SRI Experiences in Bhutan

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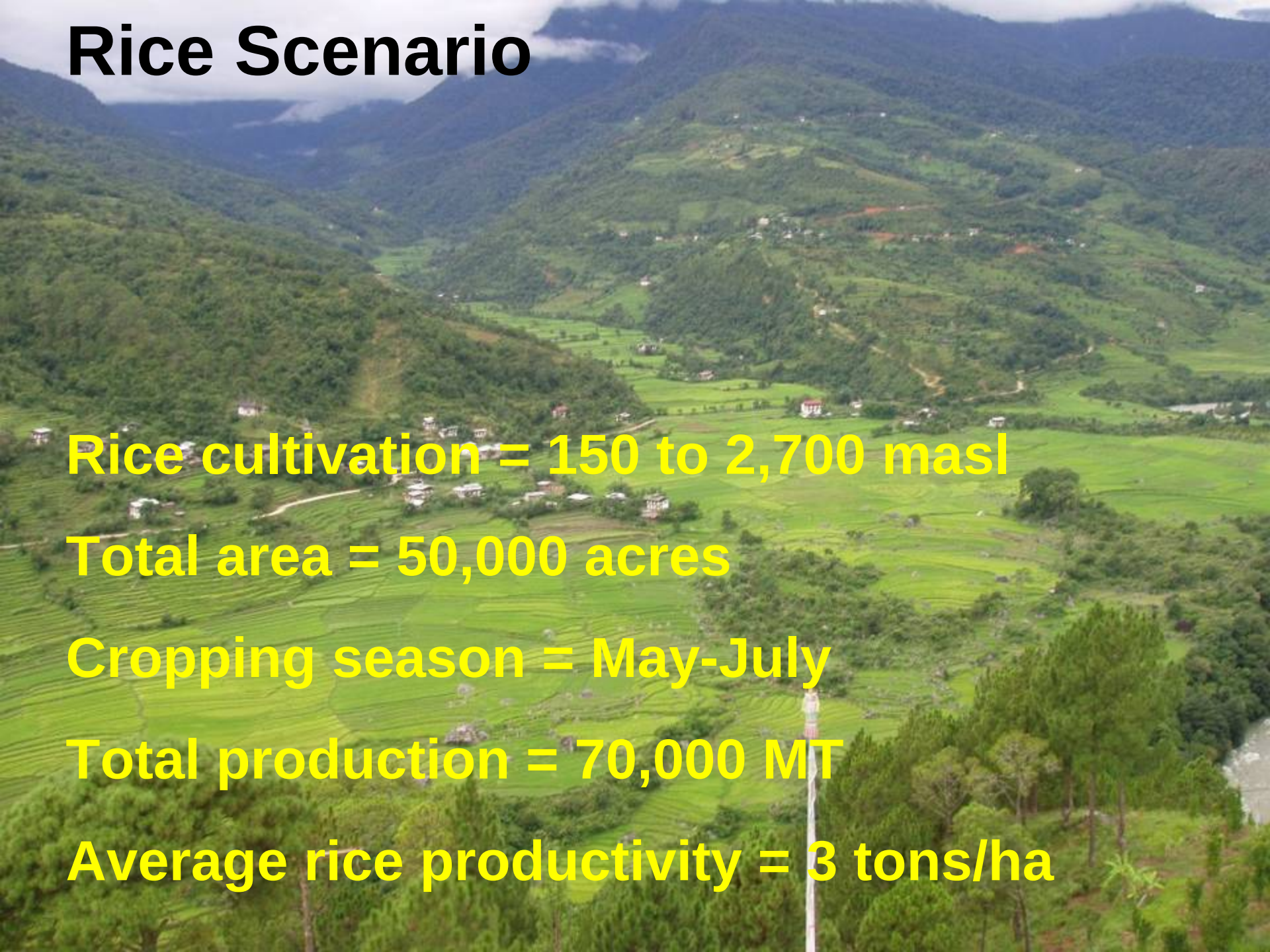
Rice Scenario



Rice cultivation = 150 to 2,700 masl

Total area = 50,000 acres

Cropping season = May-July

Total production = 70,000 MT

Average rice productivity = 3 tons/ha

SRI Activity in Bhutan

- **2006: The first SRI trials were carried out this year at three locations in Eastern Bhutan, both on farmers' fields and at a research centre -- at 1600-2000 masl**
- **These trials showed better rice crop performance**

- **Awareness of SRI was created through Demonstration-cum-Field day, media and newspaper reports, and presentation at the annual Agriculture Exposition.**


