefore, advisable to maintain local cattle that have been best adapted to the environment, as it is may be unlikely to find animal with small feed requirement and with better production performance other than the present stock. Focus should be given to improve the productivity of local animals through development interventions such as forage and pasture development, veterinary intervention, facilitating better market and encouraging off take rate, thus off-setting resource competition

Species diversity

The shrinking of the natural resources such as pasture and water further resulted in change of species composition. For instance, in the past the Karrayu pastoralists were heavily dependent on cattle. The increase in

number of camel among the Karrayu has been the recent phenomenon that has been the direct consequence of ecological change and the inability of cattle to cope with the diminishing pasture and water resources. On the contrary, the Afar and Somali are still heavily dependent on camel. Maintenance of a flexible mixture of stock species with different feeding, ranging and production, disease, and drought resistance, and reproductive characteristics maximizes yield and may provide greater long term security for the pastoral communities. A livestock herder can utilize nearby pastures with small stock and far away pastures with camel. For instance, the Kereyu travel as far as 250 Km with their camels to utilize far located grazing locations. Although the Kereyu cannot rapidly build up his camel herd because of their low reproductive rate, they are more apt than his small stock or cattle to survive drought while continuing to produce milk. The rangeland condition in the study area, as it stands now, favors the browsers than the grazers for the fact that most of the browse materials are found at height less than 5 meter. The Awash-Fantale district is nearly covered with bushes and shrubs and there are already signs of shifting in species composition among the pastoral communities. Livestock diversity is therefore a resource management strategy to ensure the survival of the pastoral production system. Judicious use of such strategy i.e. in response to changing vegetation pattern in the rangelands will remain to prove a useful strategy.

Livelihood Diversification: Current Practices and Options

In the section below emphasis will be placed on possible diverse activities that could be implemented and strengthened. Some of the activities have already begun but need further strengthening. Local communities have undergone many changes mainly in terms of their livelihood such as starting to earn their income by making charcoal, trekking animals, working as a daily laborer and broker, undertaking small scale irrigation schemes and starting to shift gradually from rearing cattle to camels. Therefore, they should be encouraged and supported by the necessary capacity building.

Dairy Marketing

The household interview conducted by the consultant group indicted that sales of milk, cheese and butter of cows and milk of camel are important sources of household income to the Afar (50%) and Kereyu (33%) compared to sales of other animal products. Some of the sales are done without satisfying home consumption, just only for cash need. Women and children do most of the

household sales activities (Figure 4), and the processing and marketing of dairy products is under the control of the women.

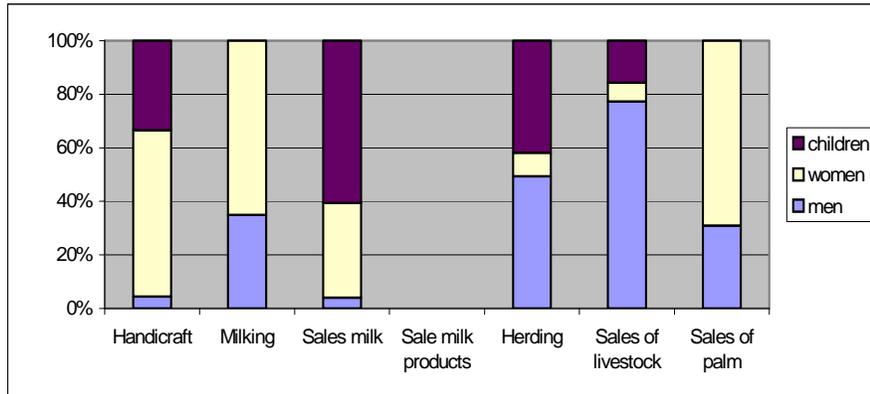


Figure 4 Sales activities by age and sex for Afar

Sale of dairy products helps to cover the daily household expenses such as food, sugar, salt, soap, Kerosene, and medicine. It is reported that only middle and rich pastoralists, who own large livestock number, usually benefit from the sales of the dairy products. Wealthier families having a high ration of lactating cows/person will more commonly have a larger surplus through out the year. This means that wealthier families could produce products like butter for a longer period each year than poorer families. Milk available for processing or sale is seasonally influenced by the total milk supply. Market access is a critical factor in the participation of pastoral women in dairy marketing. Very low level of milk supply in poor households during the dry season precluded their ability to increase marketable output in response to a given reduction to distance. An organized group of women involved in dairy marketing cannot only gain value added to milk, but also able to produce hygienic milk. Two examples here are the FARM Africa and CARE-Ethiopia led women groups.

