

PROCEEDINGS OF THE FSN FORUM DISCUSSION No. 37  
**FOOD SECURITY IN ARID AND SEMI-ARID LANDS: THE CHALLENGES OF  
SUSTAINABLE USE OF SCARCE RESOURCES**  
FROM 15 JUNE TO 10 JULY 2009

Summary available at:  
[http://km.fao.org/fileadmin/user\\_upload/fsn/docs/SUMMARY\\_FS\\_ASALs.doc](http://km.fao.org/fileadmin/user_upload/fsn/docs/SUMMARY_FS_ASALs.doc)

**TABLE OF CONTENTS**

I. GENERAL INFORMATION .....	1
II. INTRODUCTION OF THE TOPIC .....	2
III. LIST OF CONTRIBUTIONS .....	3
Contribution by Rachele Santini from FAO, Italy .....	3
Contribution by Abdul Raziq from SAVES, Pakistan .....	3
Contribution by Ced Hesse from IIED, UK .....	5
Contribution by Abdul Raziq from SAVES, Pakistan .....	6
Contribution by David Ole Nkedianye from the Reto-o-Reto Foundation, Kenya .....	8
Contribution by Hezekiah G. Muriuki from Kenya .....	9
Contribution by Salomeyesudas from APFAMGS, India .....	10
Contribution by Saverio Krätli from Nomadic Peoples, UK .....	10
Contribution by Joseph Opio-Odongo from the Sustainable Development Services, Uganda .....	12
Contribution by Sylvia Kanyiri Mbaabu from WFP, Italy .....	13
Contribution by Salomeyesudas from APFAMGS, India .....	14
Contribution by Andrew Borrell from the Hermitage Research Station, Australia .....	15
Contribution by Francois Leonardi from FAO, Zimbabwe .....	16
Contribution by Cathy Watson from the LEGS Project, Ethiopia .....	17

**I. GENERAL INFORMATION**

---

Duration:	from 15.06.2009 to 10.07.2009
Number of participants:	14
Number of Contributions:	14

## II. INTRODUCTION OF THE TOPIC

---

Dear colleagues,

I am a livestock development and policy consultant (freelance) with about thirty years of experience working to achieve improvements within the Kenyan livestock sector (Diary bias). Of major interest is the contribution of livestock to sustainable improved livelihood of the rural communities in Kenya.

Having lived in marginal areas and participated in forums and assignments discussing the many challenges facing communities living in marginal (arid and semi arid) lands (pastoralists/nomads) I have noted with concern the deteriorating of living conditions and situation of the of communities living in the vast arid and semi-arid lands (ASALs) of Kenya although over 70% of livestock (ruminants) and 100% of camels populations are found in this area. Some of the contributing factors to the deterioration of these areas overtime are: the changing, unreliable and unpredictable weather patterns, uncontrolled increasing human population and encroachment of intensive agriculture and demarcations of the better and productive areas into individual/group ranches thus interfering with migratory patterns of the pastoralists/nomads. As a result of worsening situation, there have emerged lobby groups and NGOs, some of which make matters worse (lack of professionalism, creation of dependence syndrome and serving self interest) and seem to only address short term and emotional issues while the more serious problems which require long term solutions are left unattended. The Government approach to these issues is no better.

Food security and nutritional status for communities (livestock producers and pastoralists/nomads) in these areas, where poverty levels and conflicts are also very high, is and will remain a great challenge to decision/policy makers and advisors (consultants). The best solution would be one based on mobilization of resources found in these areas.

The question then is how to use the resources in the vast ASALs of Kenya to boost food production in these areas in a sustainable way, given the current situation, to at least address the food security and nutrition of communities in these areas. A number of options have been tried in the past: irrigation schemes where there is water (but note this is usually done by outsiders since this is a new idea to nomadic/pastoralist); establishment of grazing blocks for different seasons and development of infrastructures (management of this is complex and requires high commitment from government and the local involved communities sometimes warring); capacity building/training and empowering of local communities to make the best out the difficulty situation, among other efforts. Please share with us any success story along the same lines, your insights on the issue and any good practice known to you.

It is my hope that your responses to this question will not only help me to contribute in an informed manner to future forums but will also find audience to those groups working in the ASALs some members I believe participate in the FSN Forum.

Let me sincerely thank in advance for finding time to read and contribute to above question.

I trust that some of your responses will go a long way in helping Kenya solve the chronic food shortages in the ASALs.

Best regards,

Hezekiah G. Muriuki,  
Consultant (freelance), Livestock Development and Policy  
Nairobi, Kenya

### **III. LIST OF CONTRIBUTIONS**

---

#### **Contribution by Rachele Santini from FAO, Italy**

Dear Muriuki,

The FAO Livelihood Support Programme Learning has applied many sustainable livelihoods approaches. It has a paper with lessons learned on access to water, pastoral resource management and pastoralists' livelihoods in East Africa, including Kenya.

<ftp://ftp.fao.org/docrep/fao/009/ah247e/ah247e00.pdf>

In term of good practices, I think another paper can be also of high interest "Good Practices in Agricultural Water Management- Case Studies from Farmers Worldwide"

[http://www.un.org/esa/sustdev/csd/csd13/documents/bgground\\_3.pdf](http://www.un.org/esa/sustdev/csd/csd13/documents/bgground_3.pdf)

It presents 15 case studies in different countries, including a case study on drip irrigation in the arid and semi-arid lands of Kenya.

