Participatory evaluation of planted forages in Ada’a, Miesso and Alamata woredas of Ethiopia
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Facilitated by the Fodder Adoption Project, Office of Agriculture, Office of Pastoral and Rural Development and in collaboration with other stakeholders
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Background and Objectives

The IFAD-funded Fodder Adoption Project facilitated local fodder stakeholder platforms in three pilot learning woredas (Ada’a, Mieso and Alamata) starting in May 2008. Through these stakeholder platforms different fodder options were introduced to farmers with the aim of alleviating the feed scarcity problem for enhanced market-oriented livestock production. Through focus group discussions with farmers and other stakeholders, different forage species were selected by farmers to be planted on their farms. Farmers evaluated the performance and impact of the different forages they planted in 2008 and made further choices on which to plant in following years. The results of the initial evaluation process revealed that there were preferences for certain forage species from the various options they tried in their farms. During the second year, the farmers were encouraged to plant the forage species of their preference for further fodder development. Through the activities of the stakeholder platforms successful fodder species and the processes which led to their uptake have been scaled out to new kebeles and farmers in the three woredas. As a result, the number of farmers participating in forage development increased from 44 to 84 in Ada’a, from 40 to 80 in Miesso and remained at 20 in Alamata in both 2008 and 2009 planting seasons.

A participatory forage evaluation was carried out in Sept 2010 to understand and document the farmers’ perceptions of the forages they had grown.
Methodology

Project sites

The three Pilot Learning Woredas (PLWs) where the Fodder Adoption Project (FAP) is working jointly with a number of stakeholders are Ada’a and Miesso in Oromia and Alamata in Tigray. Alamata and Miesso are dry areas in the lower altitude areas of the Ethiopian highlands where insufficient rainfall and recurrent drought are prevalent whereas Ada’a is located in the mid altitude highlands with reliable rainfall to support good crop/fodder production.

The fodder evaluation process at the three sites for the 2009 growing season took the form of a participatory rural appraisal (PRA) with a semi-structured format as opposed to selecting individual farms as was done in 2008. The PRA approach was chosen to reduce resource requirements while producing an overall aggregate perception of the farmers. There were 4, 4, and 2 farmer-group meetings in Ada’a, Miesso and Alamata respectively with each group constituting 6–10 farmers. In Ada’a, the four groups of farmers were selected from the two kebeles (Godino and Kaliti) making 2 farmer-groups from each kebele. There were a total of 8 kebeles in Miesso participating in FAP in 2009. The selection of farmers was made from all the 8 kebeles by merging farmers from 2 kebeles at a time into 1 group to make a total of 4 groups. In Alamata, as there were only 3 kebeles participating in the fodder project in 2009, only 2 groups were made; one from Tumuga and the other from Laelay Dayu and Gerjelle.

The overall evaluation process took place between August 2 and September 4, 2010 including travel and organization.

Forage interventions for smallholder farmers

During the focus group discussions at the end of the first year (2008), the following forages were identified and selected by farmers at the three project sites depending on farmers’ preferences and land suitability to increase feed availability.

- Oats/vetch: These are annual forages sown as a grass-legume combination grown every year on arable land under rain-fed conditions to provide green feed as cut-and-carry in the wet season and also to provide hay to reduce dry season feed shortage.
- Maize/lablab or sorghum/cow pea: Maize and sorghum are important cereal crops in Ethiopia with maize being grown in moisture dependable areas whereas sorghum is grown in moisture deficit dry areas. Maize/lablab and sorghum/cow pea are grown as mixtures to provide cereal grain for human food and combined green feed and crop residues for livestock feed.
- Napier grass/alfalfa or Rhodes grass/alfalfa: These are perennial forages grown as a grass-legume combination that have potential to grow over 4-5 years under good management and supplementary irrigation and are used mainly as green feed to provide year round feed as well as for hay in the case of Rhodes grass/alfalfa combination or as a sole fodder.
- Sesbania and pigeon pea: These are shrub legumes with deep root systems to reach moisture deep in the soil and to grow and retain their leaves long in the dry season. Shrub leaves provide a high value protein supplement to roughage such as crop residues and grass hay in the dry season.
- Fodder beet: This is a root crop grown on deep soil preferably by applying manure to provide dry season feed by chopping and feeding the tubers as well as the tops as green feed.
The forage evaluation process

A semi-structured format for participatory evaluation was developed by FAP staff and discussed with the development agents (DAs) and staff of the Office of Agriculture and Rural Development (OoARD) and Office of Pastoral and Rural Development (OoPRD) in all the three sites before the discussions with the farmers.

