Revitalizing rice ratooning to reduce risk and impact during hazard-prone months in the Bicol Region, Philippines

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Country of first practice	Philippines
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Sustainable Development Goals	No poverty, zero hunger and life on land

Summary

The objective of rice ratooning is to enhance environmental adaptation in rice cultivation; it is a practical way of utilizing the residual water and reducing the risk of crop failure or establishment. In combination with other methods this technology aims to reduce crop losses in typhoon prone areas and contributes to food and economic security in the region.

Description

Rice is the staple food of Filipinos. Farmers in Masarawag, Minto and Mauraro experienced high risk of crop losses (40 to 80 percent) during the typhoon month of October, November and December. During this time the rice fields have more than sufficient water; rice ratooning is a practical way of utilizing the residual water and reducing the risk of crop failure. Rice ratooning (suli, saringsing), is a “traditionally known” practice in Bicol.

However, very few farmers still practice this method, although it can be an effective strategy for farmers with less capital while the rice field is fallowed. Farmers flagged their interest in revitalizing this traditional rice technology at project start during the community planning and validation workshop, because of the high crop production losses they incurred during typhoon months of October - December and the difficulty of seedbed preparation and transplanting, during turn-around period.

The use of an appropriate short-maturing rice variety (NSIC Rc-158) with good ratoon ability was tested as good practice option and compared with the existing farmers’ variety.

The revitalized approach to rice ratooning was promoted in three municipalities (Masarawag, Minto and Mauraro) between June and October 2010 and 2011 (wet season) in lowland, irrigated farming systems in the Philippines.

1. Implementation of the technology: guideline (for the main crop)

The revitalization and replication of this traditional technology is suitable for farmers with about 1 000 m² of land for cultivation.

The expected costs for setting up a demonstration site amounts around 2 893 PHP (in 2010) including seeds, fertilizer, sign board, register and soil test.

1.1 Soil

Any type depending on the location; soils sandy loam or loamy soil.

1.2 Recommended rice variety

PhilRice variety NSIC Rc-158 (minimum germination is 85 percent; maximum moisture content, 14 percent; minimum varietal purity, 98 percent; total weed seed / other crop seed / inert matter not more than 0.10 percent).

1.3 Implementation time (main crop)

June 2010 (second crop cycle towards typhoon months of October, November and December).

1.4 Land preparation

The land should be well prepared / clean-culture by ploughing and harrowing three to four times. For sandy loam to silty loam soil, two to three ploughing to and cross ploughing with subsequent three to four laddering are required. For a clay type of soil, soil preparation requires more tillage operation at appropriate soil moisture status.

1.5 Seedling, sowing and spacing

The recommended variety is NSIC Rc-158 with an average yield of six tons per hectare and a growing cycle of ca. 113 days including seedbed preparation (PhilRice). In case NSIC Rc-158 is not available, a recommended alternative is NSIC Rc-120. Note that NSIC Rc-120 is more sensitive for abnormal rainfall conditions under El Niño (less precipitation).

For sowing it is recommended to follow the dapog method (PhilRice). Seeds should be sown in medium high land near the main field and an appropriate time to sowing seed is from May to early June (third week of May sowing and transplanted third week of June - towards wet months November / December - for location specific for the Bicol region).

Before seed sowing the organic matter and other nutrient should be ensured. The seed rate is 40 to 50 kg per hectare.

1.6 Fertilizer dose

Apply fertilizer in appropriate dose at the time of land preparation as illustrated in Table 1. Compost (rice straw) will be mixed well in the soil.

Based on the soil analysis one half (10 kg) of urea applied two days before harvest. The remaining urea (9.2 kg) applied two weeks after harvest.

1.7 Irrigation and weeding

Depending on the types of the soil, two to three times of irrigation may be needed. The first round should be applied after harvest. The second is to be applied 10 to 12 days after growth of the panicles.

The third and final irrigation should be applied during the grain formation stage i.e.

Table 1. Fertilizer dose for one demonstration

Name of Fertilizer	Quantity per ha
Urea	19.2 kg.
Trichoderma	2 packet

Source: FAO 2013

after 75 to 80 days of sowing. As needed, use rotary or hand (manual) weeding or existing practice that farmers use.

1.8 Harvesting (the main crop)

Harvest when 80 percent of the grains is mature; about 15 to 20 cm from the ground, rice stem / tillers are left in the field after harvest, for ratooning.

1.9 Rice Ratooning (farm operation practice)

- Land preparation: none. Tillers of the main crop left in the rice field are allowed to regrow and produce panicles and grains.
- Transplanting: none. Transplanting is needed because the main tillers are the ones left in the field, which after 45 days will produce grains.
- Weeding: none. Since the weeds were checked during the first (main) rice crop, weeding is seldom needed.
- Pesticide (vs golden snail) and insecticides: at this stage, the rice crop has already established its resistance, and water level is still not conducive for their presence.

1.9.1 Fertilizer application

- Two days before harvesting rice crop, apply 10 kg urea (top dress); then,
- pply another 10 kg Urea, two weeks later.

1.9.2 Irrigation

Apply irrigation, based on fertilizer application schedules;

- immediately after harvest; and
- after second Urea application.