I would appreciate your comments on these practices, about whether they really worked well in Kenya.

Regards,

Rachele Santini  
Agricultural Development Economics Division  
FAO

#### **Contribution by Abdul Raziq from SAVES, Pakistan**

Dear all

I am Abdul Raziq, I has been working as the president of an NGO (SAVES) working for livestock breeds, pastoral people and environmental issues related to animal agriculture. From my long experience working in the arid and semi-arid areas (ASALs) of Pakistan, I find that the conservation and development of local breeds along with the active involvement of livestock keepers in policy making are keys to the sustainable use of resources. Pastoral people, especially women play an important role in managing livestock genetic resources and environmental issues and they are key player of extensive livestock production systems in ASALs.

Concerning local breeds, Pakistan is basically an agricultural country. Livestock is the backbone of agriculture and makes 50% of agriculture share in national GDP. Pakistan is the cradle of many precious livestock breeds and animal genetic resource provides a major source of livelihood for many people. Arid and semi-arid land (ASAL) has given rise to a large number of different breeds. These breeds have great intra-breed diversity, multipurpose and are part of a survival strategy which people have developed to cope with extreme climatic and environmental conditions. In some areas, it is only livestock that enable people to exist, since the potential for growing crops is limited or non-existent. Pastoral livestock production systems inherently conserve animal genetic resources. Intensive animal production system is very hard to apply in such a harsh environmental conditions. Domestic animal diversity in developing countries is embedded in traditional farming and pastoral people are the key players of it. Local breeds play an important role for the livelihoods of herders and smallholders and in the utilization of marginal ecological areas. They provide a wide variety of products and yield important non-monetary benefits:

- Food, fiber, fertilizes and fuel.
- Cash income.
- Draught power and transportation.
- Savings account.
- Buffer against crop failure and other risks.
- Employment.
- A way to access and use common property.
- Support for the social network and culture.

#### Environmental issues and the role of pastoral people and their livestock

The local livestock breeds are maintained and keep on the ASAL, which are usually remote from the urban centers and are waste otherwise if not used by livestock. The keepers keep their livestock in extensive way of production system, which is rarely a threat to the environment. The keepers use the resources, which are not usually use by the urban dwellers. Their livestock in most of the cases rely on the saltish, bitter and thorny vegetation of the rangelands and drink brackish and muddy water. Local livestock is not in competition while using resources like cereals and meat. They don't pollute the land or water resources because of the low emission of phosphates. The pastoral people produce organic products, which are health friendly. The dung of the pastoral livestock is spread in the vast area and there is no accumulation of dung and gases.

#### The role of women in managing livestock genetic resources

Since women care for most livestock, they obviously have a crucial role in conserving local breeds and this must be taken into account in technical cooperation projects. Since, in comparison with "improved breeds", local breeds require fewer inputs and therefore ease women's work load considerably, women are also the ones to gain most from projects directed at conserving local breeds.

These precious and important livestock breeds we have in hand are currently under threat. The State of the World Report on AnGR (animal genetic resource) predicted that 20% of livestock breeds are at risk of extinction and in the recent six years almost 60 breeds have been lost. The average breed loss is 1 breed per month.

There are many reasons for this sad state of situation i.e. war and conflicts (some breeds are maintained on the basis of regular migration according to the season and foliage availability and the wars and conflicts minimize the herds movements), epidemic diseases, urbanization and increasing sedentization, cross breeding, changing livestock systems from subsistence (extensive) to commercial (intensive), lack of valuation of local breeds, increasing competition for natural resources, environmental degradation and global warming. Economic forces of globalization as well as political backing for crossbreeding with exotic breeds, among other factors, have already resulted in the disappearance of a large number of these breeds and many more are threatened.

The good hope is still there, the pastoral livestock keepers and the valuable knowledge they have about their animals and its habitat. It is a fact that fewer breeds are in critical position where the pastoral people make the decisions, and where the breeds are in the hands of non-commercial pastoral people. It is the utmost need of time to conserve these important breeds of livestock in their relevant habitat (in situ) with the community based indigenous knowledge (IK) of pastoral people.

The pastoral people are the communities who manage their livestock according to their indigenous knowledge (IK) and in tune with local ecological constraints. Especially in marginal environments, local livestock breeds are crucial for sustaining rural livelihoods by producing a wide range of products while requiring relatively low levels of input with regard to fodder, management and health care. Thus their maintenance is ecologically more sustainable and they entail a lower workload for women in comparison with improved breeds.

What are the keepers right

The pastoral people plays pivotal role in the animal agriculture worldwide and they are the key player of extensive livestock production systems. Pastoral people keep animal close to the conditions to wild, therefore, the traits their animals have, are of great important from the “genetic resource angle”. They have their own terminologies and knowledge for livestock production and management of animal genetic resources. Scientific breed classification systems usually do not take into account indigenous perceptions and do not correspond to local terminologies. Although farmers and pastoralists are not aware of scientific breed concepts, they often make very elaborate distinctions, leading to a local classification system that can be more refined than the official one. Livestock Keepers are creators of breeds and custodians of animal genetic resources for food and agriculture. Traditional breeds represent collective property, products of indigenous knowledge and cultural expression of Livestock Keepers. The keepers have the following rights.

