Post-graduate Education in Agricultural Systems at The Asian Institute of Technology[1]

ABSTRACT

A post-graduate masters course in Agricultural Systems at the Asian Institute of Technology is described. The course includes lectures in technical subjects such as Crop, Livestock and Fish Production as well as lectures on the analytical tools used in Farm Management Economics and Agricultural Systems Analysis. A major emphasis of the course is in the practical application of the systems approach to real farming situations both on-and off-campus. Students participate in the management of a small rainfed crop/livestock/fish farm, carry out a Farming Systems Research procedure in villages close to AIT as well as studying the off-farm factors affecting small scale farms through a series of structured assignments. Students learn to think and work independently during 6-12 months of thesis research which is carried out in the context of a real farming system.

INTRODUCTION

It must now be obvious to anyone working in Farming Systems Research (FSR) that there is a lack of people trained in the systems approach to agricultural research and development. Recent appraisals of FSR and its impact on the well-being of small-scale farmers have begun to question the efficacy of the approach (Norman and Collinson, 1985). There can be no doubt that FSR has not lived up to the expectations of all. This is partly no doubt, due to the over enthusiastic embracing of the approach as a panacea for all agricultural research ills leading to unrealistic expectations. But it must also be because the practioners of the approach are not trained for their task. Where, five years ago, could an agricultural scientist have taken a masters degree in Agricultural Systems in any tropical country?

There is now increasing interest in training and education in the systems approach to agriculture and an awareness of the need for both short course training on specific topics as well as under/post-graduate education allowing a total immersion in the approach and time to practice its application in the real world. In response to this growing need FAO initiated a major regional project to begin post-graduate training in Agricultural Systems at selected universities in South-East Asia.

FAO/UNDP PROJECT ON "FARMING SYSTEMS DEVELOPMENT IN ASIA: CROP/LIVESTOCK /FISH INTEGRATION IN RAINFED AREAS"

The FAO/UNDP Project on Farming Systems Development in Asia started in 1985. Its primary purpose is to establish post-graduate diploma and masters courses in Agricultural Systems at seven universities in six different countries in South-East Asia. These are:

Thailand	: Asian Institute of Technology, Bangkok
	Khon Kaen University, Khon Kaen
China	: Zhejiang Agricultural University, Hangzhou
Indonesia	: Institute Pertanian Bogor, Bogor
Sri Lanka	: Peradeniya University
Philippines	: University of the Philippines, Los Banos
Vietnam	: Institute of Agricultural Science, Hanoi

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Project activities include the provision of scholarships, equipment etc, arranging an annual meeting of project participants to exchange ideas as well as arranging student study tours of countries involved in the project. Advice on curriculum development is also given but each country is encouraged to develop its own course content and structure according to its own needs and resources.

THE M.Sc IN AGRICULTURAL SYSTEMS AT THE ASIAN INSTITUTE OF TECHNOLOGY

The Asian Institute of Technology (AIT) is an autonomous, international post-graduate technological institute in Bangkok. Students come predominantly from South and South-East Asia while faculty are recruited from all over the world. The language of instruction is English. AIT is a truly unique institution drawing high quality students from throughout the region yet being located within the tropics. AIT is the Regional Lead Centre for the FAO/UNDP Farmings Systems project. The masters course in Agricultural Systems makes use of these locational advantages and emphasises the practical application of the systems approach to real farming situations surrounding the institute. Most of the students on the Agricultural Systems course are government officers from research or extension organisations in their own countries. A condition of admission to the course is for the student to have had some work experience. Typical students are in their late twenties with 3-5 years work experience.

A masters degree at AIT is a five term (20 months) programme requiring a minimum of 30 credits of coursework, plus a research thesis. The course requirement is satisfied by students taking 4-5 compulsory courses and 5-6 elective courses from any division in the institute. Coursework is normally completed in 3 terms, allowing 2 terms for thesis research.

