



**Improving elements of haricot bean value chain in Alaba
Special District, Southern Ethiopia:
Experiences from IPMS**

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Abstract

The Improving Productivity and Market Success (IPMS) of Ethiopian Farmers project adopted a “participatory market oriented commodity value chain development” approach, to address problems and potentials for haricot bean production in Alaba Special District, in Southern Ethiopia.

With an emerging export market potential, attention needs to be paid not only to the production of haricot beans but also to the supply of inputs and services and marketing. Major problems diagnosed by the value chain partners included poor access to inputs including seeds, weed and disease problems, poor technology adoption and marketing of haricot bean. To address the above problems, various development actors developed haricot bean commodity with the IPMS project and Alaba Special District Office of Agriculture and Rural Development (OoARD) introduced value chain interventions for the past five years (2005 to 2010).

Initial intervention focused at building farmers capacity to multiply seed and establish seed bank using visits, trainings, demonstration, workshops, promotion and discussion. Later, to improve supply of inputs (seeds, fertilizer and agro-chemicals) support was provided to establish cooperative shop, private crop protection service and revolving fund with IPMS credit fund while comparing soil fertility technologies. Additional effort also focused at marketing of small pack, promotion of haricot bean, market linkage and establishment of seed cooperative.

Findings show an increase in farmers’ market participation from 54.5% in 2004 during baseline survey to 92% in 2009 during sample household survey. There is an increase in the proportion of farmers’ producing seed and change in focus from household consumption to seed business in targeted 19 PAs (Peasant Association). Survey results show a higher yield (9.5qt/ha) among fertilizer users compared with non users (7.2 qt/ha). On-farm yield plot trial (n=387) with 129 households (HH) in 17 PAs for three years shows mean yield of 7.04, 4.1 and 2.76 qt/ha for chemical fertilizer, haricot bean inoculants and control plots respectively. Farmers have clearly indicated their preference for the red and/or speckled varieties to white varieties. Increase in haricot bean seed multipliers from 64 HH in 4 PA to 426 HH in 19 PAs resulted in establishment of seed cooperative. While more actors are increasingly involved in value chain development leading to market oriented production, there is informal partnership and poor linkage among value chain actors. The study draws lessons on increasing production of haricot bean, strengthening input supply system and development of market intervention. On the basis of the findings, the paper outlines challenges, lessons and provides recommendations to improve existing value chain for development partners.

Key words: Haricot bean, Alaba, value chain, seed multiplication, seed banks

1. Introduction

The IPMS project, funded by the Canadian International Development Agency, was implemented to assist the Ministry of Agriculture and Rural Development in the transformation of smallholder farmers from a predominantly subsistence oriented agriculture to a more market (commercial) oriented agriculture.

The project, which started intervention in Alaba in 2005, adopted a “participatory market oriented commodity value chain development” approach, based on the concepts of innovation systems and value chains. Crucial elements in the approach are the focus on all the value chain components. Instead of focusing on production technologies *per se*, the approach also stresses the linking, capacitating of value chain partners, assessment and synthesis and sharing of knowledge among the partners.

Understanding of the value chain is essential to creating development strategies effectively. Value chain is a useful concept to upgrade competitiveness in commodity development. It helps to identify value chain aspects that are critical to improve chain performance and returns to chain actors. The framework allows governments aspiring to enhance their countries competitiveness or to pinpoint where their actions can have the most positive impact. Value chains encompass the full range of activities and services required to bring a product or service from its conception to sale in its final markets. Value chains include input suppliers, producers, processors and buyers (Campbell, 2008). The IPMS project and its partners have adopted the value chain concept to pinpoint where actions can have the most positive impact for haricot bean development.

The project introduced this approach in 10 Pilot Learning Woredas (PLW) in Ethiopia with the objective of testing/adopting so that it can be promoted nationwide. An integral part of the approach is the identification of marketable commodities and the value chain constraints and interventions. This was accomplished through a participatory process in all PLWs.

This case study focuses on the production, input supply and marketing intervention of multiple actors’ role in haricot bean development in Alaba District from 2005 to 2010. The objective is to document achievements, challenges and lessons gained in value chain development intervention.

Following the introductory section, the remaining sections are structured as follows. Section two deals with methods and approaches, while section three provides overview of the study area and haricot bean production. Section four portrays key elements of interventions in value chain focusing at production, input supply, marketing system. Section five presents results and discussion focusing at production, input supply and marketing interventions along the value chain. The section shows analysis of the situation, describes the roles and linkage of actors and cross cutting issues like gender, HIV/AIDS. Section six lists

challenges in value chain development and section seven presents' lessons and recommendations.

2. Methods and approaches

To start the development of a commodity, IPMS used a district level participatory market oriented value chain planning approach, aimed at identifying (i) main farming systems, (ii) potential marketable crop and livestock commodities at farming system level, (iii) constraints, potentials and interventions for value chain components, and (iv) value chain stakeholder assessment with potential (new) roles and linkages. Different value chain stakeholders were involved and consulted in the development process. Biophysical and socio economic data were collected, followed by open ended interviews with focus groups and key stakeholders.

This initial rapid assessment involved crop calendar, farmers seed preference ranking, and mapping of seed channel and actors. The rapid assessment was followed by some more detailed studies on haricot bean. The studies were conducted by partner institutions and/or students and/or IPMS staff using formal surveys, interviews and observations in particular CIAT's haricot bean marketing study (Ferris and Kaganzi, 2008). This was also accompanied by a series of household survey conducted over the years in the study area on market participation, variety adoption and haricot bean productivity. Field data was collected on sale of small pack of seeds for promotion in open markets. On-farm yield trial was conducted for three years to compare soil fertility technologies (chemical fertilizers and haricot bean inoculants). Haricot bean yield multiplication result was also in targeted PAs for two years.

To implement and stimulate value chain development approach and method for haricot bean in the district (*woreda*), the IPMS project facilitated different knowledge management and capacity development efforts in targeted PAs and at community level with concerned partners. The various value chain interventions are documented by the project staff in the six monthly progress reports and the annual monitoring and evaluation (M&E) reports.

2.1. Data source

To quantify the results from individual and/or combination of interventions, the project established a baseline and measured/documentated changes. Several data sources were used to establish the baseline and to document changes and results.

2.1.1. Baseline information

To establish a baseline, data from a formal household survey in 100 HH was conducted in 2004. The initial PRA study also contributed to the quantitative and qualitative baseline information. Key informants and community interviews, records and some special diagnostic studies were also used.

2.1.2. Documenting changes processes and results

Several sources were used for regular documentation of change processes and results, including six monthly progress reports, annual M&E reports, MSc thesis research, records kept by the OoARD, personal observations and diaries.

In 2009, the project also developed a set of guidelines for the PLW staff to systematically collect relevant information for the case studies including history, changes in extension services, value chain interventions (production, input supply, marketing and credit), results, challenges and lessons learned. Part of the information was obtained from the previously mentioned baseline and other sources and specially arranged (i) rapid assessment (ii) key informant interviews and (iii) household level survey.

The formal household survey conducted in 2009 obtained data from 74 sample households in 10 PAs. The PAs are Guba Sheraro, Galato, Andegna Ansha, Yanbbo, Geremma, Wanjaa, Angegna Konicha, Hulegeba Kukie, Besheno, Bendo Cholockssa. The PAs were selected as IPMS intervention and non intervention areas. Sample households were categorized as those which had adopted/benefited from haricot bean development interventions and households which had not. In sample category, wealth and gender criteria were considered to get representative households. The survey data consist of relevant production and marketing information on haricot bean including area allocation, production costs and inputs use, level of production, and marketed surplus.

