

Feed Assessment Tool (FEAST)

A systematic method for assessing local feed resource availability and use with a view to designing intervention strategies aimed at optimizing feed utilization

REPORT FOR UTTARAKHAND



Werner Stür¹, Alan Duncan²

1. International Center for Tropical Agriculture (CIAT), P.O. Box 783, Vientiane, Lao PDR. Email: w.stur@cgiar.org

2. International Livestock Research Institute, PO Box 5689, Addis Ababa, Ethiopia. Email: a.duncan@cgiar.org

It is to be noted that FEAST can't supply any magic bullet solutions but is meant to be a way to generate some basic ideas rather quickly to be taken up by local stakeholders to bring about sustainable action at local level. The tool is still in the process of fine tuning based on feedback from other partners and partners in other countries. The next steps include a second level training on the use of the final tool and use of a software for data analysis.

Feed Assessment Tool

Introduction

Feed for livestock is often cited as the main constraint to improved productivity in smallholder systems. Overcoming this constraint often seems an elusive goal and technical feed interventions tend to adopt a scattergun or trial and error approach which often fails to adequately diagnose the nature of the feed problem and therefore the means to deal with it. The purpose of the Feed Assessment Tool described here is to offer a systematic and rapid methodology for assessing feed resources at site level with a view to developing a site-specific strategy for improving feed supply and utilization through technical or organizational interventions.

Components of the tool

The tool comprises two main elements. The first is a **focused PRA exercise** which aims to provide an overview of the farming system with particular emphasis on livestock feed aspects. The second component is a simple and **brief quantitative questionnaire**, designed to be completed by experts under the guidance of the Feast facilitator. Output from Feast consists of a short report in a defined format along with some quantitative information on overall feed availability, quality and seasonality.

I. Focussed PRA

Preliminary scoping exercise with local stakeholders (in advance)

- Visit to the area meeting key local stakeholders including agriculture officials and key farmers to get a general understanding of the livestock production system
- Identify target livestock systems and farmers.
- Invite a representative group of approximately 15 men and women farmers to a ½ day meeting to assess the constraints and opportunities for improving livestock feeding systems. This meeting will consist of a participatory diagnosis with farmers and other stakeholders and visits to local farms to ground truth the earlier discussions and provide an opportunity for further discussion

Participatory Diagnosis

1. Introduction
 - *Objective: Provide a clear picture of who we are, what is our purpose in being here, what we would like to do and how long it will take.*
 - Introduce both visitors and farmers; explain the purpose and the process of meeting; give an estimate how long it will take to complete the meeting.
2. General description of farming and livestock system
 - *Objective: Obtain a general picture of the farming and livestock system so we can ask more detailed questions during the meeting. Make sure we understand the answers and ask for clarification if something is not clear.*
 - Ask farmer to explain the crops grown and livestock raised in their area. There is no need to go into details, just a general picture of the farming and livestock system including range of farm sizes, household sizes, farm labour availability, annual rainfall pattern, irrigation availability, crops grown and cropping patterns and type and types of animals raised by households.

3. Identify major income sources
 - *Objective: How important is livestock to the livelihood of farmers?*
 - Ask farmers to (1) list the main crops grown and other sources of income of farmers in the area, and (2) provide an estimate of importance of each income source (%).
 - Make sure farmers include off-farm income and remittances.
 - If it is difficult for farmers to provide percentages, ask them to rank the income sources from most important to least important and then ask how much the first, second and third income sources contribute to total income.
 - Income sources can vary a lot among households so it can be difficult to provide this answer. The main point for us is to understand how much livestock contributes to total income. Farmers will only be interested to invest time and effort into working on improving feeding systems if livestock are reasonably important to their livelihood.