The evaluation format consisted of five main parts:

1. General questions related to the participant farmers in the evaluation, the number of farmers planting the different forages in the respective kebeles and those who did not plant forages and the possible reasons for not planting
2. Agronomic field assessment of the planted forages
3. Utilization and impact assessment of the forages
4. General remarks on individual forages which included their positive and negative attributes as perceived by farmers.
5. Overall comments on the fodder development and livestock production in the kebeles and in the woreda in general.

Selection of farmers to participate in the evaluation process was made by the DAs with assistance from the woreda offices. Participants in the evaluation process included farmers, experts from OoARD/OoPRD, DAs and FAP staff. The farmers in each group were briefed about the overall intention of the evaluation: understanding farmer views on forages to inform further development within and outside the intervention areas. The farmers were then introduced to the method of the evaluation: the use of a participatory approach with a focus on allowing farmers to say what they feel about the forages they grow in the various aspects of forage field management, utilization and impact. The rest of the evaluation team played primarily the facilitation role and it was the farmers who made different comments about the forages. The evaluation process took a maximum of an hour and half with each group and in each site.

Participatory forage evaluation in Ada’a woreda

General information of the forage planting

The forages grown in 2009 in Godino and Kaliti kebeles of Ada’a woreda included: Oats/vetch, Napier/alfalfa, fodder beet and maize/lablab. The acquisition of seeds of oats/vetch, alfalfa and fodder beet was facilitated by the project through connecting farmers with seed suppliers, while Napier grass and lablab were either facilitated by other stakeholders or were acquired through farmer-to-farmer seed sharing. It was reported that a total of 84 farmers planted the different forages in 2009, primarily oats/vetch on a total of about 12.5 hectares of land in the two kebeles. The year of 2009 was a good year in Ada’a with sufficient and timely rainfall and resulted in good crop yields as a consequence.

From the list provided by the DAs and the information given by the participants during the evaluation process, it was observed that the farmers in Ada’a have continually shown interest and willingness to continue the fodder development apparently due to a realization of the importance and usefulness of the forages to mitigate feed shortages for their livestock and the notable impact on the milk yield and improved body condition of the animals.
The increase in participation was evidenced by the doubling in the number of farmers planting forages as compared to 2008 planting season (44 to 84) and by farmers’ willingness to pay for the cost of the seeds. FAP did help in sourcing and transportation of the seeds from the national research centers. Lablab seed was not sourced in 2009, but some farmers had seed from harvests of 2008 planting. 3/6 farmers did not plant fodder beet due to their low level of awareness regarding its benefits. Oats/vetch was planted by all the farmers who bought the seeds. This confirms that the crop is well accepted by the farmers. Possible reasons for its popularity are discussed later in the comments section relating to each forage species.

Agronomic assessment of forage species

Agronomic parameters such as germination, establishment, vigour and tolerance to moisture stress were discussed with farmers. The farmers were asked to rate the different forages on a 4 point scale: 0 to 3;
0 being lowest and 3 being the highest performance. Based on the assessment of the farmers (Figure 1), oats/vetch and lablab scored best for germination, establishment and biomass yield whereas lablab scored best for its performance without fertilizer input. Both oats/vetch and lablab were observed to be effective in suppressing weeds and therefore were less labour-demanding. According to the assessment, all the crops are sensitive to serious moisture stress although alfalfa was particularly susceptible.

Keys: OV = Oats/vetch; NA = Napier grass/alfalfa; FB = Fodder beet; ML = Maize/lablab.
Figure 3. Mean rating on agronomic performance of forages planted in 2009 at Ada’a.