Following the collection of all relevant information, a write shop was organized to present information in a systematic manner. Drafts of the PLW specific commodity case studies were then reviewed by experts at IPMS Head Quarter.

3. Commodity background

3.1. Description of the study area

Alaba Special District is located 310 Km South of Addis Ababa and 85 Km South West of Hawassa, the capital of South Nations Nationality and Peoples Regional State (SNNPRS). The District is located 7° 17' N latitude and 38° 06' E longitudes (Fig. 1). The District has 79 peasant associations (PAs). The total population of the district is 210,243 (49.7% are women). There are 6 ethnic groups and the dominant ethnic ones are Alaba and Gurage which comprise 81% and 10% respectively. The altitude of the district ranges from 1554 to 2149 masl, while the topography is predominantly flat. Agro-ecologically, the district is described as Weyna Dega and cool sub-humid highlands (Tropical Climate I). Mean annual rainfall ranges from 857 to 1085 mm/yr with bimodal distribution pattern while annual mean temperature varies from 17°C to 20°C. Despite the recurrent drought, flood has also been a major problem in the area. The Woreda is suitable for crop production and major crops such as Pepper, Teff, Wheat, Maize, Haricot Bean, Sorghum and Millet (IPMS, 2005).

Two farming systems have been identified in the district as Teff-haricot bean-livestock and pepper-livestock farming systems (IPMS, 2005). Although haricot bean can be produced in most of the PAs in the district, 34 of the PAs are known for having high potential (IPMS, 2005).

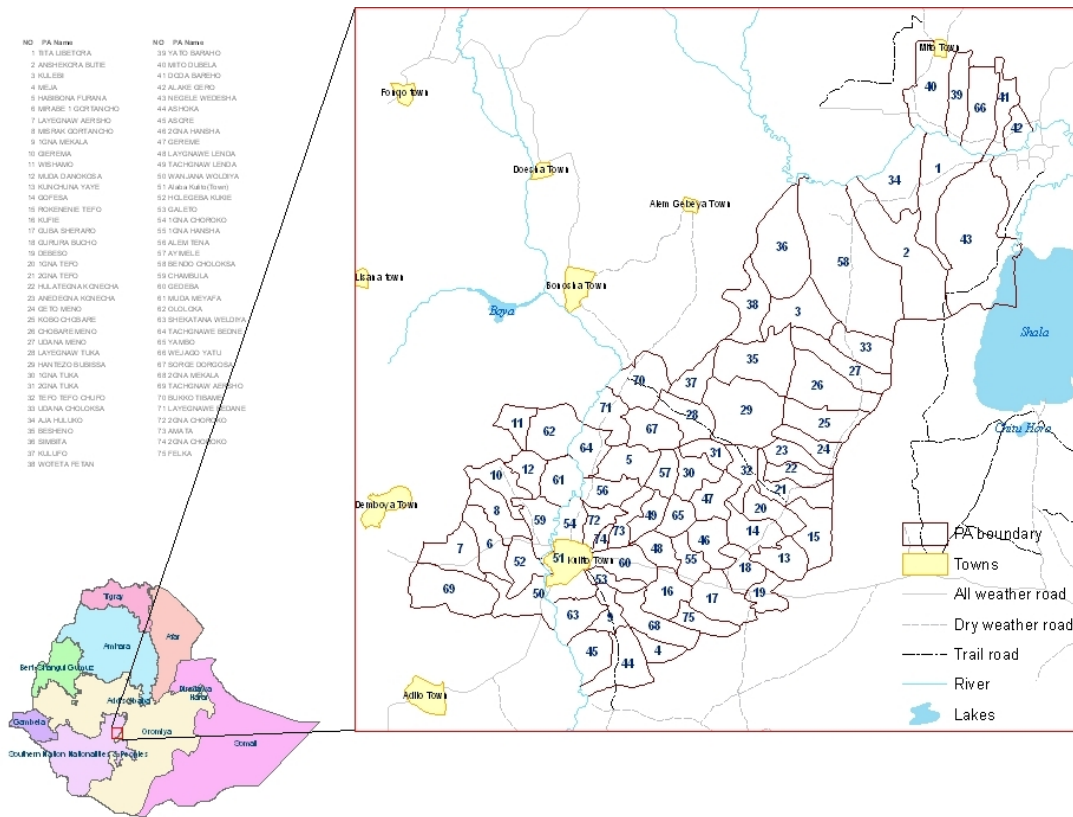


Figure 1. Location of the Study Area (Alaba Special District)

3.2. Haricot bean in Ethiopia and study area

Haricot beans (*Phaseolus Vulgaris L*) are one of the major types of pulses grown in Ethiopia (EEPA, 2004) especially in the lowlands and in the rift valley. The importance of haricot bean as a source of income, nutrition and its role in food security at a household level is very high (Simane *et al.*, 1998).

In 2002, Ethiopia exported 42,127 tons of haricot bean and generated export income of 13.2 million USD. Export volume increased to 70,350 tons generating 32 million USD in 2007 and to 78, 271 tons, generating 49.7 million USD in 2008. Haricot bean annual average production increment in the past 5 years (from 2003 to 2008) was 24.5% and its % share from total pulses production accounted for 36% in 2008 (MoARD, 2008). ECX (2009) points out that commercial haricot bean grain supplies come from production of small farmers, private commercial farms, state farmers, imports and food aid while haricot bean market participants

include producers (small and commercial farms), wholesalers, retailers, traders, brokers, agents, assemblers, processors, cooperatives, EGTE (Ethiopian Grain Trade Enterprise), and consumers.

Haricot bean production is very heterogeneous in terms of ecology, cropping system and yield. It predominantly grows from low land (300-1100 masl) to mid highland areas (1400-2000 masl) of the country (Simane *et al.*, 1998). The national average yield of haricot beans is 0.5-0.8 ton/ha (Simane *et al.*, 1998; EEPA, 2004). The estimated mean yield/ha of haricot bean in the study area is 0.64 ton/ha (IPMS, 2005). Majority of the smallholder farmers do not use fertilizer and use local seed instead of improved seeds for planting. Haricot bean is harvested by hand, heaped and sun dried for a week and then threshed by beating the dried vines with sticks or by chasing oxen on threshing floor (EEPA, 2004).

In Alaba Special District, based on the rapid appraisal, haricot bean ranks 5th next to maize, teff, wheat, and pepper in terms of area coverage. It also ranks 3rd as major marketable commodity in the district (IPMS, 2005). Estimate of haricot bean production and its use shows that 54% of red haricot bean is used for household consumption and 44% for sale while the remaining 2% is used as source of seed (IPMS, 2005). White varieties are mostly produced for the market.

Based on the participatory rapid diagnostic study and a subsequent more detailed thesis study, the following observations were made in the haricot bean value chain in Alaba:

- High crop loss associated with pest, weed and disease (bacterial blight and bean maggot, bean root rot, leaf and pod eaters /weevil larvae/, weevil in storage).
- Traditional production is dominant (e.g., poor weeding practice).
- Farmers usually deviate from recommended package (seeding and fertilizer rate) and adoption of technology is low (Negash, 2007).
- Moisture stress is one of the major limiting factors for reduced productivity and hence production.
- Poor access to inputs especially to improved seeds and agrochemicals. Inputs are not supplied on time and at right place (Negash, 2007; IPMS, 2005).
- Farmers also face marketing problems (lack of market for white beans and grains with low market standard, lack of linkage between collectors and exporters) (IPMS, 2005). The lack of markets for white beans has reduced farmer's preference for the white variety (Awash-1 and Mexican 142).

