

Note: DRAFT VERSION, NOT FOR QUOTATION
Paper for International FFS Workshop,
21-25 October 2002, Yogyakarta, Indonesia

Prepared for the INTERNATIONAL LEARNING WORKSHOP ON FARMER FIELD SCHOOLS (FFS): EMERGING ISSUES AND CHALLENGES, 21-25 October 2002, Yogyakarta, Indonesia

The impact of participatory IPM in Sri Lanka^a

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ABSTRACT

Participatory IPM in Sri Lanka has been substantially expanded over the last years. To capture the impact of training, two independent studies were conducted in early 2002: a broad scale survey on preset parameters (including non-IPM farmers as control), and an in-depth participatory evaluation where farmers determined the outcomes of IPM in six villages. Usage of insecticides and fungicides dropped to almost nil due to training, while IPM caused farmers to sharply increase their use of organic fertilizer (mostly rice straw). Herbicide use was not affected, which needs to be addressed in future training. IPM was associated with a yield increase of 23%. The comparison of IPM and non-IPM farmers suggests a very high economic rate of return. The low costs of FFS training (including costs of training-of-trainers) were recovered seven-fold within a single rice-growing season through increased outputs and decreased inputs. Moreover, the beneficial effect eroded only slightly during the 13 seasons covered by the study. No diffusion effect among non-IPM farmers was observed for the main indicators. In the participatory evaluation, farmers identified indirect benefits of training on a broad range of aspects affecting their livelihood situation, which confirms that farmers have embraced the learning approach and applied it to new areas. The need for further funding and a National policy on participatory IPM in Sri Lanka is stressed.

INTRODUCTION

There is a declining interest in rice cultivation in Sri Lanka. Rice cultivation has become less profitable due to high costs of inputs and declining prices of rice. Consequently, poverty is spreading in rural areas where the livelihoods of families depend mostly on agriculture. The Government of Sri Lanka is seeking ways to cut

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down on cost of production and to increase yield of rice. Integrated Pest Management (IPM) is recognized to play an important role.

Sri Lanka has a long history of IPM. Extension on rice IPM was first implemented in 1984 using the Training & Visit (T&V) extension system. Message-based technology was transferred to farmers by Contact Farmers through fortnightly meetings, using small demonstration plots. But even though contemporary conditions were optimal the effect was limited. The flexibility of the T&V system was tested when the Contact Farmer concept was replaced with a Group concept, which allowed for a more intensive kind of service meant to deal with complex issues (Abeywardana, 1987). Groups of farmers from the same paddy tract followed periodic training classes over a period of several years and applied the technology uniformly in their tract of roughly ten hectares while the group was given access to credit and input facilities. This approach is called the Block Demonstration. Educational principles on IPM were incorporated in the curriculum in 1985. Initial results were positive but thereafter, the programme was scaled up very fast with large numbers of extension officers and farmers being trained by 1987. Unfortunately, the content and quality of training were being compromised; training-of-trainers courses were short and had followed a trickle-down process for officers at several levels. Loss of motivation and quality resulted from the rapid expansion (Matteson, 2002).

Participatory IPM through farmer field school training was started in 1995, albeit on a small scale. There was a consistent lack of funding throughout the 1990s keeping the program at a modest 20-40 field schools per season, but in 1999 more funds became available. Recently, more Government and NGO staff graduated from season-long training-of-trainers (TOT), and the implementation of field activities could be expanded. Currently, there are 220 IPM master trainers (half of whom in Mahaweli irrigation systems) and even more farmer trainers, capable of facilitating participatory training in a large number of locations. These human resources, who are present in every districts of the island, are most concentrated in the Mahaweli Systems and in major rice-growing districts of the dry zone. Human resources in North & East province are still small due to the conflict history. The farmer field school continues to be the principle activity of the program, but several types of follow-up activities are being conducted since 1999 to strengthen specific skills of experimentation and organization, or to encourage networking between farmer groups.