Utilization and impact assessment of planted forages

In this section, the assessment of the various ways the forages were utilized, the livestock group to which the forages were fed in particular and any possible reasons for feed prioritization, the overall ranking of the forages and the reasons for best ranking are discussed. The results of the assessment reveal that almost all the farmers in the groups harvested and fed all the forages at green stage except a few farmers who kept small portions oats and vetch for seed harvest and fed the straw. This indicates that there is a serious need for feed during the wet season when all the cereals are at their vegetative stage and as such there is almost no feed from crop residues or any other source. The planted forages serve as the main source of feed during this period. There might be some weeds and thinnings from crop fields but these are very insignificant as the farmers explained. Some farmers in Godino harvested oats/vetch at a young stage since they also needed to free up land to prepare for the next crops such as chickpea as a second crop.

The livestock group fed were primarily dairy cows followed by traction oxen. This was common for all the forages mainly due to the limited quantity of feed which limits the provision to other classes of animals. Dairy cows are prioritized due to the immediate impact of the forages on milk yield even with small quantities of the forages. Oats/vetch was ranked first by most farmers for its impact on milk yield and ease of management as compared to other forages.

This was followed by napier/alfalfa and maize/lablab for their high green biomass yield and preference for dairy production. Fodder beet is apparently new to the area and as such the farmers did not have much experience with it. However, those who planted commented on its usefulness for dairy cows in increasing milk yield.
Participatory evaluation of fodder species

Table 1. Utilization and impact assessment of the forages planted in 2009 at Ada’a

<table>
<thead>
<tr>
<th>Forage type</th>
<th>Method of utilization</th>
<th>Livestock group fed</th>
<th>Reason for feed prioritization</th>
<th>Rank</th>
<th>Reason for rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oats/Vetch</td>
<td>cut and carry</td>
<td>dairy, traction, all animals</td>
<td>milk, weight gain</td>
<td>first</td>
<td>milk, body condition, ease of management</td>
</tr>
<tr>
<td>Napier/Alfalfa</td>
<td>cut and carry</td>
<td>dairy, traction</td>
<td>Milk</td>
<td>second</td>
<td>Perennial nature, continuous harvests/ biomass</td>
</tr>
<tr>
<td>Maize/Lablab</td>
<td>cut and carry</td>
<td>dairy, traction, calves, sheep</td>
<td>milk, body condition, weight gain</td>
<td>second</td>
<td>good green biomass, for dairy cows</td>
</tr>
<tr>
<td>Fodder beet</td>
<td>cut and carry</td>
<td>dairy, traction</td>
<td>Milk</td>
<td>third</td>
<td></td>
</tr>
</tbody>
</table>

Assessment of attributes of individual forages

The farmers were asked open questions on whether they had any positive or negative attributes they would like to express for individual forages they planted. Accordingly, they stated a number of positive comments for each forage ranging from field management, utilization and impact and other important points of interest. Many issues which were not captured in the former discussions were included here which makes the assessment rich and multi-dimensional.

Table 2. Positive and negative attributes of forages planted in 2009 in Ada’a

<table>
<thead>
<tr>
<th>Forage type</th>
<th>Positive attributes</th>
<th>Negative attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oats/ vetch</td>
<td>High biomass</td>
<td>Vetch sometimes is affected by pests</td>
</tr>
<tr>
<td></td>
<td>Suppresses weeds and clean field for next crop season</td>
<td>Oats becomes less palatable when over matured</td>
</tr>
<tr>
<td></td>
<td>Requires simple cultural practices</td>
<td>Intercropping may create dominance of one crop over the other</td>
</tr>
<tr>
<td></td>
<td>Provide the possibility of double cropping option (chickpea after oats/ vetch) on Vertisol</td>
<td>Vetch seed shatters and can become a weed for subsequent crops</td>
</tr>
<tr>
<td></td>
<td>Can provide second harvest if cut early for green feed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provides fast establishment and healthy crop</td>
<td></td>
</tr>
<tr>
<td>Napier/alfalfa</td>
<td>Perennial nature and provides several harvests</td>
<td>Requires relatively intensive field management</td>
</tr>
<tr>
<td></td>
<td>Shows fast impact on milk yield</td>
<td>Needs irrigation</td>
</tr>
<tr>
<td>Fodder beet</td>
<td>Less affected by free grazers as the root is stored under ground</td>
<td>Affected by rust</td>
</tr>
<tr>
<td></td>
<td>Drought tolerant</td>
<td>Requires rich soil</td>
</tr>
<tr>
<td></td>
<td>Palatable by dairy cows</td>
<td>Needs frequent cultivation</td>
</tr>
<tr>
<td>Maize/Lablab</td>
<td>Lablab leaves mixed with cereal residue increases the intake of the residue</td>
<td>Difficulty to harvest the maize separately if intercropped with Lablab</td>
</tr>
<tr>
<td></td>
<td>Lablab restores soil fertility</td>
<td>Green Lablab is less palatable at initial stage</td>
</tr>
<tr>
<td></td>
<td>Notable impact on milk yield</td>
<td></td>
</tr>
</tbody>
</table>