4. General description of the livestock production system in the area
 - *Objective: Understand the main purpose of livestock in the farming system, and explore how farmers feed and manage livestock.*
 - Ask farmers about:
 - the types of animals raised (% of households raising these animals and average holdings)
 - the purpose of raising these animals (e.g. draught, income, fattening, calf production)
 - the general animal husbandry

5. What are problems, issues, opportunities within the livestock system? Problem tree.
 - *Objective: Find out if feed is likely to be a major factor limiting animal production and if this is recognized by farmers.*
 - Ask the farmers to list major problems / issues
 - Prioritize (rank)

6. Major feed sources throughout the year
 - *Objective: Understand the main feed resources fed to animals.*
 - Ask the farmers to list the main feeds fed to animals
 - Identify the source of feed (on-farm vs. purchased)
 - List the approximate areas grown of the various sources, yields and/or prices for different feeds, if traded
 - Put this information into a table

7. Seasonal calendar (feed, labour)
 - *Objective: Understand the seasonality of available feed resources, animal management and labour use throughout the year*
 - Seasonal calendars can be used for understanding the seasonality of many different farm activities, issues, animal feeds, sales, body condition (when are animals very thin, fat, etc.). Here our main interests are animal feeds, management (e.g. grazing, feeding cut grass)
 - Ask the farmers to list the factors of interest such as major feeds fed and draw when these are fed during the year.
 - Ask farmers to indicate when there is a lack of feeds
 - Discuss if this is related mainly to quantity of feed available or if this is also an issue of feed quality
 - Use the seasonal calendar to discuss feeding issues during the year

For example:

List of items	J	F	M	A	M	J	J	A	S	O	N
Feeding maize stover											
Feeding paddy straw											
Feeding multi-cut sorghum											

8. Use the seasonal calendar to discuss potential fodder interventions

II Brief Quantitative Questionnaire

The questionnaire (Annex 2) is designed to be conducted with around six knowledgeable local experts. These could be local extension agents, champion farmers, milk collectors, feed suppliers etc. The idea for the questionnaire is not to gather specific information related to particular farms but to characterize the main elements of feed supply, use and milk/meat production from hypothetical farms typical of the site. The questionnaire is designed to be conducted in a group setting with guidance and discussion of the questions as they are dealt with. However, individual responses are required so that the final figures represent averages derived from a group of experts. These will not necessarily be very precise in relation to reality but provide a crude and adequate quantification of feed input and productive output from the farming system.

Guided questionnaire completion – notes

The farms. Ask the respondents to consider farms in the area and to rank them according to wealth, either overall cultivated area or livestock holding. Three typical farms should be imagined corresponding to the wealthiest third of households, the middle third and the poorest third. These are the virtual farms we will be asking questions about.

1. *Family size*. Does family size vary by wealth class? If not, what is the typical family size per household in adult equivalents. Adult equivalents corresponds to the number of adults (16 and over) that consume food in the household. Children between 5 and 15 could be considered as half an adult equivalent and children under 5 as a quarter of an adult equivalent
2. *Animals*. What is the typical composition of the livestock holding in different wealth categories of households? Non-lactating dairy cows will be mainly heifers and dry cows. Non-working draught animals will be mainly young replacement stock. What is the rough average weight of each category of animal?
3. *Crops*. List all crops grown on a typical farm along with representative areas for each wealth category. Then estimate the yield of material that would be fed to livestock from those areas. This might need some discussion among the group about straw to grain ratios, typical grain yields etc.
4. *Non-crop feed*. This will mainly consist of supplementary feeds fed on-farm. This could include agro-industrial byproducts as well as commercial concentrates. Estimate the amount of each purchased by a typical household in a year.
5. *Grazing*. This is tricky. Of the overall roughage intake by livestock (e.g. crop residue, planted fodder, roadside grazing, common property grazing, private grazing) what percentage of the herd's overall roughage biomass intake comes from grazing?

