

Farm Management in Agricultural Extension

Draft Report

Country Review

of

FARM MANAGEMENT IN AGRICULTURAL EXTENSION

EXECUTIVE SUMMARY

This report was based on the synthesis of the eight country reports on Farm Management in Agricultural Extension. The countries included are Bangladesh, India, Malaysia, Pakistan, Philippines, Thailand, Sri Lanka and Vietnam.

All the countries have recognized the need for assisting small farmers in order to improve their standard of living. They have all institutionalized agricultural extension services to the farming sector. Most of them concentrate their activities on transfer of production technologies to increase farm yield. While many of the farmers are now aware of the need to have marketable surpluses increasing yields is not enough. They have to know how to manage their farm business and market their products.

The problem is that agricultural extension programs have not incorporated farm business management advisory services in their list of activities. Hence, the need for extension workers and agricultural extension officials to understand the need for such training.

In most countries it is the government 's responsibility to provide agricultural extension services. There are research-extension linkages where research findings are supposed to be brought to the farmers by extension workers. There are also private and non-governmental organizations that are involved in rural development. Most private business dealing with the farmers confine their activities to the promotion of their products . Non-governmental organizations are more flexible and have succeeded in areas where the public sector has not intervened.

Farm management and business advisory services are mainly incorporated in specially funded projects . Most of these projects were initiated by universities and research institutes but have not been replicated in other parts of the countries.

Farm management is part of the curricular offerings of leading agricultural universities in the different countries. In-service training programs for extension workers provide minimal attention to the business side of farming. Most of them are designed merely to update the knowledge of extension workers on recent research findings in farm technologies. The same is true with training provided to farmers.

In the light of greater agricultural productivity there is a need to seek avenues or entry points by which farm management and farm business advice can be given to farmers. Special projects have explored those avenues and were successful . Some of them are participatory approach to extension service delivery, group and farmer-to-farmer communication etc.

Malaysia has demonstrated that farmers can be taught to keep farm records and draw up farm business plans. This was after the farmers were assisted in marketing their products and were able to realize higher incomes. In the light of limited resources farmers look up to extension workers to help them optimize the use of their resources. It is therefore imperative that those providing agricultural extension services be equipped with the necessary skills in order for farmers to become participants in the commercial sector of their economy

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Country Reviews

FARM MANAGEMENT IN EXTENSION

Agriculture is a major contributor to the economies of Bangladesh, India, Pakistan, Philippines, Malaysia, Thailand , Sri Lanka and Vietnam . Those that have embarked on industrialization programs acknowledged that it is the agricultural sector that has financed the development of the economy towards industrialization. While there are progressive farmers with enough resources majority of their farmers are smallholders and many of them are at the subsistence level of living. It is this sector that needs to be developed towards commercialization of their farm operations. They have to be helped through the extension services of their country if they are to improve their standard of living , enhance domestic food production and realize the inherent yield potential of their farms. Well-organized extension services especially in farm management are expected to bridge the gap between potential and current productivity .

A. Background and Institutional Setting

All countries have national agricultural extension programs in the public sector. There are also private sector and non-governmental organizations (NGO) helping the farmers that needed assistance. The technologies needed by the farmers are developed by research institutes as well as state colleges and universities. The extension personnel are expected to bring to the farming populace the research findings of these institutions. Thus, they form the bridge between research scientists and farmers.

The development of small and marginal farmers is a multi-agency responsibility among research, extension and the target groups. However, the main task of extension delivery differ among the countries . The public sector farm management extension services are organized at the provincial (state) level in India and Pakistan. The Philippines have transferred the responsibility to the local government units since 1993. The rest of the countries have agricultural extension programs as mainly the responsibility of their corresponding national level ministries of agriculture or departments of agricultural extension with personnel at the regional, district and village levels. Their field agents act as the frontline workers that deal directly with the farmers or farm household members.

India. Since farm management extension is primarily a national responsibility in India the central government have four major organizations devoted to extension work. Agricultural research is the responsibility of the Indian Council of Agricultural Research (ICAR). The research findings are passed on to the state departments of agriculture. The latter is charged with the delivery of improved production practices

developed by the ICAR research institutes to the farmers . The ICAR also fund the farm science centers that demonstrate and provide training on new techniques in farming . Hence, ICAR is also in the frontline extension work with this involvement.

In addition to teaching the state agricultural universities have the dual mandate of conducting research and extension in their respective areas. Each university organizes a farm science center with district extension specialists in different fields of specialization whose job is to visit selected farmers on a regular basis where proven agricultural practice or knowledge is imparted to the farmers and the problem of the farmers taken back to the concerned experts for solution at the university headquarters. The universities are also mandated to organize the agricultural officers' workshops and the farmers' fairs. The former is the venue by which agricultural extension personnel are updated on crop varieties , practices, tools, animal and poultry breeds, etc. before the main crop seasons start. The farmers' fairs provide opportunities to farmers to see the latest developments in fertilizers, plant protection materials, equipment, livestock and poultry breeds, etc. and interact with the university experts and farm input suppliers.

From the 1980's onward more and more non-governmental organizations, agricultural input industries and agro-processors are providing agricultural extensions services also. There are also some farmers' association as well as producers' cooperatives that engage in farm management extension work but are limited to a few specific crop commodities.

Pakistan. Public sector extension work is organized at the provincial level with the director general of agricultural extension as overall administrator and is responsible to the secretary of agriculture at the national level. There are officers at the district, the tehsil and then field assistants at the markiz and village levels. The field assistant is the frontline extension worker. He selects the contact farmers and motivates them to adopt new farm technologies. He also bring back farmers' reaction and feedback to the attention of his supervisors.

The institutional set-up in the public sector is well-organized but is considered top-heavy and costly in terms of administrative overhead. The linkages among research, extension and education are quite loose due to poor liaison.

The private sector provides fertilizer, pesticides , agricultural machineries and other farm inputs. The dealers also engage in extension activities to promote the sale of their products. A firm engaged in corn processing helps farmers in the production and marketing of their produce. A similar extension activity is provided by one of the sugar mills.

Agricultural universities make use of their departments of extension to translate research findings into simple language for the farm population to understand. While extension services to the farming communities are provided by such institutions there are wide variations in the types of extension activities they extend to the farmers.

A number of NGOs are involved in rural development activities of which agriculture is a part. They use the principle of participatory development to build local leadership skills. Their extension programs aim at increasing the income of farmers through training and facilitating timely arrival of agricultural inputs, introduction of technological innovations and new farm enterprises like beekeeping.

Thailand . Agriculture in Thailand includes a large number of small farms with limited land, labor and capital. These farmers are at the subsistence level of living although many have integrated crop and livestock enterprises.

The Department of Agricultural Extension had been performing its mandated task to millions of farmers through a small number of extension personnel at the provincial and district levels. The ratio of extension worker to farm families used to be 1:4,000. Aside from the inadequate personnel to help farmers at the grassroots level, many of extension workers did not have the right qualifications or training to work with the rural population. Realizing this problem the Thai Department of Agricultural Extension (DOAE) embarked on a national agricultural extension project that emphasized an integrated agricultural development approach by which several programs like on-farm irrigation, expansion of agricultural credit, improvement of extension delivery systems and creation of marketing facilities .

The establishment of the national agricultural extension project was aimed at reorganizing the structure and function of the agricultural extension system, improving the capability of the personnel at all levels and to increase the number of field personnel to handle the expanded number of extension activities.

The government embarked on this strategy to increase farm income through improved production technologies but with limited attention to farm planning, management and product marketing. The number of extension personnel have increased considerably. More than 8,000 college graduates have continuously been recruited of which 5,600 are village-based extension agents. The ratio of extension agent to farm families at present is 1: 1,000.

Among the approximately 400 to 500 NGOs committed to social work there are 113 involved in development activities but there are only 54 NGOs working in the rural areas. Activities supported by these organizations range from agricultural development and food production, irrigation and provision of potable water, non-formal education and training for new skills, health, sanitation and nutrition. Some have established rice banks, fertilizer banks, buffalo banks, credit unions, cooperatives, savings groups, and leadership training for the women and youth groups.