4. Value chain interventions on haricot beans

Based on the diagnosed problems, the project partners started several interventions along the value chain as well as studies to further understand components of the value chain, in particular a better understanding of the production system and marketing potentials and channels/outlets.

The study showed that haricot bean is planted in both small (belg) and big (meher) rainy seasons as a sole crop and inter crop, respectively. Fields under haricot bean during the small rainy season are often used for growing wheat or teff during the main rains. The average land allocated for haricot bean production is about 1 timad (i.e., a quarter of hectare) per household. Haricot bean fields are ploughed 3 times before planting and weeding is conducted once during the season (Fig. 2).

ACTIVITY	Seasons, Months and Weeks											
	Belg = Small Rainy Season (B)						Meher= Big rainy season (M)					
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Clearing			3 rd				1 nd					
Cultivation				1 st			3 rd					
Sowing				4 th				1 st				
Weeding												
Harvesting							4 th			4 th		
Threshing								1 st			1 st	
Seed Bank Collection	4 th									4 th		
Seed Cleaning		4 th										B
Seed Treatment												
Seed Disbursement		2 nd		2 nd								

Figure 2. Haricot bean and Seed Bank calendar in belg (B) and meher (M) seasons

Key = 1st, 2nd, 3rd, 4th are weeks in a month
 Source: PRA exercise in Galato and Hulegeba Kukie

4.1. Extension

Following the value chain approach, farmers and input suppliers were trained and linked to haricot bean exporters in Nazareth with the help of various actors. IPMS project and OoARD built the capacity of the farmers and concerned staff with various methods of knowledge transfer. The methods of knowledge transfer to build capacity of farmers included training, demonstration, field days, stakeholder meetings, workshops, haricot bean promotion, group discussion, HIV/AIDS and Gender sessions, leaflet distribution and visit within and outside of the Woreda. The overall beneficiaries over the past five years (2005-2010) were 6565 male and 1532 female.

4.2. Production

There are local and improved haricot bean seed varieties in the area. In the past, haricot bean production was dominated by red wolayita varieties (considered as local and introduced over 30 years ago). In 2005 the white haricot beans (Awash 1, Mexican 142), in 2006 red haricot beans (Dimtu, Nasir) and in 2007 the speckled Canscope was introduced.

OoARD staff also continued providing training on the use of improved practices including use of fertilisers, pest, disease control etc. Training sessions were organized on seed quality and standards, seed multiplication, seed treatment, crop protection and most of these trainings were accompanied by practical demonstration. To improve productivity the project also tested the use of inoculants over a 3 year period in farmers' fields and compared it with the use of chemical fertilizers.

4.3. Supply of inputs and services

In spite of the development efforts by OoARD, haricot bean development is constrained by inadequate supply of inputs (fertilizers, seeds, agro chemicals) reflecting the need for improvement of the input supply system. To improve the input supply system, the project conducted a study on the seed supply system. Based on PRA, a study and field observations, the project partners introduced four interventions i.e. i) establishment of cooperative input supply shop, ii) informal farmers seed multiplication iii) a community based seed bank system and iv) private crop spraying service

Cooperative input shop

In cooperation with Menchone Alaba Farmers' Union and OoARD, an input shop was established in Alaba Kulito Town in 2007 to stock inputs with IPMS's innovation credit fund of Birr 100,000. Even though an additional two shops were proposed to be established at Guba and Beshone market sites, the proposal was not realized. The shop supplied various agro-chemicals, fertilizers (DAP and Urea) and various types of seeds including improved haricot beans.

Informal farmers seed multiplication

As a result of the various knowledge management and skills development interventions, the extension services started seed multiplication with a group of 20 farmers in four PAs (in 2006) which expanded to 19 PAs in 2009. Linked to these multiplication efforts were the establishment of community seed bank and a seed cooperative.

Community seed bank

The problem of access to improved seed and absence of reliable seed source have been identified as major problems. Community consultation and capacity building efforts by the OoARD, project, Hawassa and Melkassa research centers lead to the establishment of initial seed banks in 2007. Objective of the seed bank is to establish a sustained supply of quality seed, conserve germplasm and maintain biodiversity within a community. The bank also ensures better handling through communal cleaning and seed treatment and storage of quality seeds collected through seed fairs.

Community seed banks are governed by local by-laws. The by-law describes membership, members' rights, obligation, role of seed bank committee and services rendered by the bank (Box 1). Haricot bean seed bank's service includes borrowing seeds with 20% interest in kind and sale of seeds to non members (in a bid to expand the coverage of the bank service). Money generated from seed sale is deposited in a community managed revolving fund. To store the seeds each group is provided with granaries (baskets) made from local materials.

Box -1- Seed Bank Community By-laws

- 1) *Members can borrow seed from the seed bank and return it with (20%) interest in kind*
- 2) *Members can use the bank to store additional amounts of seed than what is borrowed.*
- 3) *Members are allowed to borrow seed that is equivalent to what they have already stored*
- 4) *Bank distributes seed for the “Meher” main rainy season to ensure recovery from members.*
- 5) *Seed is distributed in April and collected back in December every year.*
- 6) *Seed bank is governed by 3 members marking committee for each PA.*
- 7) *Seeds are returned using seed fair session to ensure quality seeds recovery.*
- 8) *Committee ensure increase the bank seed storage every year (from bank interest)*
- 9) *Seeds which remain with members are expected to be lent or sold for at least three farmers*
- 10) *Seed bank maintain seed balance, seed fairs results and minutes using record book*
- 11) *The price of seed stored in seed banks is three times the price of grain in the local market*
- 12) *Seed bank is not allowed to store seed germplasm other than improved varieties*
- 13) *When new varieties are released, initial seeds are given to farmers so as to pop up the seed multiplication by establishing separate granary.*
- 14) *Membership mandates include collecting seeds, storing, cleaning, treating and distributing seeds, attending seed fairs , monitoring, evaluating, returning quality seeds and taking care of seed banks*

Source: IPMS community seed bank leaflet

Private crop protection service

Pre-and post harvest losses due to various insect pests, diseases, weeds and vertebrate pests are believed to be 30 to 40 % (Abesha, 2006). Inadequate crop protection services provided by untrained farmers and the OoARD contributed to these losses.

The project and OoARD therefore initiated a *Private Crop Protection Service (PCPS)* to provide inputs and crop protection service for various commodities. Training was provided by Woreda and Regional BoARD staff to 17 farmers. The farmers received credit from IPMS project through the Menchone Union, to purchase crop protection tools and agro chemicals. The amount of credit per individual was Birr 3,550, which covered the purchase of knapsack sprayer, protective clothing, bicycle and stock of chemicals.

4.4. Marketing interventions

The project and its partners developed/tested interventions for the marketing of improved seeds and grains.

Seed marketing

To improve the marketing system of improved seeds the project partners introduced two major interventions i.e. i) establishment of seed multiplying cooperative ii) sale of packaged seeds in small quantities in open markets (small pack experiment).

Grain marketing

For the marketing of grains the project facilitated: i) a marketing study by CIAT, ii) linking exporters and the union for white haricot bean sale, and iii) dissemination of price information through bill boards.

5. Results and discussion

5.1. Production, productivity and income

The OoARD data showed that in 2004, the total land area under haricot bean was 4,860 ha with 29,160 qt production (the average yield is 6.4 qt/ha) (IPMS, 2005). The household survey conducted in 2009 showed an average yield of 7.76 qt/ha, which is higher than the 2004 data. However, this might have been due to several factors not necessarily related to the project activities alone (see Table 1).

