Feed the Future Innovation Lab on Small Scale Irrigation (ILSSI)

Stakeholders' meeting on irrigated forage intervention for Ghana

At Gariba Lodge, Tamale, 21-22 Oct 2014

Report prepared by Alan Duncan

Summary

The Innovation Lab on Small- Scale Irrigation (ILSSI) is a cooperative research project being implemented through the United States Agency for International Development (USAID) Feed the Future (FtF) program. The current focused meeting of livestock stakeholders was convened with the following objectives:

- Introduce the ILSSI project and ILRI's role within it
- Establish a community of national livestock experts interested in exploring options for improved livestock productivity associated with small scale irrigation
- Brainstorm around possible intervention strategies and sites

A series of presentations were made to set the scene, introduce the project, learn about existing livestock feed initiatives in Ghana, including those of the sister programme: Africa RISING. Presentations were followed by group work to identify previous irrigated feed work and to brainstorm around opportunities and constraints to introducing improved feed through small scale irrigation. The group work highlighted the fact that there is limited previous experience of irrigated livestock feed in Ghana. This represents a constraint but also an opportunity since there is a chance to stimulate innovation in this area. The meeting included a field visit to a local small-scale irrigation scheme at Golinga. During the final plenary discussion some early intervention ideas were agreed. The discussion made it clear that Ghana would be a relatively challenging environment in which to work on irrigated feed for livestock. This is because:

- Livestock markets are less well developed here than in other ILSSI countries, certainly Ethiopia
- There is very limited prior experience of combining irrigation with livestock feed production
- Feed is generally less scarce in Ghana than in other ILSSI contexts partly because of the relatively favorable agro-ecology.

Notwithstanding these challenges, the meeting was successful in raising the issues, introducing the project and establishing a strong group of interested parties who seem committed to working together on improving livestock production through interventions involving small-scale irrigation. Any interventions would need to be carefully targeted both spatially and temporally to maximize chances of success.

Background

The Innovation Lab on Small- Scale Irrigation (ILSSI) is a cooperative research project being implemented through the United States Agency for International Development (USAID) Feed the Future (FtF) program. The project is being implemented in Ethiopia, Ghana and Tanzania where it works to enhance food security and reduce poverty by developing and introducing gender-sensitive, small-scale irrigation systems into food and agriculture production on small farms. Such irrigation schemes may support production of high value crops including forages for livestock.

The project focused on Ethiopia as a pilot country in its first year but as the project develops activities are now being extended, in Year 2, into Ghana and Tanzania. A preliminary stakeholder meeting was held in Tamale in April 2014 and livestock intersections with small-scale irrigation was considered at that meeting as part of a larger consultation on small-scale irrigation in Ghana generally. Building on that initial engagement the current focused meeting of livestock stakeholders was convened with the following objectives:

- Introduce the ILSSI project and ILRI's role within it
- Establish a community of national livestock experts interested in exploring options for improved livestock productivity associated with small scale irrigation
- Brainstorm around possible intervention strategies and sites

The meeting included around 20 participants as listed in Appendix 1. The agenda is given in Appendix 2.

Day 1 summary

Introductions

The meeting began with an introduction exercise which doubled as an ice-breaker. This involved a "spectrum exercise" around the following two questions:

- I know everything there is to know about livestock feeding in Ghana
- Small scale irrigation has huge potential to improve smallholder incomes in Ghana

The exercise raised many interesting issues which re-emerged later in the meeting and laid the groundwork for the subsequent strong engagement by participants.

Introductory presentation – Alan Duncan.

Alan Duncan introduced the project outlining the consortium of partners, the core objectives, locations, progress so far and ILRI's role within the project.

Reflections from participants included the following:

- Experience with cultivated forages is generally very limited in Ghana. Introducing the additional element of irrigation could be challenging.
- Heifer International has some experience and has been involved in frequent mentoring to farmers and estimating opportunity costs of interventions. Potential opportunities existing for irrigated fodder developments including intercropping with food crops, scaling out research

outputs from research stations to farms, over sowing of improved forages on pastures and promoting fodder trees for feeding to pregnant and young animals.