A women led entrepreneurs organized by FARM Africa is the Gewane Women Milk Group, an example of a successful co-operative experience, in Gewane town, some 50 Km from the Awash National Park. The women were organized as co-operative, had sales shop in the town for yogurt, cheese, butter, boiled milk, cream and in turn when they go back to their village they sell to their community soap, oil, salt, animal feed, kerosene, i.e. items that

have demand in rural areas. In this way, the women group link and fill the gap of urban and rural demand for different commodities according to the communities' need. The material required for the milk groups are: Shops, Churner, milk separator, milk collection barrel, cups, refrigerator, chairs and tables, spoons and others house utensils. CARE-Awash has also started organizing Dairy Marketing Women Group in Awash, and it is important to strengthen this program to benefit and empower the highly disadvantaged Afar women. The capacity of these women milk groups can be developed through training and exchange tours. There are successful women groups in northern Kenya that are involved in milk processing. There are efforts currently underway to establish mini dairies in selected location in Borana. The experience from the northern Kenyan women groups shows that emphasis is needed on the process in the identification the problems, steps towards overcoming the problems and aspects of capacity building, product choice, marketing, as well as constraints (Personal communication, Dr. Getachew Gebru). The basis for the formation of the pastoral milk processing centers should be a stakeholders' workshop where pastoral communities list and rank problems.

Fattening Group

The fattening project around Methara facilitated by CARE-AWASH is reported successful. Participants reported that they have obtained about Birr 100-200 per animal. The feed sources were sugar cane tops (from Methara sugar cane plantation) and molasses. Urea was added as a protein supplement in some cases. This year the program will be fully implemented by the pastoralists themselves. Strengthening of the fattening project will help as means of income diversification to the community, as it will link them to market. Timely sale of animals will also provide a better term of trade to the pastoral communities. Selling animals on a better term will also allow the pastoral communities to gain access to cash that will enable them to invest in other alternative income generating activities. There are initial results from southern Ethiopia, Borana pastoralists, where the savings from the sale of animals are used to invest in grain marketing, opening shops, village level bakery and also building houses in nearby towns. Providing appropriate market information and favorable environment are, however, vital elements in attracting the pastoral communities to aggressively enter the livestock market.

Basic market information is lacking that will allow the pastoralists at large; know the type of animals that are required for market. Therefore, information on age, sex and type of animals required for market is important to Pastoralists. Among the pastoralists interviewed in and around Awash National Park, 54 % of the respondents know the type and quality of livestock demanded by traders. The Afar pastoralists, 90% of the case believe that color is the most important parameter to satisfy quality demand, while the Kereyu Pastoralists emphasized livestock weight as a pre-request for better price particularly to shoat and cattle. However, both ethnic groups agreed that size of camels determine the price offered to camels. The Afars said that the trend of livestock sells have increased in the last 5 years period due to drought.

Equally important are building the capacity of the pastoral communities in small-scale business development and management, and also linking the pastoralists to the market chain. Recent initiatives along this line are documented by the Pastoral Risk Management Program (PARIMA). Clever use of market could help pastoralists mitigate asset loss in response to changing forage conditions. The most feasible approach is, therefore, to develop interventions that would build the awareness of the producers in Afar and Oromo areas, for them to be active players in the market chain that feeds the export market as well as the local demand.

Saving and credit groups

Herd owners perceive that the odds of survival using traditional means are coming under pressure, and could change for the worse. We believe that this is leading to a fundamental and widespread recognition that complimentary and alternative ways to manage risk and conservation of the livestock wealth are necessary.

For example, capturing some of these losses of livestock capital in complementary, alternative forms requires that herd owners sell some animals prior to crisis when animals flood the market and prices collapse. It also requires that herd owners have a means to save the proceeds from pre-emptive sales and invest them elsewhere. Simply providing a means to create village-level savings and credit cooperatives could greatly improve the chance that households could begin to save some resources outside of the livestock sector. The establishment of saving and credit groups in pastoral

areas is a recent experiences, and a lot of lessons can be gathered through a field visit to southern Ethiopia (around Yabello, Negelle and Moyalle) where some of the Saving and Credit Groups have now moved to the level of a cooperative, and multipurpose cooperatives.