KINGDOM

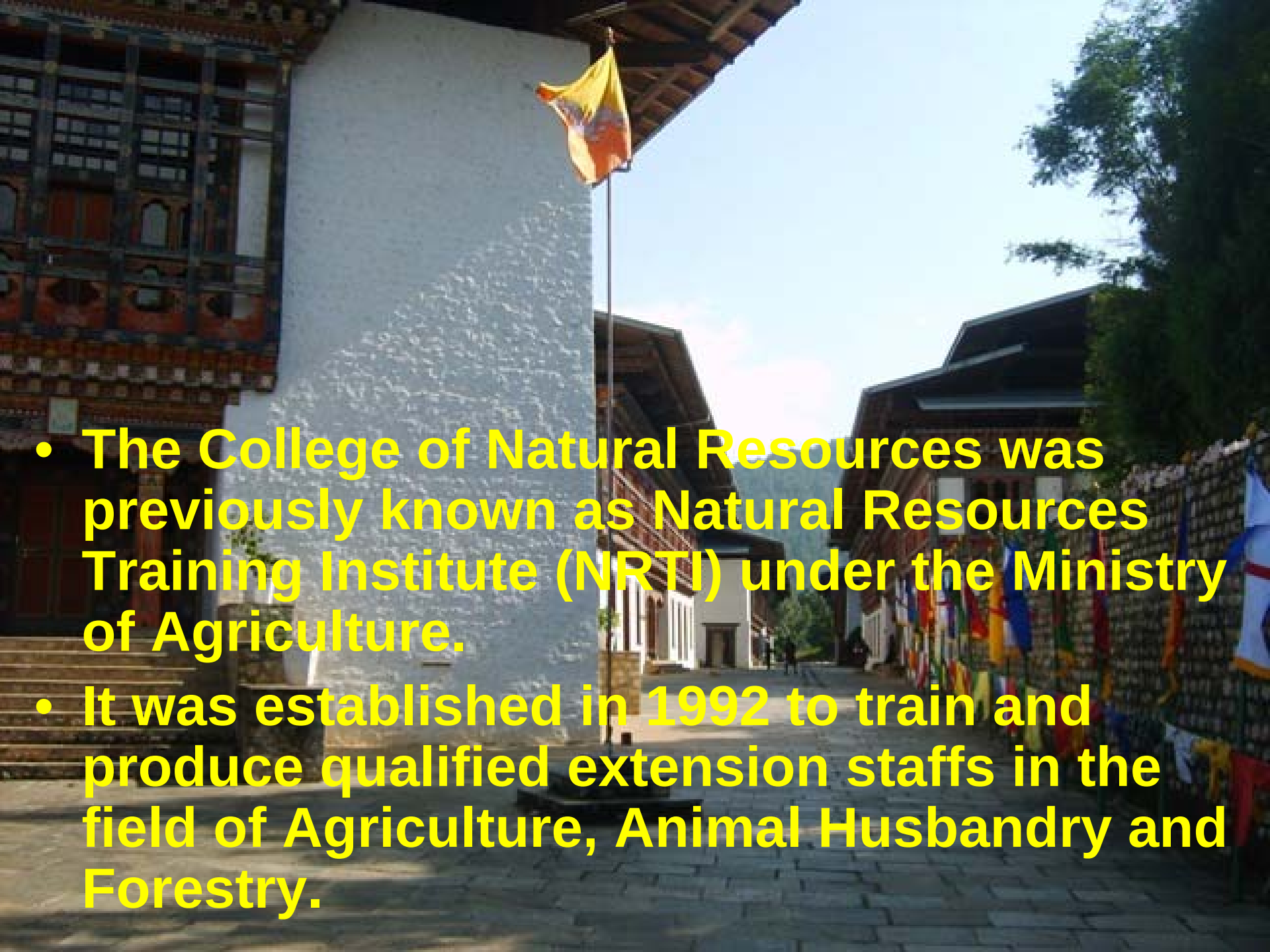
New method of planting paddy

By LOBZANG DORJI Trashigang

Almost 70 percent of the people in the country are farmers who cultivate paddy in the traditional way. Prior to our people

- **These first results opened up the door for further research on SRI methodology under Bhutanese conditions.**

- **In 2007, a follow-up study was carried out at the College of Natural Resources, Lobesa (1,443 masl) in Western Bhutan, using two rice varieties.**