6. *Production*. What are typical annual milk yields in different wealth classes from all milking animals. How many animals would typically be sold or slaughtered per year and how many kg are represented by this offtake?
7. *Seasonality*.
 - a. *Feed supply*. For each month give a score out of 10 for how much overall feed is available. A score of 10 means there is abundant feed and a score of zero means there is none.
 - b. *What is fed in different months*. For each month indicate how much of the nutrition of the livestock herd is supplied from different sources – the total for each month must add up to 10.
 - c. *Demand for labour*. For each month give a score out of 10 for how much demand there is for labour for on-farm operations.
 - d. *Market price for milk*. For each month indicate the farm gate price for milk
 - e. *Market price for meat*. For each month indicate the farm gate price for shoats and cattle.
 - f. *Rainfall pattern*. Indicate the distribution of rainfall over the course of a typical year. Score out of 10 for each month.

Reporting format

For each site the Feast facilitator should produce a PRA report according to the format set out in Annex 1. This report will describe the main elements of the livestock feeding system. In addition the exercise should yield several (say 6) completed Brief Questionnaires which will provide additional information for reporting purposes. These will be analysed at ILRI. Overall analysis of feed constraints and potential interventions will be distilled from the PRA reports, the questionnaire results and through discussion between ILRI/CIAT staff and the Feast facilitator.

Note: FEAST was developed at a stakeholder workshop in Hyderabad in June 09 and the prototype tool is currently being tested in a variety of locations including India, Ethiopia and Vietnam. The tool will be refined to make it as generic as possible while yielding useful information.

Feed assessment tool – Report for Uttarakhand

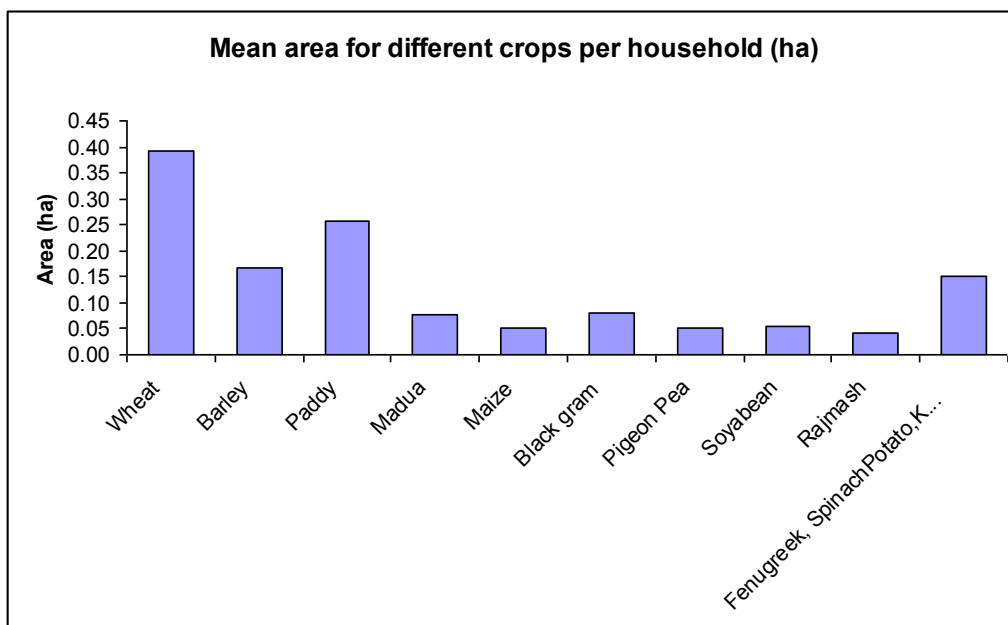
Prepared by Alan Duncan based on inputs from Sapna Jarial and Yashpal Bisht

The FEAST tool was first field tested in one of the villages (Mason village in Tehri district) in the state of Uttarakhand. Based on the learning it was further modified and applied in five other villages (Footsil, Ganora, Dungari, Siroli, Kameda and Senti). Analysis of information collected through PRA and questionnaires from all the villages gave the following impression.

