

Policy recommendations for the legume sector in Ethiopia



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Contents

- 1. Introduction and objective of this study 2
- 2. Methodology 4
- 3. The potential of legumes in Ethiopia 5
- 4. Policy recommendations 8
- 5. Recommendations for organising the legume sector 9
- Annex. Specific recommendations along the legume value chain..... 11

Summary

Since 2009, the N2Africa research-in-development project has worked on putting nitrogen fixation to work for smallholder farmers growing legume crops in 11 countries in Africa. In the last year of the foreseen project funding, ending mid-2019, the project has undertaken a policy advocacy activity, which involved bilateral interviews with 15 organisations, followed by a multi-stakeholder workshop on policy recommendations for the legume sector in Ethiopia. The objective is to bring the N2Africa results under the attention of policy makers, which should contribute to more favourable policies and more support in general for growing grain legumes.

The potential of legumes in Ethiopia is threefold:

1. For an economic objective: legumes contribute to farmer income. Soybean, common bean and chick pea are more profitable than maize. Profitability improves even more with investments in rhizobium inoculant (benefit/costs: 16-32), improved seed (b/c: 9-18), and fertiliser (b/c: 5-9). At the national level, the import bill for edible oil can be reduced by investing in soybean production and processing – currently most soybean is exported as raw material.
2. For an environmental objective: legumes contribute through N-fixation to soil fertility, and make the farming system less vulnerable to droughts and climate change. Cereals grown in rotation after legumes yield 25%-41% higher than cereals grown year after year. Considering a recommended cereal – legume rotation, the area under legumes could grow from the current 15% to over 30%.
3. For a nutritional objective: legumes address important micro nutrient deficiencies. The current consumption of 15-20 kg legumes per person per year could further increase to the WHO recommended 25 kg per person per year, requiring an increase from 1.6 to 2.4 Mha under legumes.

Discussions of the current situation and constraints along the legume value chain have resulted in the following policy recommendations:

- 1) Give more attention to legumes in policies, strategies and guidelines
 - a) For legumes as food crops, combine efforts of the Ministry of Agriculture and the Ministry of Health, and other development partners.
 - b) For soybean, mainly as cash crop, combine efforts of the Ministry of Agriculture and the Ministry of Industry and Trade, the Ministry of Labour and Employment, private sector and development partners.
- 2) Adjust import and export policies to encourage domestic processing of soya into oil and feed. Consider (temporary) import tariffs on edible oil to encourage local production of soybeans and local processing of soybean into oil and feed. Consider flexible tariffs: protecting domestic soybean production, but allowing limited import if domestic production falls short, to assure consumer access to affordable edible oil.
- 3) Encourage private sector investment, vertical integration and contract farming, in legume production.
- 4) Facilitate credit facilities for private sector in the agro-sector.
 - a) Allow more private sector banks and foreign credit facilities in Ethiopia.
 - b) Elaborate a new law, that allows farmer cooperative unions to open a cooperative bank.
- 5) Elaborate a strategy about the complementary roles of government, farmer organisations, and private sector.
- 6) Encourage the consumption of legumes for improved nutrition.

- a) Public campaigns can create awareness about the positive health effects, and improve the social status of legumes;
 - b) Consider enhanced use of legumes in recipes and processing of e.g. porridge for school feeding and other government food procurement, for better nutrition and to create a demand pulling local production.
 - c) Consider subsidies for food with legumes ingredients.
- 7) Encourage the organisation and strengthening of a legume platform (or several platforms), representing the sector, as policy dialogue partner with the sector.

For the organisation of the legume value chain, the following recommendations were made about the current platforms:

- 1) Formalise, coordinate and possibly merge, a few of the existing legume platforms.
- 2) The platform should review the existing government strategies, and make recommendations for improvements.
- 3) The legume sector platform should encourage government, its members, and other stakeholders, to:
 - a) Set up a market intelligence system, combining information about current and expected demand in Ethiopia and abroad (volumes, quality, prices).
 - b) Organise farmers in (and strengthen existing) producer organisations.
 - c) Encourage farmer - buyer contracts and vertical integration (new).
 - d) Analyse and address efficiency constraints in the value chain.

