Case Study on the adoption of direct seeding mulch-based cropping (DMC) in smallholder agriculture in Xayabouli province, Lao PDR

Presented by
Name: Tiene VANNASOUK, DDG of Dept. of Extension and Agro-processing
Outline of the presentation

1. Rationale of CA adoption in Laos
2. Significance of DMC in Lao PDR and policy support
3. Good and successful cases adoption
4. Constraints and Challenges
5. Recommendations and conclusion
1. Rationale of CA adoption in Sayabouli

1. High demand of maize for Thailand market
2. Smallholders have engaged massively in maize monocropping with conventional practices
3. The system of production is in detriment to the environment and social impacts (increased soil erosion, gradual soil exhaustion, chemical pollution of soils and hydrological systems, increased risk of human intoxication by pesticides)
Deep tillage on steeply land in Laos

Erosion
Rationale of CA adoption in Sayabouli (cont)


6. Since 2006 the PASS-PCDR- a rural development project has disseminating DMC systems on a larger scale

7. More than 1,200 smallholders using DMC system on a total of about 2100 ha
Technologies

A large range of equipments adapted to the local conditions
2. Significance of DMC and policies Support

1. DMC and other CA techniques help reducing soil erosion and degradation
2. Reduce production cost
3. Limited use of chemical fertilizer and herbicide
4. No harm for practitioner
5. Risks avoidance both environmental and economic associated with less sustainable systems based on heavy mechanization and mono-cropping.
6. Limit the vulnerability of farmers to the potential failure of a single economic activities
1- Government Decree on adoption of SCV-CA as promising technic for Agri-production and need for Integration SCV-CA to the cursus of Agri-Facult No554 dated (21/4/2005)
2-Official Ministry Circular Message on the use of SCV (DMC) /CA in application No 0372Maf dated 11/may/2005
3. Good practices and successful cases

No till of rice on S. guinensis mulch

Continuous and full soil cover is key factor for successful CA/DMC

Sowing rice with no till
3. Good practices and successful cases

No till of rice on *S*. *guinensis*

Continuous and full soil cover is key factor for successful CA/DMC

Sowing of maize in Paklay Sayabouly
No till of maize on bean (vigna umbellata) mulch, Kenthao, Sayabouly
Comparison of conventional (CV) maize monocropping and CA-DMC Maize/Vigna biannual rotation

Data from demonstration & validation sites (LAOS). Source: 5th WCCA meeting, Brisbane Australia

<table>
<thead>
<tr>
<th>Year</th>
<th>CV (kg/ha)</th>
<th>CA-DMC (kg/ha)</th>
<th>% CV/CA-DMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>3003</td>
<td>3067</td>
<td>102%</td>
</tr>
<tr>
<td>2007</td>
<td>3680</td>
<td>4701</td>
<td>127%</td>
</tr>
<tr>
<td>2008</td>
<td>3675</td>
<td>5237</td>
<td>142%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Profit USD/ha</th>
<th>CV</th>
<th>CA-DMC</th>
<th>% CV/CA-DMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>150</td>
<td>299</td>
<td></td>
<td>200%</td>
</tr>
<tr>
<td>2007</td>
<td>377</td>
<td>735</td>
<td></td>
<td>195%</td>
</tr>
<tr>
<td>2008</td>
<td>190</td>
<td>426</td>
<td></td>
<td>224%</td>
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</table>
Agroeconomic productivity of DMC maize monocropping and tillage-based maize mono-cropping systems. Source Tran Quoc Hao et al. 2008

<table>
<thead>
<tr>
<th>District</th>
<th>Villages</th>
<th>Maize yield (kg/ha)</th>
<th>Production cost (USD/ha)</th>
<th>Net income (USD/ha)</th>
<th>Labor productivity (USD/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boten district</td>
<td>7 villages</td>
<td>5237</td>
<td>115</td>
<td>633</td>
<td>19</td>
</tr>
<tr>
<td>Kenthao district</td>
<td>11 villages</td>
<td>4697</td>
<td>123</td>
<td>548</td>
<td>15</td>
</tr>
<tr>
<td>Paklay district</td>
<td>10 villages</td>
<td>6542</td>
<td>122</td>
<td>803</td>
<td>20</td>
</tr>
</tbody>
</table>
Acidic Soils Xieng Khuang

Objectives
- Increase pH
- Correct Fertility
- Improve Production & incomes

Intensify Meat production
- 500 Kg/ha/year

Diversification

Correcting fertilizers
- CaCO3 increased upto 2T/ha
- and Micro éléments

Improved forages
- Brach + Styo

Beef production

Pig fattening

Rice Direct Seeding

Soyabeans Direct Seeding + legume

Crops Rotation
- Rice + Soyabeans + Maize

Source: 5th WCCA meeting, Brisbane Australia
4. Constraints and challenges

1. Old belief dies hard (Mindset)
2. Herbicide application is needed in the start up
3. Agricultural Commercialization vs CA
4. Limited access to equipments (machineries)
5. The agricultural sector is entirely structured around tillage-based maize monoculture
6. Limited service providers specialized in CA
7. No specific policy support CA practitioners
8. Crop residues (leftovers are resort of pests, rodents and prone to wildfire
5. Recommendations and conclusion

1. Identifying the key moments for intervention along with specific agroecological transition pathway is critical for dissemination of CA
2. Strong policy support for CA practitioners is required
3. Establish Unit to promote CA at MAF/increase awareness of CA
4. Share common objectives among world community/LICA (in ASEAN)
5. International support through rural development projects
6. Social adherence (coherence), group production is an important determinant for adoption
7. Participation of local leader
8. Establish community learning center through regular support from extension workers
9. Potential development exists and proven CA solutions can be applied
Thank you for your attention