It is to be noted that FEAST can't supply any magic bullet solutions but is meant to be a way to generate some basic ideas rather quickly to be taken up by local stakeholders to bring about sustainable action at local level. The tool is still in the process of fine tuning based on feedback from other partners and partners in other countries. The next steps include a second level training on the use of the final tool and use of a software for data analysis.

Farming system

The villages assessed (Footsil, Ganora, Dungari, Siroli, Kameda, Senti) are all characterized by mixed crop-livestock systems. Cereal and legume cropping predominate and livestock are kept mainly to supply draught power for tillage and as a source of milk for domestic consumption. Arable production is largely rainfed: in Rabi season (October-June) the main crops are wheat, barley, mustard and vegetables. In Kharif season major crops are paddy, maize, finger millet, barnyard millet, pulses and vegetables. There is a small amount of irrigated land allowing paddy rice and vegetables to be grown. Average productivity of crops (especially paddy) in irrigated land is 14-15 quintal/ha, while productivity of crops grown in rainfed land varies from 8-10 quintal/ha. Labour is generally derived from family labour. Women undertake many of the livestock-related activities particularly in collection of fodder from communal forest areas. This represents a major demand on labour as is a significant constraint within the system.

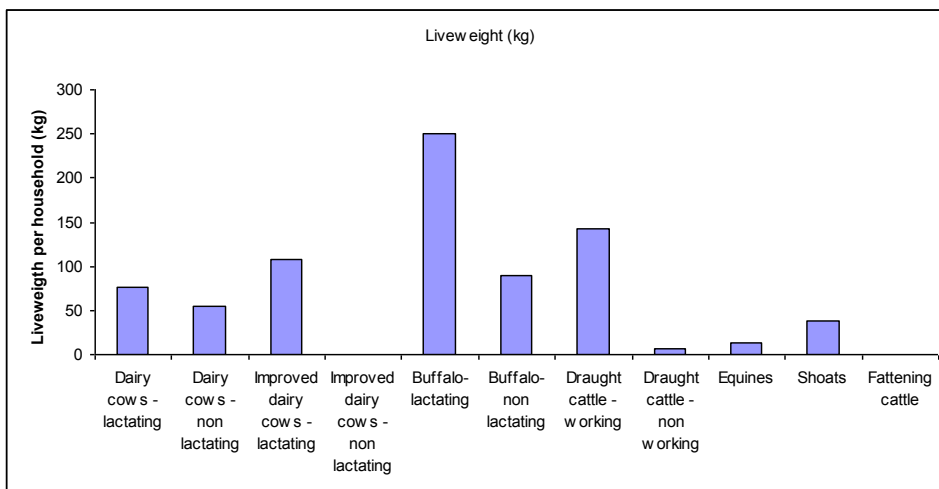


Major income sources

The agricultural system is largely subsistence oriented. There is some sale of vegetables and milk as cash income sources. Livestock are central to the agricultural system in supplying draught power, manure etc but management of livestock for market-oriented production is minimal. Average annual earning from sale of milk varies from Rs.10,000 to Rs.14,000/family. In addition, around 50 percent families of the village also rear goats and annual earnings from sale of goat varies from Rs.2,500 to Rs.5,000/family. As well as agricultural activities, some households derive some income from government jobs and there is presumably some remittance income from youth working outside the area.

Livestock production system

Livestock are kept primarily for draught power and manure to support arable operations. Milk production, primarily for domestic consumption, is also important. The draught power function of livestock is critical because of small plot sizes with limitations on mechanisation potential. There is seasonal migration of households to different homesteads at different altitudes to make use of agro-ecological variation. Livestock are fed using a mixture of zero-grazing and free grazing. Buffaloes are largely stall fed, cattle are stall –fed during monsoon and shoats are entirely free grazed. The difficult and mountainous terrain restricts access to livestock-related services and to markets. There is little AI for example and there has been little introduction of improved genetic material.