4.2.4 Bee Keeping (Apiculture)

Bee keeping is not a known practice in Awash area. However, by introducing this new practice, communities can benefit much as an alternative income source. Traditionally, honey is harvested from tree trunk, holes and termite mounts. If we support this practice with modern beehives and management system, then both the Afar and Kereyu communities might benefit much more in selling of honey. It is quiet common that bees need constant water sources and they usually can fly a maximum of 3 km per day in search of flower and water. In effect, constant river basins such as Awash and Kesem riverbanks are ideal place for beehives mounting. There are also different floras flowering at different seasons of the year in reverine areas, making the honey harvest more frequent per year. In order to exploit this resource, the community has to get the access right to Awash Riverine, which has been denied by either the park or the state farm for several decades. This requires negotiation with relevant institutions.

4.2.5 Palm leaves processing

One other benefit to communities in the north of the Park around Filwuha spring is through the harvesting of the Doum palm leaf, which provides a primary source of income for around 500 households. However, it is considered by many to be unsustainable exploited and an illegal activity within the Park. In addition, the community benefits from these activities are much reduced due to five powerful traders controlling the harvest. CARE Awash conceived the idea of organizing women group on palm tree harvest. Storehouse was constructed. However, due to excessive exploitation of Doum palm leaves during the recent drought the community has banned the harvest of the leaves.

The other experience of elsewhere in the world about palm tree is the use of its fruit for animal feeding. Different authors carried out a series of consecutive trials, involving animal feeding on the palm fruits (Duran, 1998). The fruit that is destined for animal feeding will include the unripe fruit and also a reject fruit for human consumption and the seed. Its nutrient

composition is: dry matter 95%, protein 5% ether extract 23 %, crude fiber 15% and ash 2%. Its energy value is equivalent to that of sorghum. A trial conducted by using whole palm fruit with 200 gram of soyabean as protein supplement. 0.5 kg per day weight gain is reported in Colombia (Duran, 1998). Therefore, using palm fruits of Afar area pastoralists can benefit from fattening or increased milk production associated with sugar cane residue, hay, straw or other roughages. The practicality of this proposal, however, should follow resource assessment on potential and constraints palm fruit feeding under Afar ecology.

Therefore, to establish a means for sustainable use of Doum palm in the future the followings are important (1) To develop a nursery site for Doum Palm tree propagation and plantation in order to catch up the lost vegetation as well as to increase production as it has there been experienced from Turkana region of Kenya. Lucky enough Doum palm does grow pretty fast even with very little rain/water. (2) Organize and train community leaders on sustainable use of palm tree there by establish traditional rules and regulations on its harvest. (3) Provide training and technical support to the already organized women group on sustainable use, processing, and manufacturing of goods out of palm leaves). (4) Linking to market out let.

Community Game Practices and Hunting License

According to informants lions are predominantly found outside the park boundary, living in a bush encroached areas near human villages. Planning Officer from the Awash Fentale Woreda Economic and Social Affairs Department informally reported that a lion kills 3-5 cattle per day. The Pastoralists (53% and 76% of Oromo and Afar, respectively) indicated that predators have killed their animals in the past ten years. The major wildlife threat to Afars is lion (37%), followed by Hyena (26%). The Oromo pastoralists ranked Hyena (84%) and Fox (13%) as big threats. The Afars have reported that there is a frustrating fear that the lion population is growing at an alarming rate, given the loss of animals, one option to control the population of lions is by encouraging community benefit sharing from licensed hunting fees. For instance, if 12 lions are certified for hunting per annum and only 25% of the income goes to the community, then (4,000USD hunting cost per lion x 12 lions) x 25%= 12000USD is due to the community, and this can be utilized for local community development. Warthog is also over populated in many areas

to the extent of damaging the natural resources, and the current hunting fee for a warthog is 100 USD.

Having realized that hunting has a good benefit, the Afar community, in Boloita and residents along Bulga river has started to conserve Zebra, and rear some Oryx (13 reported), and the area has been declared by the community as a 'no-hunting zone'. Prior approval by the community is mandatory for hunting. There is a wide traditional belief by pastoralists that the presence of Oryx in a large herd of cattle will be useful for blessing of cattle population and a sign of good fortune. This traditional belief helped the safeguarding of Oryx. Wildlife conservation and management requires communities' partnership, and formal/legal benefit sharing mechanism should be part and parcel of that. The assumption here is that if local pastoralists benefit directly from wildlife populations in their area they will be more willing to ensure their conservation and management on a sustainable basis. Such integrated conservation and development projects are being carried out in several countries in Africa including Kenya, Tanzania and Zimbabwe, and some success has been registered in the case of the CAMPFIRE program of Zimbabwe in which wildlife is utilized primarily through Tourism and Safari hunting (Kiss, 1990).