- Livestock Keepers have the right to make breeding decisions and breed the breeds they maintain.
- Livestock Keepers shall have the right to participate in policy formulation and implementation processes on animal genetic resources for food and agriculture.
- Livestock Keepers shall have the right to appropriate training and capacity building and equal access to relevant services enabling and supporting them to raise livestock and to better process and market their products.
- Livestock Keepers shall have the right to participate in the identification of research needs and research design with respect to their genetic resources, as is mandated by the principle of Prior Informed Consent
- Livestock Keepers shall have the right to effectively access information on issues related to their local breeds and livestock diversity.

In conclusion, the local breeds along with the active involvement of livestock keepers in the policy making can be good hope for the future challenges of food security.

Best regards,

Dr. Abdul Raziq  
President SAVES

#### **Contribution by Ced Hesse from IIED, UK**

Dear all,

I fully share the views of Hezekiah G. Muriuki below. In the arid and semi-arid lands, livestock are a major source of food security for local people while also providing huge, though unrecognised, benefits for the wider national and regional economy. In addition to providing nutritious diets (milk and to a lesser extent blood and meat), livestock are sold to purchase other food items (cereals, sugar, tea, etc.); they are critical capital assets, insurance, savings, etc. But for these benefits to be realised, livestock have to be mobile. The dispersed and unpredictable nature of resources in the drylands are often seen as a constraint, and mobility as a coping mechanism to such constraints. Recent research by Saverio Kratli in Niger shows how this is only part of the picture and indeed the smaller part. His work argues how variability is in fact a huge asset and how Wodaabe herders have developed complex institutions to exploit variability in a positive way thereby extracting higher returns (milk, meat, food security, etc.) from the rangelands than would be the case if rainfall, soils, etc. were less variable.

As Hezekiah says, pastoral production systems have been severely disrupted (mobility blocked, critical dry season grazing reserves alienated) undermining their capacity to ensure higher levels

of food security. A key area of support is institutional in nature - secure land tenure rights, the right to move with animals including cross-border (this is critical as most borders in Africa divide pastoral lands dividing pastoralists from their wet and dry season grazing; the Kenya-Uganda border is a good example of this), the right to negotiate access to resources, etc. This requires that decision-making be devolved to institutions that include, and possibly are based on customary institutions.

Marketing is another critical area as is protection of capital assets during shocks such as drought. The combination of lack of pasture and water and collapsing terms of trade for livestock in drought years, effectively disposes pastoralists of their core breeding stock thus leaving them destitute and unable to exploit the return of the rains. They remain as "pastoral drop-outs" a burden to the state. Innovative work is being done by a range of organisations in this area, recently documented by the Livestock Emergency Guidelines and Standards (LEGS) project (<http://www.livestock-emergency.net/>). Pastoralists generally do not rely solely on livestock but practice a range of other activities to diversify their livelihoods base ranging from Nets, to maintaining trading links with small towns, to practising small-scale rained agriculture where conditions allow. The problem is that many governments and well-meaning development actors fail to recognise this.

Finally, one must recognise the role of livestock reared in pastoral areas in supporting hundreds of thousands of other livelihoods not only in the drylands but other areas as well - e.g. actors involved in the very substantial cross-border livestock trade, small town traders importing cereals from farming areas and other commodities, the roast meat trade, etc etc.

Best wishes,  
Ced

#### **Contribution by Abdul Raziq from SAVES, Pakistan**

I would like to add some lines about the approaches of SAVES (Society of Animal, Veterinary and Environmental Scientists). By working on the right of the livestock keepers and the conservation of livestock breeds, SAVES aims to promote the sustainable use of resources in arid and semi-arid lands (ASALs). I hope that I can learn useful information from like-minded people and have your advice on the conservation of the precious livestock breeds which are already under serious threat.

In the ASALs of Pakistan, it is the utmost need of time to conserve the important breeds of livestock in their relevant habitat (in situ) with the community based indigenous knowledge (IK) of pastoral people (please see below more details on the current situation). In this context, in 2005, the like-minded animal scientists decided to organize a body based in Balochistan province of Pakistan, that works for the well being of the livestock and its keepers. It was felt that if the livestock keepers will be well established then the breeds and its ecology could be secured. Livestock keepers are the environment friendly people and their way of livestock production is beneficial for the well being of the nature. The pastoral livestock breeds consume the resources, which are otherwise waste. In most of the cases their livestock consume muddy and brackish water, which have no other use.

So, this organization is to work for the following aims:

- To organize the livestock keepers
- To ensure the livestock keepers rights
- To help in maintaining a livestock friendly ecology
- To work for the characterization and documentation of the local livestock breeds according to the perspectives and the breeding goal of the keepers of breeds.

- To document and validate the indigenous knowledge about the breeding, feeding and health management of their breeds

Success stories:

- With the efforts of the SAVES, the livestock keepers has realized their importance for the well-being of animal agriculture and livestock production
- The loss to many livestock breeds has minimize with the consultation and discussion with the relevant breed keepers
- Free of cost medical camping from time to time in some areas to eliminate epidemic diseases

Future strategies:

- Value addition to livestock products especially milk
- Niche marketing for the product of the breeds under threat
- In situ conservation with the help of livestock keepers

We are not alone in this struggle:

- League for Pastoral people (LPP)
- Life initiatives
- Endogenous livestock Development (ELD)
- WISP (World initiatives for Sustainable Pastoralism)
- WAMIP
- DAD- net

All the above organizations are in line with the cause of our SAVES. Let's join our hands and save the beauty of our planet. The planet is beautiful with the animals and plants, which make our nature and ecology.