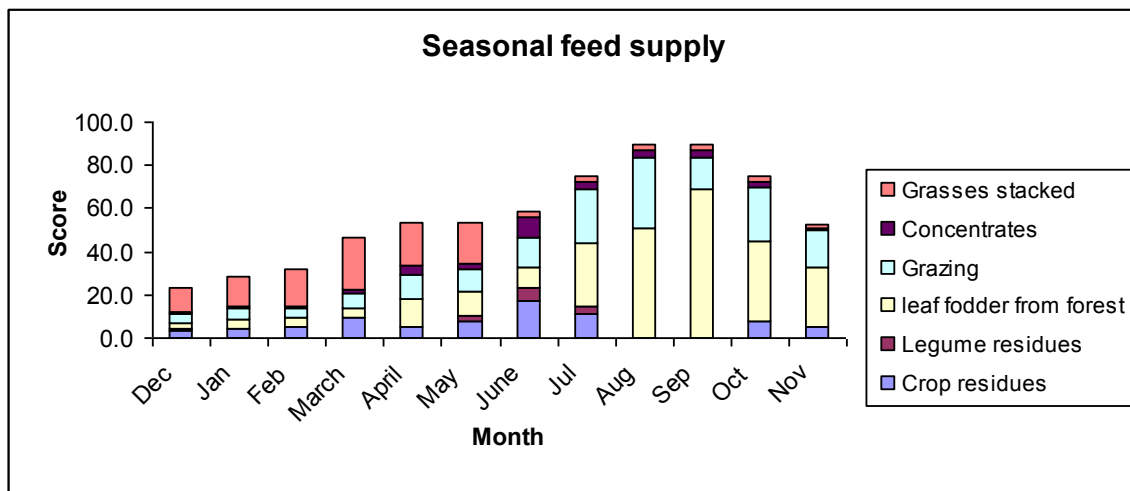


Problems, issues, opportunities

Fodder scarcity is a major issue. Although breed improvement is minimal, milk yields are even below the potential of the existing indigenous animals and feed scarcity is a major factor. Grazing land is under severe pressure and long hours are spent by women in collecting fodder from forest areas. Access to veterinary services and AI limit opportunities for enhanced animal performance. In terms of opportunities identified at village level, improved community management of common grazing resources appears promising for alleviation of feed scarcity. There also appear to be opportunities for goat rearing to exploit high local demand for goat meat.

Major feed sources throughout the year

Feed supply is highly seasonal. During the monsoon season abundant grazing resources and tree leaf fodder fulfill feed needs. Seasonal shortages are reduced through storage of seasonal grasses. Concentrate feeding is minimal. Crop residues form a component of the feed resource for livestock for most of the year.



Potential interventions

The most immediate constraint for livestock production in the area is feed scarcity. In terms of **feed interventions**, there is limited potential for on-farm fodder production due to land scarcity. The labour required to fetch tree fodder is a major demand on the system and any potential intervention needs to aim to produce more high quality material to feed within close proximity to homesteads. The two major feed interventions in progress are planting of bunds with Congo Signal grass and Napier and introduction of improved fodder pigeon pea. Pigeon pea was selected since it is already in the system and introduction of higher biomass varieties would represent a win-win solution. However, the amount of extra biomass produced is likely to be relatively small. Introduction of high yielding grasses on bunds appears to be a promising strategy and since seasonal grasses are already harvested and stored, this strategy should fit readily into the system. An additional possibility would be introduction of improved fodder trees on bunds in the form of hedges.

There could be merit in considering the **commodity focus of the livestock enterprise**. Most attention has been directed toward dairy production to date and the establishment of mini-dairies is impressive. However, the difficult terrain and market accessibility present problems for production of a perishable commodity such as milk. An alternative commodity could be live goat sales since there appears to be strong demand at competitive prices for finished goats. There could be a case for developing a goat rearing system based on confined feeding on tree forage and grass. A market feasibility study would be the first step in developing this option.