1. Introduction and objective of this study

Since 2009, the N2Africa research-in-development project has worked on putting nitrogen fixation to work for smallholder farmers growing legume crops in Africa. N2Africa has been active in DRC, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda and Zimbabwe, and since 2013 also in Ethiopia, Tanzania and Uganda. By 2018, N2Africa had reached more than 660,000 smallholder farmers with improved technologies (seed varieties, rhizobia inoculant, fertilisers) for grain legume production. The project has worked with government, research, and private sector value chain actors to support the legume sector.

In the last year of the foreseen project funding, ending mid-2019, the project planned a policy advocacy activity, in Tanzania and Ethiopia. The objective is to bring the N2Africa results under the attention of policy makers, which should contribute to more favourable policies and more support in general for growing grain legumes. Chapter 2 describes steps in this policy advocacy process. Chapter 3 presents the potential of legumes in Ethiopia. Chapter 4 summarises the main policy recommendations, following some of the main constraints along the value chain, while Chapter 5 presents recommendations for better functioning platforms, for legumes, and for soybean. In the Annex, a short overview is given of more detailed recommendations along the value chain.

This policy advocacy activity is divided into two steps:

1. A first step is the policy analysis: through interviews with different stakeholders along the value chain from inputs, production, processing, trade and consumption, finding out what aspects could be further strengthened, and how policy could play a role in this. An important aspect is to find out from policy makers what the current policy objectives are, and what policies are in the making, that could be served by any of the benefits of leguminous crops.
2. A second step is policy advocacy, through a multi-stakeholder meeting in which the results of the policy analysis are presented and discussed, and consensus is sought about next steps, focusing on current and future policies, but also considering current and future support programmes, to enhance the place of leguminous crops in agricultural development, and its benefits for the various objectives, relevant in Ethiopia.

This report presents the findings of the first step, as input and preparation for the second step.

2. Methodology

Initial discussions were held in the N2Africa project management team in the Netherlands, followed by a field visit to Ethiopia 20 interviews were conducted with various stakeholders (in government, private sector, farmer organisations, NGO's), done together with the N2Africa country coordinator, between 10 and 15 Dec 2018. The review of agricultural policies (Stadler, 2017)¹ plus a few additional policy documents and other studies on legumes in Ethiopia were consulted. Perceptions about the current functioning and recommendations, for the whole legume sector and of specific segments in the value chain, were combined in a report with draft recommendations. These draft recommendations were discussed in a policy recommendations workshop in Addis Ababa, on 3 May 2019, of which the results are incorporated in this final report. This document can assist further policy advocacy efforts by development partners towards the Ethiopian government and donor organisations.

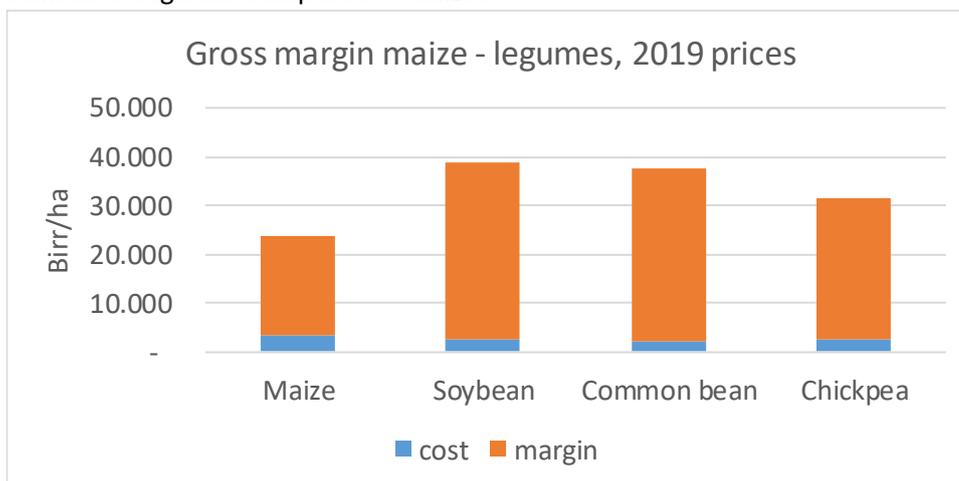
¹ Stadler M. 2017. [Review of policies relating to legume intensification in N2Africa countries.](#)

3. The potential of legumes in Ethiopia

Legumes, including soya, potentially contribute a lot to three main objectives: (i) economic, at household and national level; (ii) environmental; and (iii) nutritional objectives.