General overview of livestock production systems in Ghana – Prof.~~Dr~~ Emmanuel Osafo, Kwame Nkrumah University of Science and Technology

Prof~~Dr~~ Osafo presented an overview of livestock issues in Ghana. The presentation touched on a range of issues including statistics on the livestock population, trends such as urbanization and their effect on livestock production, issues around livestock ownership patterns, feeding management, reproductive performance, milk marketing arrangements and small ruminant production patterns.

Reflections from participants included the following:

- In some rural areas, feed shortage occurs during the wet season when all fields are planted to food crops. Counter-intuitively there is sometimes excess feed during the dry season when there are a lot of crop residues around and open grazing is possible after crop harvest. Irrigated fodder is therefore produced when there is already plenty of feed in the dry season. How can the irrigated fodder contribute to solving the feed shortage problem? Conservation and processing of feed to be used during periods of feed scarcity may be a more promising intervention package
- Tradeoffs exist between stubble grazing and mulching for soil moisture retention and soil fertility. This needs to be considered when thinking about grazing-based feeding
- Targeting holiday markets for fattened animals is a promising idea

Livestock feed issues in Ghana and links with Africa RISING programme – Dr Asamoah Larbi, International Institute of Tropical Agriculture

Dr Larbi introduced the Africa RISING project, its genesis, the hierarchy of research sites, partners, and approach. He went on to present some ideas around assessing feed deficits in Ghana. Finally he presented some experiences of irrigated forages from his experience around the world particularly in the Middle East.

Reflections from participants included the following:

- Most of the presented experiences are from outside Ghana, so how can they be adapted to the Ghanaian situation? Solutions: Pilot test with interested farmers using Africa RISING innovation platforms
- There are big irrigation schemes in the Upper East region ~~North East Ghana~~ that could form part of this project
- Flooding of crop fields increases overall productivity and hence availability of animal feed
- Crop residues and potato vines are used as feed in the Upper East region ~~North East~~ – CIP interventions
- Sustainable land management requires return of manure which in turn requires adequate feeding

Feed diagnosis activities in Northern Ghana - Solomon Konlan, PhD~~MSc~~ student, University of Development Studies, Tamale and Africa RISING

Solomon presented data from his PhD~~MSc~~ study of feed markets in Northern Ghana. The study involved collecting feed samples from 3 regional markets at 3-monthly intervals. Price and quality data were collected to assess seasonal fluctuations in feed supply, price and quality. The results are very relevant to the ILSSI project in helping to target activities in areas of seasonal feed shortage.

Reflections from participants included the following:

- There is strong price variability with seasons and types of residue e.g. cow pea haulm fetches a better price than rice straw in Upper East Region of Ghana.
- Prices are generally highest in Upper East Region
- There is a low level of local browse use
- Farm gate price and market price are different so there is a need to differentiate between the two
- Recent trends show an increase in animal numbers and a decrease in grazing land making marketed forage production a strong option

Experiences of Heifer International on livestock interventions in Ghana – Mr Roland Kanlisi, Heifer International Ghana

Mr Kanlisi outlined Heifer's ethos and activities in Ghana. He went on to present some reflections on Heifer's animal health interventions involving small ruminants and feed interventions involving dairy animals. He emphasized the importance of focusing on market linkages and capacity building as part of any intervention strategy.

Reflections from participants included the following:

- What does "pass on the gift" mean? It springs from Heifer's ethos of empowering beneficiaries to help neighbours by sharing technologies and experience.
- Most of the examples were from Southern Ghana. Do you also have activities in the north? Yes.

Example of irrigated fodder production in Ethiopia under ILSSI – Mr Aberra Adie, International Livestock Research Institute, Ethiopia

Mr Aberra described recent experiences of intervening with irrigated forages in Ethiopia as part of the ILSSI project. The intervention involved small plots of irrigated oats and vetch linked to sheep fattening aimed at seasonal festival markets. The presentation described the approach and presented some emerging lessons that could be useful for the ILSSI project.

Reflections from participants included the following:

- Soil fertility issues in relation to irrigated fodder could be important – mixing legumes with grasses could help nutrient restoration for subsequent crops
- Some thought needs to be given to ensuring a sustainable seed supply system for diversified fodder options

- We need to think about fodder market options in addition to direct feeding of forages for fattening or dairy

Biophysical constraints to small-scale irrigation in Northern Ghana – Tim Ellis, International Water Management Institute, Ghana.