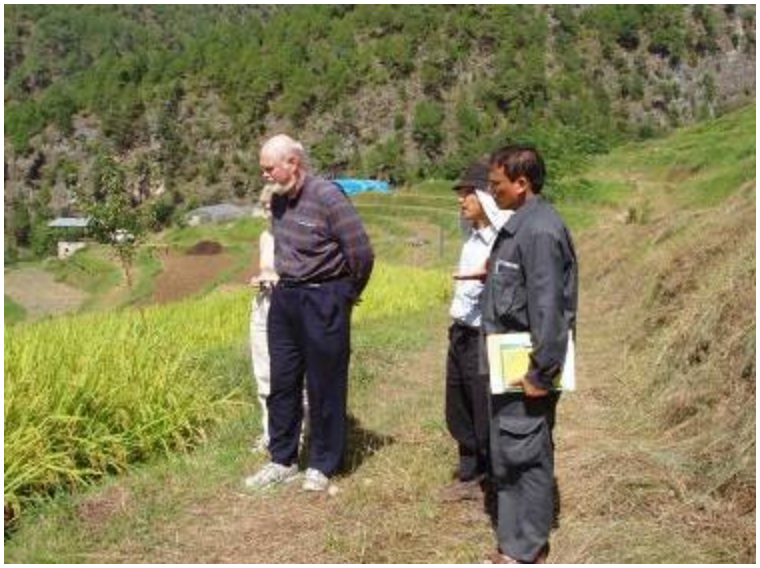


- The College of Natural Resources was previously known as Natural Resources Training Institute (NRTI) under the Ministry of Agriculture.
- It was established in 1992 to train and produce qualified extension staffs in the field of Agriculture, Animal Husbandry and Forestry.

Aromatic variety from Sri Lanka (NRTI 1)

IR 64

Yield and yield-contributing parameters of trials at two sites			
Sl. No	Parameters	**Site I (Lobesa)**	**Site II (Lobesa)**
1	**Rice variety**	**NRTI 1**	**IR 64**
	<u>Average fertile tillers/hill</u>		
	20 x 20 3-leaf stage	22	24
	30 x 30 3-leaf stage	31	32
	Random 3-leaf stage	19	22
2	Control (> 7-leaf stage)	18	20
	<u>Plant height (cm)</u>		
	20 x 20 3-leaf stage	128	100
	30 x 30 3-leaf stage	124	116
	Random 3-leaf stage	128	97
3	Control (> 7-leaf stage)	126	134
	<u>Yield MT/ha</u>		
	20 x 20 3-leaf stage	4.89	5.97
	30 x 30 3-leaf stage	4.14	**6.05**
	Random 3-leaf stage	4.09	**6.10**
4	Control (> 7-leaf stage)	3.51	5.83
Yield calculated at 14% moisture content			



- **In October 2007, Prof. Norman and his wife visited Bhutan.**
- **Met and had fruitful discussion with numerous researchers and officials of the MoA on SRI.**
- **Made presentation on SRI to researchers as well as the agricultural trainees of my college.**

- **2008:**
- **Several trials were done at different locations both in research centres and farmer's field by different researchers of the Ministry of Agriculture.**
- **Joint evaluation trials on SRI were carried out at 4 locations (2 in farmer's fields and 2 on-station) with a research centre of MoA.**


RICE VARIETAL TRIAL UNDER
SRI MANAGEMENT
VARIETY:
1. IR64
2. BAJO MAAP 2
3. KHANGMA MAAP
4. NYABJA
5. VERNA
SPACING: 25 X 25 cm
YEAR : 2008
LOCATION: LOBESA


96 tillers
Nyabja
variety

Results

Rice Variety	Yield (t/ha)		Fertile tillers		No. of hills/6m²	
	SRI	Non-SRI	SRI	Non-SRI	SRI	Non-SRI
IR 64	11.37	**9.10**	38	22.3	96	98
Bajo Maap 2	**13.50**	7.40	41	18.2	96	126
Khangma Maap	8.72	3.63	33.6	15.9	96	96
Nyabja	**14.83**	**9.27**	**44.7**	19.12	96	100

Result

Average yield = 13.7 ton/ha

Average fertile tillers = 47


• Refresh the knowledge of our field extension staff on emerging and new techniques/ technologies recently developed and those that are visible in the field so that they could extend them further to the farmers.

Farmer's field using IR 64 variety at 25x25 cm

Average yield with SRI = 8.7 ton/ha; 96 hills

Average yield with non-SRI = 6.0 ton/ha; 211 hills

- *Potamogeton distinctus* -- or bog pond weed – is a dominant weed with rice – reducing paddy yield by even 30-40%.
- It thrives in standing or running water, and it forms rhizome tips (or *turions*, overwintering buds) in soil.
- The resting rhizome tips produce shoots within 7-10 days of flooding.