Economic benefits

- Legumes contribute to farm household income. Calculations show the profitability for farmers of legumes compared to maize:



Maize: Yield 2018 CSA 3944 kg/ha; price 2018 estimate 6 B/kg; 100kg urea + 100 kg DAP

Soybean: Yield 2018 CSA 2800 kg/ha; 14 B/kg (ECX); 50 DAP

Common bean: Yield 2018 CSA 2250 kg/ha; price 2019: 17 B/kg (ECX); 50kg DAP

Chickpea: Yield 2018 CSA 2058 kg/ha; price 2019: 15 B/kg (ECX); 50kg DAP

- Gross margins of additional costs and additional benefits, of using inoculant, improved seed, and fertiliser. The yield effect of additional inputs is presented as a range: the high estimate is based on the average effect found in N2Africa on-farm demo plots with chickpeas in Ethiopia (Wolde-meskel et al., 2018)²; the low estimate is 50% of this, assuming lower yield effects under large scale adoption. This shows that inoculant is the cheapest option and has the best benefit-cost ratio.

	yield kg/ha	cost B/ha	benef B/ha	B/C
no inputs, local seed	1800			
+ Inoculant	180-360	158	2,520-5,040	16-32
+ Improved seed	250-500	400	3,500-7,000	9-18
+ Fertiliser	225-450	700	3,150-6,300	5-9
All inputs	2,455-3,110	1,258	9,170-18,340	7-15

inoculant every year; improved seed 1 in 4 years; 50 kg DAP; soya 14 Birr/kg

² Wolde-meskel, E., van Heerwaarden, J., Abdulkadir, B., Kassa, S., Aliyi, I., Degefu, T., Wakweya, K., Kanampiu, F., Giller, K.E. 2018. [Additive yield response of chickpea \(*Cicer arietinum* L.\) to rhizobium inoculation and phosphorus fertilizer across smallholder farms in Ethiopia](#). Agriculture, Ecosystems & Environment, 261, 144-152.

- By increasing national-level efforts in the legume sector, farmer adoption of inoculant, improved legume seed, and fertiliser for legumes are expected to increase. The estimated 121-243 kg/ha yield increase, averaged for the whole country, would result in an additional legume production worth US\$ 88-175 million per year.

legumes	potential	adoption		projected
	add kg/ha	2019	2023	add kg/ha
% using inoculant	180-360	2%	30%	50-101
% using impr seed	250-500	22%	45%	58-115
% using fertiliser	225-450	14%	20%	14-27
Yield	655-1,310			121-243
Additional production Et 1.6m ha				194-388 *1000 ton
Value additional production per year				88-175 MUS\$

* 2019 average price legumes 14 Birr/kg; exchange rate 31 Birr/US\$

- Increased soya production and processing reduces the import bill for edible oil. Currently soya is exported as raw material, while the domestic prices are higher than world market prices, only to obtain the foreign currency needed to import palm oil that can be sold with a large profit in Ethiopia.
- Legumes fix nitrogen, which reduces the import bill and farmer costs for mineral fertiliser (economic benefit) and reduces soil fertility depletion (environmental benefits, see below). In Ethiopia, grain legumes are cultivated on about 1.6 million hectares of land. Assuming 50 kg of chemical N fertilizer substitution per ha per year (average yield 2 t grain legumes / ha), foreign currency spent for purchasing 80,000 tons of chemical N fertilizer can be saved, which corresponds to about 56 m US\$).

Environmental benefits

- Legumes improve soil fertility and soil health. They fix N, which, besides reducing input cost for farmers, also reduces soil fertility depletion if otherwise no fertilisers would be used or reduces pollution and soil acidification if otherwise too much or wrong types of fertiliser would be used.
 - From an environmental and agronomic point of view, in many areas, the optimum is to grow legumes in a 3 year rotation with cereals and other crops. Another option is to intercrop legumes with cereals. From this point of view, the current area under legumes, only about 15% of arable land, could easily expand to 30-35% of arable land.
 - A systematic review and of research (Franke et al., 2018³) has shown that cereal yields are between 25% higher (fertilised cereals) and 41% higher (unfertilised cereals), when grown in rotation after legumes.
- Including legumes make the cropping system less vulnerable to climate change. Legumes serve as cover crops, making farmland less drought sensitive than pure maize on bare soil,

³ Franke, A. C., van den Brand, G. J., Vanlauwe, B. & Giller, K. E. (2018). [Sustainable intensification through rotations with grain legumes in Sub-Saharan Africa_A review](#). *Agriculture, Ecosystems and Environment* 261: 172-185.

and reduce soil and water erosion. In general, the effect of a more diversified cropping system (species and varieties), including legumes of various duration, reduces the risk of crop failure. For example, in areas where a second crop is grown on residual moisture, chick peas are more drought resistant and more profitable than wheat.