Dr Ellis gave an impromptu presentation reviewing recent experiences with establishing dug-outs as part of the Africa RISING project in Northern Ghana. He went on to alert participants to some of the biophysical barriers to successful small scale irrigation in smallholder systems. His presentation emphasized the large volumes of water needed for successful irrigation and the difficulty of sourcing such large volumes using traditional water sources.

Group work

This concluded the day's presentations and the remainder of the day was spent in small group discussion around the following questions:

- What are some previous successes and failures around irrigated forages in Ghana – location, partners, brief description of activities
- What are the key opportunities for improving livestock production through small scale irrigation?
- What are some the barriers?

The following is a summary of some of the issues raised in discussion:

Group 1:

1. Previous successes: No known success and failure stories around irrigated forages in Ghana
2. Opportunities:
    - Increased water availability for livestock production
    - Improved fodder production
    - Reduction of conflict over grazing land due to increase availability of feed
    - Increase crop-livestock integration through year round crop integration and residue feeding
    - Fattening of animals can be improved
    - Employment opportunities can be increased (income, nutrition, gender equity)
3. Barriers
    - Psychology of farmers to accept fodder cultivation versus crop production
    - There could be conflict on the use of irrigation water
    - Accessibility of fodder for animals in irrigated fields could be a problem when crops are grown
    - Allocation of irrigated fields for cultivation of fodder could be a challenge among farmers
    - Conflict may occur between sedentary and transhumance farmers

Group 2:

1. Previous successes: No experiences of irrigated fodder production emerged from the group.

2. Opportunities:
    - Increasing livestock population in peri urban areas
    - Increase in intensification of livestock production
    - Integration of vegetable-livestock production
    - Increased demand for milk and dairy products
    - Creation of off season employment for youth
    - Fish farming
3. Barriers:
    - Culture of not growing cultivated fodder
    - Lack of market information- can affect profitability
    - Lack of experience
    - Marginal contribution of livestock to the diets and economy of households
    - Poor policy support for livestock production
    - Poor levels of education and training (formal/informal)
    - Ghana boasts relatively abundant biomass resources
    - Uncontrolled bush burning
    - Limited supply of planting materials
    - Under-resourced extension services

Group 3:

1. Previous experiences:
    - Relay cropping - Groundnut and *Cajanus cajan* in Botanga, experience of Ben Alenyorege at Tolon
    - Stylosanthes as forage – issue of grazing damage, needed close supervision
    - Irrigated sorghum/millet. After harvest, re-sprouted material which can be fed in situ after biomass accumulation
    - Dugouts through draught power for supplementary irrigation. Need to supply extra food to be popular– Africa RISING, IWMI
2. Opportunities:
    - Targeted marketing of livestock – connecting livestock feed interventions to seasonal market peaks
    - Fodder markets- irrigation to smooth seasonal market fluctuation. Take advantage of peri-urban markets
    - Close nutrient loop – around kitchen gardens. Returning manure to kitchen gardens
    - Extra biomass in irrigation schemes – can market the excess
    - Marketing of traditional dairy products- Wagashie (soft cheese)
    - Irrigated fodder shrubs
    - Trend is back to draught power because tractors are expensive and ageing
    - Forages in rotation for improved soil health
3. Barriers:
    - Fencing to avoid livestock damage – costly. Alternatively exclude livestock by community agreement but this can be complex
    - Economic profitability of allocating land for forages
    - Farmers' attitude- beliefs and mindsets
    - Need for collective action

- Biophysical barriers- Potential to get out water out of the ground fast enough
- Entrepreneurial skills

Day 2

Day 2 began with a field visit. Participants first visited an urban livestock market in Tamale and conversed with local actors. A range of small ruminants were on sale. These were being fed on groundnut haulm, pigeon pea pods, bran and some fresh grass. During the visit a forage vendor arrived on a bicycle with around 10 bundles of wild grass. These had been carried for around 10 km and the vendor makes several such trips per day. Each bundle sells for 2 Ghana Cedis (around 0.6 USD).