As can be observed from the assessment, oats/vetch has many strong attributes which make it attractive.
to most farmers. Its negative aspects could easily be controlled and managed. As oats/vetch is an annual crop (flexibility in the farm land use plan) and cultivated at the same time and using similar methods to cereals such as wheat and barley, farmers are more comfortable to plant it than any other forage crop.

The farmers expressed their desire to continue growing oats/vetch regardless of some of its drawbacks. With regard to the price of the seeds, the farmers indicated a willingness to pay of Birr 10.00/kg for oats and vetch, Birr 5.00/kg for lablab, Birr 400.00/kg for alfalfa, and Birr 50.00/kg for fodder beet.

General comments on forage development and livestock production in Ada’a

The following general comments regarding the lessons learned from the forage development activities and future perspectives were shared by the farmers at the end of the assessment sessions:

- Grazing land is almost nil at Ada’a and factory by-products are expensive. This makes cultivated forages a promising option as a cheap and high quality feed resource.
- Many other farmers are visiting the forage fields and showing interest to try them. The OoARD/Livestock Office has to facilitate the scaling out to a larger degree by increasing the farmers’ level of awareness through training.
- Wives who noticed the benefit of the forages encouraged their husbands to continue to grow the forages.
- Women favour dairy cows while men tend to favour traction oxen during feeding
- Free grazing is a challenge to grow perennial forages – community efforts and by-laws are necessary to deal with this problem.
- Livestock production is drawing the increasing attention of farmers due to the increased level of awareness of its importance for nutrition, income and traction. Farmers are realizing that without better feeding, the animals cannot perform to their potential.
- Market demand for livestock products is increasing even in local markets and communities. Therefore, if resources (land, cross-bred cows, etc) permit, forages and livestock businesses are likely to become more prominent.
- Continued technical backstopping and mentoring is essential for further and sustainable development.

Participatory forage evaluation in Miesso woreda

General information of the forage planting

Forage options grown in the 8 kebeles in Miesso woreda in 2009 were cow pea, cow pea/sorghum, lablab, lablab/sorghum, Napier grass and pigeon pea. The 8 kebeles which were part of the scaling out program of the woreda included Huse Mandera, Torbayo, Gorbo, Billilo, Agamsa Chale, Hunde Misoma, Hargeti and Kenteri.

FAP collaborated with Adami Tulu Agricultural Research Center (ATARC) to provide seeds of cow pea, lablab and pigeon pea to the new 4 kebeles (Agamsa Chale, Hunde Misoma, Hargeti and Kenteri) whereas seed provision for the on-going 4 kebeles (Huse Mandera, Torbayo, Gorbo and Billilo) that had started in 2008 had their own source from the previous year. Our principle was to try and avoid providing more than starter seed to avoid development of dependency and unsustainable adoption. Napier grass development was facilitated by OoPRD and 80 farmers in total participated in 2009 in the 8 kebeles, i.e.
10 farmers from each kebele. The total area planted to the different forages in the year amounted to about 22.5 hectares. The major forage crops planted by farmers which survived on most farms were cow pea followed by lablab. Napier grass and pigeon pea planting material were also sourced for all farmers by OoPRD but the rate of survival was poor for both crops due to moisture stress in the case of Napier and infestation of the seeds by insects in the case of pigeon pea. The 2009 crop season was considered as a bad year due to the erratic and short rainfall in the woreda. However, cow pea being a short duration and drought-tolerant crop, was grown satisfactorily in 2009. Four groups of farmers participated in the forage evaluation process by merging farmers from each 2 kebeles into one group. Grouping of the kebeles was made as follows:

- Group 1: Huse Mandera and Torbayo
- Group 2: Gorbo and Billilo
- Group 3: Agamsa Chale and Hunde Missoma
- Group 4: Hargeti and Kenteri

The farmers at Miesso were so dynamic that regardless of the discouraging climatic conditions, they tried each and every opportunity to grow possible crops in the area. This was observed when the farmers planted the crops twice or even three times during the season when rain started and then stopped. Cow pea and lablab were planted by the majority of the farmers and were observed as tolerant to drought when even cereal crops such as sorghum could not withstand the stress. The farmers were willing to continue to grow the fodder species for various reasons. Cow pea and pigeon pea are needed as dual purpose crops; Napier and lablab are needed for their high biomass yield. Farm level seed production and sharing is becoming a common practice in Miesso. Therefore, sustainability of seeds/planting materials does not present a problem. However, this practice needs to be reinforced by the technical and institutional support from the OoPRD. In the absence of any local source, the farmers are willing to buy the seeds from market. Asked about their willingness to pay they responded as follows:

- Cow pea – Birr 10.00/kg
- Lablab – Birr 20.00/kg
- Pigeon pea – Birr 15.00/kg
According to the farmers, Cow pea seed can now be obtained from local markets. Lablab and pigeon pea are not available in the market which makes their demand higher. The farmers are not worried about Napier grass planting material since a small number of cuttings will be adequate as starter material.

Agronomic assessment of forage species

Similar agronomic parameters to those used in Ada’a were employed to rate the field performance of the forages. All the crops were rated highly for germination and establishment except pigeon pea which was rated average. Pigeon pea may do better if planted from seedlings rather than seeds. Napier and lablab were rated highest in terms of biomass yield whereas pigeon pea was rated lowest for forage yield. The legume forages were the ones that performed best without commercial fertilizer. The leafy forages (cow pea and lablab) suppress weeds and so require less weeding and hence labour. Pigeon pea stands first in tolerance to moisture stress followed by cow pea. These crops survived the moisture stress in the critical drought period when cereal crops such as sorghum and maize failed to survive. The farmers who planted sorghum/cow pea mixture managed to achieve some production compared to those who planted sorghum or maize as sole crops which totally failed.

Utilization and impact assessment of forages

Cow pea and pigeon pea as dual purpose crops were harvested and utilized at a mature stage using the grain for humans and the residue for the animals. Some farmers mentioned that they harvested cow pea at green stage for the grain for humans and the leaves for the animals. Lablab and Napier were harvested green as a cut-and-carry feed. First priority during feeding was given to the dairy cows followed by traction/fattening animals. At Miesso, fattening is a priority and men prefer feeding the fattening animals. However, since women are closer to the farm and responsible for the routine animal care, they favour feeding the dairy cows. The reason for feed prioritization was explained to be the fast response of the dairy cows to increase milk yield even when small amounts of feed are given. The farmers mentioned that in order to notice similar level of impact with the fattening animals one needs a good amount of feed for an extended period of feeding.
Cow pea was ranked first by all the farmers as a multipurpose crop (food, fodder, cash, soil enrichment, etc). Those farmers with irrigation access rated Napier grass equal to cow pea for its high biomass from a small amount of land and its capacity to give a year round green harvest. Lablab stood second for its high green fodder yield and pigeon pea third because of low fodder yield in addition to its lower palatability.

Assessment of attributes of the individual forages

Cow pea, among all the introduced fodder crops, was assessed to have the most merit and just a few negative attributes which agrees with its high overall preference by the farmers. Some farmers fed cooked cow pea grain as a treatment to sick animals and observed fast recovery. The other crops, though they too have a reasonable number of positive attributes also have some negative attributes which make them stand second or third in the preference rating. Both cow pea and pigeon pea (dual purpose crops) were evaluated to be susceptible to pests at the post harvest period. Pigeon pea pods are also affected by insects during the growth stage. The farmers, though they say that they have traditional ways of combating pests, also expressed the need for additional help from the experts in handling the pest problem.

