Lao farmer's experience on resilience agriculture by introducing rice direct seeding and mechanization

Presentation by

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Country overview and the agriculture sector

Lao People's Democratic (Republic Lao PDR) is a landlocked country of 236,800 km^2 . The country is divided into 18 provinces, which are made 149 districts, and of around 11.390 villages. The population of Lao PDR is estimated at 6.5 million (2012). The country is home to 49 difference ethnic groups with a high diversity of languages spoken, culture and tradition.

Lao PDR's agro-climatic profile is divisible into three main zones: the northern mountainous region; the hilly and mountainous region of the centre and south, and the plain of Mekong river. The country has two seasons: dry and wet seasons

Country overview and the agriculture sector (continue)

Laos has an agriculture base economy; agriculture continues to play a major role in Lao PDR's economy, newly reported, agriculture accounted for about 24,1% of gross domestic product (GDP) in 2015; the growth rate of agriculture is about 3,4%; paddy production achieve 4,2 mill. Tons in 2015.

In five year plan 2016-2020 it is planning to increase rice production of around 4,7-5 mill. Tons, of which 2,1 mill. Tons will be used for domestic consumption as food security and 1-1,5 mill. Tons plan for trading.

Of about 80% of the total population in Lao PDR work in agriculture sector. Therefore, the impact of climate change on agriculture will have a significant effect on poverty vulnerability in Laos.

Country overview and the agriculture sector (continue)

Lao People's Democratic Republic (Lao PDR) is highly susceptible to climate change and natural hazards, particularly to flood and drought conditions which seriously affect the country's agricultural production.

Lao PDR is very vulnerable to natural disasters, including extreme weather events which have been increasing in frequency and intensity. Almost all the country's farming systems are susceptible to flooding, drought and the late onset of the rainy seasons. With a high dependency on traditional agricultural systems and a predominance of smallholder farms, the impacts of such natural disasters can be all the more devastating.

Country overview and the agriculture sector (continue)

The two main rice farming system make up about two-third of Lao PDR's total cultivated area, namely the (i) lowland irrigated or rain-fed agriculture system prevailing in the Mekong flood plains and the (ii) shifting cultivation farming system dominating the upland areas. Horticulture and coffee are cultivated in smaller systems on the Bolaven plateau. The majority of agriculture production is characterized by near-subsistence farming system.

However, over the last two decades, agricultural production has become increasingly mechanized.

Improved seed varieties, organic farming, and general reduction in the use of chemical fertilizers, pesticides, and herbicides have been promoted during the past few years as part of the Government's effort to introduce green and clean agricultural development.

Common rice growing techniques in Lao PDR

- Rice transplanting by hand,
- Rice seedling transplanting by motorized translators,
- Broadcasting
- Direct seeding
- SRI
- Drum seeding
- Parachute method

The rice production project for national food security

Content of national food security

1. Food availability
2. Food sustainability
3. Food accessibility
4. Food safety/ nutrition

General condition of agriculture and food security

- Lao PDR is agriculture base social-economy;
- It is characterized by small farmers
- Farmer organization is still weak
- Majority is subsistence farming system, less commodity production;
- Every Lao farmers are facing with natural hazards, this lead to low productivity,

Challenge and constraint for food security

- Over use of natural resources lead to negative impact to environment and social-economic development;
- Land and forest degradation
- Flooding in rainy season and water shortage for dry season,
- Weak of agriculture infrastructure (irrigation system, lack of training center service, limitation of marketing house to include storage, packaging house, cool storage, etc.)

Rice production strategy by 2020 and 2025

Over all strategy for rice production

- Target by 2015 to achieve 4,2 million Tons of paddy
- Target by 2020 to achieve 4,7-5 million tons of paddy
- Target by 2025 to achieve 5.5 million tons of paddy
- Average paddy rice for export expected at 500,000 to 600,000 tons per annual.

Strategy for food security

- Paddy rice for domestic consumption 2,5 million tons, of which 2,1 million tons direct consumption and 400,000 tons for reserve.

Assessment of domestic food consumption need

- Estimation the population of Lao PDR by year 2020 will be increased to 8,7 millions;
- paddy rice need for domestic consumption to be produced 2.5 million tons 2.1 million tons use for direct consume and 400,000 tons for reserve;
- Therefore, Lao farmers have to produce rice for two seasons;
- And improve rice productivity for 4,5 - 5,5 tons per hectare.

Focused areas for rice production

- Agriculture land of around 2 million hectare, rice cultivated area is around 772,500 hectare to include rain-fed rice production; irrigated land area is 125,000 hectare;
- Rice production is mainly in 10 Provinces, namely Champasak, Saravan, Savannakhet, Khamoun, Bolikhamxay, Vientiane Province, …. At the agricultural zones two and three

Rational on rice direct seeding

- Why Lao farmer decide to grow rice by using direct rice seeding, the reason is as follow:
- Water shortage, raining out of season;
- No irrigation scheme available, irrigated rice field is accounting at around 15% of the total cultivated areas;
- Rice direct seeding is one of most common rice cultivated method in Lao PDR, has advantage on resilience agriculture, climate change, less rain, suitable for the flooded area;
- The rice plant grow continuously, resistance to a drought and flooding condition;
- Direct seeding is suitable, and can be applied for wet season and in non-irrigated areas;

Land preparation in dry field condition

- After 2 – 4 times of raining field can be ploughed with deep of around 15-20 cm, leave it for sun dry 10-15 days

Land preparation

- , then, rotor/ harrowing.
- During this stage can be applied bio-fertilizers to make soil moist.