Participants then travelled to a small scale dam irrigation scheme at Golinga. There they were hosted by the secretary of the local water user group and a number of other users. The major crop is rice and AGRA are funding some agronomy trials. The area is divided into 0.5 ha parcels and around 150 households are involved. Participants asked the farmers whether growing irrigated forage would be of interest. Although they expressed interest, some simple calculations by participants suggested that such an enterprise would not be profitable compared with rice. The Secretary indicated that any intervention would need to improve soil health suggesting that intercropping with legumes might be promising. However, the question of whether species exist that would fit with rice and thrive under water-logged conditions remained unresolved. The dam was constructed by the Ghana Land Planning Department in 1969 and has been maintained by the community in recent years. Some improvements were recently made with Chinese support.

Final Plenary Discussion

The afternoon was spent in discussion focusing especially on sites and intervention options. The discussion began with some reflections on the morning field visit and some brainstorming around irrigated forage options. The discussion proceeded to think about sites leading to the following incomplete table which we agreed to enhance through subsequent e-mail dialogue:

Site name	**Existing projects (e.g. Africa RISING)**	**Irrigation potential and type**	**Livestock market potential and type**
Golinga	Ex-CPWF	High, small dam	High – close to Tamale
Bontanga	Not known	High, large dam	Medium – close to Tamale
Bonia	Africa RISING	High, large dam	High – close to Bolga and Navrongo
Gia	Africa RISING	High, large dam	High – close to Bolga and Navrongo
Zanko			High – close to Wa
Passe			High – close to Wa
Gylli			
Sazie			
Yatguri (Drylands)			
Tibali	Africa RISING		High – close to Savelugu and Tamale
Digu			
Jimle			
Demabi (Drylands)			

Biagu			
Samboligo			
Nyangua	Africa RISING		High – close to Paga and Navrongo

Participants then brainstormed on potential intervention strategies although with limited success partly because of the very limited previous experience of combining irrigation with livestock feed production in Ghana. Two potential interventions emerged:

1. Intercropping of legumes into cereals e.g. rice (but rarely intercropped because of excess water- maybe relay cropped). An alternative would be maize intercropped with groundnut.
2. Growing grass on marginal areas within irrigation schemes. Species could include *Panicum* spp and *Andropogon*

It was generally agreed that Ghana is a relatively challenging environment for introducing the concept of improved feed from irrigation. This is because:

- Livestock markets are less well developed here than in other ILSSI countries, certainly Ethiopia
- There is very limited prior experience of combining irrigation with livestock feed production
- Feed is generally less scarce in Ghana than in other ILSSI contexts partly because of the relatively favorable agro-ecology.

The meeting concluded with an after-action review and a few words of thanks by Alan Duncan

Appendix 1 - Agenda

Day 1: Tuesday 21 October, 2014

Time	Topic	Responsible
09:00	Welcome and Introductions	Augustine Ayantunde
09:30	Introduction to ILSSI	Alan Duncan
10:00	General overview of livestock production systems in Ghana	Emmanuel Osafo
10:30	Coffee/tea	
11:00	Livestock feed issues in Ghana and links with Africa RISING programme	Asamoah Larbi
11:30	Feed diagnosis activities in Northern Ghana	Solomon Konlan
12:00	Experiences of Heifer International on livestock interventions in Ghana	Roland Kanlisi
12:30	Lunch	
13:30	Example of irrigated fodder production in Ethiopia under ILSSI	Aberra Adie
14:00	Plenary discussion reflecting on morning's presentations	Alan Duncan
14:30	Group work – opportunities and constraints to irrigated feed options for livestock in Ghana: Ideas for interventions	Alan Duncan
16:00	Tea/coffee	
16:15	Reporting back and plenary discussion	Augustine Ayantunde
17:00	Close	

Day 2: Wednesday 22 October, 2014

Time	Topic	Responsible
08:30	Field visit to irrigation facilities around Tamale and livestock/fodder market	Solomon Konlan
12:00	Lunch	
13:00	Ideas for site selection	Alan Duncan
14:00	Priority activities for ILSSI Livestock activities in Ghana	Alan Duncan
15:30	Coffee break	
16:00	Wrap up and closing	Augustine Ayantunde
16:30	Close	

Appendix 2 – Participants

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