Nutritional benefits

- Increased consumption of legumes, combined with increased consumption of vegetables, dairy products and eggs, is the most affordable option to reduce malnutrition in Ethiopia. Meat and fish are often too expensive for poor households. Legumes contain many of the macro and micro nutrients that are currently not consumed enough, and they are cheaper than meat and fish.
 - Current legume consumption in Ethiopia is about 15 kg per person per year (excl. soybean and groundnuts (Akibode and Maredia, 2011)⁴; we assume 20 kg incl. groundnuts).
 - If the increase in legume consumption, from the current 20 kg up to the recommended 36 kg per person per year (see below), would be produced locally, this would require an increase of the land under legumes by about 50% (see text box below).
 - Soya oil has more poly-unsaturated fats and is healthier than palm oil.
 - Milk and eggs, and, as far as affordable, small amounts of meat, also contribute to improved nutrition. Legumes are important ingredients for livestock and poultry feeds.

Generally, the most limiting nutrients in African diets are vitamin A, and B12, calcium, iron and zinc. The food items that should be eaten more of include dark green leafy vegetables and fruits for Vit A, animal source foods for Vit B12, and legumes for calcium, iron and zinc (N2Africa, Ilse de Jager⁵).

The EAT Lancet Committee recommends a global healthy reference diet that includes about 36 kg legumes per person per year (18 kg dried legumes, 9 kg soybean products, and 9 kg ground nuts; to be adjusted by country and region). Compared to the current diet, this reference diet includes *more legumes and vegetables*, and less cereals and tubers, and would reduce deficiencies in several micro nutrients, and reduce malnutrition.

If the Ethiopian population of 108 million would increase legume consumption by 16 kg per person per year, this would require an additional 864,000 ha under legumes (average yield 2.0 t/ha), an increase from the current 1.6 m to a desired 2.4 m ha under legumes.

⁴ Akibode S. M Maredia. 2011. [Global and Regional Trends in Production, Trade and Consumption of Food Legume Crops](#). Report submitted to the CGIAR Special Panel on Impact Assessment, 27 March 2011.

⁵ de Jager, I. (2013). [Nutritional benefits of legume consumption at household level in rural areas of sub-Saharan Africa](#). N2Africa Report. Wageningen: Wageningen University.

4. Policy recommendations

1) *More policy attention to legumes, requiring joint efforts from different ministries.*

- a) **Policy constraint:** grain legumes, currently grown on 15% of arable land, do not yet receive the attention they deserve in policies that combine the different objectives: agriculture development and farm economy (seed and rhizobium inoculant research and multiplication, extension); trade, industry and national economy (import substitution, domestic processing), environment (resilience by diversification with legumes); and nutrition (encourage legumes consumption).
- b) **Policy recommendation:** The government should give more attention to legumes in policies, strategies and guidelines, to achieve different objectives: national and farmer economy, environment and climate change adaptation, and nutrition and food security. These ambitions should be documented in policies, so new strategies, action plans, and programmes by government and development partners can link up to these policies.
 - i) For legumes as food crops, combine efforts of the Ministry of Agriculture and the Ministry of Health, and other development partners, in a joint public campaign for producing and eating more legumes; train extension staff of new production techniques and market linkages.
 - ii) For legume seed, fertiliser and rhizobium inoculants, establish and strengthen regulation and quality control of inputs.
 - iii) For soybean, mainly as cash crop, combine efforts of the Ministry of Agriculture and the Ministry of Industry and Trade, the Ministry of Labour and Employment, private sector and development partners, in a joint campaign to encourage farmers to grow more soybean.

2) *Support and protect the domestic emerging soybean sector*

- a) **Policy constraint:** currently, Government already encourages the import of agro machinery with a tax exemption, which is good, but the current trade policies encourage export of raw materials (e.g. soybeans) and import of final products (e.g. palm oil), which discourages domestic processing.
- b) **Policy recommendation:** The government could adjust the import and export policies to encourage domestic processing of soya into oil and feed. The government could consider (temporary) import tariffs on edible oil to encourage local production of soybeans and local processing of soybean into oil and feed. Flexible tariffs are possible as well: protecting domestic soybean production, but allowing limited import if domestic production falls short, to assure consumer access to affordable edible oil.