Table 1. Productivity and average gross margin for haricot bean farmers

Farmer type ^a	Average Area (ha)	Average productivity (kg/ha)	Average variable costs (Birr per ha) ^b	Labor (Adult Equivalent per ha)			Average value of haricot bean production (Birr per ha)	Average gross margin (Birr per ha)
				Own	Hired	Total		
Users	0.56 (n= 17)	950.6**	335.20***	32.5	17.9*	50.4	2794.73**	2459.53*
Non users	0.59 (n=57)	724.1	131.98	39.0	9.3	48.4	2128.84	1996.85

Note: ^a Households are categorized as users if they used purchased fertilizer.

^b Variable cost includes seed, fertilizer and other chemical costs (opportunity cost of own seed is computed using the average market price).

***, ** and * are significantly different from the other group mean at 1%, 5%, and 10% level, respectively.

The same household survey in 2009 also showed that 23% of the sample households use fertilizer (DAP) for haricot bean production. Average gross margin analysis results are presented in Table 1 by classifying the sample households into fertilizer users and non-users. There is a clear average productivity difference between fertilizer users and non-users, and the productivity difference also resulted in value of production difference between the two farmer groups.

A comparison between baseline household surveys in 2004 (all PAs growing haricot bean) and 2009 (sample of 10 PAs growing haricot bean) (see approaches), showed a significant improvement in market participation for the sampled PAs and households (see Table 2).

Table 2. Market participation and prices

Levels of market participation and prices	Data source	
	Baseline household survey (2004) (N=100)	2009 household survey (N=74)
Percentage of total produce sold (%)	64.0	66
Percentage of HH selling beans (%)	54.5	92
Percentage of beans sold per HH (%)	32.0	59
Average selling price (in Birr/kg)	1.30	2.94

A study by Negash (2007) examined the extent of improved haricot bean variety use based on a sample survey of 160 households (HH) in 4 PAs (Alemtena, Laygnaw Lenda, Gofessa and Kunche Yaye) from a total population of 1,066 haricot bean growing households. According to this study, 31 % of the households used improved varieties in 2007 compared to 11 % in 2004 (baseline situation). The progressive trend in use of improved haricot bean variety agrees with finding of the IPMS household survey conducted in 2009.

While white beans were considered for production initially, farmers clearly indicated their preference for the red varieties which were more multipurpose in use (see Table 3). This fact has also been confirmed during small pack experiment (See Section 5.3).

Table 3. Farmers' description of haricot bean variety and preference in Alaba

	Varieties in their local names		
	Bisha (Red, small, medium and red kidney)	Gamballa/Beranberu (Small black and others with various colours)	Wojo (White)
Positive attributes	<ul style="list-style-type: none"> • Medium and large sized • Sweet taste and consumed at home • Marketable • Yield best & early maturing • Disease tolerant 	<ul style="list-style-type: none"> • Various size and colors • Various taste • Marketed • Not much consumed 	<ul style="list-style-type: none"> • Medium sized • No taste • Can not be eaten at home • Marketed by exporters • No flatulence • For export market
Negative attributes	<ul style="list-style-type: none"> • Susceptibility to aphids • Small sized ones do not fetch good price 	<ul style="list-style-type: none"> • Slow germination • Discolor other food • Late maturity • Flatulence • Fetch small price 	<ul style="list-style-type: none"> • Requires good management • Susceptible to pod borers and post harvest insects (difficult to handle) • Locally not marketable
Rank *	Best of all and ranks first (improved red like Dimtu and Nasir are more preferred than red Wolayita)	Ranks least (various colors and size) and is least preferred	• Ranks second (White Mexican 143 is preferred to Awash 1 and Awash Melka)

Source: Farmers and experts group discussion, Choroko, Ulegeba Kukie, (2006)

*based on taste, color, maturity, yield, market demand, resistance to disease and drought

Intervention in haricot bean development involved comparison of soil fertility technologies (inoculants with chemical fertilizer) as part of a production technology. On farm trials of haricot bean using inoculants (bio fertilizer), chemical fertilizer (DAP and Urea), and control plots (n=387) were conducted for three years (2006-2008) involving 129 HHs in 17 PAs (Table 4).

Table 4. Distribution of on-farm trial plots (with inoculants, chemical fertilizer and control)

Year	No. of Households	No. of PAs	Total number of plots applied	Plots with yield (n ^a)	Plots without yield
2006	62	9	186	181	5
2007	56	6	168	157	11
2008	11	2	33	32	1
Total	129	17	387	370	17

Although haricot bean yield was low due to erratic and low rainfall during trial periods, results were consistent in showing yield rank order of chemical fertilizer (7.04 qt/ha) performing better than inoculants (4.1 qt/ha) and the control plot (2.7 qt/ha) (Table 5).

Table 5. On-farm haricot bean yield (qt/ha) comparison of inoculants, chemical fertilizer and control plots (2006-2008)

Year	Inoculants			Chemical fertilizer			Control		
	n ^a	Mean	Std. Err	n ^a	Mean	Std. Err	n ^a	Mean	Std. Err
2006	60	4.3	1.00	61	8.6	1.18	60	3.0	0.95
2007	52	4.2	1.09	53	6.8	1.18	52	2.3	0.95
2008	10	3.8	1.12	11	5.7	1.28	11	3.0	1.00
Total	122	4.1		125	7.04		123	2.76	

Note: ^a n = plots with yields

Gross margin analysis for soil fertility technology takes similar trend. Table 6 shows that the highest return (2250Birr/ha) was obtained from chemical fertilizer while the least return (1120Birr/ha) was obtained from control plots. The average return from inoculants was 1540Birr/ha. These on-farm results show the existence of inoculants as potential technology. It is also good to note that bio-fertilizers are environmentally friendly and can have long lasting effect.

Nevertheless, the results still confirm the highest yield and best economic return from chemical fertilizers (Table 6).

Table 6. Feasibility analyses of technologies for soil fertility in haricot bean production

	Inoculants	Chemical fertilizer	Control ^a
Application rate (kg or pack/ ha)	4 pack/ha	100 kg/ha	
Input price (Birr/kg or pack)	25 Birr/pack	550 Birr/qt	
Average cost (Birr/ha)	100	550	
Average yield (Qt/ha)	4.1	7.0	2.8
Output price (Birr/Qt)	400	400	400
Average value (Birr/ha)	1640	2800	1120
Gross margin (Birr/ha)	1540	2250	1120

Note: ^a control is plot with no fertilizer application

5.2. Input supply and services

Cooperative input supply shop

During the past three years (2007-2009), the cooperative shop in Kulito town supplied inputs to 22 PAs. Most commonly served farmers come from Wanja, Galato, Aymale, Laygnaw Lenda, AlemTenna, Gedeba, Hulegeba Kukie, Andegna Choroko, Huleteгна Choroko, Andegena Tuka, Yambo, Sorge and Ansha.

The advantage of inputs supply shop is that, *first*, inputs are sourced from dependable sources (reduces problems of adulteration). *Second*, inputs are also sold on cash basis but sometimes sold on credit for cooperative members. *Third*, the shop provides inputs at lower price (e.g fertilizer price is lower by 30-40 Birr/qt) compared to private shops. *Fourth*, inputs are inspected by OoARD subject matter specialists. *Fifth*, the procedures for input supply acquisition has been reduced (it does not involve approval of OoARD, travel to union warehouse and depositing money in the Bank).

According to farmers, the establishment of the shop increased access to input and reduced time spent in getting inputs. Promotion of the input shop was organized to let more farmers know about the existence of the service. Management of the shop was however found to be inadequate in its third year of operation, which led to temporary closure and relocation of the shop.