There are also a great number of private and commercial organizations at the local level. These are banks, insurance companies, and merchants that cater to the farming population. Merchants have a long history of association with farmers as their only source of credit, farm services and outlet for their farm produce. The merchants

understand the community needs, have access to market information and are in close contact with government officials. One should never underestimate their power and flexibility at the local level.

Bangladesh. The Department of Agricultural Extension is the key implementing agency of the agricultural extension policy. Since 1971 the delivery of extension services by the public sector has undergone several organizational changes. There were as many as six directorates that were created. Soon it was apparent that all of them were catering to the same farmers separately with different messages that led to confusion, high cost and competition for scarce resources.

In 1982 the six directorates were merged to form the Department of Agricultural Extension (DAE). Aside from the DAE there are ten more government agencies that are involved in farm management extension. These are bilateral programs and projects that complement the DAE in providing extension services to farmers and other clientele.

The public sector extension activities have a relatively narrow focus, i.e., one agency focuses only on crops, another on livestock, etc. On the other hand, the NGOs provide multiple services to their beneficiaries. Most of the NGOs however are handicapped by the fact that their beneficiaries have limited land, or are landless and marginal farmers.

The NGOs started extending assistance with the raising of vegetable and poultry, and small-scale fishery and agro-forestry projects. Then gradually they moved towards major crops like hybrid rice, maize, etc. There are more than one hundred local, national and international NGOs involved in agricultural extension activities. They try to organize the landless, marginal farmers and women into groups. The services they provide include credit, input procurement and training. In some areas the target clientele are farmers not reached by the public sector agencies. In recent years there is a trend towards greater collaboration between the public agencies and the NGOs.

The private sector participants in farm management extension are mainly seed companies, fertilizer and pesticide dealers. As such their activities are mainly toward the promotion of their products. There are also small plant nurseries owned by individual farmers that have been put up in the last two decades. Many of them had been established with NGO assistance and they have become the major source of planting materials for fruit and timber trees, vegetable crops, flowers and other ornamentals.

Malaysia. Agriculture in Malaysia consists of two subsectors: the estate and the smallholders. The estate sector is highly commercialized planting of industrial crops. They are efficiently managed plantations. On the other hand the smallholders have an average farm size of only 1.45 hectares that are less commercialized and not as well-managed. They grow mainly vegetables, paddy and coconut.

Agriculture was used to finance the country's development towards industrialization. With the rapid industrialization that began in the 1980's the agriculture sector declined in importance to the extent that it has been experiencing a negative growth rate. Thus, the Third National Agricultural Policy (NAP3) was instituted to maximize farm income through optimal utilization of resources and enhance domestic food production. Its objective is to accelerate the transformation of the traditional smallholder into a dynamic commercialized sector with emphasis on efficient farm management.

The development of the smallholders is a multiagency responsibility with close interrelationship among research, extension and target groups. Research findings or technology output from research agencies and universities are channeled to various agricultural agencies. These are evaluated for adoption by the extension agency, the Department of Agriculture. In turn they are developed into a technology package consisting of all aspects from planting to marketing of the produce for delivery to the target group.

Extension service is by agency specialization along commodity lines. However, in the smallholder crop subsector the Department of Agriculture provide technical and farm management extension services for almost all crops through extension workers at the state and farm levels.

Philippines. Agricultural extension in the Philippines is the responsibility of the Department of Agriculture, the local government units and the state colleges and universities. In the past the Department of Agriculture together with its attached bureaus and agencies provided the extension services needed by the farmers. However, in 1993 the main responsibility of delivering the needed services was transferred from the Department to the local government units. The Department is now involved in commodity-based programs at the national level. The devolution has slowed down the delivery of basic services due to varying capabilities of the local government units, changing priorities and lack of coordination among the various agencies. The state colleges and universities are involved in agricultural research but only a few have been able to make a continuing creditable impact on research and extension programs.

Many NGOs are engaged in agricultural extension through their local community development programs. A few are outstanding in the quality of their research and extension activities in the community and in their training of personnel as well as farmers and fishermen.

Private companies conduct extension activities such as seminars and training primarily to promote and market their product lines. Their activities are done independent of the public sector efforts.

Sri Lanka. Historically, the agricultural sector of Sri Lanka was predominantly export-oriented. It was only in the middle of this century that attention was paid to the domestic food crops sector while maintaining its advisory service for the plantation crop sector run by the commercial entrepreneur type of farmers. Most

of the domestic food sector producers are subsistence farmers hence the emphasis was on self-sufficiency of basic food items.

Agricultural extension is the prime responsibility of the Department of Agriculture (DA). From the early 1970's the responsibility was divided among different agencies, i.e., the DA handled only crops, the Department of Animal Production and Health the livestock sector, the perennial crops such as spices and condiments by the Department of Export Agriculture. While the DA refined its extension programs toward farmer training, skills development, attitudinal changes and farmer-extension-research linkages the other agencies concentrated more on the delivery of materials and subsidies rather than pure extension work.

Sri Lanka also tried the Training and Visit (T and V) system introduced by World Bank but it has mixed success and therefore it is difficult to assess its impact. Another strategy that was introduced was the farmer-centered farming system based integrated extension approach. The four agencies involved in agricultural extension were supposed to work as a team to maximize the services of their personnel through bottom-up holistic approach, joint work planning, field visits and joint operations. The approach was expected to lead to more sustainable, environmental-friendly production scenarios.

Prior to implementation a survey was done to identify the major problems facing the farmers. It turned out that most of the problems were institutional issues such as water availability, repairing of bunds, lack of good farm roads, lack of credit and availability of seeds and other planting materials that were considered beyond the scope of the agencies.

The integrated approach was implemented from 1993 to 1998. After several years the desired outcomes did not materialize because: (1) the different agencies have their own mandated tasks and were unwilling to compromise in order to achieve the desired goals and (2) the joint program did not get the active support of the supervisory officers although the field workers were committed to its implementation.

Sri Lanka suffered from lack of a coherent policy on agricultural extension. It continues to be viewed as the total responsibility of the government and no effort has been made to share the extension activities with the private sector and the non-governmental organizations.

Vietnam. Agricultural extension was synonymous to capitalism concepts and was not at first accepted in the country. However, it became an organized system in 1993. The national indicative plan for the country included a proposal for strengthening of agricultural extension, redistribution of staff, establishment of extension infrastructure and specific training activities. The surplus of high school graduates who cannot get into universities were tapped to join the extension force after providing them with training and encouraging them to become extension agents.

The Department of Agricultural Extension was established in 1993 whose top down activities were seen as benefiting mostly the rich farmers not the poor ones. Realizing the problem two provinces – Tra vinh and Soc trang in southern Vietnam - were able to establish an effective agricultural extension system together with the University of Cantho's farming systems research and development institute. They used the farming system approach in agricultural extension in trying to address the needs of the poor farming communities.

B) Trends in Commercialization of Agricultural Production Systems

All countries recognize the importance of small farmers to the economy and the need to help those that are economically and technically inefficient in terms of income generation and resource use. Malaysia has adopted group farming and land consolidation/rehabilitation approaches to transform the traditional subsector into a highly commercialized production system under the NAP3 program. Its objective is to increase the productivity of this sector through farming systems research, extension and research.

In India several new agencies were created by the government to promote the development of specific crops through commodity boards, market operation through marketing boards and the command area development authority. With a view towards demonstrating the impact of recommended technology demonstration centers are set up in adopted villages. These centers have gone a long way in the propagation of new technology such as ready-to-eat weaning foods, use of mineral mixture in livestock feeding, etc. Under the farm training service the entrepreneurship development program offers training in new technologies such as mushroom culture, bee keeping, fruit and vegetable preservation and fish farming. Similar programs are also offered in the animal sciences. The universities also have two schemes: one is the woman in agriculture scheme where the women are trained and the other scheme is the technology assessment and refinement where indigenous technologies are being refined with high-tech agriculture technology. Radio stations and the initiation of rural programs resulted in the wider use of mass media for agricultural development.

The Philippine government developed the medium term agricultural development plan whereby the Department of Agriculture introduced three major programs requiring massive research, extension and training and other agriculture support services. The programs include: the grains production enhancement, the medium term livestock development, key commercial crops development. The successful introduction and implementation of this development plan relies heavily on the research, extension and training capabilities of the Department of Agriculture. The trend and impact on agricultural production will continuously be expected on the kind and support services at the local government units.

