



A Series on Integrating Climate Change & Natural Resource Management into Feed the Future

The Interface of Livestock, Climate Change, and Food Security: Building Resilience in Southern and Western Zambia Through Community Based Livestock Production and Marketing

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Speaker

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Mara Russell:

Today I'm going to be talking about the interface of livestock climate change in food security and a little bit about how we've done that work in a program on community based livestock production and marketing in Southern Zambia. I actually come from the standpoint of food security. So you've heard it from the standpoint of how conservation can impact food security. I'm actually coming from the standpoint of what does conservation have to offer to food security and livelihoods. I also have to acknowledge the contribution here of my colleague here, Carmen Jaquez who is really the brains behind this presentation. She is our Africa Regional Livestock Specialist and also heads our Environmental and Climate Change Taskforce.

There are a few things I hope that this presentation will convey today. In particular we want to look at what's the impact of degraded environments on food security. It can actually be an underlying cause of food insecurity if productivity is limited by poor soils and lack of water resources that we've seen but also climate change has an impact on shocks, on creating shocks as we'll see. This has a devastating impact in terms of food insecurity particularly among small holders and people who are vulnerable. At the same time if natural resources are protected and secured such as some of the examples that we've seen and some of what I'm going to talk about these are assets that are very, very important for people who are really depending on low input agriculture but also those who are working at a higher input level. If soil is productive and water resources are available this has the opposite impact. In other words, it improves food security and livelihoods. So these are two things I hope this presentation will address today.

So first of all lifestyle plays a critical role in terms of food security. It's often seen as like a capital investment for households, for farmer households and people – and what they do people don't eat animals very much. They live off of the interest as it were. So in other words, so sort of sow milk is one of the very big income earners for households. It's also a source of barter. A livestock generally are produced on a one to two year basis for many animals but poultry is more productive and eggs are available for selling. But herd growth can be a means of earning a livelihood. Draft power also is critical both in terms of farming to maintain fields but also in terms of transportation. It's not just something that can improve livelihoods from the production standpoint but also in terms of people lease out their animals so they can earn income from that.

Also some other things to keep in mind as far as animals are concerned is that everybody has – livestock holders tend to have a hoof account. So they have a certain number of animals that they maintain over a period of time and under stress these animals can be sold if need be for food or they can instead of consuming a lot of the products that they would normally consume, say milk,

they may sell them in order to increase their income and during times of stress. Now in most cases people try to manage their animals in such a way that they don't sell off the most strategic animals which tend to be things like breeding females. A certain number of animals generally sustain a household and people usually know what those are particularly in pastoral livelihood areas. So that's an important thing to keep in mind.

Now also nutrition is important and all of these products up here listed milk, eggs, blood and meat are all consumed by poor households and hopefully – one of the things that we've seen is that when people increase their productivity, their livestock productivity they tend to eat more of them because they don't have to sell them which is a positive aspect in terms of how livestock contribute to livelihoods. They also contribute to nutrition. The only area where you do see that people are very, very selective as I mentioned they don't tend to eat their animals that much except usually during ceremonies like marriages, births, visitors are coming and things like that. Then usually only the small animals, poultry, maybe a goat, something that is easy to replace, relatively less expendable.

Okay, pressing the wrong button. Now for those of you I guess most of the folks here are not climate change experts. So just kind of to summarize what are sort of the major trends that we see happening in terms of climate change in the coming years it's likely to become hotter and wetter with temperatures increasing 1.8 degrees centigrade over the next century. The rains though, one of the things that is going to be a compounding factor in this is that rains are going to be less predictable in terms of their frequency, intensity, duration and location. I think this is something that farmers are already seeing that it's hard to make planting decisions. It's hard to know whether crops are going to fail or not.

Also at the same time, climate change has an impact in terms of increasing the frequency, intensity, duration and location of weather shocks, droughts, floods particularly and extreme storms, extreme cold and hot. All of these things have an impact on agriculture. Certainly this adds a great deal of risk and uncertainty particularly for small holders. So it's likely that there will be a major increase in crop losses by halfway through the century if not all the way through the century, at least 10 to 20 percent. We're already seeing a great deal of this. So in terms of the impact not only is it going to mean that productivity is limited or reduced but very often there will be economic impacts as well.

Now how can livestock maybe improve on this situation or bring about great resiliency? First of all, not everywhere but in some context livestock can be available year round as a resource, as an asset that can support food security for

farmers. I know, for example, one very good example of this is in Zambia where actually the hunger season falls during the rainy season. So there's greater milk production. Therefore, farmers can continue to sell their milk supplies during the hunger season and earn income in that way.