Best regards,  
Raziq Kakar, President of SAVES

### **Background/ situation in ASALs Pakistan**

Like-minded Scientists organized The SAVES in 2005. The organization is based in the Balochistan province of Pakistan, which is the homeland of many precious livestock breeds. This region is the cradle of animal domestication and many pastoral tribes reside here along with their livestock. The province makes only 5% of the human population of the country but masses more than 20% of the national livestock.

The province composed of arid and semi arid areas (ASAL) and is very famous for its organic nature of livestock and agriculture production and own large scale of rangelands with much herbaceous and succulent vegetation. Animal husbandry and agricultural farming is the centuries old occupation of the inhabitants and many pastoral communities travel with their livestock according to the season and foliage availability. The major livestock species are sheep, goat, camel, cattle, donkey and chicken. Some indigenous families only migrate according to the season and the availability of the herbal plants. They know the season and place of the herbal plant and collect it. These people treat the human and animal diseases with the local herb and earn their livelihood. Such families keep dogs, chicken and donkeys for their household and migrate round the year.

The other parts (except than Balochistan) are also very rich with animal agriculture and the prominent examples are the pastoral people of Cholistan, Thar, Thal, Pothar, Northern areas and the Pakhtoonkhwa. The famous livestock keepers communities are Jath, Rohi, Thari, Raigi,

Bhakkarwal, Afghan etc. For detail study please read the following link.  
[http://www.lifeinitiative.net/docs/pastoral\\_map\\_of\\_pakistan.pdf](http://www.lifeinitiative.net/docs/pastoral_map_of_pakistan.pdf)

Threats to livestock breeds and the embedded lifestyle and culture. As discussed that the important livestock breeds were domesticated in the regions, which is the nowadays Pakistan. These breeds have great intra-breed diversity, multipurpose and are part of a survival strategy which people have developed to cope with extreme climatic and environmental conditions. Pastoral livestock production systems inherently conserve animal genetic resources. Intensive animal production system is very hard to apply in such a harsh environmental conditions. In the present conditions these precious and important livestock breeds we have in hand are currently under threat. The State of the World Report on AnGR (animal genetic resource) predicted that 20% of livestock breeds are at risk of extinction and in the recent six years almost 60 breeds have been lost. The average breed loss is 1 breed per month. There are many breeds which are under threat in Pakistan especially, Balochistan. The most relevant examples are the Raigi, Kharani and Brahvi camel. Barbary goat, Hernai sheep and Bhagnari cattle are also under threat. There are many reasons for this sad state of situation i.e. war and conflicts (some breeds are maintained on the basis of regular migration according to the season and foliage availability and the wars and conflicts minimize the herds movements), epidemic diseases, urbanization and increasing sedentization, cross breeding, changing livestock systems from subsistence (extensive) to commercial (intensive), lack of valuation of local breeds, increasing competition for natural resources, environmental degradation and global warming. Economic forces of globalization as well as political backing for crossbreeding with exotic breeds, among other factors, have already resulted in the disappearance of a large number of these breeds and many more are threatened. The good hope is still there, the pastoral livestock keepers and the valuable knowledge they have about their animals and its habitat. It is a fact that fewer breeds are in critical position where the pastoral people make the decisions, and where the breeds are in the hands of non-commercial pastoral people. It is the utmost need of time to conserve these important breeds of livestock in their relevant habitat (in situ) with the community based indigenous knowledge (IK) of pastoral people.

#### **Contribution by David Ole Nkedianye from the Reto-o-Reto Foundation, Kenya**

This is a topic of great importance to us. The ASALs are going through a lot of changes most of which are likely to leave thousands of pastoralists in a very food-insecure situation. There is hardly any support from the policy side and that only worsens a bad enough situation. Other contributors (Kamuaro, Ced and Muriuki) have said it clearly and I concur.

Reto-o-Reto project (<http://www.reto-o-reto.org/>) is organizing a workshop on the future of Pastoralism in Maasailand (to start with) scheduled for mid July this year. We plan to discuss these key issues. Besides, we are working closely with some of our partners to capture (in a study) the unfolding drought in the whole region (but particularly Kajiado District). The study will be in the month of July also.

Something sad is that in spite of the scaring drought that is deteriorating with time, the Finance Minister did not set aside some funds for the purchase of livestock through the Kenya Meat Commission (KMC). Right now many pastoralists want to sell part of their livestock (as mass starvation is imminent before the next (short) rains, but they have no market. Most of these pastoralists have now moved to the northern part of the district where there were some rainfall showers but the pastures are already depleted. In the next one month the cattle will hardly have anything to eat. Most are already weak having come from a series of prolonged dry spell characterised by failed rains. This drought could easily turn out to be one of the worst in several decades. But what plans have been put in place by the government to salvage the situation? Is pushing out cattle from Conservation areas (by use of Helicopter) the way to go? This is the only thing that the government is doing consistently.



On another note, institutional capacity is needed among pastoralist communities. As these droughts recur more frequently and show more severe swings, there is hardly any consistent debate on what to do to mitigate the effects, pressurize policy makers, try innovative measures to avert the worst....There is certainly a gap to be filled.

I think we need to have a concerted effort in dealing with these issues. They are just huge!

More later.

David Ole Nkedianye  
Co-Director, Reto-o-Reto Foundation,  
Graduate Fellow, ILRI and  
PhD Candidate, Edinburgh University, Scotland, U.K.