Lablab, despite its high biomass and seed/grain yield, was disliked for its bitterness of grain which makes it unpalatable to humans. Nevertheless, it was stated that some farmers tried to eat the cooked grain.
after pouring out the water from the first round boiling of the grain to reduce the bitterness. They testified that the grain can be used for human food without any problem. However, it was suggested during the discussion that further experimentation has to be done with the aid of the professionals to ensure safety for human use. The farmers with irrigation facilities scored Napier grass equally to cow pea and perhaps even higher for its high biomass yield which can be fed to fattening animals for cash return.

Table 4. Positive and negative attributes of forages planted in 2009 in Miesso

<table>
<thead>
<tr>
<th>Forage type</th>
<th>Positive attributes</th>
<th>Negative attributes</th>
</tr>
</thead>
</table>
| Cow pea       | High palatability at all stages of growth  
                  Fast recovery after damages such as hail storm  
                  Needs simple cultural practices  
                  Drought tolerance  
                  Less labor requirement for weeding  
                  Dual purpose (food and feed)  
                  High grain and biomass yield  
                  Observed impact on milk yield  
                  Soil fertilizer restoration  
                  Fast cooking ability of grain – saves fuel and time  
                  Grain has its own oil and so no need of adding oil for wat (sauce)  
                  Grain is sweet (delicious) | Grain/seed is susceptible to pests  
                  Attacked by wild animals as it is very palatable |
| Lablab        | High biomass  
                  Soil fertility improvement  
                  High seed yield especially from re growth  
                  Drought tolerant  
                  Less susceptible to pests as compared to cow pea and Pigeon pea | Grain is not commonly edible (bitter) as opposed to cow pea though some farmers started eating boiling and flushing out the water  
                  Late maturing as compared to cow pea  
                  Seed is affected by aphids at second harvest  
                  No market for grain as it is not common as human food  
                  Forage alone less palatable at green stage |
| Napier grass  | Perennial nature and high biomass from individual and frequent harvests  
                  Palatability at vegetative stage by all classes of animals  
                  Good for milk yield and body condition  
                  Soil water conservation | Irrigation requirement in the dry season  
                  Less palatable when over matured  
                  Requires relatively intensive field management |
| Pigeon pea    | High grain yield  
                  Grain is edible by humans  
                  Re growth after cutting (perennial nature)  
                  Drought tolerant  
                  Establishes fast | Susceptible to pests and needs cost of pesticide and skill of application  
                  Forage is less palatable by cattle;  
                  Only goats and camels take it fast  
                  Stem not used as feed |

General comments on forage development and livestock production in Miesso

- Miesso area is food insecure due to low grain production as a result of low rain fall. Livestock production is the only option at the moment and therefore fodder development with species suitable to the environment is the only option.
On-farm forage seed production and farmer-to-farmer sharing is a common practice in the area. This practice has to be assisted by the stakeholders to improve further strategic dissemination of the materials to a larger number of communities.

There is a need to increase awareness with the farmers in other kebeles so that the feed issue is given full attention for expansion in the woreda.

Forage seeds have been distributed to many farmers through farmer-to-farmer seed sharing without the knowledge of the extension office. Therefore, there is a need to follow up and monitor the development.

Use and further development of indigenous knowledge of pest management is essential to effectively control pests.

Earlier, the farmers did not realize the usefulness of the fodder crops which made the adoption of the technologies slow. Now it has become evident that the fodder crops are not only useful as animal feeds, but are good sources of human nutrition and income. Therefore, farmers are convinced to allocate a reasonable size of land for fodder crops because of market demand and increased level of awareness.

Organized seed production and farmer-to-farmer experience sharing has to be given emphasis by the OoPRD for further scaling out.

Participatory forage evaluation in Alamata woreda

General information of the forage planting

Forage options grown in the 3 kebeles in Alamata woreda in 2009 were cow pea, pigeon pea and Napier grass. A few farmers at Tumuga planted alfalfa with irrigation. The three kebeles were Tumuga, Gergelle and Laelay Dayu. FAP facilitated cow pea seed supply whereas OoARD provided pigeon pea seed and Napier grass to farmers. 20 farmers from the 3 kebeles participated in the Fodder Adoption Project in 2009, i.e. 10 farmers from Tumuga planted cow pea, Napier grass and alfalfa, 5 farmers from Gergelle planted Napier grass and cow pea and 5 farmers from Laelay Dayu planted pigeon pea and cow pea.