Seed supply channels and multiplication

The haricot bean seed channels and actors were mapped by the value chain actors in an agri-business workshop (Fig. 3). The different varieties are made available to farmers from Research Centers (Hawassa and Melkassa), Ethiopian Seed Enterprise, marketed and sourced by OoARD or Union and/or Projects like IPMS. As can be seen from the different channels, the diversity of haricot bean in the village is high and maintenance of homogenous seed source for one type of variety in the system is difficult. The potential for seed adulteration is high and the development of a reliable source of seed for farmers through seed multiplication is essential.

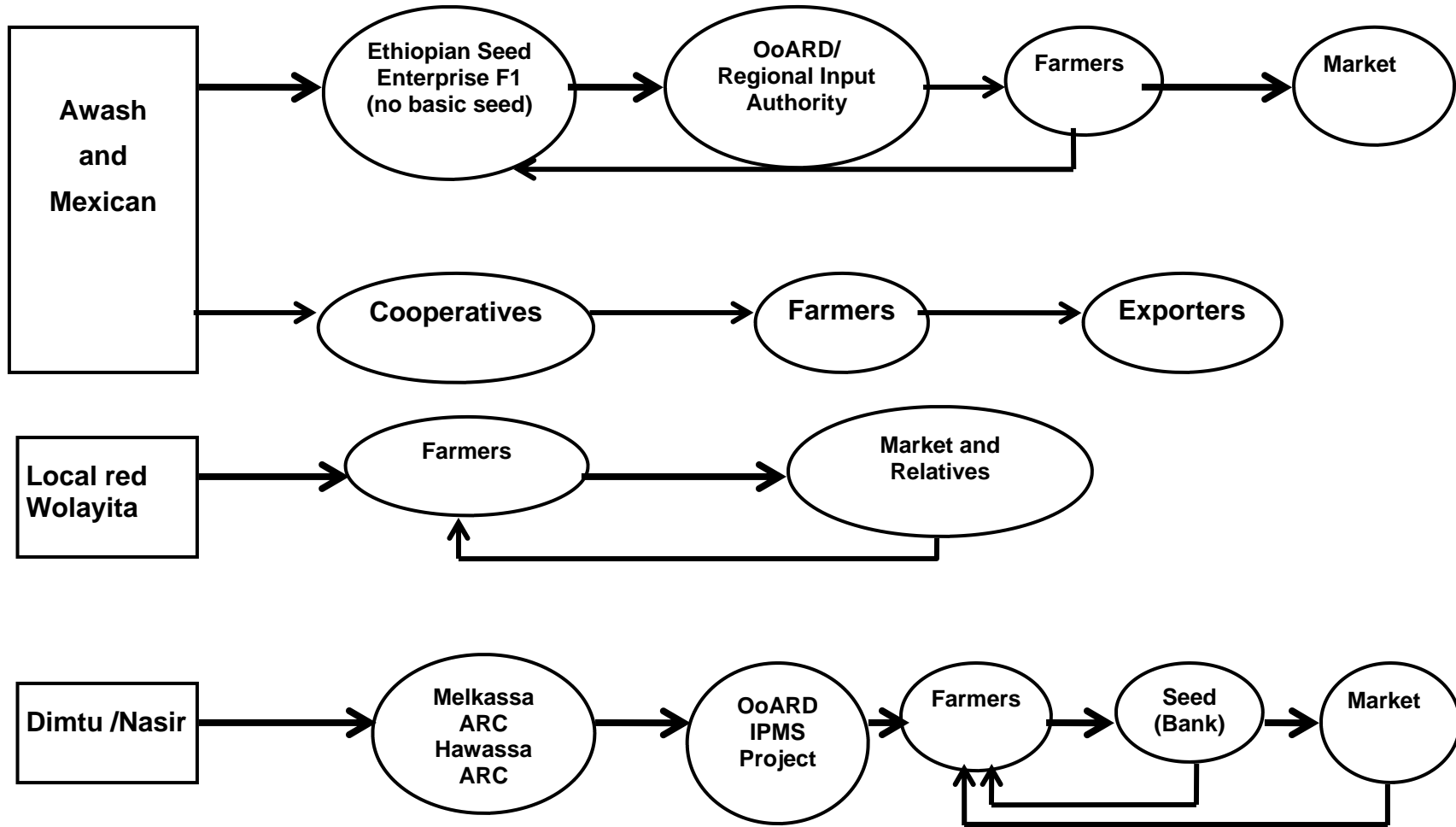


Figure 3. Haricot bean seed channels and actors

Seed multiplication started informally in 4 PAs in 2006/07. In 2008, multiplication was initiated by 60 HHs (4 women) in 4 PAs with 8 qt of Nasir and Dimtu varieties (foundation seeds) from Melkassa Agricultural Research Centre (MARC). In the 2009 “meher” - main rainy - season, the multiplication was scaled out to a total of 426 HHs in 19 PAs with 12 qt of haricot bean from MARC and 3.25 qt of IPMS purchased seed (Table 7). At the end of 2009, famers formed a seed multiplication cooperative. The scale out of multiplication will continue to additional 12 PAs in 2010 by OoARD and People In Need (an NGO).

Table 7. Result of haricot bean seed multiplication, 2008-2009

Main rainy season	PAs	Area (ha)	HHs*	Seed (00' Kg)		Use of Seed Multiplied (00' Kg)			
				Distributed	Multiplied	Recovered Seed for Bank	Sold/used as food	Farmers Seed	Sold seed to partners
2008	4	8	(N ₁ =61) (N ₂ =64)	8	104.87	10.87	56.8	32.0	5.2
2009	19	23	(N ₁ =404) (N ₂ =426)	23.24	181.6	17.3	48.6	109.1	6.6

Note: * N₁ is the total number of HH targeted and N₂ is the number of households with harvest

The key challenges in the seed system are: *first* the low seed recovery associated with crop failure. Especially in 2009, harvest among seed multipliers was very low due to poor rainfall distribution. *Second*, there is the significant loss of seeds from seed system due to consumption at home and seed sale to market (54% in 2008 and in 27% in 2009). Msiska and Chibambo (2001) pointed out that seed multiplication remains unsustainable unless improved varieties are recognized by farmers as being superior over their traditional varieties. Although farmers do understand the quality of seed they produce in the area, they are often forced to sale seed to the market to get immediate cash, when partners delay in seed purchase.

While the purpose of the seed multiplication was to increase the availability of improved seeds using community seed banks as collection and disbursement center, it is also worth to note that supply of seeds also goes outside the PAs (through exchange, sale and gift). Thus, the established seed cooperative is expected to work more on reducing seed loss out of the seed system and on ensuring seed business through marketing intervention.

Community seed bank

At the end of 2007 seed banks were already established in 4 PAs (Hulegeba Kukie, Galato, Andegana Choroko and Uletegan Choroko). This activity also continued in 2008 and expanded to 15 PAs (Kobo Geto, Uletegna Konicha, Guba Sheraro, Andegna Teffo, Chambulla, Muda Meyafa, Wanja, Uletegna Ansha, Andegna Ansha, Mekalla, Shekate, Kuffee, Andegan Tuka, Gurura Bucho, Debeso). At the end of 2008, seed banks were established in 19 PAs. The seeds returned to the seed bank after the 2009 harvest and basic seeds supplied from MARC (12 qt in 2009) enabled to scale out seed multiplication to an additional 12 PAs in 2010. At the end of 2010, seed banks had already expanded to 31 PAs. In each PA there are 20 HHs as members of the seed bank with a chair person.