In Thailand the present trend is to involve the private sector in rural development. The comprehensive agricultural development strategy is an integrated

approach to agricultural development. It recognizes that only a combination of factors can get agriculture moving such as technology, education, provision of infrastructures, access to credit and inputs, marketing services as well as attractive prices and the information needed for development. The common features of the projects under this strategy are: (1) promotion of agricultural production through improved extension services, (2) provide production credits in cash or in kind to farmers and (3) improve marketing facilities for farmers.

The Bangladesh report admitted that the country has not given attention to and serious thought yet on how to transform subsistence farming to commercial agriculture. However, there were significant achievements that opened up avenues for participatory, situation-based technology development and transfer that can mobilize local creativity, energy and experience through its agricultural support services project.

The agricultural services innovation and reform project is a followup project that aims to address issues related to holistic farm management through the integration of various extension services as well as address farm management issues. Similar projects are planned for agricultural diversification and intensification, cereal technology transfer, and improvement of soil fertility.

JOBS, an NGO-funded by USAID provide initiatives and assistance to small, medium and micro enterprises to expand and/or start-up new enterprises through a wide range of assistance including business management and marketing skills.

Agriculture in Pakistan is in transition from subsistence to commercial farming. These are not confined to any particular area or farming system. All farming systems in different parts of the country have been experiencing dynamism in terms of use of improved inputs. The adoption of improved varieties, fertilizer, pesticides, and mechanical innovation have resulted in significant improvement in the yields of various crops. A large share of future yield increase will have to come from improved crop management.

Majority of subsistence farmers in Sri Lanka practice crop and livestock husbandry in mixed farming systems. However, with one agency handling crops and another agency dealing with livestock extension activities there is greater confusion and therefore rejection of new technologies. The basics of farm management are lacking and actual training on farm management as a business enterprise is minimal. The importance of this area of training is apparently not fully realized by the agricultural extension agencies.

The farming system approach in Vietnam enable the agricultural extension personnel to determine appropriate technologies that are:

- 1) easy to apply by farmers particularly the poor farmers;
- 2) utilizing as much as possible local sources of inputs that could be generated by farmers themselves;
- 3) environmentally least harmful;

- 4) least costly inputs; and
- 5) yielding optimum products whose by-products can be integrated into the production system.

The provincial governments gradually picked up ideas from these activities formulated their own extension programs of technology transfer. The first province to apply this program was An giang which has since become the highest rice-producing area in Vietnam. Its success encouraged other provinces to follow.

C) Current Status of Farm Management in Extension

Extension services provided by agricultural agencies in almost all countries are mainly concerned with technology transfer. Hence the advisory services provided consist mainly of technical information such as agronomic practices, pest and disease control. Traditionally, frontline workers are generalists in that they are expected to answer all types of questions on crop and livestock production but not on the farm business aspect.

Farm management and business advisory services from public and private extension institutions are almost non-existent in Pakistan. Such services are provided to export-oriented commercial farmers in Sri Lanka but not to subsistence farmers. However, a farmer-centered farming systems approach is now being implemented in Sri Lanka since 1992 to encourage the participation of farm households in decision-making and emphasizes the close interaction of various agronomic and livestock systems for subsistence as well as commercial farmers. In Bangladesh socio-economic problems like marketing, credit, input and commodity price receive little attention. Perhaps this is also due to the lack of felt need on the part of the farmers for information on new technologies and practices.

Malaysia has incorporated farm management concepts and tools into the extension delivery system that include farming systems, marketing, farm enterprise budgeting, farm business plan and farm record-keeping. Promotion of farm management concepts in Thailand is carried out through demonstration plots, provision of farm management, agribusiness and marketing training courses for farmers, holding of field days, exhibits and providing answers to farmer's questions on marketing.

What appears to be agricultural extension in Vietnam is a little more than simple transfer of agricultural technology to farmers. By and large it is mainly a top-down system that pays little attention to the real needs of the farmers nor the concern for sustainability of ecosystems. Hopefully with the spread of the practice of farming systems the top-down system is gradually being replaced by participatory approach initiated by universities or non-governmental organizations planning to assist a local community.

Illustrative Examples of Farm –Related Advice.

The Philippines have pilot projects that try to establish new extension methodologies using farm management and related techniques to increase farmers' income. One of the them is a model extension project of the Agricultural Training Institute under the Department of Agriculture funded by Japan International Cooperation Agency from 1993 to 1994. Three pilot sites were chosen. One in the province of Bataan with six farmer-cooperators using farm record-keeping in low cost farming/production. Another is in Antique using group study method for processing fish by the Rural Improvement Club and bamboo craft by 4-H Club members. The third site is in Cavite using demonstration farms for the different fertilizer applications for high value vegetable crop production. Series of orientation meetings, rapid assessment and seminar-workshops for the farmer-cooperators and extension workers were conducted with the assistance of an Expert and Extension Method Research Committee from other agencies. The committee is tasked to come up with improved training system and guidance for the extension workers.

Results of the project show that increase in income can be achieved as a result of model extension activities with regular consultation with extension workers, organization of farmers for group activities and continuous practice of farm record keeping. There is a need however to validate and replicate the model projects for multi-location testing before it matures for area-wide expansion.

Another project is the University of the Philippines at Los Banos farmer-scientist training program. It is a crop-based program for sustainable agricultural development. The main objective is to give farmers direct contact with agricultural scientists to develop their technical and scientific capabilities to grow crops utilizing appropriate farming technologies. It also aims to strengthen the research and extension capabilities of local government units so they can render better and effective extension and training services in their areas of responsibilities.

The farmer-scientists who completed all phases of the training program can serve as the connecting link to the state college and university scientists and extension workers. They have become multipliers by encouraging more farmers in their villages to adopt improved farm practices. They have gained confidence in making farming a business enterprise.

Integrated intensive farming systems is being pursued by the government of Bangladesh, the UNDP and FAO on cereal technology transfer. It encourages appropriate policy support for participatory needs assessment, planning and organizing block demonstrations and promotional activities, rural infrastructure development, input and output pricing and marketing for the small farm families.

In Bangladesh the nongovernment organizations like JOBS and CARE have success stories among its beneficiaries. One is a poultry project under the JOBS program. Lilia Begum is a member of the Prodip Mahila Samitee of the Proshika Kaliakar Development Center. In December 1998 she took a 6-day formal training on poultry management from the JOBS program and decided to start a poultry enterprise. She borrowed Taka 70,000 from Proshika in February 1999 and bought

636 chicks. From the first batch she earned a profit of aka 8,000. She expects her profit to reach taka 1,300,000 from five batches in two years. Her whole family is now engaged in the venture. Hoping to become an affluent female entrepreneur, Lilia would like to encourage her group members to initiate similar ventures through this type of credit program.

Hajera Begum together with her husband used to work in other people's households but are earning very little. In 1993 Hajera Begum initiated a livestock venture with a taka 10,000 loan from Proshika. She received training from JOBS on livestock and after completing she was given a loan of taka 12,000. She used the money to purchase a cow which is now producing 10 to 12 liters of milk daily. Her husband and son looked after the cow and sell the milk at the local market.

In Vietnam agricultural students who are undertaking applied research-cum-extension activities are sought after by provincial and district governments since they serve as substitutes for government extension agents. Each fourth year agriculture student under the supervision of his/her respective professor and a local administrator lived with the selected farmer for five months to perform a close cycle of rice crop experiment which eventually used as a demonstration plot. The farmer-cooperator eventually become a local extension agent himself through the help of the guest student.

Farm Record-keeping. Sustainability of farm record-keeping depends on its effectiveness, potentials and demand. Since most small farmers have little education generally they rarely keep systematic records of their farm business. No effort either by the farmers or by government agencies are done to promote it. Since farmers are not made aware of the benefits of farm record-keeping they often harbor fear that the information collected through farm records may be used to tax their income. Farmers when asked to maintain records demand payment in return. They argue that they lack resources to keep farm records besides devoting time which otherwise could be used to look after the farm.