### **Contribution by Hezekiah G. Muriuki from Kenya**

Dear all,

Let me first thank all those who have contributed so far to the question “how to use the resources in the vast ASALs of Kenya to boost food production in these areas in a sustainable way, given the current situation, to at least address the food security and nutrition of communities in these areas”. I am hopeful of getting more responses.

From the responses so far, it is emerging that the answers to food security in the ASALs lies with the communities living in those areas, with the assistance of the Government and others such as NGO's, based on what the communities have decided. Although professionals and their modern lessons have a role to play, customary rules are critical in ensuring efficient use of resources in these areas. It is imperative therefore that the capacity of the communities living in those areas, to make informed decisions, should be enhanced. The decision process should be inclusive and not elitist. It is however disturbing that in almost all the times, the issue of expanding human and livestock populations in those areas is somehow wished away and does not seem to feature in discussions aimed at addressing the food security issues. While the populations continue to expand (likely human population doubling in every 2 decades), the major resources – land (pastures) and water, are static if not shrinking, due to worsening weather conditions.

In essence the ASALs have to produce more from the limited and perhaps shrinking resource to continue supporting if not improving the livelihood of the communities who have no choice but to eke their livelihood from these areas. Or are these communities to move out – but to where? What role will science/technology play towards improving the livelihood in these areas? Can we in the long term, use science to increase productivity (at faster rate than the population growth) from the available resource?

I am aware we do not have quick solutions but the first step is to be bold, honest and innovative when addressing the food security issues in these areas. As David Ole Nkedianye has pointed out – “there is hardly any consistent debate on what to do to mitigate the effects ..... we need to have a concerted effort in dealing with these issues. They are just huge!”

More inputs on the question please!

Best regards,  
Hezekiah G. Muriuki

### **Contribution by Salomeyesudas from APFAMGS, India**

Dear all,

The best way to look at the sustainable use of resources is first to listen to local people, especially local elderly people and to understand how they managed their resources all these years and handed over to us will be an amazing story.

I worked with marginal communities as well as main stream communities and also with tribal communities.

Their millet crop based agriculture system provided room to humans, livestock, soil nutrition, medicine so on and on --- literally every need is met if they have little timely rains.

Before planning any program the key is too understands their strong knowledge system which managed the fragile ecosystems.

For example along with Millets, they grow lentils, pulses, oil seeds and host of greens will come up as uncultivated foods which are edible, medicinal and can be incorporated as compost into the soil.

Farmer managed groundwater systems is another project which used the tremendous knowledge of farmers and achieved great success in terms of converting the private goods concept to public property and the collective responsibility it created among the farming community is highly appreciable and adoptable as well.

In order to create food secure communities it is essential to look at uncultivated foods as sustainable sources.

For more details

[www.ddsindia.com](http://www.ddsindia.com)

[www.apfamgs.org](http://www.apfamgs.org)

[www.keystone-foundation.org](http://www.keystone-foundation.org)

[www.mcgill.ca/cine](http://www.mcgill.ca/cine)

Sincerely,

Mrs. Salomeyesudas  
H.V.F. Estate, AVADI  
Chennai - 600 054  
T.N. India

### **Contribution by Saverio Krätli from Nomadic Peoples, UK**

Dear All,

As one of the previous contributions (by Ced Hesse) made reference to my work I was contacted by the moderator with the request to expand on its nature and implications. I try to do so here below. Thank you very much for your interest.

My research was on cattle breeding and animal production amongst the WoDaaBe herders of Niger. The WoDaaBe are highly specialised cattle keepers. They produce most of the Bororo

zebu breed in Niger, which is by far the most exported cattle breed in the country (i.e. they produce for the market, not for subsistence, and manage to do it incredibly well: their Bororo is the heaviest breed in the Sahel).

As far as this discussion is concerned, the output that seems the most relevant is the following:

Ecological features that agricultural science normally considers an obstacle to production (namely the highly unpredictable variability of the Sahelian environment) are turned by the WoDaaBe into a key resource precisely for production.

Studies on herds of Bororo under mobile management systems show that the herds feed selectively on a diet that is substantially richer in nutrients than the average nutritional value of the range in the regions they move across.

Specialised labour and livestock are key to production, beside the most commonly recognised pasture and water. The production system uses strategic mobility and competent teams of animals for targeting and exploiting the short-lived concentrations of nutrients characteristic of the Sahelian range.

In my paper I explain Bororo's selective feeding in the context of the WoDaaBe breeding and management system and in the light of current knowledge on ruminants' feeding behaviour. A complex breeding and management system is aimed at minimising all disturbances in the production environment (including human and other cattle) that could negatively impact on the animals' capacity for selective feeding as well as for maximising the benefits of their diet.

You are welcome to download a recent paper summarising the findings of my research from this link:

[http://km.fao.org/fileadmin/user\\_upload/fsn/docs/Krätli%20S.%202008%20-%20Cattle%20breeding,%20Complexity%20and%20Mobility%20in%20a%20Structurally%20unpredictable%20Environment.pdf](http://km.fao.org/fileadmin/user_upload/fsn/docs/Krätli%20S.%202008%20-%20Cattle%20breeding,%20Complexity%20and%20Mobility%20in%20a%20Structurally%20unpredictable%20Environment.pdf)

For those who don't have time to read the paper, here are, in a nutshell, two arguments that might contribute to this discussion:

1. 'Natural resources' are treated as objectively defined but actually they are not.