4.2.7 Eco-tourism and community based tourism

Awash National Park is reach in its scenery such as Fentale Creator, Filwhoa Spring, the grass plains and Awash River falls. The local community can participate in the tourism industry in several ways. Among these are cultural shows. Both the Afar and Kereyu community have a rich traditional culture. Particularly the hairstyle and dressing of boys, girls, women and elders has its own local meaning and are attractive to visitors. There are different dancing ceremonies such as for engagement, wedding, hero ceremonial celebration and others, and all are interesting to attend. The traditional household utensil made out of skin, false pumpkin, woods and local material are also attractive in their color and shape, visitors who are interested can buy them and in turn the community benefits by selling traditional utensils and dresses, bracelets etc. This can also empower the pastoral women, and allow them play a great role in manufacturing of handicrafts.

The community can also participate in allowing tourists to visit their Tukul, rent riding camel, hire camel ride escorts which will help local communities generate income from tourism. The other historical potential of Awash area is it's being a center of origin for the first hominids. Ancient tools used by these hominids were also discovered in the area near Awash. Tourists might be interested to buy replica of artifacts of these ancient tools, and if the local communities are trained in the manufacturing of artifacts of ancient tools, then the community might enjoy from tourism income through selling of these tools. However, in order to promote a community-based tourism, a lot of work has to be done in the area of training and awareness creation. There are some traditionally built cultures and materials that have been lost gradually from the community. These have to get revived. Clear understanding is required of the type of culture and handicrafts, which are attractive to tourists and those who are not. Reorientation of some cultural practices and modification of some handicrafts might be necessitated to attract the attention of visitors. Similarly the community has to get awareness about the western culture including their preference, behaviors, attitudes, nutrition, hygiene, symbols and possibly languages.

4.2.8 Aquatic Resource development and harvest

Baska Lake is not lifeless water. There are fish, amphibians, reptiles, birds and mammals in the water bodies. Fishery development and fishing could be one option to diversify the income of local community. These may need some pre-request such as organizing associations, training on fishing, supplying inputs like nets, fertile eggs, linking market etc. In general, potentials on economic utilization of water bodies found in and around Awash National Park have to be assessed well.

Handicraft

Kobo PA woman has been manufacturing bags, baskets, hats and mats out of sisal and decorate it with local coloring material. This woman reported that during last year drought her major income was coming from sales of handicrafts. The problems she encountered in manufacturing are lack of raw materials, inefficient production capacity and absence of market link. The interesting thing is that it is only this woman who has reported the skill of manufacturing handicrafts. It is argued that if other local women are trained on appropriate handicraft manufacturing skills based upon locally available

material with established marketing link, handcraft can be used as alternative sources of income diversification.

A typical example for handcraft as alternative income source is the case of the Turkana women in Kenya. Turkana Women groups make the Turkana Doum Palm basketry products. The raw materials are sourced from the shores of Lake Turkana and in the dry riverbeds of this arid zone of Kenya's Northern side. The Turkana people are traditionally a pastoralist community, due to the prevailing poverty in the area; the weaving of Doum Palm products has become an alternative source of income generation.

Conclusions and Summary of Recommendations

Pastoralists in Afar and Kereyu, similar to other pastoralists in Ethiopia are under pressure in terms of natural resources decline and the impact of recurrent drought. Dependence solely on livestock is not becoming the way forward, and there is a dire need to diversify income and livelihood sources so as to provide themselves a better cushion against natural and man made calamities. These calamities threaten the very system and are implicated as causes of shock to this system. The rangelands, as they are now, are increasingly unstable, and unable to support the existing population of the pastoralists, the wildlife and the needs for state development interventions. Consequently, there is conflict of interest among the ethnic groups on access to, and control over resources, and this entails far-reaching consequences for sustainable development. There is therefore an urgent need for a multifaceted approach where by a sustainable natural resources management is put in place, and also there is a case for understanding the livelihood options that need to be promoted to increase resilience. Herd splitting and mobility are vital components of the pastoral coping strategies, together with species diversification. Herd dynamics in the pastoral systems, with proper recording and appropriate data, can be used as a proxy to determine strategic points for market intervention, and thus avoid the asset loss in terms of livestock loss due to drought.