1.10 Harvesting

Harvest the ratoon crop 45 to 50 days later.

2. Results and findings

Timing of planting in highly-irrigated areas, coupled with rice ratooning and use of suitable rice varieties have increased the overall resilience for small farmers in Minto

Table 2. Yield performance of NSIC Rc-158 for timing of planting with rice rationing (2010)

Location	1st crop cycle Yield (t/ha)		2nd crop cycle Yield (t/ha)		3rd crop cycle Yield (t/ha)		Average yield (t/ha) per crop cycle	
	GPO	EFP	GPO	EFP	GPO	EFP	GPO	EFP
Buhi, Cam Sur			4.2 + 0.4	3.28	3.35+0.39	2.70	3.77+0.39	3.0
Gubat, Sorsogon	2.75+0.9	2.25	4.5 +0.89	2.95	3.45+0.8	2.97	3.57+0.86	2.72
Guinobatan, Albay	2.6+0.42	2.50	3.25+0.39	3.0	3.2+0.42	2.75	3.02+0.41	2.75
Average yield (main crop+ ratoon) t/ha	2.93	2.37	4.54	3.07	3.87	2.81	3.45+**0.55**	2.82

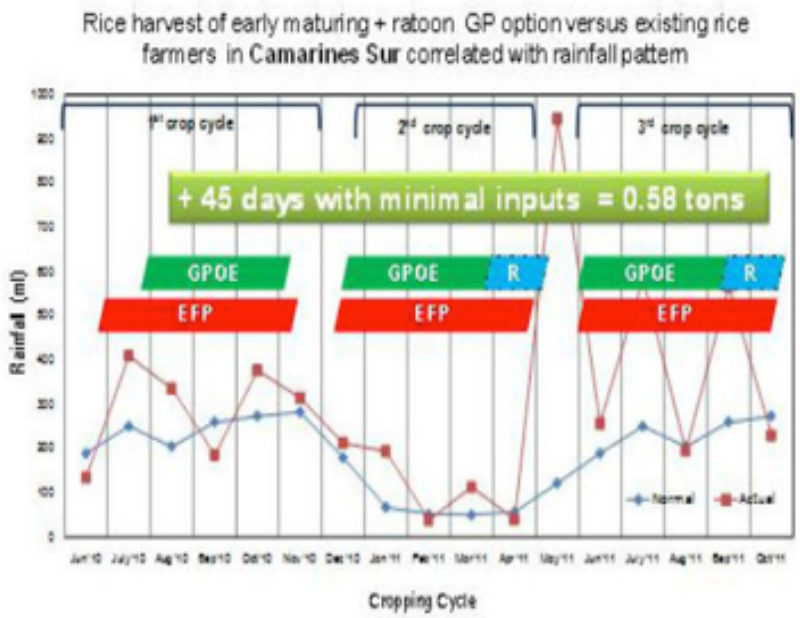
Source: FAO 2013

Figure 1. Performance of early and ratoon rice GPO

Sites	1st Crop Cycle (Tons/ha⁻¹)		2nd Crop Cycle (Tons/ha⁻¹)		3rd Crop Cycle (Tons/ha⁻¹)	
	GP Option	EFP	GP Option	EFP	GP Option	EFP
CamSur	-	-	4.20+ 0.41	3.28	3.35+ 0.42	2.70
Albay	2.70+ 0.40	2.50	3.25+ 0.39	3.00	3.20+ 0.43	2.75
Sorsogon	2.75+ 0.90	2.25	4.50+ 0.89	3.95	3.45+ 0.9	2.97

Source: FAO 2013

Figure 2. Rice harvest of early maturing and rationing GPO



Source: FAO 2013

and Masarawag. Experiences in Ormoc, Davao and Sorsogon indicate that additional yield of 25 to 30 cavans (one cavan are ca. 50 kg) are possible within 60 to 75 days after harvest (Malabanan, 2008 & Bar, 2004), using appropriate varieties, both certified and hybrid rice varieties.

Data indicate that rice ratooning produced additional rice yields of 550 kg per hectare within 45 days. Yield difference was significant at 5 percent level using t-test with a t-value = 3.06 and p-value = 0.008. Additional support of Local Government Units (LGU) is recommended to establish functional seed systems, storage and distribution of stress tolerant varieties that is accessible to farmers and enable them to mitigate effects of natural hazards.

3. Further reading

- De La Torre. 2010. Detailed Implementation Guidelines, GPOs Lowland Irrigated Agro-Eco Zone;
- Report for TCP PHI 3203 (http://foris.fao.org/static/data/nrc/bicol/Report_Implementation_guidelines_lowland.pdf);
- Philippine Rice Research Institute (http://www.philrice.gov.ph/); and

- Dapog Method: http://agropedia.iitk.ac.in/content/methods-raising-rice-seedlings-dapog-method.

4. Agro-ecological zones

- Tropics, warm

5. Related/Associated Technologies

- 7722;
- 7724; and
- 7723.

6. Objectives fulfilled by the project

- Women-friendly;
- resource use efficiency; and
- Pro-poor technology.