Another thing that is happening quite a bit is that there is a diversity of breeds in species and in fact there are new efforts to try to increase and diversify the breeding so that animals will be more resilient in diverse climates. They can also enhance farm productivity. I'm going to talk about fodder production, manure use and grazing practices and how they can best be coordinated to improve productivity but also I want to mention that as incomes increase particularly the off season incomes this actually has a positive impact in terms of productivity on farms. Very often what you see is that during those periods and during the dry periods farmers do a lot of – engage in a lot of migrant labor in a lot of contexts. This income can actually reduce the amount of migrant labor that they have to engage in and therefore improve their livelihoods. Also it helps for landless populations and urban populations who own animals.

Now at the same time one of the benefits of owning animals is that the demand for meat and animal products is increasing. According to IFPRI's impact model this increase is likely to be something on the order of 6 to 23 kilograms per person in the future. Now, as you probably – many of you are aware of the discussion about the long shadow of livestock. They do and I would be remiss if I do not say this contribute to climate change. The quantification of that basically is 18 percent of the anthropogenic greenhouse gas emissions which is the human generated greenhouse gas emissions and – but what is contributing to that? Interestingly land use and land use change account for 36 percent. That's over one-third. Manure management is the other big generator at 31 percent. So nearly two-thirds occur as a result of these two factors. The animals themselves generate about 25 percent and feed production is 7 percent. Processing and transport is only 1 percent of that total.

Now what is this issue with land use and land use change? It's interesting that currently about 3.4 billion hectares of land are used as pasture and 26 percent of the lands that have emerged from glacial areas and non-agricultural lands slightly over a quarter of those are being used for pasture and 470 million hectares are used for feed production. Unfortunately that's about one-third of the arable land on earth. So that new market for livestock unfortunately is driving a lot of land going to feed crop production. However, that is also a very good income earning opportunity for small holders.

What is driving a lot of this pasture use and this change in land management however is countries that are doing a lot of open grazing which is kind of

counter intuitive because that's a very traditional, extensive type of strategy. In fact in Brazil is where a lot of this is happening due to deforestation and increased use of land for pasture. So it's kind of – it's an interesting thing. You would think that grazing animals might not generate as much greenhouse gas and in fact in some cases that is true. The extensive production systems which are more traditional these tend to be low input systems and low output systems. They are lower emissions per unit area but higher per production unit. I'll explain that in a minute.

Intensive production systems which are the modern systems on the other end of the spectrum they are high emissions per unit area. So if you have a hectare under intensive livestock production you will have higher emissions however, per production unit there are lower emissions. Now the reason for that is that it's very concentrated in particular areas. So the unit itself, the product itself would result from fewer emissions. Now you also would need to produce fewer of them to – basically for income. The value of these products tend to be higher than the value of what is produced through extensive systems and the returns, the net returns are higher.

But one thing to keep in mind is that neither one of these systems is perfect. On the low end the extensive production system may not result in the types of incomes for producers that they need in order to survive. They may over exploit. For intensive productions, highly, highly intensive productive systems can also be detrimental to the environment obviously and have a very, very negative impact on natural resources. What needs to happen is a better kind of understanding of the intermediate areas. Where is extensivity important in terms of mitigating intensive systems and where is greater intensivity important in terms of improving the livelihoods for the more extensive, those dependent on more extensive systems?

Back to Zambia. Just to kind of introduce you to the community livestock program, the goal of the program is to build resilience of vulnerable households in Kazungula and the Seshake districts by restoring their livestock production capacity and livelihood asset base. Now these districts are in southern and western Zambia and there are three areas that the program works in. First of all, this is a partnership between Land O' Lakes and the Africa Center for Holistic Management. The project began last year in April and will go until October 2011 and it's funded by the Office of Foreign Disaster Assistance under USAID.

So the first part of the project is to improve marketing and market access. So this is one of the areas where we're getting a little bit more intensive. Goat producer and marketing associations have been developed and farmers have been trained in improving animal husbandry including feeding, reproduction,

etc and breeding. They're also being trained in business skills such as marketing, market assessments, planned sales, negotiations, basic bookkeeping and group sales. At the same time they're working on improving land management and this is where the holistic management practices have come in and really the reason why they were brought in because of poor forage quality and dry season loss of body condition. Also another aspect of this is that they're working on improving animal health to ensure their marketability.