Quality seeds are recovered by farmers for banks using seed fair session. In the session, seed multipliers farmers come with their seed to be ranked by the committee. The best seeds are recovered for the bank while farmers' seeds with inferior or low quality are rejected. Farmers whose seeds are rejected will exchange their seeds with farmers with best seeds to pay back seeds in kind for the bank. Seed cleaning and treatment are done collectively by seed bank members to maintain seed quality in the bank. Seeds are treated with Malathion or Actellic using seed mixer at 2:1 ratio (200gm of seed for 100gm of chemical). Seed treatment is conducted annually in farmers' villages and can be done by private crop protection service providers. In 2009, 44 packs of Malathion (each 50 gm) were used for 5.36 qt of Dimtu and Nasir haricot beans for seed banks in 4 PAs.

Private crop protection for haricot bean

Realizing the problem of crop loss, inadequate crop protection service for haricot bean commodity and low involvement of private sector in crop protection service delivery, the IPMS project and OoARD developed agricultural service focused at alleviating problems of crop loss through the "private crop protection service" (PCPS) in Alaba Special District.

A preliminary assessment of the private crop protection service (PCPS) shows that in the 2007/2008 cropping season, 11 PCPS providers served 1,104 households with 1,707 ha of land in 19 PAs. The service resulted in community financial gain from increased haricot bean yield with average income of 1257 Birr during the service period per service provider. Results show higher demand, positive perception and better attitude for PCPS and a reduction in crop loss in the served areas. A more detailed assessment of the PCPS is on-going, however like any other crop, haricot bean producers can get the service to reduce crop loss associated with weeds, pests and diseases.

5.3. Marketing of improved seeds and grains

Seed multiplication cooperative

Seeds multiplied in 2008/9 were purchased by Hawassa Research Center and Inter Aid France for dissemination to other districts with the assistance from OoARD to collect and bulk seeds. Subsequently, the project partners tried to organize the seed multiplying farmers into formal groups (seed multiplying cooperative) in order to produce and sell quality haricot bean seeds. The cooperative can get technical assistance from OoARD. Future development direction for the cooperative could be collective seed marketing, accessing basic seed from the research system as well as focusing on seed business through seed packing, sorting for quality marketing.

Marketing of small packs and promotion of haricot bean

Phiri *et al* (2000) describe the problems for seed delivery to African farmers and offers an innovative method for improving seed access, particularly for seed of new crop varieties using small packs. Thus, MARC provided small packs of haricot bean to be disseminated and promoted in open market (through funding from Tropical Legume II project). The idea was initiated by CIAT (International Centre for Tropical Agriculture) staff to be implemented by stakeholders as a result of the workshop held in Nazareth.

IPMS project and OoARD organized eight market promotion days in June 2009 and July 2010. During these promotions a total of 36 brochures, 12 posters and 500 leaflets on haricot bean varieties were distributed to 440 farmers. In June 2009, a total of 208 farmers (13 women) from Alaba and 5 adjacent woredas purchased the seeds on three market promotion days. In July 2010, a total of 232 farmers (8 women) have taken part from Alaba and 8 districts on five market promotion days (Table 9). Although 95% of the farmers are from Alaba, participants were drawn from Badawacho, Angecha, Siraro, Shalla, Demboya, Sankura, Gimbichu and Kedida Gamella districts. The finding reflects the high potential of technology diffusion in wider geographic area using open markets as promotion sites.

Table 9. Result of small pack experiment for haricot bean seed (2009/2010)

No	Haricot Bean Variety	Quantity of seed supplied (gm)			Duration
		(00 gm)	Quantity of seed pack (gm)	Number of packs (sold)	
1	Cranscope	1	500	200	June 2009
2	Nasir (Red Haricot Bean)	0.4	200	200	June 2009
3	Nasir (Red Haricot Bean)	0.5	500	100	June 2009
4	Nasir (Red Haricot Bean)	1	1000	100	June 2009
5	Nasir (Red Haricot Bean)	1	2000	50	June 2009
6	Dimtu	0.7	1000	70	July 2010
7	Dark Kidney Bean	1.94	1000	388	July 2010
8	Deme	0.5	500	50	July 2010
	Total	7.04	6700	1158	

Source: Kulito market promotion data (June 2009 and July 2010)

Nasir small packs were all sold out on the first day indicating the farmers' preference. Farmers were also asking for Dimtu and Dark Kidney Bean variety, again showing the demand for red haricot bean in the area. No data were collected on the small pack preference, however sale of 1158 packs to 440 farmers shows that on average a farmer purchased 3 pack/family, indicating the possibility for sale of larger packs and prospect for commercialization of small-scale seed multiplication.

Market assessment

Introduction of white haricot bean varieties was undertaken by OoARD and Menchenon Farmers' Union for export in 2005/6. A study conducted by Ferris and Kaganzi (2008) did confirm a potential market for white haricot beans in Nazareth, while reflecting better marketing opportunities for red haricot beans from Alaba for the export market to Kenya.

Linking producers and exporters

The project facilitated linkages between the Union (Alaba Menchenon Farmers' Union) and an exporter in Nazareth in 2006. Partner linkage resulted in output marketing of 380 qt of white haricot bean from the union. The exporters in

Nazareth, Umer and Awad Export P.L.C, purchased at 380 birr/qt while providing free of charge packing materials and transport. The challenge in the output marketing was to meet export market demand both in terms of quality and quantity (seed colour, size, purity and seed shape). The white haricot bean produced was small in quantity and inferior in quality to meet export market standards. Unlike the red haricot beans (Red Wolayita, Dimtu, Nasir), the white (Awash and Mexican) are not used for food consumption and are not preferred by farmers. At the end, the white varieties were not adopted by farmers in the study area.

Market information dissemination

Haricot bean market information collection and dissemination started in 2006 in the study area in three of the main market sites (Kulito, Besheno and Guba) using billboards by the project in cooperation with OoARD and Lay Volunteers International Association (LVIA), an Italian based NGO. In Kulito market, information dissemination is also undertaken using a loud-speaker in open market. The collection and dissemination of market information by OoARD staff continued since 2006 except when there was power interruption, office restructuring and staff reshuffling. Now, Food for Hungry International (FHI) is also involved in market information dissemination in other parts of the district. Public support to ensure service provision involves organizing basic and refreshment training for OoARD staff on Market information collection and dissemination and maintenance of the billboard.

5.4. Mainstreaming gender and HIV/AIDS

While increasing income from haricot bean in production, input supply and marketing intervention for seed multiplying farmers, integrating HIV/AIDS and gender issues for the farmers was also a focus of the IPMS project and OoARD. Bishop-Sambrook (2008) used gender and HIV/AIDS analysis to characterize stage of HIV/AIDS epidemic in the district.

According to the study, three separate epidemic groups (limited impact, moderate impact, impacted) in ascending order were used to characterize stage of the epidemic in the district. The district is classified as moderately impacted reflecting that urban communities are impacted and the disease has also progressed to rural areas and has reached an impending stage. With the encouragement of the district Women's Affairs Office, the seed bank group and seed multiplication cooperatives were linked with a local anti HIV/AIDS club (Alaba Fere club) to get awareness on HIV/AIDS and Gender issue. The effort is believed to minimize misuse of the income and ensure women participation in haricot bean marketing. The club members organized drama, jokes, and music sessions and distributed leaflets to increase awareness on HIV/AIDS and gender issues. Club members read poems, narrated stories on the risk of HIV/AIDS and the problem of excluding women in local languages. The drama emphasized the importance of HIV testing and demonstrated how farmers can protect their family

while benefiting from increased income from haricot bean production. The sessions were well attended by boys, girls, women and men in the village (sessions attended by 56 people, among which 26 women) and they are believed to have increased the awareness level of farmers so as to ensure that HIV/AIDS and Gender are mainstreamed into the value chain development.