At present there are several income diversification activities in progress in the study area and most of these have been initiated through partnership between communities, local government and NGOs. These activities that are already started and those that have a potential to start need to be looked in-

depth to be able to identify entry points for improvement or scaling up. Some of the recommendations that emerge from this study are:

1. Development interventions should consider their future impacts on natural resource utilization and loss of bio-diversity (e.g. Restocking and breed dilution)
2. The potentials on economic utilization of water bodies found in and around Awash National Park have to be assessed sought and well investigated (e.g Lake Basaka)
3. Dry season fall back areas and key-grazing resources lost to park and state or private development schemes must be discussed amongst stakeholders for a mutual agreement and benefit
4. Income diversification options like irrigated agriculture, cropping, and bee keeping need to be assessed and promoted with the participation of the community. The community needs to be assisted in the development of a community action plan.
5. Livestock marketing opportunities that link the pastoral communities with the domestic and export market must be explored through partnership with Government and Non-Government institutions, such as the Livestock Marketing Authority e.g. linking pastoralists with the export Abboiters.
6. Grain consumption is a fact of life for the pastoral communities in the study area. Drought reduces milk yields, causes the quality of cattle to decline and leads to low cattle prices as pastoralists sell off cattle to meet basic needs. Therefore, pastoralists face weak term of trade. If no other options are open, this can lead to asset stripping with herds being reduced to unsustainable levels. Grain storage could be one way of responding to market failures that creates unfavorable term of trade, and thus inadequate food security for pastoralists. Available grain storage technologies targeted for dryland areas should be promoted.
7. Careful attention should be given to evaluate the sustainability, efficiency, and impact of intervention activities
8. Livestock sale in normal years to buy grains, savings in the bank and/or investment in different income generating schemes, practiced elsewhere in the country such as by the Borana people, could be adapted to the area.

9. Further research and studies are recommended on natural resource utilization of the area (Lake Beska, Doulm Palm, Prosoposis, etc) with alternative use to improve the livelihood of the community.
10. Pastoral women play leading role in livestock management and family welfare, therefore, women led projects and women empowerment is essential for successful development interventions in and around Awash National Park. This could be realized through exchange tours, skill development training and establishment of women groups e.g milk groups.
11. There are ample opportunities to tourism development in the area because of the proximity and various scenic features in and around Awash National Park. Community based tourism has to be initiated through active involvement of the community and stakeholders.
12. NGOs, involved in various development and relief interventions with the pastoral community in the study area need to harmonize activities. Equally important is the need to establish partnership with local government offices in the implementation of development interventions. The local regional pastoral development offices, ANP and the Methara Sugar State Plantation should be brought on board in planning interventions with the community. Involvement of the local government ensures continuation of activities and sustainability of achievements.
13. Overall, the empowerment of the pastoral communities and building its capacity through awareness creation, study tour, sharing of experiences, and development of community led pilot projects is the key to the co-existence of the various stakeholders, and to the conservation of the natural resources.

Reference

- DAGRIS, 2002. Domestic Animal Genetic Resources Information System (DAGRIS). Version 1. (eds J.E.O. Rege, W. Ayalew and E. Getahun). ILRI (International Livestock Research Institute), Addis Ababa, Ethiopia.
[<<http://dagris.ilri.cgiar.org/>>]
- Duran A.O., 1998. The African palm: A strategic resource for integrated systems of tropical production. First FAO Electronic conference on tropical Feeds and Feeding Systems. FAO Animal Production and Health Paper, FAO, Rome.

Kiss A, 1990. Living with wildlife: Wildlife resource management with local participation in Africa. Technical Paper 130. Washington DC, The World Bank.

Moore G, 1982. Forestry, wildlife and National Park Legislation in Ethiopia. FAO, Rome, Italy. 128 pp.

Nigatu Alemayehu and Getachew Gebru, 2002. A Snap Survey on Pastoralists Perception on Genetic dissipation of Boran Cattle. Unpublished Report.

Petrides GA, 1961. Wildlife preservation and national parks in Ethiopia. *Wildlife*, Nairobi 3(3): 24-26.