Now the reason this project was brought about was because of a number of shocks that have reduced the livestock population. First, contagious bovine pleuro-pneumonia or CBPP there was an outbreak in 2006 and then that was repeated in 2007 and 2008. Killed off lots of the cattle in the area and imposed a cattle movement ban. Also in 2007 and 2008 there was a significant flooding along the Zambezi and this continued over a long period of time and resulted in a number of asset losses.

Goats were introduced because they are not susceptible to CBPP. It's possible to plan their breeding and target their markets. They also – the holistic management was brought in order to support crop production. So what this is shaping up to be is a semi-intensive livestock production system focused on improved feeding, selective breeding for high yields and fast growth. Also their timing, the planning of the offspring and increasing the production potential of natural resources. There are dire predictions for Zambia in terms of climate change. I just want to quickly mention that we're seeing the same types of increases in temperature and rainfall as have been predicted globally and particularly in Southern and Western Province. So this is going to continue over time.

Now I'd like to introduce the whole aspect of holistic management. This here is a cattle boma or corral that where the cattle are staying overnight. Holistic management is a decision making process that helps people make decisions that are socially, economically and environmentally sound. It's a framework that allows for management, land management of relationships between land grazing animals and water in ways that mimic nature. The first step in managing holistically is the establishment of a clear, encompassing goal that embraces all desired outcomes and expresses the will and commitment of those who will be involved in achieving it. So it is a holistic goal.

The way it's often viewed is that animals are moved to the right place at the right time for the right length of time. Range lands are often degraded because animals loosely move through an area selecting only a few plants. If plants are not broken down or the tops eaten before the next season new growth essentially smothers. Trampling and good grazing speeds up the oxidation

process as well as encourages ground litter to protect soils from erosion. Planned grazing calculates how long animals will need to stay in a piece of land based upon the numbers, where grasses are in the growth cycle and grass composition and land size.

This is the remains of a boma or corral that were placed on the land that was burned illegally. So bad management practices. These are better management practices. This is a close-up on the ground with manure litter on it and this is kind of the result of ten years of this type of planning, holistic management. This is actually taken at the end of the dry season. So after a very long period of time when many of these areas dry up and it was about 32 degree centigrade when this photo was taken. So there's presence of water and good quality forage from this.

So the goal of the project is to increase community capacity for the practice of sustainable range land management. Really the approach is to train a number of different stakeholders as mentioned here as well as improving the livelihoods of the goat producers and their marketing groups. Some of the lessons learned. There are a number of really important lessons learned from this project. I know I'm supposed to wrap up here but I will try to go through these quickly.

Farmers are very interested because of a great deal of soil erosion and the problems that they've experienced in raising crops. Wait a minute. Yeah, okay. I am supposed to be on that one. Okay, but the issue is that farmers are not very familiar with these practices. Many of the households that we're working with are traditional herders. They move their bomas frequently but not all the time. But they move them every few weeks. So they prepare pens and they keep them over night but what happens is that instead of animals moving around they pick up the manure and everything and they move it to gardens. So they – and to crop fields. Although this is a good practice what it means is the people have to go around and collect them. Lots of the beneficiaries are women. This adds to their labor. Also the manure only stays in the top soil. So it doesn't go down and it's also liable to high losses due to wind and soil erosion.

Also holistic management really requires animals and as 90 percent of the herds were lost during this period there's a need to bring in more animals. We have been doing stocking but it's going to take time. Really the problem is also trying to keep animals in one place. So there's been kind of a move to try and get the animals concentrated so that where they are becomes more fertile rather than moving the manure from one place to another. What this has required actually is getting a better understanding of the land tenure system and the governance structures around it. While the project trained a lot of the implementers, the

implementing the problem was that they did not train traditional authorities who have a lot of control over how things are done in the areas. This has been done now and they've actually seen greater reinforcement by these traditional authorities to make sure that people stay on – keep to the holistic management practices.

Also another issue is the timeframe. Eighteen months is a very short period of time in which to see all of the impacts of the project in terms of livelihoods and in terms of land reclamation but we are seeing some improvement over time and we do hope that the training that we've done to all of the local authorities and traditional authorities will bring about many of the changes that we're hoping to see over time. One thing that we have done is to work with the Ministry of Livestock and Fisheries Development in Zambia to try to get them to be more facilitative of this process. So hopefully that will also help to see more of this in the future. Thank you.

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