



Ex-ante assessment of demand for improved forage seed and planting materials among smallholder farmers in Ethiopia: A contingent valuation analysis

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Growth in incomes, population and the rate of urbanization in Ethiopia are driving demand for more and better quality livestock products. Yet, shortages in the availability of forage seed and planting materials (FS and PM) are impeding the supply of adequate animal feed. These shortages constrain Ethiopian farmers from taking advantage of development and market opportunities offered by increasing demands for livestock products. It hinders improvement to farmers' livelihoods and contributions of livestock to national income. This study implements a contingent valuation (CV) study augmented with break-even-point (BEP) analysis to explore the potential for commercial forage seed industry development in Ethiopia.

Objectives

Currently, a fully-functioning market for FS and PM does not exist and many investors are unaware of the potential market demand and prices needed to assess the financial viability of establishing FS and PM industry. The limited supply of FS and PM available is bought by NGOs and government entities (regional state offices) for distribution to the farmers at no cost or subsidized price.

Therefore, this study seeks to assess the 'potential' market demand and prices for improved commercial FS and PM among smallholder farmers in Ethiopia, specifically to:

1. Elicit information on farmers' awareness, attitudes, perceptions and interest in purchasing improved FS and PM;
2. Estimate livestock farmers' willingness to pay (WTP) for improved FS and PM;
3. Determine the factors which influence farmers' WTP for FS and PM; and
4. Determine whether the estimated livestock farmers' WTPs show there are sufficient incentives for entrepreneurs to invest in establishing enterprises to produce and market FS and PM.

The farmers' WTP and variables affecting farmers' WTP in this study were estimated from CV survey data. The survey sampled 450 farm households randomly drawn from Africa RISING pilot project clusters in four regions in Ethiopia: Oromia; Amhara; Southern Nations, Nationalities, and Peoples (SNNP); and Tigray. The farmers' WTPs for FS

and PM were elicited using two CV questioning formats: the closed-ended double-bounded dichotomous choice (DBDC) and the open-ended formats (for details, see: Mitchell and Carson 1989). Break-even point (BEP) analysis was also conducted to assess the commercial viability of FS and PM production and marketing businesses in light of the current involvements by NGOs and the public sector in forage seed distribution and marketing.



Key findings

- There is already a significant level of awareness, but a relatively low level of adoption of improved forage crops among sample smallholder farmers. Approximately 87% of the sample reported they are aware of improved forage crops of some kind, while only 51% of the sample households reported ever using improved forage crops.
- There is significant potential market demand for improved FS and PM among smallholder farmers in

Ethiopia. Between 64–81% of the farm households surveyed were willing to buy improved FS or PM, if they were commercially available in the market.

- The estimated WTPs were found to be 44–675% of the FS and PM prices observed in the market. The highest percentage of WTP relative to the market price (675%) was observed for desho grass planting material. Meanwhile, the estimated WTPs for alfalfa, Rhodes grass, pigeon pea, cow pea, lablab and vetch were ETB 291, 211, 143, 150, 135 and 24 per kilogram, respectively.

However, the WTP for oats, desho and Napier grass at ETB 14.3, 2.7 and 1.6 per unit of PM, respectively, were found to be higher than their current market prices. The market prices observed in the study were those mainly charged to NGOs and government distributors of FS and PM.

- The econometric analyses revealed that one of the most important factors positively influencing farmers' WTP were their awareness of FS and PM. This finding indicates the critical importance of extension services in raising awareness of the likely benefits of feeding animals improved forage, as well as how to grow FS and PM. There is also a need to use promotional materials and advertising to raise awareness of, and generate demand for, FS and PM among smallholder farmers.
- The fact that the estimated farmers' WTPs for some FS (alfalfa, Rhodes grass, pigeon pea, cow pea, lablab and vetch) were below the prices paid by NGOs to seed producers (to distribute to farmers for free or at subsidized prices) indicates that the NGO price structures for some FS may not be commercially sustainable.

In such situations, forage seed prices would have to drop significantly in order to make farmer purchases directly from seed producers or seed dealers more attractive. This could occur if future demand from NGOs disappeared or declined greatly. Alternatively, for some PM (oats, desho and Napier grass) the WTPs were found to be higher than current market prices, indicating the existence of stable price structure for these PMs.

- In order to assess the financial profitability of FS and PM production and marketing business, the WTPs were compared with the estimated break-even prices. The break-even price for alfalfa, vetch, oats, and Rhodes grass seeds were found to be greater than their respective WTPs. Assuming the WTPs are the potential market price facing the seed producers, these results indicate there is no profit incentive for alfalfa, vetch, oats and Rhodes grass seed producers.

This also suggests the appropriate role of NGOs is in subsidizing these forage seeds and their withdrawal from FS and PM markets might make some FS and PM production unprofitable for seed producers—unless the government takes up the role of NGOs in buying the FS and FM and distributing it to farmers at subsidized prices. On the other hand, the break-even

prices for pigeon pea, cow pea, lablab FS production and the break-even prices for desho and Napier grass PM production were lower than their respective WTP values. This indicates the seed producers could at least cover their costs of production and the provision of a price subsidy might not be necessary if NGOs stop buying and distributing the FS and PM for these forage crops.

- Improving productivity is one way of increasing the competitiveness of FS and PM production. Assuming the WTP figures reflect the potential market prices facing the seed growers, the level of productivity per hectare required to cover the total per hectare production costs was also assessed by determining the break-even production of seed per hectare. For instance, for alfalfa, at the observed WTP, the break-even production required was about 446 kg/ha, implying the need to increase alfalfa per hectare yields by 78% to break even.

Similarly, productivity increases of about 24%, 23%, and 118% would be required for Rhodes grass, vetch and oats, respectively, in order to break even given their respective WTPs. The results indicate substantial yield improvements are required for alfalfa, Rhodes grass, vetch and oats to cover total production costs. However, for other forage crops, their break-even yields were lower than the estimated yield levels, and although yield improvement is desirable in the short-

run, it is not as pressing as for the seed production of other forage crops.

- Public or NGO engagement in the distribution of FS and PM may make sense in areas in which private sector involvement is not currently profitable and/or too risky. However, ultimately, potential investors will need to be able to operate profitably for their businesses to be sustainable in the long-run.

Thus, there is a need to delineate where the public and private sectors can and need to invest, to encourage private investment in the establishment of potentially profitable FS and PM enterprises, and public investment or private-public partnerships (PPPs) in specific FS and PM value chains. The results of the WTP study and BEP analysis provide insight as to whether, and to what degree, government price support will be required to ensure the FS and PM production and marketing businesses are sustainable in the long-term.

One of the most important future research areas could be in terms of detailed characterization of the public and private good nature of FS and PM production and marketing, which would in turn inform the appropriate organizational and business models and public-private partnerships for the sustainable development of forage crops sector. Farmers' also need appropriate technical advice on the proper harvesting, storage, transportation, processing and utilization of forage crops.





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