3) *Encourage private sector investment and vertical integration*

- a) **Policy constraint:** currently, the legume markets are not integrated: legumes are sold by farmers to traders in spot markets; there is little investment from processors or exporters in production by farmers or in input supply chains by agro-processors. Up to recently, farm and marketing contracts could not be enforced. Contract farming is new; a draft 'farm and marketing contract' was being discussed in Dec 2018. Vertical integration is new, but there are some examples, e.g. with barley grown by smallholders for the brewery.
- b) **Policy recommendation:** The government should encourage private sector investment, liberalise the provision of inputs (seed, fertiliser), and encourage vertical integration and contract farming, in legume production. Development partners are interested in supporting a

private sector led, e.g. pulled by a processor or exporter, value chain of legumes, in particular soya. A private actor with access to capital can contract farmers or farmer cooperatives, provide inputs on credit, farmer extension and advice, organise bulking, and assure offtake.

4) Facilitate private sector and farmer cooperatives to engage in credit to the agro-sector.

- a) **Policy constraint:** Access to credit is a constraint for the agro-sector. Agro-processing enterprises had difficulties in accessing credit from foreign financial institutions, and cooperative unions are not yet allowed to start a cooperative bank.
- b) **Policy recommendation:** Government should facilitate credit facilities for private sector in the agro-sector.
 - i) The government should allow more private sector banks and foreign credit facilities (Rabobank, GAFSP) to support the agro sector in Ethiopia.
 - ii) The government should elaborate a new law, that allows farmer cooperative unions to open a cooperative bank (this is currently not allowed).

5) Elaborate a strategy about the complementing roles of government, farmer organisations, and private sector.

- a) **Policy constraint:** currently, there is still little room for private sector in the agro-sector. In spite of several successful pilots, e.g. with direct seed marketing, private companies producing rhizobium inoculant, private agents distributing inputs, and farmer cooperatives doing their own processing and export, it seems that government is still holding on to too many tasks and leaving too little room for private sector and entrepreneurial farmers.
- b) **Policy recommendation:** The government should discuss with farmer organisations, private sector, and development partners, to elaborate a strategy about the complementing roles of government, farmer organisations, and private sector. The government should maintain an important role in setting regulations, licencing, and quality control, while gradually leaving other roles (import, production, distribution, including that of fertilisers) to private sector.

6) Encourage the consumption of legumes

- a) **Policy constraint:** Legume consumption in Ethiopia is low (15 kg per person per year), compared to consumption in e.g. Kenya or Uganda. Legumes provides some of the micronutrients that Ethiopians currently do not eat enough of (e.g. calcium, iron, zinc).
- b) **Policy recommendation:** The government should encourage the consumption of legumes: the ultimate goal of agricultural production is food security.
 - i) Public campaigns can create awareness about the positive health effects, and improve the social status of legumes;
 - ii) The government could consider enhanced use of legumes (and other nutritional ingredients) in recipes and processing of e.g. porridge for school feeding, possibly other government food procurement, for better nutrition and to create a demand pulling local production.
 - iii) The government could consider the arrangement of special subsidies (cheaper prices for food with legumes ingredients)

5. Recommendations for organising the legume sector

From the interviews and some of the other studies reviewed, the organisation of the legume sector in Ethiopia came out as a main challenge.

Policy constraint: Currently, there is no well-functioning platform yet that assures a good communication within the legume value chains, that represents the different stakeholders, and that is considered by government as formal policy dialogue partner. There are several legume platforms, sometimes called innovation platforms, that are supported on a temporary basis from research or NGO projects. INTAC also established a pulses network. There is a recently initiated ‘Soybean stakeholder platform’ in which farmer cooperatives, and buyers and processors participate. Most platforms have only temporary funding, and are not yet formally recognised by government.