Field Training for direct seeding

- Extension workers demonstrate how to operate direct seeding to farmers

Seed preparation before applying

- Rice see germination must be over 90%;
- Before applying seed should be dry under sunshine for 1-2 days;
- Seed rate 60-80 kg/ ha
- Seed deep at 4-5 cm
- Seeding in a direction of Sun set and sun rise

Field monitoring during growing stage by local extension worker

waiting until seed is starting to germinate, then, slowly keep water level by 5-10 cm

- After 20-25 days field checking to find a death plant and replace it by new seedlings.

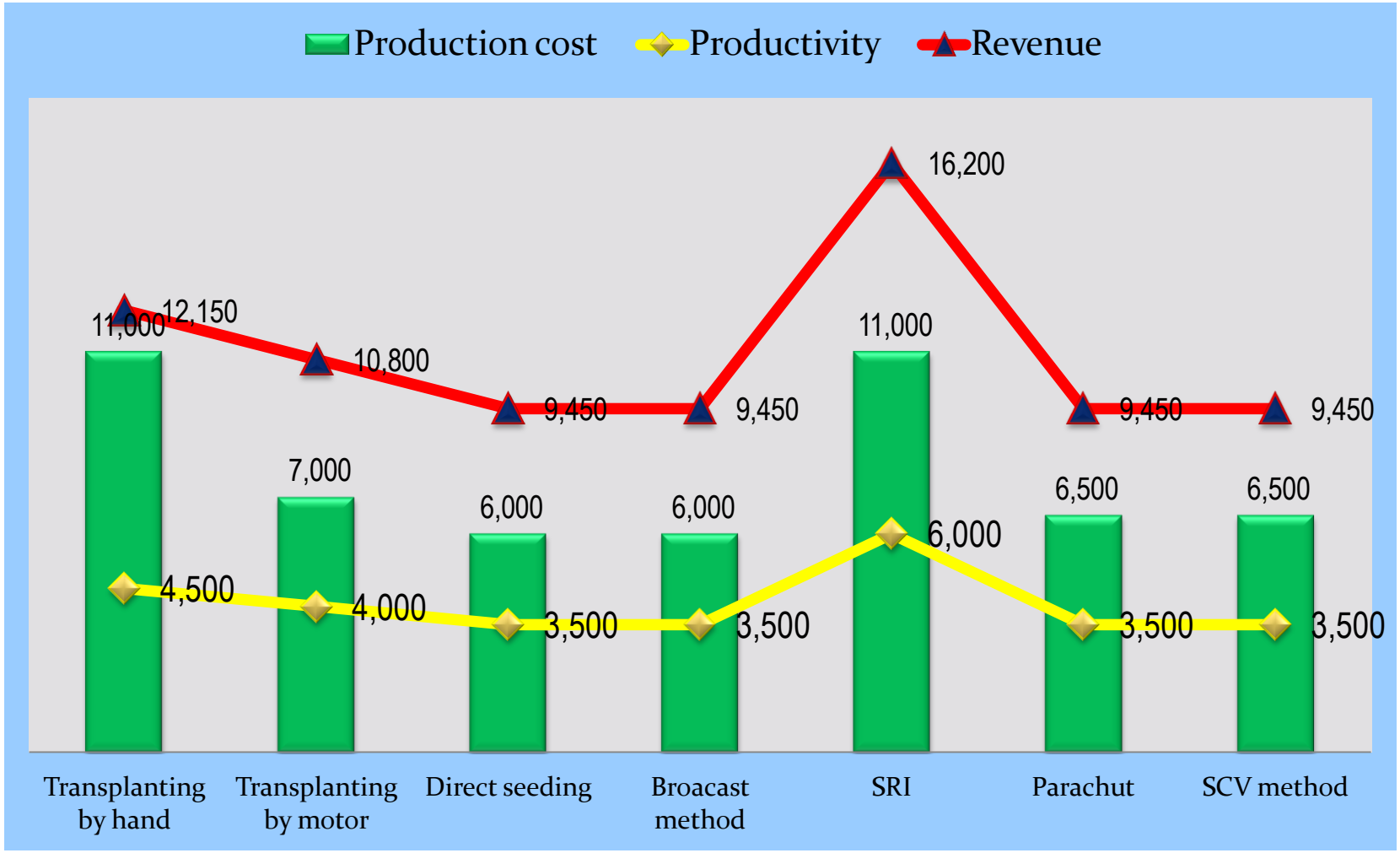
Fertilizer application at tillering stage and flowering stage