We normally talk of 'natural resources' as if they were material features in the environment. Yet, 'resource' is what is of use to a particular set of users: that is, any given 'resource' implies both use and users. In exactly the same ecological environment, 'natural resources' as 'defined' by a bird will be very different from 'natural resources' as defined by a buffalo (but also, most likely, as defined by a bird of a different species). Any talk of 'natural resources', represents as objective what is necessarily subjective. Consequently, 'natural resources' perspectives imply as universal what are in fact simply particular (if dominant) ways of using the environment by particular producers.

What is 'resource scarcity' for a particular set of producers (because of the ways they use the environment) can actually be a valuable resource for another set, capable of using the environment in different ways.

2. The way we understand the environment depends on the ways we use it (obviously this is particularly true for applied sciences, but not only).

'Unpredictable variability' in the drylands refers chiefly to precipitation that is not uniformly distributed in space and time, with its complex consequences on a rich diversity of soil and vegetation. The important point here is that in the ecological conditions in which the WoDaaBe run their operations, unpredictable variability is the rule rather than the exception.

Unpredictable variability results in a distribution of nutrients on the range, that is neither stable nor uniform. On the contrary, in the Sahelian bush nutrients develop in patchy, short-lived and random concentrations. In analogy with random concentrations in power supply, I shall call them 'spikes'. Most importantly, these spikes - positive and negative - are not represented in average values.

Yet, all systems for measuring 'natural resources' on the range (e.g. precipitation, biomass, carrying capacity, etc.) rely on the meaningful possibility of average values.

As long as average values are applied to temperate climates, where ecological diversity in space and time is relatively regular and uniformly distributed, they work very well in helping the

producers to capture economies of scale (as, for example, in the European agricultural tradition). In agricultural traditions where production relies on ecological uniformity and regularity, measuring procedures are developed to capture uniformity and regularity, while ignoring positive and negative spikes as exceptions.

The situation however is fundamentally different in environments that are driven by unpredictable variability. In these cases, applying models of agricultural production that rely on uniformity and regularity is problematic: hence the representation of the drylands as 'characterised by resource scarcity'.

Best wishes,  
Saverio Krätli

**Contribution by Joseph Opio-Odongo from the Sustainable Development Services, Uganda**

Dear All,

I take note of the valuable comments already made by some of the members of the forum in response to Hezekiah Muriuki's request. Indeed, the challenges identified by Hezekiah in his submission are similar to those in the Oxfam Briefing Paper 116 – Survival of the Fittest: Pastoralism and Climate Change in East Africa (<http://www.oxfam.org/policy/bp116-pastoralism-climate-change-0808>). That briefing paper focuses on climate change, political and economic marginalization, inappropriate development policies, and increasing resource competition.

By way of resolving the challenges, the paper proposes that national governments should: i) recognize and protect the pastoralists' land and resource rights; ii) put an end to inappropriate development policies aimed at pastoralists; iii) empower the pastoralist communities to influence policy and programming; iv) create positive diversification for pastoralists and alternative livelihood for ex-pastoralists; v) acknowledge and address the specific needs of ex-pastoralists in national and regional development strategies; vi) provide social welfare support to pastoralists communities in terms of cash payment in place of food aid to enable them meet their diverse livelihood needs; vii) ensure that appropriate mechanisms are in place to manage conflict between pastoralist groups and others; viii) negotiate regional governance regimes that enable amicable trans-boundary movement and migration; and ix) work with the Africa Union to develop a pastoral policy framework for rationalizing and harmonizing national policies on pastoralism.

Based on my experience within the Africa region, these and the other issues already raised by members of the forum can be categorized as follow:

Resource access and control that ensure equitable access and control regimes that avoid the marginalization of some segments of the population whose livelihoods depend on the ASAL resources. Mechanisms for controlling powerful vested interests that undermine the survival of pastoralists must be instituted. The land tenure regimes must protect the interests and pastoralists.

Market access, to enable the population in the ASAL market livestock and other livestock products plus other valuable products that can be produced from the ASAL resources. Fortunately, the ASAL ecosystems tend to be rich in biodiversity with tremendous qualitative value. The ecological conditions of the ASAL enable species to be resilient, tolerant to drought and salinity and able to grow and set seeds within a very short timeframe. Some of the ASAL species in Ethiopia and Southern Africa have attracted global interests among the producers of pharmaceutical and dietary drugs. Access of such markets and the equitable sharing of revenues accruing from it with the ASAL communities can help promote sustainable livelihoods. Indeed, the market access programme of the Drylands Development Centre in Nairobi is yielding valuable experiences and lessons in this regard.

Vulnerability management, especially vulnerability to both poverty and climate change. The marginalization of the ASAL communities within the political economy is an issue that deserves special attention in this regard. Vulnerability-proofing of macro-economic and other policies vis-à-vis the livelihood needs of the pastoralists is essential. Pastoralism is an appropriate land use in the ASAL compared to ranching that is favoured by modernists. Indeed, Kenya can draw useful lessons from the manner in which the liberalization and privatization policies that promoted ranching in the ASAL made some of the Masaai communities more vulnerable to livelihood insecurity. Similar lessons can be drawn from the manner in which the promotion and privatization of water development (boreholes) in communal grazing land in Botswana by private commercial farmers made affected ASAL communities more vulnerable to inadequate accessibility to water and grazing.