Trial using some of the components of SRI method at Bumthang (2,660 masl).

- **So far, there has been a steady progress in promoting SRI method of paddy cultivation in the country.**

- **Trainees and farmers involved are taken aback when they see the tillering potential of rice with SRI method.**

- **One can hardly accommodate one hill in one's hand while harvesting paddy with SRI method.**

- **One farmer informed that weeding is an extra burden, but most of his neighbors has asked for seeds from his SRI plot (thinking that the success is due to genes rather than practices).**


2009 and Forward

- Continue disseminating SRI technique to trainees, who will be future extension agents.






Through their extension delivery services to the rural people, they have an important task in uplifting the rural economy by facilitating production increases and by supporting marketing systems in far-flung areas.

- Help progressive farmer group to grow more red rice with SRI method.
- Conduct research to see the effect of alternate wetting and drying on *Potagometon* reduction.
- Get more government support to promote SRI method.

A 2-page article on SRI method of paddy cultivation published in CNR's Annual Magazine.

SRI: A Corrective Method of Rice Production

Karma Lhendup, Lecturer, AG Faculty

The System of Rice Intensification, popularly known as SRI was developed in Madagascar by a Jesuit priest, Father Henri de Laulanie, twenty years ago while working with the rice farmers. Since its first trial outside of Madagascar in 1999-2000, it has been slowly receiving attention of the rice farmers, researchers and policy makers alike and gaining acceptance and popularity in the farming community in view of the associated benefits viz., saving seed, water, cost, increased soil health and grain yields vis-à-vis traditional method of rice cultivation. Presently SRI is adopted in 28 countries including Bhutan (http://ciifad.cornell.edu/sri/countries) and many countries are expected to join the SRI network.

SRI is a new and promising resource saving method of growing rice under irrigated and rain-fed conditions. Studies in a number of countries have shown significant increase in rice yield, with substantial savings of seeds (80%), water (25-50%) and cost (10-20%) compared to conventional methods. SRI is not a technology, but a set of simple ideas or principles drawn as a corrective measure to the conventional method. The ideas are:

1. **Transplant young seedlings**: In SRI

2. **Transplant carefully**: This involves avoiding trauma to the roots by removing young seedlings with a trowel, unlike the transplanting-shock of uprooting, transporting and transplanting associated with conventional method that reduce the potential growth of rice plants. It also involves ensuring the seed sac is attached to the root of the seedling's initial source of nutrition, transplanting immediately after uprooting, shallow transplanting (2-3 cm deep) with minimum downward push. This is because if seedlings are transplanted with great downward thrust, the roots are abnormally positioned, requiring longer time to reposition. This results in delayed tillering.

3. **Plant single & seedling with wider spacing**: Plant one plant per hill with wide spacing (>20x20cm) in square pattern, unlike in conventional method that is random and close. This not only saves the amount of seeds required, but also reduces the competition for nutrients, water and sunlight. Further, when rice plants are set out singly, far from each other, with good soil conditions, their roots will have plenty of space to spread out resulting in large number of tillers (as high as 100)

Journal of RNR Bhutan

Volume 4, Number 1

August 2008

ARTICLES

System of Rice Intensification (SRI) Method of Rice Cultivation

How to Produce More Rice with Less Inputs

A Field Extension Manual

Karma Lhendup, Faculty of Agriculture, College of Natural Resources
Royal University of Bhutan

The System of Rice Intensification is a new and promising resource-saving method of growing rice under irrig rain-fed conditions. Studies in a number of countries have shown a significant increase in rice yield, with sub savings of seeds (80-90%), water (25-50%), and cost (10-20%) compared to conventional methods. SRI i technology, but a set of simple ideas and principles that help produce more productive and robust plants. Th are:

I. Transplant very young seedlings, raised in an un-flooded nursery. II. Transplant them carefully and shal Transplant single seedlings and at wider spacing than now. IV. Apply a minimum amount of water – no con flooding. V. Control weeds with active soil aeration. VI. Rely as much as possible on organic matter for soil ferti Steps 1 to 7 show SRI methods.

Step 1

Plate 1

Plate 2

Step 1

Nursery preparation using available input methods (Plates 1, 2). Pre-soaking seeds in for 24 hours and incubating in a rags for 24 before sowing in a well-drained, garden-like n helps seeds to germinate faster. Line or n sowing of seeds in nursery can be done (Plate


Thank You