BACKGROUND

1.1 IPM in Asia

Traditional agriculture in tropical Asia was practiced in harmony with nature. It preserved the diverse life forms with the agro-ecosystems and promoted the conservation of bio-diversity within farming systems. However, with the introduction of chemical insecticides, plant protection specialists in the early 1950s recommended complete control of pests with chemical insecticides, ignoring the beneficial role of fauna. Subsequently, during the period of the Green Revolution farmers in developing economies were urged to use insecticides on a "calendar basis" or based on economic threshold levels of pests. The costs were considered an acceptable insurance "premium". However, farmers were unable to deal with the complexities of pest development under high input regime. Some governments contracted pesticide companies to provide large-scale aerial applications of insecticides with disregard to the negative impacts. Crop protection specialists and government-supported extension services assumed that they were better able to take decisions to control pests, than the farmers. However, their perceptions got jolted due to massive outbreaks of pests like brown plant hopper (BPH) in many rice-growing countries in South-East Asia. Researchers soon discovered that BPH outbreaks were insecticide-induced (Kenmore et al., 1984) and that breeding rice varieties resistant to BPH under continued pressure of insecticide use would be a futile exercise (Gallagher, 1984).

Despite these facts, many governments continued to promote large-scale use of pesticides under their sponsored plant protection programmes as well as by extending subsidy on pesticides, under the false notion of protecting the crop to ensure food grain production to provide food to a growing population. Such a biased approach by government agencies supported by plant protection specialists has led to the development of resistance among pests, pest resurgence and secondary pests emerging as major problems, environmental pollution, pesticide residue in food and food commodities and increasing health hazards to farmers and consumers (Peter Ooi, 1998; Ragunathan, 2002).

In response to the emergence of such problems associated with chemical pesticides which were used for the control of insect pests by governments, extension services and farmers, the search for solutions to these problems led to the development of a new form of Integrated Pest Management (IPM) through a farmer educational approach. The working definition of the participatory form of IPM is composed of four principles, which are:

1. Grow a healthy crop
2. Conserve natural enemies
3. Conduct regular field observations
4. Farmers become experts

The first principle refers to good agricultural practices necessary for growing a crop that is able to withstand environmental stresses such as infestation by plant feeding insects or plant diseases. The second principle refers to the aim of reducing the use of chemical insecticides to deliberately support the populations of beneficial organisms. The third principle refers to the need for farmers to regularly observe and analyse their crop ecosystem in order to make timely and evidence-based management decisions. The fourth principle implies that expertise on sound crop management has to be with the farmers themselves, who are in the best position to respond to local and dynamic field situations.

IPM programs in rice have relied on the Farmer Field School (FFS) approach to empower farmers to grow healthy crops in a cost-effective manner, while chemical pesticides are used only as last resort. The IPM-FFS is a modern form of farmer education which is field-oriented, practical and which used experiential learning methods ('learning by doing'). IPM-FFS activities, often held under a tree near the field, take place in regular sessions, starting from planting and continuing until harvest. Groups of 15–30 farmers observe and analyze their agro-ecosystem on a weekly basis, facilitated by a field trainer. They learn to make appropriate management decisions, the effect of which is evaluated in the next weekly observation.

These weekly learning cycles give farmers the confidence and capacity to grow a healthy crop. This learning process is assisted by additional exercises and simple experiments that enable farmers to understand aspects of field ecology and plant development (e.g. pests-natural enemy population dynamics and crop damage-yield relationships). Farmers can thus discover that insecticides are rarely needed in tropical rice ecosystems. In fact, insecticides can easily induce a pest outbreak problem, for example in the case of the brown planthopper. Group communication exercises incorporated into the FFS curriculum aim to enhance group building between participants, which can facilitate the emergence of concerted action after the FFS. IPM Farmer Field Schools in tropical rice commonly result in immediate benefits to farmers in terms of reduced agro-chemical inputs and stable or increased yields. Moreover, rice FFS are a proven entry point for further farmer-driven development and local programs.

IPM programs in Asia have added post-FFS training activities in order to strengthen three types of skills: (i) skills to conduct farmer-to-farmer education through field schools, (ii) organizing skills to conduct planning, management and evaluation of concerted activities and associations, and (iii) skills of experimentation to generate and use new knowledge to feed into local programs. Together, these three elements facilitated sustained community-based activities, such as farmer clubs, associations, farmer advocacy, and lead towards farmer empowerment and local programme ownership.

This has resulted in what has been called "Community IPM", a situation where farmers are organising and implementing their own IPM activities, as instigators rather than recipients of IPM. Hence, Community IPM is about farmers joining forces to promote farming practices which they know are healthier and more efficient (Pontius, Bartlett & Dilts, 2002). Government and NGO trainers thus have a new role to play in supporting farmers who are managing their own IPM activities. Community IPM has emerged from training programmes organised by Government agencies and NGOs in various parts of Asia.

1.2 IPM in Sri Lanka

As early as 1984, rice IPM was initiated under the transfer of technology model in the form of the Training & Visit (T&V) extension system. In this top-down, message-based system, technology was transferred to farmers by Contact Farmers. Despite strong policy support, the effect was limited. The model worked for simple prescriptions, for instance, on the use of improved varieties, but did not work for complex field problems, for instance, in pest management. Subsequently, the Contact Farmer concept was replaced with a Group concept called the Block Demonstration. Educational principles on IPM developed in the Philippines were incorporated in the curriculum in 1985, and initial results were positive. Thereafter, the programme was scaled up very fast with 35,000 farmers trained by 1987, but the content and quality of training had been compromised. A parallel development in Indonesia and the Philippines since the late 1980s gave rise to the IPM-FFS approach (see section 1.1). The programme on participatory IPM in Sri Lanka started from 1995, albeit at a small scale due to a consistent lack of funding throughout the 1990s with just thirty units per season. From 1999 onwards more funds became available, and larger numbers of trainers graduated from season-long training-of-trainers. By 2002 when the IPM project ended, there were 220 IPM master trainers, half of whom in irrigation systems of the Mahaweli Authority of Sri Lanka (MASL), and over 200 farmer trainers (farmers who have become FFS trainers), capable of facilitating FFS in a large number of locations (see van den Berg, Senerath & Amarasinghe, 2002). Human resources in the Northern and Eastern provinces have been small due to the history of the ongoing conflict .

1.3 WHO's strategy on IVM

In 2004, a Global Strategic Framework on Integrated Vector Management (IVM) was developed and is now the official strategy for WHO (WHO, 2004b). IVM involves the use of a range of locally appropriate and effective vector control interventions, often in combination, to reduce or interrupt disease transmission. Intervention options are selected on the basis of knowledge about local vector biology, ecosystem, disease transmission, and morbidity. Chemical insecticides are considered the last resort for vector control after all non-chemical options have been considered. IVM is based on the premise that effective planning and operations for vector management is not the sole preserve of the health sector but requires the collaboration of various public and private agencies. The active engagement of local communities is considered a key factor in assuring sustainability. The aim of IVM is to improve cost-effectiveness, ecological soundness and sustainability of vector-borne disease control.