Farmers' participatory evaluation of rice production technologies in Bay Islands

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This study was conducted among farmers in the South Andaman islands through the participatory rural appraisal technique for agroecosystem analysis (Conway 1985) to evaluate the comparative performance of four different high-yielding varieties (HYVs) (Jaya, Bhavani, Mansarovar, and IR18351) with local variety C14-8 from the farmers' perspective. It also investigated the level of awareness and adoption of rice-based technologies among farmers in these islands. A sample of 150 farmers was selected randomly from five villages (i.e., 30 from each) in South Andaman District. Farmers were mostly small and marginal landholders (with a landholding of 0.1–2.0 ha) living in clusters. A group of 30 farmers in each village was asked to rank the different rice varieties prevalent in their locality based on different characteristics. Actual rice production data were collected from farmers' fields from 1995 to 2000 and adjusted to give a per hectare yield. Also, through a semistructured interview schedule, data on knowledge and adoption about the recommended package of practices in rice in these islands were collected from 150 farmers. Knowledge index (KI) and adoption index (AI) were calculated.

The ranking of rice varieties prevalent in the area showed that the majority of farmers preferred cultivating C14-8 over medium and short-duration HYVs (Table 1). Although the yield and profitability of HYVs were significantly higher, indigenous variety C14-8 had greater yield stability and less production risk than the other HYVs. The humid tropical climate, with its uncertain monsoon rainfall, favors biotic (insect pests, diseases, and weeds) and abiotic (water stress, waterlogging) stresses in rice cultivation in these islands. Moreover, because of the islands' remoteness, plant protection chemicals, farm machinery, and other infrastructure are not always available. Also, there is no government procurement system for rice. Rice cultivation among small and medium farmers is mainly subsistence in nature. Farmers observed the incompatibility of HYVs such as Mansarovar, IR18351, and Bhavani, despite their higher potential, under biotic and abiotic stress conditions in the field. HYVs are mostly cultivated in a small area (0.1 ha) because of more risks involved. HYVs are susceptible to most insect pests and diseases; hence, the risk of crop failure was high. Incessant rainfall for 8 mo (May-December), coupled with the unavailability of a covered threshing floor, threshing machine, and sunny days, made the farmers prefer long-duration photoperiod-sensitive varieties despite their low yield. These could be harvested, threshed, and stored easily during the rain-free period in December-January. Production of straw for cattle fodder was also considered an important criterion among poor, small, and marginal farmers.

Farmers' knowledge and adoption of HYVs and local varieties and key recommended packages of practices in rice were also assessed during the survey (Table 2). Only 14% of the farmers adopted HYVs. Typically,

Table 1. Farmers' ranking[a] of characteristics of several rice varieties.

Characteristic	Jaya	Bhavani	Mansarovar	IR18351	C14-8
Yield	4 (3.6)	3 (3.3)	4 (4.2)	5 (4.5)	2 (2.5)
Yield stability	3	2	2	3	5
Risk involved in cultivation	3	4	4	3	1
Profitability	4	4	4	5	2
Seed availability	3	3	2	2	5
Insect pest and disease incidence	3	4	4	3	2
Tolerance for weed infestation	2	1	1	2	5
Tolerance for water stress	1	1	1	1	3
Labor use	4	4	4	4	2
Compatibility with weather	2	2	2	3	5
Taste	2	2	2	3	5
Digestibility	2	3	3	3	5
Grain size	Medium	Medium	Medium	Medium	Coarse
Straw yield	3	3	3	3	5
Parched rice making quality[b]	2	1	1	1	5
Food security	3	2	3	3	5

[a]Scale 1–5, 1 = least/minimum, 5 = maximum/high/more/best. Yield scores were based on visual assessment by farmers. Numbers in parentheses are yields (t ha^{-1}). [b]Rice that is partially cooked, flattened, and dried.

Table 2. Knowledge and adoption of recommended technologies for rice (HYV and local) production among farmers in South Andaman villages.

Technology component	Knowledge index (KI)	Adoption index (AI)
Recommended HYV	35	14
Summer plowing	41	9
Use of certified seeds	39	13
Optimum seeding rate	46	27
Seed treatment	19	0
Nursery management	65	36
Row-to-row spacing	53	22
Plant-to-plant spacing	47	29
Weed control	47	18
Use of balanced fertilizers	26	11
Plant protection measures	49	36
Optimum time of harvesting	71	53
Postharvest technology	52	44
Av	45.4	24.0

farmers who adopted them had more land (1–2 ha), were moderately literate, had better access to infrastructure, and had fields located above low-lying valleys. Farmers had a relatively high awareness (KI = 71) of optimal harvesting time; 53% of the farmers adopted a variety that could be harvested comfortably under good weather during the dry period (AI = 53). More than half of the farmers were aware of proper nursery management and adoption of this technology was moderate (AI = 36). Because of poor knowledge of seed treatment (KI = 19), farmers did not adopt this technology (AI = 0) at all. On the whole, although many farmers (KI = 45.4), were aware of the various technologies, natural (biotic and abiotic stress) and cultural (farm labor, fertilizer, plant protection chemicals, infrastructure, and marketing facilities) constraints hindered the adoption (AI = 24) of many of these practices in rice cultivation in the South Andaman Islands.

Reference

Conway GR. 1985. Agro-ecosystem analysis. Agric. Admin. 20(1): 31–55.

Web notes

Apple snails
http://www.applesnail.net/

Bibliography on the golden apple snail (*Pomacea* spp.)
http://www.applesnail.net/content/contributions/biblio_joshi/bibliography.htm

The Apple Snails Web site is a well-illustrated compendium on the biology, ecology, and taxonomy of "the biggest living freshwater snails on earth. A large amount of material is devoted to the maintenance of apple snails as aquarium pets. Information on the management of apple snails as agricultural pests is limited. However, linked to the Apple Snails Web site is the Bibliography of the Golden Apple Snail, which provides full citations for papers on this pest published since 1994. (Two earlier print bibliographies, cited on the Web site, catalog the golden apple snail literature published prior to 1994.) The bibliography is maintained by scientists from the Philippine Rice Research Institute and Central Luzon State University, Philippines.

Agricultural Science and Technology Indicators
http://www.asti.cgiar.org

The Agricultural Science and Technology Indicators (ASTI) initiative compiles, processes, and makes available internationally comparable data on institutional developments and investments in agricultural research and development (R&D) worldwide, and analyzes and reports on these trends in the form of occasional policy digests for research policy formulation and priority-setting purposes. It is a joint project of the International Food Policy Research Institute (IFPRI) and the International Service for National Agricultural Research (ISNAR) in collaboration with many other organizations worldwide. This Web site contains a recent global overview report on agricultural research titled "Slow magic: agricultural R&D a century after Mendel," as well as other interesting reports and graphs on agricultural research around the world. The site also contains large time-series databases on the number of researchers and public expenditures in agricultural research for a large number of countries. Data on the site are freely available to all. One section contains links to Web sites of numerous agricultural research institutions around the world.