In the Philippines efforts to promote record-keeping is so far only on pilot project areas. One of them is the Agricultural Training Institute model extension project. The other one is the International Rice Research Institute- UPLos Banos farm record-keeping project. Detailed records of a group of farmers are kept with some guidance from the researchers. From the research experience there are limitations that make farmers discontinue the practice.

The same is true with Sri Lanka. There is no organized farm record-keeping among farmers on a large scale. The practice has been undertaken only on some specific projects to gather crop records of the farmers. Most of them were case studies. Although there had been attempts to include records of income and expenses to be used in developing farm projects they were not meant for farm management and business development.

Recently the second phase of the perennial crop development project selected farmers who were provided with farm management advice so as to develop this sector into a commercialized one. Aside from the provision of concessionary agricultural credit it also assist the investor with a business plan that includes the basic farm plan, costs and returns over a period of 10 to 15 years, net profits with cost-benefit ratios to judge the investment rate of return and internal rate of returns to compare with alternative investment portfolios and debt recovery ratio to check the credit worthiness of the investment. This is followed by advisory services on appropriate technologies. It is hoped that future advisory services will elevate their enterprises into real business management level where the client can also be assisted in terms of cost reductions, storage, advanced contracting, national and international trade, quality control, etc. The challenge is to be able to identify farmer-investors with business-oriented traits who will be receptive to a holistic advisory service coupled with training on farm management that can be tied up with a commercially oriented marketing scheme.

It seems only Malaysia's Department of Agriculture has adopted the use of farm record keeping as a farm management tool for the collection of data for farm business and enterprise analysis that started in 1974. In the early years of implementation the records kept were very comprehensive and required farmers to record all physical and financial information of the overall farm business. In later years the design was modified to keep it simple and user-friendly.

The objective of the Malaysian program on farm record-keeping is to encourage farmers to treat farming as a business enterprise. Farmers were chosen on the basis of their ability to read and write. The selected farmers are issued farm record books and given a short training course on farm record-keeping. Technicians make regular visits to the farmers to assist them and ensure that proper and regular records are being kept. During these visits records kept by the farmers are collected and analyzed at the district level. Results of the analysis are given to the farmers to let them know how their farm business fared.

D) Farm Management Training and Materials

Printed matters are the most common materials used for bringing the new agricultural technologies to the farmers. The most common are leaflets, handouts, and journals. Most of them deal with production technologies while farm business advice are minimal or altogether non-existent

The following are some of the training programs offered to farmers in their respective countries:

<u>Country</u>	<u>Training Activity</u>	<u>Sponsor</u>
India	farmers' fairs, field days entrepreneurship training	state agric'l universities Farm Training Service

Education	farm advisory service	Directorate of Ext.
	farm training	-do-
	farm information and communication	-do-
Pakistan	seminars, workshops, fairs farmers' advisory cell training courses and demonstration	agricultural universities Sind Agric'l University Technology Transfer Unit (Nat'l Agric'l Research Center)
Malaysia	technical advisory services	Dept. of Agriculture
	farm record keeping	-do-
	direct selling program	-do-
Bangladesh	agricultural support services	Ministry of Agriculture
	innovation and reform	-do-
	diversification and intensification	-do-
	cereal technology and identification	-do-
Philippines JICA	model extension project	Agric. Training Inst.-
	farmer-scientist training	Univ. of the Phil-Los
Banos	farming systems development	FAO-TSARRD
	farm record keeping	IRRI
Thailand Off.	farm management demonstration	Northern Reg'l Ag. Ext
Vietnam	farming systems	Univ. of Can tho

The cereal technology project (TCIT) of Bangladesh is the only reported project that developed a handbook on Participatory Rural Appraisal wherein different approaches and methods to enable farmers to share, enhance and analyze their knowledge of life conditions , how to plan and act are described. The goal is to improve the capability of agricultural extension workers and research scientists in dealing with their target clientele. However, aside from the income and expenditure matrices it did not include farm business advice.

While Vietnamese universities actively promote farming systems there is no official textbook written on the subject. Each university designs its own teaching and training materials based on what they learned from previous training courses in the country or abroad. Specialized educational and training materials such as multi-media programs, videos and posters are still lacking. Most universities still depend on external funding for farming systems research and training.

Farm management in formal education. Universities offering degree programs in agriculture specifically agricultural economics usually include courses in farm management. In Pakistan (particularly in Punjab) the department of farm management offer a course in farm records and planning for students pursuing an undergraduate degree in agriculture. Two other course offerings are: principles of farm management and land economics and farm appraisal. In Faisalabad a course in planning for livestock production is offered to students in animal husbandry. Aside from the undergraduate courses the following farm management courses are offered at the graduate level:

FM 700	An introduction to farm business
FM701	Methods of farm management investigation
FM 702	Farm costs and farm appraisal
FM 703	Advanced farm planning and budgeting
FM 704	Applied linear programming
FM 705	Econometric methods in farm management
FM 706	Economics of agricultural production
FM 707	Applied production functions
FM 708	Project preparation and appraisal
FM 712	Dynamic agricultural production functions
FM 713	Operations research approach to farm management
FM 714	Advanced quantitative production economics
FM 719	Special problem
FM 720	Seminar
FM 721	Advanced econometrics
FM 722	Natural resource economics
FM 723	Advanced production economics
FM 724	Application of mathematical techniques fro farm management
FM 725	Farm management's role in farming systems research

The formal education course contents offered by educational institutions in the Philippines for farm management and related extension personnel are those in agricultural economics and agribusiness. At UP Los Banos College of Economics and Management have departments of agricultural economics and agribusiness. The list of sample specific courses are shown in Annex I.

Farming systems and extension is a recent field of study taught in the agricultural universities and research institutes in Vietnam. Agricultural systems as a subject is offered in three universities while farming systems is offered at four universities. The former is handled by just one teacher while the farming systems course is taught by a team of teachers of economics, soils, crops, livestock, forestry and fisheries using a combined method of teaching through lectures, field practicum, thesis or special problems.

The farming systems offered by the universities is usually linked to a research or development project which requires a thorough analysis of the agro-ecosystem of

the project area derived from a survey that could involve the students and teaching team.

Agricultural extension is a course offered at all six universities requiring 30 to 45 hour-credits. They are taken by agronomy, animal husbandry and veterinary science majors. In some agricultural research institutes graduate studies in farming systems are offered as a separate program leading to the “Candidate” degree.

In Thailand formal education courses in farm management are offered in the curricular programs both at the undergraduate and graduate levels. Some of the courses offered at Kasetsart University are :

- Ag. Econ, 221 - Principles of farm management
- Ag. Econ. 521 - Advanced farm management
- Ag. Econ. 405 – Economics of sustainable agriculture
- Agronomy 461 – Cropping systems

The leading universities offering farm management courses in the different countries are:

Thailand	-	Kasetsart University
Pakistan	-	Peshawar University
Bangladesh	-	Bangladesh Agricultural University
Philippines	-	University of the Philippines at Los Banos
Vietnam	-	University of Can tho
India	-	Chaudhary Charan Singh Haryana Agricultural University
Sri Lanka	-	School of Agriculture

In-Service Training Programs. The government agencies responsible for farm management extension services provide in-service training to the extension personnel .

In Thailand the Department of Agricultural Extension provide a training program in farm management, agribusiness and marketing concepts and methods that include the following aspects: approaches to increased production and income and key points to improve resource use and tools used in farm management extension. The government set aside a budget for this purpose annually. The Department stresses the importance of extension workers being able to understand the management problems before giving recommendations to the farmers. Hence the emphasis of the training are: (1) how to conduct a simple farm survey, (2) how to analyze input-output data (3) how to prepare a farm plan and budget and (4) how to keep farm records and accounts. The different training programs are shown in Annex II.

Similarly in Malaysia it is the Department of Agriculture that conducts the training. The in-service farm management training programs are conducted by

officers who are graduates of agricultural economics, agribusiness or farm management. They are conducted regularly at the officers' training institutes.

In these training programs the extension officers are taught the importance of including the various farm management concepts in their extension functions. The details are shown in Annex III. They were also trained in the use of computerized spreadsheets as an important tool in the preparation of crop enterprise budgets and cash flows. It also includes procedures in linking worksheets to facilitate the preparation of whole farm financial analysis.