To capture the impact of training on participatory IPM, an impact study was conducted. A common problem with impact studies is that simple indicators do not accurately describe project achievements whereas case studies lack coverage and thus representation. We chose a combination of broad-scale and in-depth data to capture the impact of participatory IPM in the field. This dualistic approach provided information from two different angles with different emphases (van den Berg et al. 2002). Our decision to involve the project's stakeholders (trainers and farmers) was in line with the project's objective to enhance local ownership within an evolving program but introduced a possible bias. Yet, outside enumerators or participant observers would have introduced new problems of interpretation.

BROAD-SCALE STUDY

A broad-scale study was conducted to measure the average impact of training on agricultural parameters in different parts of the country. The study covered 275 IPM sites to assess the impact of training on quantitative agricultural variables. 117 Non-IPM sites were selected as control. The comparison was parallel, i.e. conducted at the same time at non-IPM and IPM sites. Parallel comparison avoids variation in the natural or economic environment due to time or season; this is important because economic conditions and the occurrence of droughts have varied over the last years. A non-IPM site was selected from the village neighboring the IPM village with roughly similar agronomic and socio-economic conditions, but not from the same village. The interviews were conducted by provincial IPM officers in the Districts and Mahaweli Systems. The general profile of IPM and non-IPM respondents indicated no difference in family size, non-paddy agriculture, irrigation facilities, labour conducted, and cropping pattern, suggesting similar basic conditions of the two categories. Paddy landholding, however, was slightly larger in the group of IPM farmers, but it cannot be ruled out that this was an effect of IPM training.

Training affected a number of farmer practices. The agronomic variable most affected by training was the incorporation of rice straw (used by 31% of non-IPM farmers but by 84% of IPM farmers), which improves physical and biological soil properties. This important source of organic manure is available in large quantities to paddy farmers. Moreover, IPM farmers used nitrogen fertilizer better in line with plant requirements, they used more potash, and improved their land preparation methods. IPM farmers visited their fields at shorter intervals, allowing for timelier crop management.

As a result of these combined changes, there was a 23% increase in yield and a 41% increase in profits from rice cultivation. Insecticide use (mostly WHO class II) was reduced by 81% causing savings in agrochemical inputs. Herbicide use was not affected because integrated weed management was not dealt with in the field school curriculum. Yield increases were particularly high in isolated areas hitherto unreached by extension services. In intensive rice irrigation systems, such as those of the Mahaweli Authority, yield increases due to training were less dramatic (on average 11%) because yield levels were already among the highest in the country.

Economic benefits due to training as a consequence of reduced inputs and increased outputs, were \$150 per hectare; which at an average landholding of 0.6 ha comes at a benefit of \$87 per season per farmer. Training costs were low, at \$7 per farmers for field school training, and an estimated \$5 per farmer to account for TOT training costs. Hence, total training costs of the project were \$12 per farmer and, consequently, the cost-recovery rate was very high. Costs of training could be recovered by seven-fold within a single season. Even when assuming a high level of error in the survey data, e.g. due to biases in respondents or trainers, the benefits of training remain convincing. An average of 18.2 farmers participated per field school. Women made up 29.7% of field school participants.

After grouping the IPM respondents according to the year they followed field school training, the durability of training effects could be determined. The number of insecticide applications per season was lowest among the most recently trained farmers, while applications were slightly higher among farmers trained longer ago (up to 6 ½ years). This indicates that the training effect on insecticide use eroded only slowly. Training effects on rice straw use and yield were durable over the study period of 6 ½ years. Hence, farmer field school training is a medium- to long-term investment.

The diffusion of training effects between villages was negligible. Farmers who knew about IPM but had not followed a field school did not reduce on insecticide applications or attain higher yields as compared to farmers who did not know about IPM. Apparently, the skills necessary for agroecosystem analysis are not easily transferred to outside farmers but require a practical learning process. The practice of rice straw incorporation is less complex and, thus, would be easier diffused. However, the result on rice straw was inconclusive due to the small sample size.