Political Visibility and Clout, so that the population in the ASAL can influence national policies, plans and budgets. Rather than wanting to wish away pastoralism, which is the most appropriate land-use system because it enables people to adapt by moving livestock according to the shifting availability of water and pasture, we need to devise the most effective ways of making it co-exists with other land-use systems in the country. Substituting pastoralism with sedentary land-use systems is less likely to ensure sustainable use and management of the ASAL resources. The political voice for this is very faint in many developing countries. In the specific case of Kenya that Hezekiah addresses, although pastoralism contributes roughly 10% of the GDP, the pastoral communities continue to lack both political visibility and political clout in the affairs of state. Maybe with the recent creation of the ministry responsible for the ASAL region the situation will begin to change for the better!

Trans-boundary issues and management of resource-use conflicts, so that the inevitable cross-border movement of pastoralists and their livestock become orderly. Here the GEF regional biodiversity project and the market access project of the DDC that followed offer useful lessons., with profound governance implications.

My apologies for a lengthy contribution!

Joseph Opio-Odongo  
Director, Sustainable Development Services (SDS)  
P.O. Box 23221  
Kampala, Uganda

#### **Contribution by Sylvia Kanyiri Mbaabu from WFP, Italy**

Dear All,

I am a Kenyan though currently abroad. The issue of marginalized pastoralists is not a new one. It has recurred ever since Independence.

My input is not from a professional point of view at all but just a general contribution.

In all the debates about pastoralists and sustainable livelihoods we tend to forget one very important factor: the political aspect.

Mr. Muriuki did point out that programs have been implemented so far but did not work.

It has always been evident that the political capital of any given community does matter a lot in Kenya. I do understand the sensitivity of the matter but it needs to be put into account. We can not ignore the fact that in many cases our authorities do not act out of benevolence and good will.

Unfortunately the Pastoralists in Kenya have always been termed as the least endowed in terms of political status hence might not be of much interest politically.

It is evident that no matter how effective or efficient a program or project is designed to be, the ultimate role and commitment of the government is crucial for success.

When we talk of Market Access as Mr. Odongo suggested we have to think of all market infrastructure that needs to be put in place for the access to be realised. Of course the involvement of the community is key, but the bottom line comes back to the role the government plays to make a conducive environment for the feasibility of any projects.

Giving the members of the community a voice is quite important hence they can then put the government and any involved stakeholders to task on receiving equal or even more attention in the national agendas. Mr. Ole Nkedianye did point out a good example of the budget allocation. I need not say further.

The new ministry dealing with arid and semi-arid lands (ASAL) affairs is a step in the right direction but there is still much to be done since the existence of the ministry is one thing and its effectiveness is another.

Unfortunately I do not have answers of what can be done but just a suggestion of a more broad approach on factors affecting the sustainable use of resources in the ASAL.

Best Regards,

Sylvia Kanyiri Mbaabu  
Food Security Policy and Markets Unit  
Policy, Planning and Strategy Division.  
WFP-Rome, Italy

#### **Contribution by Salomeyesudas from APFAMGS, India**

I forgot to share an important note with you all. It is of high importance to look at local health care systems for livestock. Simple, reliable and without side effects, it works effectively.

In Deccan Development Society India, women were trained in local health care system as paravets in the year 1997- 98 onwards and they are continuing their profession helping in their villages.

For more details please visit  
[www.ddsindia.com](http://www.ddsindia.com)

There are several other organizations that have expertise in this area.

Sincerely,

Mrs. Salomeyesudas

Chennai - 600 054  
T.N. India

## **Contribution by Andrew Borrell from the Hermitage Research Station, Australia**

Dear All,

I've enjoyed reading the discussion following Hezekiah's introduction to this topic. I'd like to begin a new 'thread' of discussion that focuses on cropping aspects of food security in arid and semi-arid land (although the pastoral component is still important in these farming systems).

I'm a crop physiologist with the Queensland Government working on drought adaptation in cereals (sorghum and wheat) in north-eastern Australia. For the past 16 years I've also been involved in developing rice-based cropping systems to enhance food security in semi-arid eastern Indonesia (West Timor and Lombok). This work has been undertaken with my colleague and friend, Dr Don Van Cooten. Our research was initially undertaken in West Timor (1993-98), then we collaborated with the University of Mataram (Lombok) and La Trobe University (Victoria, Australia), on a project funded by the Australian Centre for International Agricultural Research (ACIAR) between 2001 and 2007.

I'll begin with some comments on food security in West Timor. Key constraints to production in this semi-arid region are drought, water-logging, poor soils and erosion. The challenge for the region is to secure year-round food production in such a fragile environment. More than 90% of the rain falls in a distinct wet season between November and April. Therefore, cropping in this region is dependent on matching crop growth with water supply. In particular, crop production depends on the efficient use of rainfall during the wet season, including avoidance of waterlogging, and efficient use of stored soil water during the dry season.

It was considered necessary to identify and examine in isolation, those cultural and management components likely to inhibit the development of a viable and practical system based on permanent raised beds. We then attempted to integrate these components into a sustainable farming system. The following components were considered:

- Compatibility of raised beds for rice and upland cropping;
- Timeliness of operations;
- Water harvesting and drainage;
- Utilising stored soil water;
- Mechanisation;
- Weed control;
- Erosion control;
- An integrated approach to food and cash cropping;
- Living fences; and
- Availability of labour.