In Bangladesh the Department of Agricultural Extension prepares a master training plan every year based on the training needs analysis of the Department's training wing. The training plans cover all Department officers and staff as well as other client groups. It also conducts a fortnightly and monthly training sessions for thana and district staff. The courses include mainly production technologies. To increase the capacity of extension service personnel in farm management the Department provide a budget for foreign training and study tours for their staff.

In-service training for Pakistan field assistants are conducted in various agriculture training institutes to make them aware of advances in mainly production technologies . Farm management's share of the course is about eight percent of the total credit hours for a two-year program.

The Agricultural Training Institute of the Philippines provide training at the Department of Agriculture for the local government units' extension workers and farmers through the regional training centers. State colleges and universities also maintain extension and training staff and operate within their localities on a limited basis. Most NGOs also take part in the training activities but the program modalities, content and frequency are dictated by donor-sponsors and availability of funds.

Sri Lanka's Department of Agriculture also conduct its training program through its in-service training institutes at the district training centers. The training programs are mainly on crop production, post harvest technology, women in agriculture and management. The farmer-centered farming systems approach is being implemented in the country since 1992.

The state agricultural universities of India organize agricultural officers' workshop just before the beginning of the main crop seasons. In such workshops all the officers of the state government concerned with the delivery of the farm management extension service to the farmers assemble at the campus of the state agricultural university for a few days. Participants are informed about the crop varieties, practices, tools, livestock and poultry breeds developed by the university scientists who discussed in detail. These workshops are also attended by selected farmers, policy makers and administrators.

Short-term non-degree training courses in farming systems are offered by all agricultural universities and many research institutions. Most of the courses last from

three days to one week They are designed for local extension workers and farmers. At the University of Can tho where the Mekong Delta Farming Systems Institute is located, these courses and related activities are offered:

1. Training on farming systems methodologies
2. Trainer-trainee approach where mobile training teams trained by the Center teach the farming systems concept to local technicians, administrators and farmers in order to allow for rapid generation of trained resource persons.
3. Annual workshops of the Vietnam farming systems network are held to discuss the research results of the previous year . In addition, feedback from the network members are solicited and the plan of activities for the following year is discussed.

The government agencies of Thailand offer non-degree training courses in cooperation with Kasetsart University .Some of the in-service training courses offered to agricultural extension officers include farming systems concept and sustainable agriculture . These are organized by the Office of Extension and Training in cooperation with other agencies.

E. Stakeholders' Needs Assessment

The Farmers. Agriculture, like other sectors of the economy in all the countries included in this report is undergoing changes due to technological and scientific developments .While farming used to be perceived by farmers as a way of life and not as a business enterprise such perception is now changing due to these new developments. Current extension services emphasize approved practices as they apply to different farm enterprises. However, small farmers are sometimes not interested in them since some of the recommendations have little relevance to their farming operation or may not be applicable.

Farmers are rational. They respond to changes in technologies, prices of inputs and outputs. However those with little education calculate the profitability of their enterprises in their minds not on paper. Their interest needs to be stimulated in order to develop new profitable farm business . They might be convinced if they can see on paper how it can be done. They are interested to know how to make better decisions about resource allocation.

In Bangladesh it was found that majority of farmers lack the felt need for new technologies and practices. Small farmers may lack the perception of the advantages such practices may have on their farm operation. Hence, the advantage of new technologies have to be demonstrated convincingly to them. Other issues that need to be addressed are natural resource degradation in relation to land use patterns, soil fertility and biomass, inundation and flooding, water logging and drainage, conservation of biodiversity and other environmental issues that farmers feel are affecting their lives. Farmers also need to be helped in solving socio-economic problems like marketing, credit, input and output price.

Various extension programs in the Philippines have contributed and provided lessons that call for more participatory and effective approach to extension delivery services at the farmers' level. This level requires a broader community focus and need to be more responsive to locally identified needs and opportunities especially for agrarian reform communities.

Most extension services are commodity- specific which emphasizes input supply with insufficient attention to the socio-economic diversity of the rural communities, farmers' ability to learn from each other, management constraints, integrated farming interests, complementarity between livestock and crop enterprises, conservation practices in the uplands, post harvest handling and marketing.

It is now widely recognized in the country that the effectiveness of farmer- to-farmer communication process have been responsible for the adoption of technologies that have major impacts on agricultural development. The use and replication of those processes through active participation of farmers could further increase the impact of extension/training programs.

As Indian agriculture moves from the subsistence level to the commercial level farmers are using more and more cash inputs than they did a few years ago. They are also producing greater quantities for sale in the markets. These developments have increasingly exposed them to external factors such as credit, markets and prices.

Farm plans and budgets and other tools of farm management are seen as helpful to farmers in solving problems of adjustment to external stimuli. The farmers look up to extension workers to provide the guidance that they need in these areas. There is a need to design special farm management programs as they focus on crop and livestock that have the potential for higher net returns.

With decreasing soil fertility, new technology and proper resource management have become essential in Thailand agriculture. However there is a need for technology developed elsewhere to be modified and improved to suit local conditions before they are recommended to the farmers. The other concern of farmers is access to capital and procurement of production inputs.

With the transformation from traditional to commercial farming and the introduction of market-oriented extension services Malaysian farmers are now generally more appreciative of farm management and farm business advice from extension workers. There is however a need to further provide the commercially - oriented farmers with advice with regards to the selection of the most financially viable farming systems. The farmers need to be trained in the preparation of crop and enterprise budget/cash flow.

In a survey conducted in Sri Lanka the major issues brought out by the farmers are not related to production constraints but with institutional issues such as water

availability, repairing of bunds, lack of farm roads, lack of credit and availability of planting materials.

Extension Workers. In order to make extension workers' recommendations more relevant to farmers' needs and be able to provide the right farm management and business advice to the farmers there is a felt need by the extension officers for further training on farm management techniques and business advice particularly on the whole farm business analysis and the preparation of farm business plans. Training in farm business accounting and bookkeeping are also felt needed to further enhance the transformation of farming into a business entity. While all countries have this problem it is given emphasis in Malaysia where farmers are now commercially-oriented following the success of the direct selling program organized by the Department of Agriculture.

Thailand have improved its agricultural extension service to a considerable degree but it is not yet sufficient. In many farming areas the extension workers are too few relative to the coverage area assigned to them. Based on their capabilities their assigned areas are often too large to be efficiently managed. Furthermore aside from their field work extension workers are also given administrative assignments that add to their work load.

Agricultural extension workers need to be motivated to be more efficient in their job. Some incentives that can encourage them are: opportunities to undergo short and long term training in farm management, agribusiness and marketing training courses, study tour in model farms in the country as well as in other countries. They also need to be provided with materials to familiarize themselves with farm management methodologies, audio-visual aids and basic farm bookkeeping.

Pakistani extension workers are not aware of farm management techniques and farm business analysis although they know that maximizing profit from farm enterprises is very important to the farmers they serve. Hence, there is a need for further training in farm management techniques. Extension workers who are supposed to train the farmers need training themselves in the preparation, maintenance and analysis of farm business records, margins and production costs, farm budgeting and in the assessment of farm efficiency measures.

After the devolution of agricultural extension activities to the Philippine local government units it was realized that the skills and knowledge of the extension staff are inappropriate for their new roles. It would be beneficial if they could be trained in current extension methodologies, extension planning, communication skills, farm problem diagnosis, financial analysis and farm management.

Some of the excellent lessons learned from various noteworthy successful projects including their training materials and curricula can be used for training of extension personnel. Improving farmers' skills through them will require training in adult education principles and practices, learning contact modules, strategic

management approaches, apprenticeship skills and experiential approaches can help increase the capability of the extension workers of the local government units.

For Sri Lanka the real need is to identify farmers that are business-oriented who can be given a holistic advisory service. Farm management training should be tied up with the production aspect as well as the marketing process. The country has a history of giving business advice to the commercial export crop sector that can provide useful insights in trying to help the small farmers. The extension workers can also link the client-farmers with other technical institutions when the needed advice is beyond the capacity of the extension personnel.

Bangladesh need to widen its horizon in terms of finding innovative ways to help small farmers. In-service training programs have been conducted regularly for the Department of Agricultural Extension staff members but it was admitted that very little has been achieved to benefit the farming community at large to draw them into the commercial sector.