![Figure 7](image_url) | Number of farmers acquiring planting material and planting forages in 2009 at Alamata.
The 2009 season in Alamata lowland areas was exceptionally dry and farmers were seriously affected by drought. Most of the forage fields planted were affected by drought and failed to establish. It was difficult to assess the forage planting in terms of area of land due to the serious drought encountered by farmers. Nevertheless, the farms at Tumuga fared better due to the availability of supplemental irrigation. Two groups of farmers participated in the forage evaluation, i.e. one group from Tumuga kebele (10 farmers) and the other group combining Gergelle kebele (5 farmers) and Laelay Dayu kebele (5 farmers).

Agronomic assessment of the forage species

Apart from the few irrigated farms at Tumuga, almost all the rest were not successful due to the drought. The farmers could only evaluate the performance of the forages from the irrigated farms and from their past experience. Cow pea was rated the best in all aspects of the field performance followed by alfalfa and Napier grass in irrigated fields. The farmers could not evaluate pigeon pea as it failed to germinate (due to lack of moisture) and at the same time they had little past knowledge about the crop.

Utilization and impact assessment of forages

Those farmers who planted and had good establishment utilized all the forages as green cut-and-carry feeds. The obvious reason for use of the green cut-and-carry system was the shortage of feed in general and it was not possible to keep the feed for drier periods. There was no serious targeted feeding in the area in contrast to Ada’a and Miesso. Market orientation of the livestock products is less in the area and the amount of the forages produced is too small to attract any market oriented targeted feeding. Whatever amount of feed produced was provided to the whole herd in common. Nonetheless, the women farmers expressed their observation of the impact of the forages on milk yield of the local cows.

Cow pea was ranked highest by the farmers for its high biomass yield under rain fed conditions. The farmers with irrigation facilities ranked Napier grass highest for high biomass yield and year-round green forage supply.
Table 5. Utilization and impact assessment of forages in 2009 in Alamata

<table>
<thead>
<tr>
<th>Forage type</th>
<th>Method of utilization</th>
<th>Livestock group fed</th>
<th>Reason for feed prioritization (Major impact area)</th>
<th>Rank</th>
<th>Reason for best rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow pea</td>
<td>cut and carry</td>
<td>All animals</td>
<td>milk, weight gain, body condition</td>
<td>first</td>
<td>Weight gain</td>
</tr>
<tr>
<td>Napier grass</td>
<td>cut and carry</td>
<td>dairy, calves</td>
<td>most affected during feed scarcity</td>
<td>first</td>
<td>Works well with irrigation, biomass, perennial nature</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>cut and carry</td>
<td>All animals</td>
<td>feed shortage for all animals</td>
<td>third</td>
<td></td>
</tr>
</tbody>
</table>

Assessment on attributes of individual forages

The general assessment of each forage crop was made considering both the pros and cons of the various forages. Cow pea was popular because of its simple management similar to that of other pulse crops. Its palatability by all classes of animals and contribution to soil fertility were among the positive attributes reflected during the discussion. However, one disadvantage mentioned was its single harvest per season. Napier grass was liked most due to its continuous growth and high biomass yield. Its negative attributes included its toughness when over matured which made it unpalatable to the animals. Some of the positive attributes of alfalfa mentioned by farmers included its soft stem and a reduced threat of theft since people did not recognize it as a useful feed. Its negative attributes included its susceptibility to disease and pests and its low seed yield. The farmers at Alamata, unlike those at Miesso are not used to eating cow pea grain and are less sensitive to the importance of improved livestock feeding in general. This might be attributed to less awareness of the market for livestock products in the area.