- First application after 15 -18 days use NKP 16-20-00 with 100 kg/ha
- Second application at tillering stage, NKP 46-00-00 with 60 kg/ha
- Third application at flowering stage fertilizer NKP 15-15-15 with 60 kg/ha

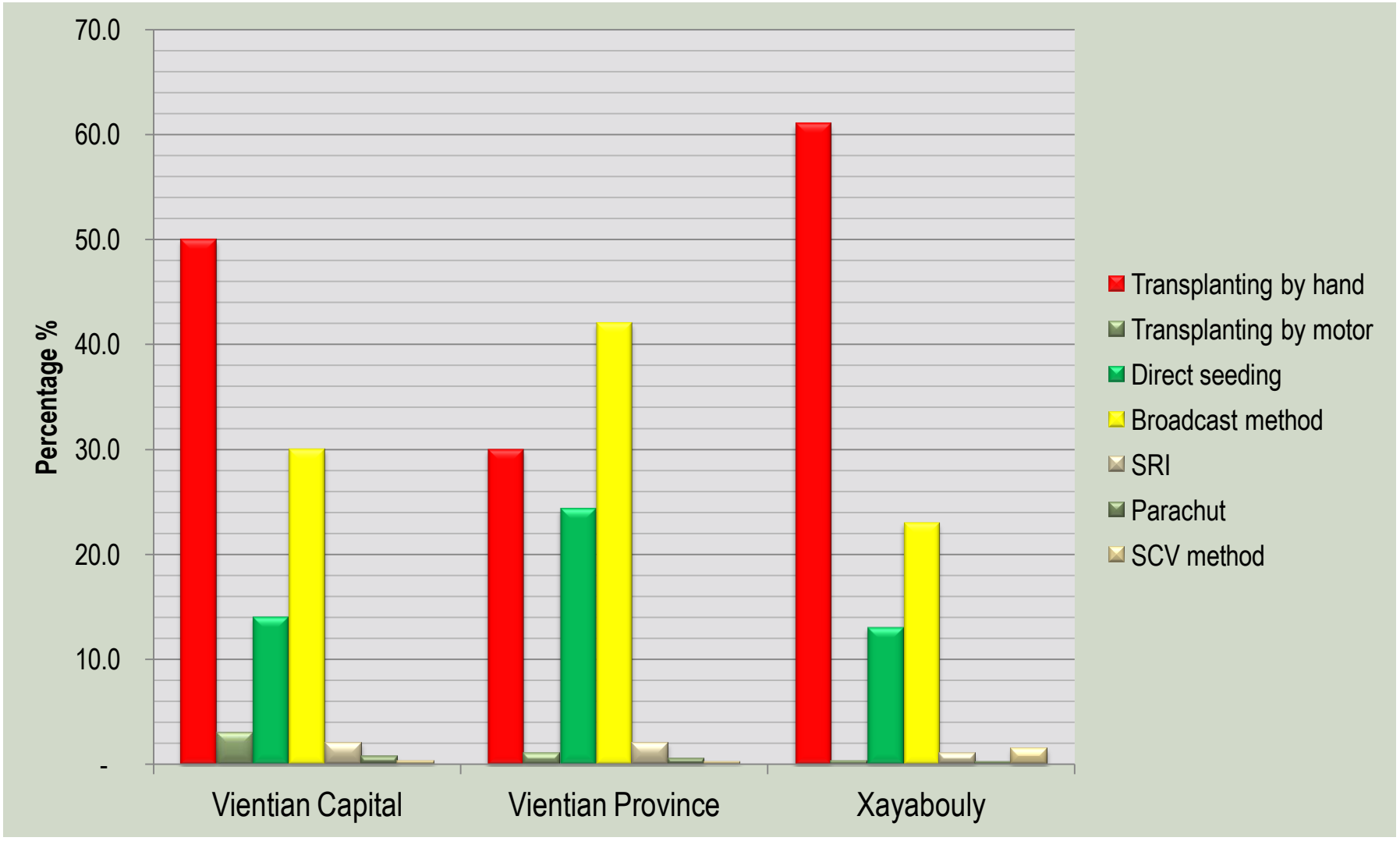
Harvesting stage

- After rice flower at about 50% during flowering stage, from this point forward around 30 days farmers can decide to harvest.
- The picture show newly introduce mini combine harvesters train to farmers.

Comparison Cost-benefit from difference method of growing rice



Percentage of applying difference method for growing rice



Lesson learnt

- Direct rice seeding is one of most important method of growing rice adapting to climate change, farmers can easily apply, reduce work process, namely deducting rice seedlings preparation,
- Less cost for poor farmers as a whole rice growing process, suitable for a family with lack of labors, save times for others family activities;
- It can be prevented against snails attack, because rice plant is already grow while heavy rain come.

Challenges

- machine or equipments use for rice direct seeding is relative expensive, so that individual poor farmers cannot buy it;
- It is still have a problem with weed control, some farmers use herbicide to control it during first stage;
- The direct rice seeding method can only apply in rainy season, but rarely in dry season.

Thank you.

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