IN-DEPTH STUDY

As main stakeholders, farmers are in the best position to determine the impact they experience from a project. Therefore, a participatory evaluation was conducted in six villages for the purpose of self-assessment and knowledge generation by farmers to strengthen their local programs. The results of their evaluation were utilized to analyse the effects of IPM training in the lives of rural communities. Taking of photographs by farmers was used as a method of self-assessment to reflect on the achievements attributable to the project. Farmers spent one week in their respective villages to determine and photograph the direct or indirect outcomes of IPM training. They wrote captions explaining why they took each photograph. With few exceptions, picture taking was conducted in the absence of a trainer which implies that the data represent genuine farmer effort. Thirty farmers, eight of whom women, conducted the evaluation. All photographs and captions are given in van den Berg et al. (2002).

The in-depth study confirmed the basic outcomes of the broad-scale study. According to the photos and caption by farmers, training affected the use of rice straw as manure, the timing of synthetic fertilizer application, the reduction in the use of insecticides, and the frequency of field observations. In addition, it revealed a variety of qualitative and indirect outcomes -- ranging from experimentation with organic rice farming to farmers obtaining leadership status -- which farmer teams ascribed to the effect of IPM training. Women became more closely involved in farming, farmers started helping each other at labor-intensive times, and farmers organized themselves to produce seed paddy or to market pesticide-free rice. Moreover, the access to Government aid improved, and IPM farmers assumed a leadership role in their village.

Moreover, the in-depth analysis recorded innovative outcomes of training much better than a broad-scale analysis. Farmers reported how they started producing their own quality seed, tested out new planting methods to reduce the reliance on herbicides, began applying cattle and poultry manure to the field, and initiated marketing of pesticide-free rice. Also, they extended their new knowledge to vegetables, fruits and

legumes, and used traditional or new methods of pest management. Some of these outcomes had been guided by the trainers whereas others originated from farmers. The results also demonstrate how the increased profits, recorded in the broad-scale study, eased poverty. Profits were used to build new houses, to improve or diversify agricultural production (purchase of two-wheel tractor, cows and poultry, cultivation of legumes), and provided new business opportunities (three-wheel taxi, sewing machine, refrigerator for yoghurt, grinding machine, vegetable sales outlet, shop, pesticide-free rice marketing unit).

When comparing the six villages, the range of outcomes was wider as villages had a longer post-field school history, with on average three new outcomes per year. This suggests that participatory IPM sets in motion the development of local programs that progresses with time.

In livelihood terminology, participatory training on IPM influenced the assets that constitute the livelihoods of rural communities and, thus, contributed to alleviating poverty. IPM enhanced natural assets, by supporting farmers' own efforts to implement farming practices and carry out studies which take account of ecological processes. IPM enhanced human assets, by supporting farmers' skills and efforts to train others using content and methods which promote critical thinking and improved decision-making. IPM enhanced social assets, by supporting farmers' own efforts to build associations and networks, which will give them a voice and an improved means of helping each other. IPM enhanced physical assets, by providing materials or structures that improve living conditions, generate new income or create new farmer-led initiatives. IPM enhanced financial assets, by bringing more money into the village and establishing mechanisms to manage that money.

By participating in the evaluation, the farmers reported that they gained new personal and social skills, which could be beneficial to their continuing local programs. Comments like “[only] by doing the evaluation we realized the benefits of IPM” and “we learned that poverty is not just a poor financial status” imply that there is a need for skills to analyze and evaluate farmer-led activities and processes. The evaluation caused participants to plan new initiatives and to expand existing activities.

CONCLUSIONS

Participatory IPM was found to be decidedly cost-effective, durable, and providing motivation, cooperation and a sense of program ownership to farming communities. The learnt principles and skills caused farmers to embark on new initiatives or programs. The beneficial effect of training was found to be solid due to a combination of study design, large production benefits, low costs of training, and verification through farmer-taken photographs.

When comparing the study from Sri Lanka with impact studies conducted in South-East Asia, it appears that there is more potential to increase yield of rice in Sri Lanka, resulting in higher benefits of training. Also, IPM training costs in Sri Lanka are by far the lowest in the Asian Region.

In view of the potential of participatory IPM in Sri Lanka and its compatibility with rural culture, it is recommended that funding is sought for another three years. Also, a National policy is urgently needed that specifies a strategy for participatory IPM.

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