Understanding niches for multi-purpose-legume intensification in smallholder farming systems: Early applications of the decision-support Legume CHOICE tool in Ethiopia

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Introduction

Legumes have great potential to contribute to rural livelihoods and natural resource status, either in the form of food, income, feed, protein, soil nutrients and fuel. However, the provision of a given function differs between legume classes, types and species, and needs different intervention approaches. This tool guides decision-making around legume interventions.

Research objectives

• To diagnose the farming system and related entry points for multi-purpose legume intensification in farming system.
• To understand niches for identified legumes and design best-fit legume interventions for different farmer types.

Materials and methods

Four implementation sites were selected from CRP Humid tropics field sites (Table 1).

Table 1. Description of Ethiopian Legume CHOICE project implementation sites

<table>
<thead>
<tr>
<th>Implementation sites</th>
<th>Field site</th>
<th>Total household</th>
<th>Ave. altitude</th>
<th>Agro-ecology</th>
<th>Market access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lalisa-Dimtu (Lowland agro-ecology)</td>
<td>Diga</td>
<td>700</td>
<td>1306</td>
<td>Lowland</td>
<td>Good</td>
</tr>
<tr>
<td>Fromsa (Mid-altitude agro-ecology)</td>
<td>Diga</td>
<td>550</td>
<td>2140</td>
<td>Mid-altitude</td>
<td>Medium</td>
</tr>
<tr>
<td>Chillanko (Highland agro-ecology)</td>
<td>Jeldu</td>
<td>500</td>
<td>2943</td>
<td>Extreme highland</td>
<td>Good</td>
</tr>
<tr>
<td>Kolu-Galan (Highland agro-ecology)</td>
<td>Jeldu</td>
<td>1150</td>
<td>2685</td>
<td>Highland</td>
<td>Medium</td>
</tr>
</tbody>
</table>

The Legume CHOICE tool has been applied following three steps:

1. Qualitative assessment of the farming system;
2. Context assessment of key attributes or constraints; and
3. Community need assessment for different legume functions.

Results and discussion

• Output from the tool has helped to select the best legume-intervention options (Table 2).

Qualitative assessment of the farming systems

• Livelihoods of the study areas depend on the crop-livestock farming system.
• Legumes are a major component of this farming system.
• Both grain, fodder and/or tree legumes are cultivated but on a very limited share of the farmland.

Legume production and productivity constraints

• Each community has a set of constraints that limit selection of appropriate legume interventions options (Fig. 2).

Demand for legume functions

• Each community demands different things of legume interventions (Fig. 3).
• Farmer preferences for those candidate legumes can differ between implementation sites (Table 2).
• Each legume fulfills the various legume functions to varying extents (data not shown).

Conclusion

A range of constraints and production objectives in which the farming system operates need to be considered for legume intensification.

Legume CHOICE decision-support tool has high potential to support selection of best-bet options for legume intensification based on needs for a range of benefits that legumes can deliver (Fig. 2-3 and Table 2).