Decision Makers' Views. Apparently there is already enough data particularly in India generated in the last decade to demonstrate that the farm planning approach has great potential for increasing farm incomes. The approach starts with an awareness of the fact that farm resources, i.e., land, labor and capital are limited. It is within these constraints that alternative farm plans are developed.

Since the goal is to increase farm income then a more intensive cropping system has to be introduced. This will mean high-yielding and short duration crop varieties. Obviously it will require more capital investments. This may not be a big constraint considering that there are lending institutions that have relaxed their requirement through agricultural lending programs. Under this changed condition the following options can be studied in order to improve the provisions of extension assistance related to farm business planning:

- (1) prepare and compare existing farm income under the farmers' own planning system with an alternative farm plan and
- (2) estimate the extent of increasing farm income by increasing capital availability, i.e., by relaxing the assumption of limited availability of capital.

Appendix 4 shows two synthesized farm plans on the basis of crop budgets that demonstrate how the options mentioned can be applied.

If the goal of extension programs is to stimulate economic activity in the agricultural sector then it should involve farmers in (1) identifying and prioritizing problems and constraints to increasing productivity and incomes from farming and (2) plan, implement, monitor and evaluate focused location-specific action plans to address the problems. Emphasis as claimed especially by Philippine officials should be given to demand-driven extension services.

The extension staff of the future will need highly developed analytical skills in agricultural production systems and a wide network of contacts among the private and public sectors. They will have to become facilitators of information. To ensure relevance these extension workers need to acquire skills to assist in problem analysis of farm production systems and to be able to access funds for local development programs.

Considering the above conditions the training services should be developed at two levels: the provincial or municipal and then at the community or grassroots level. These options have to be considered in view of the fact that there is very little evidence to suggest that there was effective extension service to small farmers in the past. In addition there had been a general lack of support among local chief executives to the extension workers.

Therefore the challenge facing localized programs are : (1) more farmers are needed to be involved with new technology messages, (2) intensified use of mass media facilities like radio and TV, (3) strengthen linkages of research, extension and farmers and institutionalize the continuous flow of information among them, (4) develop programs for quality extension personnel in the future, and (5) develop monitoring and evaluation systems to measure the effectiveness of farm management/business advisory extension services with a view to developing innovative techniques.

F. RECOMMENDATIONS

The future approach to extension should essentially address the need to integrate the basic principles of farm management if the small farmers are to be assisted into the commercial sector of the economy. Apparently there is a need to improve and refine the delivery of extension services not only to promote the production aspect of farming but also its operation as a business in order to make farming more sustainable and profitable.

a) Possible Entry Points for Farm Management and Business Advisory Services;

1. The extension delivery system should consider the group approach as opposed to individual contacts to make the service more cost- effective. This will also encourage the farmer –to- farmer communication process that enhances the chance of better adoption of the practice.

2. Effective implementation of land reform measures may encourage and motivate farmers to keep records. In the light of rapid commercialization of agriculture farm record keeping has become a necessity. Extension workers should be given training in record-keeping to be able to guide the farmers. Organizing a round

table conference among selected farmers who are keeping farm records can shed light on the problem of strategy, sustainability and effectiveness of the farm record data in decision-making.

3. Extension workers should hold workshops on farm record-keeping at least twice a year to discuss ways of analyzing the data, its use in decision-making and problems related to farm record-keeping in general. Through the extension service agencies the governments should campaign to make the farmers aware of the advantages of the practice and to remove the farmers' fear of being taxed as a consequence of the practice.

4. Front line agricultural extension workers should be given in-service training on a regular basis to be more relevant to their areas of assignment and to improve their skills. Major emphasis should be on the development of annual extension plans.

5. The governments must support the policy of developing the agricultural sector by increasing the efficiency of methods of production. They should also strengthen the coordination among all the agencies involved in agricultural development especially at the farm level. In addition, measures are also needed to make extension personnel more accountable, responsible and relevant so that they are more responsive to the problems and opportunities faced by the farming communities of Asia.

6. To further enhance efforts at transforming subsistence agriculture into farming as a business some entry points that can be tapped to bring to them the business advisory services are; women's group, village cooperatives, non-governmental organization assisting in rural development, farmer-contact groups as well as local leaders.

7. Farm management extension activities should include women's participation. It is foreseen that the importance of women will progressively increase with the increase in their authority in influencing decision-making in their families. Bangladesh' Grameen Bank set a pioneering example of putting women at the cornerstone of development efforts.

8. It is believed that much can be accomplished by the public and private sectors working together through complementary activities that can address technology development needs and dissemination of research findings. Possibilities of public-private sector collaboration should be explored. Non-governmental organizations have an edge over public institutions in organizing and mobilizing human resources since they have the flexibility and often the resources not available to government agencies.

9. Government investments in physical and social infrastructures is imperative to convince the farmers to make major investments or permanent farm improvements in their lands or use of input. There can be remarkable improvements in technology

transfer if government agencies correct institutional and infrastructural weaknesses such as lack of good farm-to-market roads, irrigation and drainage, credit, etc.

10. Introducing postharvest technologies to increase value of farm products can go a long way in generating more income and employment in rural areas. Rural industries can be developed by linking production with processing and marketing. Product conversions and on-farm processing can hopefully hasten the demand for farm business advisory services.

b) Priorities for FAO

1. It was suggested that a modular training approach that incorporates agribusiness and best practices results in farm business management and farming systems development should be comprehensively prepared to accompany prepared modules done by FAO in the past.
2. Technical assistance is needed in curricular development through consultation, testing and validation particularly in the development of training programs in farm management, economics and social analysis as well as environmental assessments of projects.

Three different types of training courses for which materials could also be developed are suggested:

1. Agricultural extension training
 - technical courses
 - extension supervisory and programming courses
 - extension management courses
2. Project planning and management
 - extension research/training techniques in project planning
 - project appraisal (M and E)
3. Agricultural survey, interpretation and report writing
 - survey methods and techniques
 - interpretation and report writing

Other specific programs:

- a) Community participation and empowerment for sustainable food security
 - community organizer
 - farm management specialist
 - support staff and volunteers
 - in-service training – skills development and management
 - participatory development training
- b) small farm improvement program
 - farm business advisory services through international and local consultants
 - technological research activities
 - appropriate training for researchers, trainers and extensionists
 - direct budgetary support for demonstration plot activities

- monitoring and evaluation
 - c) farm business development program
 - an integrated market –driven technical and support services to revitalize extension service at the local level
 - a. develop and package information on best practices and results from farm innovations
 - b. develop effective extension education, information and communication between researcher-extension worker and community –based organizations /farmer members
 - c. implement best practices and results farm innovations using the participatory approach
 - d. in-service training
 - e. credit, supplies, marketing and other support systems
4. To further strengthen the application of farm management techniques and farm business management advisory services the following priorities are recommended for FAO support:
- a) development of training materials for the preparation of a Farm Business Plan
 - b) development of computerized templates for the preparation of whole farm financial analysis, and
 - c) training in farming systems research and development.

Annex 1

Farm Management and Related Courses at UP Los Banos- Philippines

DEPARTMENT OF AGRICULTURAL ECONOMICS

AECO 1. Fundamentals of Agricultural Management (3) Principles underlying management and their application on agricultural business, offices and programs. 5 hours a week (2 class, 3 lab.) PR.ECO 11. (1,2)

AECO 103. Statistical Analysis of Agricultural Economic Data (3) Statistical methods in the analysis of agricultural economic data, 5 hours a week (2 class, 3 lab.) PR. STAT 1 or COI. (1)

AECO 104. Principles of Agricultural Business Accounting (3) Principles of accounting with emphasis on their application to agricultural business. 5 hours a week (2 class, 3 lab.) PR. ECO 11 (2)

AECO 110. Agricultural Production Economics (3) Fundamental concepts in resource allocation and their application to agricultural production. 5 hours a week (2 class, 3 lab) PR ECO 102 or COI. (1)

AECO 111. Farm Management (3) Principles underlying farm management , including farm labor, marketing agricultural products and analyses of farm costs and returns, 5 hours a week (2 class, 3 lab.) PR. ECO 11, (1,2)

AECO 112. Farm Management Practice (3) . Application of principles of farm management on a commercial farm. 7 hours a week (1 class, 6 lab.) PR AECO 111 or COI. (2)

AECO 120. Marketing Farm Products (3) Principles of marketing of farm products; description of types and functions of marketing organizations and market outlets for agricultural products. 3 hours a week (class). PR ECO. 11 (1,2).

