

DIRECT SEEDING MULCH-BASED CROPPING SYSTEMS FOR RICE-BEEF PRODUCTION IN THE PLAIN OF JARS, XIENG KHOUANG PROVINCE, LAO PDR: AN EXAMPLE OF THE "CREATION-VALIDATION" METHODOLOGICAL APPROACH

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CONTEXT

The Plain of Jars is an acid, infertile savannah grassland covering an area of about 60,000 ha in the western part of Xieng Khouang Province, northeastern Lao PDR. In this ecology, farming systems are mainly based on lowland rice cultivation and extensive livestock production. An increase in rice production and intensification of the livestock industry are two key components in the Lao government's poverty alleviation strategy for this area. The main agronomic constraints for developing crops and forage systems are related to unfavourable soil chemical characteristics characterised by low pH, along with nutrients deficiencies and high levels of aluminium saturation.

OBJECTIVES AND METHODS

Since 2004, the Lao National Agro-Ecology Programme (PRONAE) has developed an integrative research approach that links reference data acquisition in controlled area, in situ farming system validation in farmers' plots and monitoring. The advantages of the approach are through the case of DMC systems developed in 2005 by the project to intensify rice-beef production in the Plain of Jars. The farming system initially proposed was a 5-year rotational sequence where improved pasture land was implemented in the first year, fattening activities conducted in the following three years and pasture regenerated in the fifth year using rice as a cash crop to finance pastureland re-implantation. Costs and benefits of the system were simulated according to the data collected in the creation sites. At the end of the 5 years, an average net income of 160 \$US/year/ha was expected. System was then proposed to 92 families from 12 different villages for an in situ validation on 76 ha.

Costs & Benefits expected from Beef-rice 5-years farming system (for 1 ha plot)

Plot of 1 ha	1st year	2nd year	3rd year	4th year	5th year
	Pastureland implemen.	Bulls fattening	Bulls fattening	Bulls fattening	Pastureland re-implem (rice+forage)
COSTS (US \$)	240	765	803	842	303
Plot fencing and designing	nd	nd	nd	nd	nd
Pastureland implementation	100	0	0	0	140
Fertilizer	120	125	132	139	146
Animals & animals care	0	615	645	675	0
Credit requirement	220	420	440	470	286
Credit interest	20	25	26	28	17
LABOUR (md.ha-1)	68	72	62	62	55
Fencing & Fence maintenance	30	20	10	10	10
Crops implementation and management	8	2	2	2	10
Seeds harvesting	30	0	0	0	35
Bulls management	0	50	50	50	0
BENEFITS (US \$)					
Bulls sale	0	1000	1050	1100	0
Seeds production	210	0	0	0	395
GROSS INCOME (US \$)	210	1000	1050	1100	395
NET INCOME (US \$)	-30	235	247	258	92
LABOUR PRODUCTIVITY (US \$/ wd)	-0,44	3,26	3,98	4,16	1,67

RESULTS AND DISCUSSIONS

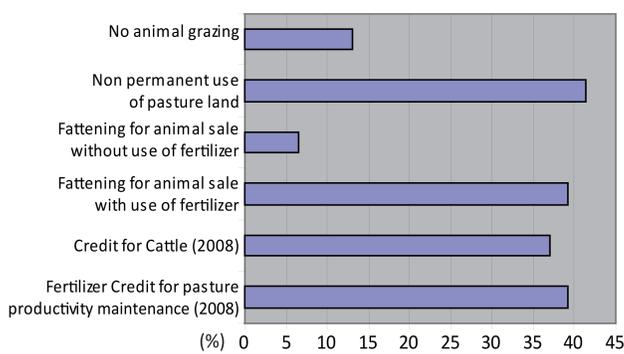
Even though promising results have been described at the creation site, 3-years of continuous validation have revealed several constraints for mass extension. In-field monitoring and surveys with farmers showed the main constraints to be: (i) market channel constraints (forage seeds) or malfunctioning (cattle), (ii) fencing costs and maintenance, (iii) credit access, amount and payment modalities, and (iv) the technical skills required for good-quality pastureland implementation.

This feedback has given rise to development-related discussions and proposals regarding credit access, market channel functioning and training supports to be provided to farmers. This feed back as also given rise to new research topics, such as how to generate higher incomes during the first year of implementation?

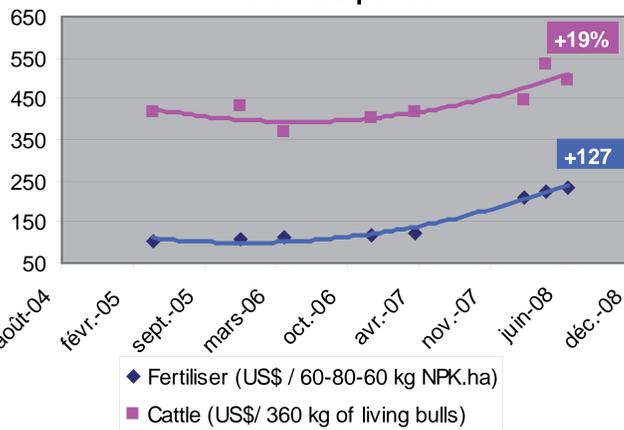
New farming systems based on direct sowing of rice associated with forage species on degraded native pastureland have therefore been tested at creation sites and are currently under validation with farmer groups.



Farmers use of improved pasture land in 2008 (PRONAE monitoring, n=92, 12 villages)



Fertilizer and cattle price evolution on 2005-2008 period



CONCLUSION

This rice-beef system "creation-validation" process shows (i) the need to maintain research activities to feed the development process and (ii) the merits of the approach for determining the potential for technology dissemination.

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