Process

This analysis and thoughts on interventions need to be part of a participatory process of enhancing livestock production based on dialogue with farmers and other local stakeholders. Based on experiences in Ethiopia and in Vietnam, attempts to deal with feed scarcity seem to be most successful when tackled by a stakeholder group through regular meetings and a rolling joint action plan. The assessment presented here is merely a means of providing an external assessment of the current situation and ways of changing it. This could be used as a discussion starter for a stakeholder dialogue. Such stakeholder groups work well with diverse actors from research, extension, NGO's, milk co-operatives, farmer groups etc. The next stage could be establishment of such local stakeholder groups (or strengthening existing ones).

Alan Duncan
7/12/09

Annexure 1

Feed assessment tool – PRA report

- General Farming System Description. *Objective: Obtain a general picture of the farming and livestock system* Give a general description of farming and livestock system – what crops are grown and what livestock are raised. What is the typical farm size and household size. What is the availability of labour and how is it affected by off-farm opportunities? What is the annual rainfall pattern and irrigation availability?

- Identify major income sources. *Objective: How important is livestock to the livelihood of farmers?* List the main crops grown and other sources of income of farmers in the area (including off-farm income and remittances). Provide an estimate of importance of each income source (%). The main point for us is to understand how much livestock contributes to total income.

- General description of the livestock production system in the area. *Objective: Understand the main purpose of livestock in the farming system, and explore how farmers feed and manage livestock.* What types of animals are raised (% of households raising these animals and average holdings) and their purposes e.g. draught, income, fattening, calf production. How are these animals managed in terms of housing veterinary care, breeding etc?

- What are problems, issues, opportunities within the livestock system?
Objective: Find out if feed is likely to be a major factor limiting animal production and if this is recognized by farmers. List the major problems and issues identified by farmers along with their rankings in terms of importance.

- Major feed sources throughout the year. *Objective: Understand the main feed resources fed to animals. Describe the main feeds fed to animals and their sources (on-farm vs. purchased). List the approximate areas grown of the various sources, yields and/or prices for different feeds, if traded.*

- Seasonal calendar (feed, labour). *Objective: Understand the seasonality of available feed resources, animal management and labour use throughout the year. Produce a seasonal calendar along the lines described above.*
- Potential interventions. *Objective: to list potential interventions as identified by farmers. From the seasonal calendar and other discussions, describe some possible intervention strategies arising from the discussion with farmers.*

Annexure 2

Quick Feed Survey - Fodder Adoption Project

Respondent name	
Affiliation and job title	
Country	
District	
Date	

Typical households

Poor (lowest third of hh)	Middle- income (middle third of hh)	Wealthy (top third of hh)
---	---	--

Family size (adult equivalents)			
---------------------------------	--	--	--

Animals

		Poor	Middle- income	Wealthy	Rough average weight per animal (kg)
Herd composition	Dairy cows - lactating				
	Dairy cows - non lactating				
	Improved dairy cows - lactating				
	Improved dairy cows - non lactating				
	Draught cattle - working				
	Draught cattle - non working				
	Fattening cattle				
	Shoats				
	Equines				
	Other				

Non-crop feed

How much supplementary feed is fed annually per household?

	Name and description	Poor	Middle-income	Wealthy	Local unit name	1 tonne = how many local units
Supplement 1						
Supplement 2						
Supplement 3						

Grazing and common property resources

What percentage of overall roughage (i.e. crop residues and green feed) comes from grazing resources) over the course of a year?

What percentage of overall roughage comes from cut and carry common property resources (e.g. tree fodder from forests, grass from roadsides etc)

Production per household (per year)

Production	Milk yield per year (litres)			
	Meat offtake per year (kg)			