AECO 121. Food Marketing (3) Food marketing principles and practices; economic appraisal of the food industry structure, conduct performance. 3 hours a week (class). PR. AECO 120 or COI. (2)

AECO 122. Agricultural Price Analysis (3) Analysis of the factors affecting the prices of agricultural products. 3 hours a week (class). PR. ECO 102 and AECO 103 or COI. (2)

AECO 123. Agricultural and International Trade (3) Patterns of world trade in agricultural products, national and international trade policies related to agricultural development. 3 hours a week (class), PR. ECO 101 and ECO 102 or COI. (1)

AECO 130. Agricultural Finance (3) History, development and mechanism of agricultural financing in the Philippines; organization and operation of financing institutions serving agriculture; farm appraisal and evaluation, 3 hours a week (class). PR. ECO 11. (2)

AECO 136. Cooperatives (3) Structural organization and operation of cooperatives. 3 hours a week (class). PR. ECO 11. (1)

AECO 140. Land Economics (3) Economic principles as applied to the management of land and land-based resources; study of the physical, economic and institutional and other relevant factors that affect, condition and control the use of these resources. 3 hours a week (class). PR. ECO 11. (2)

AECO 150. The Economics of Agricultural Development (3) An analysis of the role of agriculture in economic development. 3 hours a week (class) . PR. ECO 101 and ECO 102 or COI. (1,2)

AECO 151. Agricultural Policy (3) National farm organizations; economic analysis of different aspects of agricultural policies and programs, 3 hours a week (class). PR. ECO 101 and ECO 102 or COI. (1,2)

AECO 160. Introduction to Research Methods in Agricultural Economics (3) Methods and techniques in conducting agricultural economic research with emphasis on current agricultural problems. 5 hours a week (2 class, 3 lab.). PR. AECO 103 or COI. (1,2)

Annex 2

Training Program in Farm Management, Marketing and Agribusiness in Thailand

TRAINING “FARM MANAGEMENT, AGRIBUSINESS AND MARKETING” PROGRAMS.

1. Training Program for Trainers.
2. Training Program for Provincial’s Subject Matter Specialist.
3. Training Program for Extension Workers.
4. Training Program for Farmers.

Table 1 : Type, Duration and Participants of Training Programs.

Training Program for	Trainers	Provincial’s Subject Matter Specialist (SMS)	Extension Workers
Type of training	Seminar and Workshops.	Workshops.	Workshops.
Duration	One month	10-days	7-days
Participants	Subject Matter Specialist from Head office and Regional offices 30 persons	Subject Matter Specialist from 76 provinces 200 persons	Extension Workers from amphurs and districts 4,000 persons

Table 2 : Topic discussed, Lessons, Methodology and Output of Training Programs.

TOPICS DISCUSSED	Trainers	SMS	Extension Workers
What can extension workers do in Farm Management, Agribusiness and Marketing	√	√	√
TOPICS DISCUSSED	Trainers	SMS	Extension Workers
How to train			
- SMS.	√	-	-
- Extension Workers.	√	√	-
- Farmers.	√	√	√
How to organize the training program for			

- SMS.	√	-	-
- Extension Workers.	√	√	-
- Farmers.	√	√	√
Hot to prepare the manual for			
- SMS.	√	-	-
- Extension Workers.	√	√	-
- Farmers.	√	√	√
How to conduct farm surveys.	√	√	√
How to prepare farm plan and budget.	√	√	√
How to keep farm records and account.	√	√	√
LESSONS			
What is Farm Management	☆	☆	☆
Data collection and analysis.	☆	☆	☆
Capital budgeting.	☆	☆	☆
Investment.	☆	☆	☆
Farm plan and budget	☆	☆	☆
Farm records and account	☆	☆	☆
Agribusiness development.	☆	☆	☆
Marketing.	☆	☆	☆
METHODOLOGY OF TRAINING			
Lecture	❖	❖	❖
Case study.	❖	❖	-
Practice.	❖	❖	❖
Farm survey, data collection and analysis.	❖	❖	❖
Presentation and discussion.	❖	❖	❖
OUPPUT OF TRAINING	Trainers	SMS	Extension Workers
Curriculum of Training Course :			
➤ 10-days for SMS.	Δ		
➤ 7-days for Extension Workers		Δ	
➤ 5-days for Farmers.			Δ
Manual for :			
⊃ SMS.	❖		
⊃ Extension Workers.	❖	❖	
⊃ Farmers.	❖	❖	❖
Publication and Audio-visual Aid.	♣	♣	♣

1. Program “the Intensive Farm Management, Agribusiness and Marketing Course”

This program trained for farm management’s trainers.

1. Objectives.
 - To train subject matter specialist from head office and regional office for the core trainers
 - To prepare the manual, publication and audio-visual aid for training programs.

2. Course contents.

	Hours
- Principle of Farm Management.	12
- What can extension workers do in Farm Management, Agribusiness and Marketing.	12
- Farm survey. Data collection,	18
- How to analyze input output data.	36
- Farm plan and budget.	15
- Farm records and account.	15

- Investment.	12
- Agribusiness development.	15
- Marketing.	15
- Case study.	15
- Discussion	15

2. Program "Farm Management, Agribusiness and Marketing Course"

This program trained for Provincial's Subject Matter Specialist.

1. Objectives.
 - To train subject matter specialist from provinces
 - To prepare the manual, publication and audio-visual aid for extension workers and farmers training program.
2. Course contents.

	Hours
- Principle of Farm Management.	5
- What can extension workers do in Farm Management, Agribusiness and Marketing.	6
- Farm survey. Data collection,	10
- How to analyze input output data.	10
- Farm plan and budget.	6
- Farm records and account.	6
- Investment.	2
- Agribusiness development.	6
- Marketing.	6
- Discussion	3

3. Program "Farm Management, Agribusiness and Marketing Course"

This program trained for Extension Workers from amphurs and districts.

1. Objectives.
 - To train extension workers from amphurs and districts.
 - To prepare the manual, publication and audio-visual aid for farmers training program.
2. Course contents.

	Hours
- Principle of Farm Management.	3
- What can extension workers do in Farm Management, Agribusiness and Marketing.	3
- Farm survey. Data collection,	6
- How to analyze input output data.	6
- Farm plan and budget.	5
- Farm records and account.	5
- Investment.	2
- Agribusiness development.	5
- Marketing.	5
- Discussion	2

4. Program "Farm Management, Agribusiness and Marketing Course"

This program trained for Target Farmers...

1. Objectives.

- To train the target farmers, who done the Farm Management, Agribusiness and Marketing Demonstration Farms from 76 provinces.
- To train the farmers, how to do the farm plan and budget and how to do the farm records and account before improving their farms.
- To plan how to extend the each demonstration farms.

2. Type of training.

Workshops in 76 provinces...

3. Duration.

5-days. For training and practicing.

4. Course contents.

	Hours
- Principle of Farm Management.	5
- How to improve the farms	3
- Agribusiness and Marketing.	3
- Farm survey. Data collection,	2
- Farm plan and budget (practice).	6
- Farm records and account. (practice)	6
- Crop, Livestock and Fishery Technology.	3
- Discussion.	2

Annex 3

FARM PLANNING AND BUDGETING-MALAYSIA

FARM BUSINESS PLAN FORMAT

1. OBJECTIVE

- i. To provide an opportunity for an entrepreneur to objectively and critically view and evaluate farming as a business entity.
- ii. To study and evaluate the viability of a farm business.
- iii. As a tool for farm business financing.
- iv. As a tool / guide for daily farm business management.
- v. As a means for optimal allocation of farm business resource.