Table 6. Positive and negative attributes of forages in 2009 in Alamata

<table>
<thead>
<tr>
<th>Forage type</th>
<th>Positive attributes</th>
<th>Negative attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow pea</td>
<td>Palatability by all livestock classes</td>
<td>Only single harvest per season (annual) and incur additional cost every year for establishment</td>
</tr>
<tr>
<td></td>
<td>Fast impact on body weight and condition of animals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simple and similar field management like other pulses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No threat of theft</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good for soil fertility</td>
<td></td>
</tr>
<tr>
<td>Napier grass</td>
<td>Perennial nature and year round green forage supply</td>
<td>Threat of free grazing animals and theft</td>
</tr>
<tr>
<td></td>
<td>High biomass yield</td>
<td>Stem is woody and leaves are rough when over matured</td>
</tr>
<tr>
<td></td>
<td>Fast impact on milk yield</td>
<td></td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Less threat of theft as people recognize it as weed</td>
<td>Susceptibility to diseases and pests</td>
</tr>
<tr>
<td></td>
<td>Soft plant even at a later stage of maturity</td>
<td>Intolerant to weed</td>
</tr>
<tr>
<td></td>
<td>Perennial nature</td>
<td>Low seed yield</td>
</tr>
<tr>
<td></td>
<td>Good as supplement to crop residue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diverse ways of utilization (green, hay)</td>
<td></td>
</tr>
</tbody>
</table>
General comments made by farmers on forage development and livestock production in Alamata

- There is potential for farmers who are already aware of fodder development issues to share their knowledge and experience with other farmers in the community.

- Feed scarcity forced farmers to feed cactus pads to the livestock following burning of the spines. There is a huge need for charcoal to burn the spines which aggravates deforestation and environmental degradation. With the introduction of cultivated forages these negative environmental effects could be reduced.

- The biomass yield of the cultivated forages is very high from a small area of land.

- The current production level of forages per farmer is very small which needs to be increased to a larger scale if the farmers are interested to improve the productivity of their livestock.

- The size of grazing land is decreasing to zero and the area is exposed to continuous drought. Therefore, there is a serious need for developing improved forages.

- The OoARD has to work harder on the scaling out and sustainable seed production and distribution. The office has already started encouraging farmers in seed production and reselling to the office who in turn sell to the new farmers. Cow pea seed is being sold for Birr 8.00/kg in the area.

Summary and Conclusion

In general the participatory forage evaluation process was accomplished successfully in all the three sites. The process was well appreciated by the farmers and the experts since it allowed full participation of the group members in contrast to structured interviews which limit the expression of individual comments. It was possible for all involved to learn from the discussions since there was useful experience developed among farmers on the process of growing and utilizing the forages. The scaling out of the forages is now proceeding spontaneously through the transfer of forage seeds and knowledge from farmer to farmer without the influence of external parties: the farmers need only proper facilitation of the transfer from farmer to farmer and in many cases this happens spontaneously. It was peak weeding season in Ada’a and Muslim fasting season in Miesso when the evaluation was made. However, the farmers who are well acquainted to the forage development did not hesitate to share their valuable time to participate in the evaluation. This implies that the farmers and stakeholders have built a strong mutual social capital in the farming community.

Most farmers in the groups expressed their appreciation of the fodder development and the fast impact it made within a short period of time. They further underlined that this engagement should not stop at this level; there is a need for scaling out so that the wider farming community can benefit. Certain forages such as oats/vetch in Ada’a and cow pea in Miesso were viewed as a breakthrough in terms of livestock production and human food production. Farmers are asking for more options to minimize risks.

Farmers have their own way of doing things distinct from what the development practitioners advised. For example the farmers in Miesso have tried to experiment with the use of lablab grain for human food and...
also treating sick animals with cow pea grain. These and other similar practices within the community have to be encouraged and backed up with scientific support.

There is a serious challenge to the experts and DAs to strengthen their communication with the farmers and to ensure farmers at all levels are supported to make decisions on issues that are critical to their livelihoods.

In general, continued collective action and efforts by concerned stakeholders working in the project woredas to create farmer awareness and to promote the value of fodder crops linked to wider livestock value chain issues would yield considerable dividends in enhancing livestock-based livelihoods.

Acknowledgements

The involvement of the farmers during the evaluation process in the three sites was very active, encouraging and participatory and the farmers deserve much of the appreciation. The DAs and staff of OoARD and OoPRD involved in all the sites have been very cooperative and supportive in the facilitation during the field evaluation process and we thank them for their time and effort. Facilitating, sharing of experiences and contribution by Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project and by all stakeholders working in the respective woredas on fodder improvement is highly valued.