This resulted in the following recommendations:

- 1) The government could encourage the **organisation and strengthening of a legume platform** (or several platforms), representing the sector, as policy dialogue partner with the sector. The government could assign a central focal point for this legume network platform. This platform can signal and address various constraints along the value chain, in dialogue with government and other stakeholders (see below).
- 2) **Formalise**, coordinate and possibly merge, a few of the existing legume platforms. A quick inventory during the workshop showed four candidate organisations that could play that role:
 - i) Chickpea platform, production and marketing, public lead, 15 members,
 - ii) Ethio-Netherlands Trade for Agri Growth (ENTAG), across value chain, private led, 50 members.
 - iii) Ethiopian pulses, oilseeds, spices, association (EPOSPEA), international market, private led, >300 members.
 - iv) Ethiopian Pulse Council (Concom level), production and local market, public-private led. This was proposed as the most suitable candidate platform for our purpose, because they are more on the ground, while EPOSPEA is more for large exporters. Preferable this remains led by the private sector.
- 3) The platform should **review the existing government strategies**, and make recommendations for improvements. Specifically for soybean, develop a long-term plan for the development of the soybean sector. Anticipate the time and phases that the development of a new crop will go through.
- 4) The legume sector platform should encourage government, its members, and other stakeholders, to:
 - a) **Set up a market intelligence system**, combining information about current and expected demand in Ethiopia and abroad (volumes, quality, prices). Farmers should be able to respond to changes in expected demand. Information about (anticipated) quality criteria on the demand sides should also be forwarded to the seed sector, thus motivating private sector involvement here, and to farmer extension.
 - b) **Organise farmers** in (and strengthen the existing) producer organisations, for joint marketing and a better bargaining position, efficiency in the value chain, and to estimate farmer’s demand and organise seed and other inputs.
 - c) **Encourage farmer - buyer contracts** (new), that can be the basis of vertical integration and provision of inputs and advice to farmers. Because of the strong market demand and private sector involved, soybean could be a good case to start with.
 - d) Analyse and **address efficiency constraints** in the value chain (including post-harvest mgt., bulking and grading), to reduce the production costs and increase the competitiveness on the international market.

Annex. Specific recommendations along the legume value chain

The interviews yielded more detailed recommendations, following the (numbered) legume value chain step-by-step, from seed, inoculant, fertiliser, and extension, to production, processing and trade, and consumption; in short, bullet form. One of the main recommendations is to have a functional legume platform, which then could address most of the more detailed constraints and recommendations in this overview.

Seed varieties

- Faster research, need for disease resistance (Faba, Chickpea)

Seed production

- Discuss with government, private sector, and Local Seed Producing Cooperatives: how can the best complement each other? (LSPC good for legumes, ISSD)
- Create demand (demo's, local agro dealers) and assess seed demand (ICT assisted), to encourage private seed production
- Government should allow Direct Seed Marketing (tested in pilot) on national scale.
- Government moving from govt input supply to regulating and monitoring private sector.

Rhizobium

- Continue informing private sector and government about prod and quality control.
- Strengthen different, parallel inoculant distribution channels (govt, PS, coops)
- Government to reconsider government production, and preferably leaving this to, and encourage, inoculant production by the private sector.
-

Inputs in general

- Allow private sector import and distribution of fertiliser (pilot ongoing).
- Encourage and support private sector agro dealers, besides other existing channels.
- Government could limit input supply, fill gaps left by private sector and LSPC.
- Govt role would be more in regulation, monitoring and quality control.

Credit:

- Allow foreign and private banks to support agro sector
- New laws that allows cooperative bank.

Extension

- Legumes more emphasis in extension packages; refresher course, update materials.
- ICT supported extension.
- Transform from supply driven to demand driven extension
- Besides govt extension, there is room for private extension (commercial farming)

Cooperative unions

- Make Coops more business oriented. There are good examples.

Production

- Promote legumes in rotation with cereals. (residual moisture, soil fert., diseases).
- Mechanisation: test and promote. (grading sieves, planters, harvesters)
- Legumes fit in 'cluster approach', promoted by ATA / MoA

Processing

- Encourage local processing (Shiroh, oil, feed), agro industrial parks.
- Make investment in agro-processing more attractive. (now other sectors are more interesting: lower tax enforcement, quicker returns)

Markets

- Connect producers to markets (bulk, grade → local/export market)
- Change import and export policies (related to access to foreign currency). Currently, local processing is discouraged.
- Export licencing more transparent; preferably no export bans.
- Information about quality requirements for export → farmers, processors, traders.

Consumption

- Encourage consumption of legumes (Consumption in Ethiopia is low)
- Consider regulation for mixing in legumes in bread flour and school feeding.
- Behavioural change communication to increase status of legume-food