5.5. Linkage and role of value chain actors

Actors in haricot bean value chain development are presented in Figure 4. The key actors in haricot bean development are Melkassa and Hawassa ARCs, local traders and exporters, farmers and their Union, OoARD, HIV/AIDS club and the IPMS project. As depicted in the figure, farmers take the key position in over all development and the size of actor also reflects the role in the development process. There are changes in organizational role over the years and the major one is the increased role of private sector (Union in input supply, farmers in crop protection service provision). The role of farmers has increased considerably in market participation. Although the value chain involves multiple actors, existing partnership between actors is informal. Linkage between actors is variable. Linkage between farmers and exports is weak (thin arrow), between research center and farmer is medium (medium sized arrow) and between farmers and OoARD is strong (wide arrow). Networking effort between actors is emerging but needs strengthening.

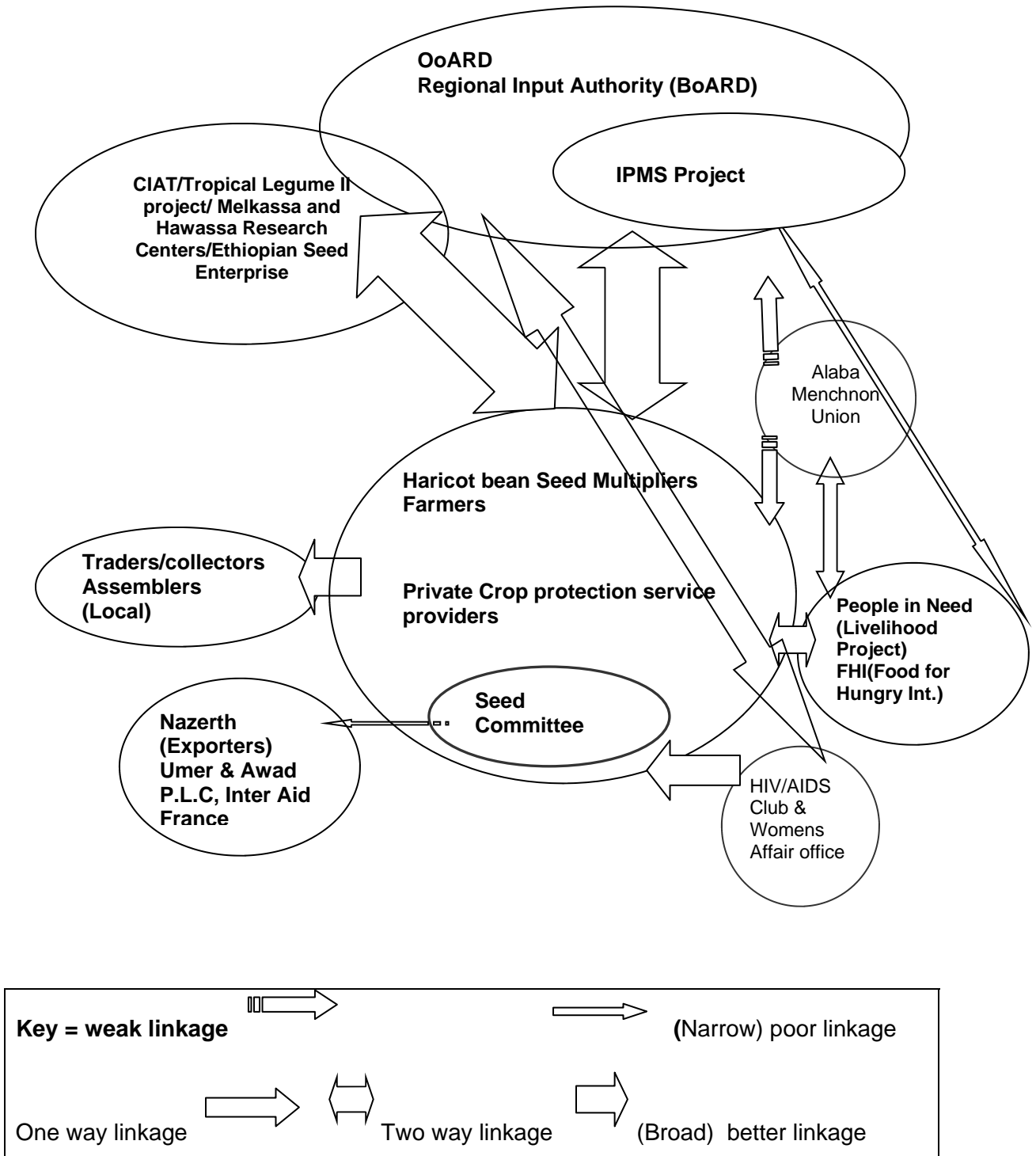


Figure 4. Value Chain Actors and Linkage, 2006-2010

Involvement of anti HIV/AIDS clubs and district women's affair office in haricot bean development is a recent practice. Involvement of actors like People In Need (NGO) started in 2008. Research centers are source of foundation or basic seed while OoARD, IPMS and the Union act as implementing agency. IPMS project has played a linking role for various actors along the value chain (e.g exports) and in building capacity of the community with OoARD.

Table 10. Actors role in haricot bean value chain development

Actors	Actor description and role
OoARD (Office of Agriculture and Rural Development) Regional Input Authority (Bureau oARD)	The office of agriculture is a key actor to host projects by NGO (nongovernmental organization). The office has played key role to introduce technologies associated with haricot bean. The office has trained SMS and mainly farmers on seed multiplication jointly with partners. BoARD supplied seeds to farmers for multiplication through OoARD in 2005/6.
IPMS project	The project assisted the OoARD introducing new varieties as of 2006 from research center to community, demonstrated bio-fertilizers, and seed treatment machines. IPMS has organized trainings, seed fair session, visit, drama, workshops and established community seed bank and linked farmers with exporters.
Nazareth Haricot Bean Exports, Inter Aid France	Haricot Bean Factory in Nazareth was identified as a potential marketing point. Umer and Award Haricot Bean exporters purchased haricot bean in 2005, Inter Aid France purchased in 2009
Local traders and assemblers	Local traders and assemblers are involved in marketing of haricot bean and sell to exporters. They work independently.
Melkassa (MARC) and Hawassa Research Institute (ARC), International Center for Tropical Agriculture (CIAT), Tropical Legume II Project, Ethiopian Seed Enterprise (ESE)	Provided basic or foundation, prepared leaflets and manuals on haricot bean, organized planning and reporting workshop. training for SMS to enhance skill and knowledge, initiated the idea of small pack experiment and the packs. Hawassa Research Center has purchased haricot bean from farmers to distribute to others and both ARC and MARC organized annual meetings. CIAT implements Tropical Legume II with partners in the nation. ESE-Hawassa is also source of improved haricot bean for farmers in the district.
Alaba Menchoneon Farmers' Union	The input shop supplied inputs for crop protection service, disbursed credit for farmers. The union is potential private sector for seed business in the district.

HIV/AIDs club and women affair office	Anti HIV/AIDs club (Alaba Free) organizes drama, jokes, music session to increase awareness on gender and HIV/AIDS in cooperation with district women affair office for farmers.
Farmers	Key actors in the value chain, they constitute the seed committee, crop protection service providers and seed multipliers. Farmers are responsible for recovery of multiplied seed and to keep in community bank. They are involved in seed collection, seed fair, cleaning, treatment and disbursement. Farmers also provide private crop protection. Farmers are linked with most actors involved in haricot bean development.
People in Need (NGO), FHI (Food For Hungary International)	Involved in establishment of seed bank in 4 PAs as of 2009. Built 4 community seed banks in 2009/10 and FHI provided haricot bean seed for farmers in 12 PAs in 2008-2010.
Alaba Menchenon Farmers Union	The union is source of credit for farmers involved in crop protection and is also involved in marketing of haricot bean grain.