Our experiments found that a range of crops, in addition to rice, can be grown on raised beds during the wet season, overcoming the previous limitation of waterlogging to crop growth. These crops included soybeans, sorghum, maize, pigeon pea, yam bean and cassava. Assuming that the basic food/cash crop requirements of subsistence farmers can be met from intensive lowland production, the option exists to reforest the eroded upland cropping areas with a range of perennial species to provide food, fodder, firewood, building materials and medicines.

Initial construction of raised beds prior to the wet season in lowland areas, and maintenance of permanent structures thereafter, enables crops to be sown at the onset of the wet season, thereby avoiding end-of-season drought. Soybean yields were almost doubled by sowing in December rather than January, highlighting the advantage of early sowing into raised beds. Since manual construction of raised beds took more than 200 man-days/ha, appropriate mechanisation in the form of a two-wheeled hand tractor and associated bed-maker were developed for the construction and maintenance of the beds.

Early sowing and harvesting of the wet season crop opened the way to plant a drought-resistant species such as sorghum in late March or early April, better utilising stored soil water from the end of the wet season. This system greatly enhances the probability of attaining both wet and dry season crops each year. These combined strategies provide a means of enhancing food security for subsistence farmers in semi-arid eastern Indonesia.

These concepts were further expanded and developed on the neighbouring island of Lombok between 2001 and 2007 in the ACIAR project mentioned above. The adoption of these ideas by farming communities in southern Lombok has been a success story. But more about that later...

Kind regards

Dr Andrew Borrell  
Principal Research Scientist  
Centre Leader, Hermitage Research Station, Warwick  
Queensland Primary Industries and Fisheries  
Australia

### **Contribution by Francois Leonardi from FAO, Zimbabwe**

I would like to make a very small comment on dryland and pastoralist even if I am not a specialist in these areas.

The population growth both of human beings and cattle has been mentioned by some of the contributors; I believe it is one of the main issues leading to all the current conflicts over scarce resources, and I faced exactly the same type of situation -but with a total different socio-economic background- recently in my mission to Rodrigues, a small island of the Indian Ocean, where too many cattle overgraze the pasture.

Individual strategies of maximizing their herd size clash the global interest and the more cows on limited resources, the less productive they are. It is not a unique case where individual interest clash with the global one. If the herd was belonging to only one person, the management would be for sure different.

In larger pastoral areas, the issue of animal demography is critical and recent studies/census show how far national statistics can be from the reality -case of Niger, from 2.2 million -before census- to suddenly 8.2 million after -FAOSTAT revised the figure backward.

Item	2004	2005	2006	2007
Niger Cattle	6929840	7336090	7762507	8242830
FAOSTAT   © FAO Statistics Division 2009   01 July 2009				

In consequence planning to use efficiently -I would avoid intensively- the natural resources and calculating wealth of the herders, not to speak about meat production, is often misinterpreted because of lack of reliable information in the pastoral areas/communities.

Last but not least, most of these areas are now considered as chronically food insecure and received extensive amount of food aid year after year -case of Somaliland and Afar in Ethiopia... in consequence -not the only one- many cattle owners do not need to sell some of their animals and herds are growing,,, generating more conflicts and at the end of the day endangering the whole livelihood system in case of drought.

Regards

Francois Leonardi  
Policy Officer. Southern Africa



## **Contribution by Cathy Watson from the LEGS Project, Ethiopia**

Dear All,

I was on leave in the UK and by the time I checked the Forum website, I realised that the discussion had already closed. However, I would still like to share with you a little information about the work of LEGS, the Livestock Emergency Guidelines and Standards project, for your information:

LEGS is the result of concerns expressed by a number of humanitarian and development agencies about the quality of disaster response in livestock-keeping communities. All too often in a drought, for example, responses are not initiated until many of the livestock have already died, and in many cases the response does not address the livelihood needs of the livestock owners but focuses only on the 'traditional' arena of human food security, health and shelter. Where livestock-based responses are implemented, they may be too late, or inappropriate, or undermine existing private sector services that are vital for the long-term survival of local livelihoods. As a result of these concerns, a set of international guidelines and standards were proposed, following the process and format of the Sphere project, to promote a livelihoods-based approach to disaster response that sees livestock as a key livelihood asset. The guidelines are designed to complement initiatives such as Sphere that focus primarily on human needs.

LEGS has been developed by a multi-agency team, drawing on expertise from around the world and involving consultation with a mailing list of over 1500 individuals and agencies. LEGS brings together best practice in a number of key areas that can support livestock keepers during and after a disaster, namely: destocking, veterinary support, provision of water and feed, livestock shelter and restocking. Options, issues to consider and key challenges and constraints are outlined for each of these technical interventions. LEGS begins with a discussion of the importance of livestock in livelihoods, and the role of livelihoods-based emergency response in protecting and strengthening those livelihoods beyond the disaster itself. Guidelines for assessment and response identification focus on the need to identify responses that are 'appropriate, feasible and timely'. Further information and details of how to order a hard copy of LEGS are available on the LEGS website: [www.livestock-emergency.net](http://www.livestock-emergency.net), where a free PDF version of the guidelines can also be downloaded.

Livelihood-based livestock interventions in emergencies like those described in LEGS offer livestock keepers such as pastoralists the opportunity to protect and strengthen their key assets during and following a disaster, thereby strengthening their food security and the future sustainability of their livelihoods, helping to avoid the 'pastoral drop-outs' that Ced Hesse described earlier.

Please let me know if you would like any further information on LEGS, and apologies once again for the late reply.

Best wishes

Cathy Watson

LEGS Coordinator

Website: <http://www.livestock-emergency.net>