A masters degree in Agricultural Systems normally has the following structure :

	Recommended Core Courses	Some Elective Courses
Term 1	Agricultural Systems Crop Production Systems Aquaculture Systems Farm Development (practical)	Agricultural Mechanisation and Management Post-Harvest Technology of Cereals Agricultural Development and Planning
Term 2	Livestock Production Systems Farm Management Economics Farming Systems Improvement (Practical)	Agricultural Experimentation and Statistics Soil Fertility Management Fish Breeding
Term 3	Integrated Farming and Waste Recycling The Environment of Farming Systems (practical)	Agricultural Systems Analysis Soil and Land Classification Fish Nutrition Post-Harvest Technology of Fruit and Vegetables
Term 4	Thesis research	
Term 5	Thesis research	

At the heart of the course are the three practical courses involving the students in close contact with real farming systems both on and off-campus. From this experience of reality spring problems, questions and the stimulus to acquire specialist knowledge to solve these problems and answer the key questions. The technical courses on crops, livestock and fish endeavour to present subject knowledge in the context of real farming systems. The multifaceted nature of the management of farms is taught in the Farm Management Economics course which presents an integrated view of farming as does the course on Integrated Farming and Waste Recycling. A course of lectures on the theory of the systems approach is taught in the first term. These are the key elements of the course and to these students can add knowledge from other courses in the institute according to their own interests.

OFF-CAMPUS PRACTICAL WORK

During the first year of the course students execute a FSR procedure in a rainfed rice farming system in Ban Na, Nakon Yayok Province. The procedure involves :

Definition of objectives
Analysis of secondary data
Site selection
Description and analysis of system
Design of improvements
Testing of improvements on farm

In the first years of the course emphasis was placed on description and analysis, with some Thai students working on indentified problems on-farm for their thesis research. This year the students will build on the previous students' work and greater emphasis will be placed on the design and testing of improvements although the students will also carry out the preceeding steps in the procedure.

Assignments are set and usually take the form of reports that might be written if the student was a member of a FSR team in an agricultural research station.

Although the procedure provides the students with a framework in which to work the specific details of the work are essentially unpredictable. This encourages the students to debate issues among themselves and take decisions about the action they want to take. It is important to allow time for students to pursue issues as they arise. For example last year in response to the low and late rainfall an assignment was developed that required the students to analyse historical rainfall data for Ban Na and AIT and relate it to the water requirements of different rice production methods, as well as different crops. Students were required to calculate estimates of rainfall probability in order to derive some simple decision rules for farmers concerning rice varieties, method of planting and alternative crops to rice. This was a valuable exercise because it forced the students to not only acquire information but also to develop their own methods of analysis to solve specific and real problems.

The off-campus practicals are not solely focussed on individual farm households and their on-farm problems. They also seek to develop an understanding in the student of the off-farm factors that impinge on farmers and their farms. The supply of farm inputs, the marketing of products and the influence of government policy are some of these factors. Specific assignments are given on topics such as 'The Fertilizer Marketing System in Thailand' or 'Dairy Policy in Thailand', the students then decide which organisations in the public or private sector they need to talk to and appropriate visits are made.

ON-CAMPUS PRACTICALS

A 2.5 hectare teaching farm is maintained on AIT campus together with a 2.5 hectare research area adjacent to it. The farm consists of crop, livestock and fish enterprises which are integrated together where appropriate. The advantages as well as the dilemmas of integrating enterprises are explored by students while they manage the farm. The farm is not irrigated so that students are forced to face the same problems as are faced by all farmers in rainfed areas. In Asia, this set of farmers are in the majority.

Students begin by drawing up farm plans for the next growing season and following dry season. They then assist in the management of the farm having discussions about important decisions. 'Hands-on' practical farm work is also carried out by students. During the running of the farm problems arise which may be tackled during the student's thesis research. Research areas include :

Rainfed rice production
Annual and perennial pastures
Baby corn production
Low input fish production
Mushroom cultivation
Simulation studies of large ruminant production

THE END PRODUCT

The end product of the course is a person who is intelligent rather than informed, primarily a biologist, but who is unafraid of either economics or mathematics or getting their hands dirty and who is as well, a psychologist and a diplomat. Such a person we hope will be an opportunity maker and taker and a problem solver rather than a walking encyclopaedia.

REFERENCES

Norman, D. and Collinson, M. 1985. Farming Systems Research in Theory and Practice. In : J.V. Remenyi (ed.), Agricultural systems research for developing countries : proceedings of an international workshop held at Hawksbury Agricultural College, Richmond, N.S.W., Australia, 12-15 May 1985. ACIAR Proceedings No. 11.