External and internal factors were analyzed for haricot value chain development. The analysis shows ways to strengthening of seed multiplication in the area by showing the weakness and strength, the opportunities and treats (See Table 11).

Table 11. Situation analysis in haricot bean value chain development

Strengths	Weakness	Opportunity	Threats
Strong Partnership at national level (OoARD, IPMS and MARC)	Less involvement of private sector at Woreda level (e.g Union)	Existence of foundation or basic seed sources ESE or MARC	Inadequate or irregular rain
Input supply (MARC for basic and foundation seeds)	Seed committee needs capacity building	High demand for seed in market and at home	Short supply of foundation or basic seed
Output marketing to encourage seed producers (15% premium from grain market)	Frequency of monitoring inadequate	Existence of IPMS project, farmers research group (FRG) project	If members fail to obey the commitment
Data recording (yield focused/ outputs)	Inadequate field data and incomplete feedback for researchers	Suitable agro climatic condition	Lack of formal knowledge sharing among actors
Seed bank establishment and committee formation	Seed fair was not conducted in all PAs where there is seed bank	Existence of farmers indigenous seed storage methods	Lack of trust among members
Seed bank rules are internalized and seed are treated	Seed marketing is not quality based	Existence of support actors (OoARD, IPMS, People In Need)	Droughts may influence seed recovery

6. Challenges in development of haricot bean value chain

Challenges which still exist and/or are expected to emerge when scaling out the various interventions are summarized below:

- Sustained sources of basic and foundation seed for multiplication may hamper future development of seed multiplication as part of the value chain.
- Except for the national coordination effort (by Tropical Legume II project) where national partners meet twice in a year, coordination is weak among partners. Coordination at district level is so weak that involvement of private sector/cooperatives is still missing.

- There is a loss of seed due to consumption at home or sale to market. Farmers consume and sale due to immediate need for cash after harvesting instead of circulating back to the local seed system.
- There is limited business development service in seed inspection, packing, labeling and seed marketing or quality based marketing which will affect seed business.
- Problems associated with moisture stress, poor weeding practice, inadequate seeding and fertilizer application rates still require further intervention.
- The social significance, potential for scale up and sustainability of informal seed multiplication and community seed bank establishment is well recognized. The future of haricot bean value chain development, however depend on the public and private sector support to build local community's capacity.
- The role of the OoARD in the value chain development approach has been very strong, but need to gradually be taken over by communities, cooperatives and private sector partners.

7. Lessons learned and recommendations

- The study shows an increasing trend in seed multiplication from 4 PAs to 19 PAs and a change in focus from consumption to seed business resulting in establishment of seed cooperative. Likewise, farmers' market participation increased from 54.5% in 2004 to 92% in 2009 with an increase in the proportion of their produce reflecting potential for commercialization of seed production. The cooperative is recommended to strengthen seed recovery to seed banks and build efforts on collective seed marketing.
- Survey shows a significant higher yield of 9.5 qt/ha by fertilizer users compared with 7.24 qt/ha by non users. On-farm yield trial for three years shows mean yield of 7.04, 4.1 and 2.76 qt/ha for chemical fertilizer, haricot bean inoculants and control plot respectively. Though chemical fertilizers are the best in yield and gross margin, inoculants could also be future alternatives.
- Lessons from input supply elements in haricot bean value chain shows the social significance of community seed banks (as center for seed collection and disbursement). The seed committee is however suggested to maintain seed quality (through cleaning, seed treatment and seed fair session) while mainstreaming HIV/AIDs and gender issue and developing linkage with partners as sources seeds.
- Lessons in strengthening input supply systems shows importance of input shop crop protection service and revolving fund. Thus, it is recommended that of additional private input shop be established by private sectors and support be given for continued use of crop protection service and established revolving fund.

- Partnership between actors in haricot bean value chain development is informal with poor linkage. The involvement of private sector is weak. It is recommended that OoARD coordinate partners for better linkage, formal partnership and encourage private sector involvement in value chain development (e.g Union).
- Lessons in marketing intervention show small pack experiment and variety promotion session are fast methods to diffusion of haricot bean technology to broader geographic area. Results from the experiment confirm that there is high demand for red/speckled haricot bean. In addition, small pack experiment and variety promotion (methods) verified fast diffusion of haricot bean variety in shorter period over wider geographic area. Seed cooperatives are recommended to continue to use the intervention for marketing.
- Intervention on haricot bean output marketing shows that farmers are working with inferior quality standards for export and small volume of haricot bean. Thus, partners are advised to focus their intervention mostly on improving quality and quantity of haricot bean
- Looking at the dynamism and diversity of haricot bean value chain elements, there is still a need for future intervention by partners (e.g, building capacity of seed committee and cooperative and introducing haricot bean thresher technology). It is recommended that OoARD strengthen support to business development for commercialization of seed production.

8. References

Abesha D (2006) *Pest Management Practices in Small Holder Agriculture: The Agricultural Extension Perspective*, In Bekele et al (2006) pp 109, Facilitating the Implementation and Adoption of Integrated Pest Management (IPM) in Ethiopia,

Bishop-Sambrook C (2008) Dynamics of the HIV/AIDS epidemics in value chain development in rural Ethiopia and responses through market-led agricultural initiatives, Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project, International Livestock Research Institute (ILRI), Working Paper 12. ILRI (International Livestock Research Institute), Nairobi, Kenya. 84 pp.

Campbell, R. (2008). The Value Chain Framework, Competitiveness at the FRONTIER, theme: Value Chains, pp 3-4, July, 2008, monthly forum publication, Indonesia.

ECX (2009) Commodities/Haricot Bean (Ethiopian Commodity Exchange, ECX) <http://www.ecx.com.et/commodities/haricotbean>

EEPA (2004). Ethiopian Pulses Profile, Product Development and Market Research Directorate Ethiopian Export Promotion Agency (EEPA).

Ferris S. and Kaganzi E., (2008). Evaluating-marketing opportunities for haricot beans in Ethiopia. Improving Productivity and Market Success of Ethiopian Farmers (IPMS) Project working paper No 7.

IPMS (2005). Alaba Pilot Learning Site Diagnosis and Program Design, Project document compiled based on stakeholder consultation workshop in July 2005.

MoARD (2008) Annual Statistical Bulletin 2008 (2000 E.C), 2008 Budget year and main agricultural products and export performance annual statistical bulletin http://www.eap.gov.et/content/files/documents/Marketing/newdoc/Annual_statistical_report_final_2000.pdf (Amharic document)

Msiska B and Chibambo B (2001) The Future of Small Scale Seed Multiplication and Dissemination By NGOs in Malawi: Perceptions of Action Aid and Concern Universal, a paper presented On Bean/Cowpea Collaborative Research Support Program- East Africa in Proceedings of Bean Seed Workshop Held in Arusha, Tanzania from January 12-14.

Negash R (2007). Determinants of Adoption of Improved Haricot Bean Production Packaging in Alaba Special Woreda, Southern Ethiopia. A Thesis Submitted to the Department of Rural Development and Agricultural Extension, School of Graduate Studies , Haramaya University.

Phiri, M.A.R. Chirwa, R. Kandoole S. and Tripp, R. (2000). Introducing New Bean Varieties with Small Seed Packs: Experience from Malawi. Network on Bean Research in Africa, Occasional Publications Series, No. 32, CIAT, Kampala, Uganda.

Simane B, Worthmann, C.W.S and Hoogenboom G. (1998) Haricot Bean Agro ecology in Ethiopia: Definition using agroclimatic and crop growth simulation models. African Crop Science Journal, Vol. 6 No.1 pp 9-18.