2. PROJECT BACKGROUND

- i. Project location
- ii. Agro-climatic parameters
 - a. Rainfall data / pattern
 - b. Weather conditions
 - c. Crop suitability zone

- iii. Soil Suitability
 - a. Topography of land
 - b. Soil properties (type, texture, fertility status, pH, water source)
- iv. Current Status of Farm
 - a. Farm size
 - b. Land ownership
 - c. Present land use
 - d. Cropping systems
 - e. Cultivation practices
 - f. Labour availability
 - g. Farm mechanization
 - h. Level of technology
 - i. Water source
 - j. Prices
 - k. Capital asset
 - l. Livestock / aquaculture
 - m. Off-farm activities
 - n. Non-farm activities
 - o. Roads and transport services
- v. Background of Project Participant(s)
 - a. Demography
 - b. Occupation
 - c. Income status (farm and non-farm)
 - d. Farm family
 - e. Social obligations / restrictions
 - f. Level of technology, skills and farm knowledge

3. PROJECT PROPOSAL

Based on technical analysis, determine the type of project:

- i. Crop-based project
- ii. Livestock / aquaculture-based project
- iii. Farm product / services
- iv. Farming systems

Basis for enterprise(s) selection:

- i. Market demand
- ii. Soil suitability
- iii. Agro climatic suitability
- iv. Gross margin analysis for enterprise ranking
- v. Farmers' experience

4. CROP- ROTATION AND PLANTING SCHEDULE

Scheduling based on the following factors: -

- i. Market demand
- ii. Price trends
- iii. Weather
- iv. Soil suitability

- v. Labour availability
- vi. Availability of farm machineries / farm infrastructure
- vii. Pests and diseases management

5. SCHEDULE OF ON FARM ACTIVITIES

Schedule of farm activities by calendar dates:

- i. Land preparation
 - ii. Farm infrastructure development (farm roads, fencing, irrigation etc)
 - iii. Nursery preparation / management
 - iv. Sowing / planting
 - v. Transplanting
 - vi. Fertilizer programme
 - vii. Pests and diseases management
 - viii. Pruning
-
- ix. Weed control
 - x. Harvesting
 - xi. Marketing

6. PRODUCTION SCHEDULE

The objective of the schedule is to ensure a continuous production to facilitate marketing of farm produce and cashflow management.

Prepare daily, weekly or monthly schedule depending on enterprise type.

7. FARM INFRASTRUCTURE DEVELOPMENT AND MACHINERY/EQUIPMENT REQUIREMENT

- i. Types of infrastructure and machinery / equipment required:
 - a. Drainage
 - b. Farm roads
 - c. Fencing
 - d. Bridges
 - e. Irrigation system
 - f. Farm machineries / farm tools
- ii. Estimate Cost of infrastructure development and machineries / equipments.
- iii. Prepare schedule of infrastructure development.

8. FINANCIAL ANALYSIS

- i. Prepare and analyze:
 - a. Individual crop budget / cashflow for each crop rotation of each crop
 - b. Crop budget / cashflow for each crop (cumulative all rotations)

- c. Budget / cashflow for whole project (whole farm analysis of all crops/enterprises)
- ii. Components of Budget / Cashflow for Financial Analysis
 - a. Cash Inflow
 - Crop / enterprise yield
 - Sales price
 - Gross income
 - b. Cash Outflow
 - Cost of Development
 - Cost of Material Input
 - Cost of Labour
 - Other Costs
 - c. Financial Indicators
 - Net Income
 - Cumulative net income
 - Net Income per month
 - Net Income per month / participant
 - Gross margin
 - Cost of production per unit output
 - Cost of production per unit land area
 - Return to investment
 - Internal Rate of Return (IRR) – where applicable
 - Net Present Value (NPV) – where applicable
 - Benefit Cost Ratio (B/C Ratio) – where applicable
 - Payback Period

9. ANALYSIS OF LABOUR REQUIREMENT

Prepare schedule of seasonal labour requirement based on project schedule.

10. MARKETING PLAN

- i. Marketing strategy
- ii. Marketing channels
- iii. Added value (product quality, packaging and grading)

11. PROJECT MANAGEMENT

- i. Project Organization
- ii. Organization Chart
- iii. Daily Farm Activity Roster
- iv. Administration

Annex 4

Illustration on how Farm Management Principles are Useful to the Farms

The farm management extension worker can play a strategic role in solving an identified problem, we assume the following problem: **Problem:** Determining the most profitable level of fertilizer use. **Antecedent to the problem:** Introduction of high yielding, short duration crop varieties of wheat, paddy, maize etc. which demand higher levels of fertilization associated with other inputs like irrigation water, weedicides and insecticides than the indigenous varieties, has created the problem of optimum use of the scarce quantities of available fertilizer. In other words, farmers seek the understanding of using such doses of fertilizers on high-yielding and indigenous crops which would give them maximum possible profit under the prevailing crop output and fertilizer prices. **Data and research techniques:** The data used to provide a solution to the above problem were obtained from the fertilizer experiments conducted at the Uttar Pradesh Agricultural University, Pantnagar, Distt. Nainital, India on Mexican dwarf and Indian tall wheat for three years. Six different doses of nitrogen varying from 0 to 200kg. per hectare each at 40kg. interval were applied in different plots of the same fertility level and phosphorus was held constant at all the six levels at the rate of 50kg. per hectare. Five irrigations were given at an interval of 20-25 days. Production function approach was used to analyze the data. The results are summarized in Table 1.

Table 1. Yield and net profit per hectare at most profitable levels on Nitrogen application and at varying prices of wheat taking price of Nitrogen fixed at Rs. 2.65 per kg.

Variety	Level of Nitrogen application (Kg.)		Yield (Kg.)	Total Revenue*(Rs.)	Total cost (Rs.)	Total Net profit* (Rs.)
	Giving maximum physical production	Giving maximum profit				
Wheat @ Rs. 76 per quintal						
Sonora 63	100	98.58	4104.48	1517.24	261.24	1256.00
Sonora 64	140	126.61	5395.54	2528.77	335.52	2193.25
Lerma Rojo	120	110.69	5128.04	2435.51	293.33	2142.18
Wheat @ Rs. 62 per quintal						
Sonora 63	100	96.27	4095.51	1232.18	255.12	977.06
Sonora 64	140	124.41	5386.98	2057.64	329.69	1727.95
Lerma Rojo	120	108.97	5121.35	1982.71	288.77	1693.94
Wheat @ Rs. 81 per quintal						
C 306	100	79.09	3315.92	766.84	209.59	557.25
NP 876	80	73.90	2944.14	1080.45	195.84	884.61
NP 887	80	63.00	2591.03	745.54	166.95	578.59
Wheat @ Rs. 73 per quintal						
C 306	100	77.46	3310.29	686.99	205.27	481.72
NP 876	80	73.00	2941.29	971.47	193.45	778.02
NP 887	80	62.00	2587.58	669.39	164.30	505.09

*Total revenue, total cost and net profit per hectare incident to application of Nitrogen, that is, due to Nitrogen application above zero Nitrogen level

Source: Singh I.J., (1971)ⁱ

Solution to the Problem: It is common knowledge that the level of resource use including fertilizer application differ for the Mexican dwarf and Indian tall varieties of wheat. But how much fertilizer one should apply to get maximum possible profit under fluctuating price levels for wheat and fertilizer is neither known nor can easily be worked out without an understanding of the application of economic principles and logic in farm management extension. Also, as may be seen from Table 1, the level of Nitrogen application which gives maximum physical production does not necessarily give maximum profit. This distinction is important to make best use of the limited quantity of fertilizers in a country, region or farm, and suggests that to get maximum profit, it is economic efficiency and not the technical efficiency, which should be focussed. Further, such a distinction can be detected only by one who knows the maximum and minimum conditions of profit maximization and advocates profit optima rather than technical optima and is acquainted with the application of the logic of mathematics in farm management extension.

By analyzing the basic data on the nitrogen wheat experiment and presenting it in understandable form (Table 1.), the farm management extension worker, thus, presents various alternatives before the farmer who can make choice regarding the optimum nitrogen use under a particular price level for nitrogen and wheat.

2.2 Identifying and measuring the management factor

The objective in identifying and measuring the management factor is to facilitate optimizing resource combinations. Knowing the level of managerial ability of farmer would be useful in a number of ways. It would be helpful to the individual farmer

himself as an indicator of probable success with various types of farms and to the commercial banks advancing agricultural credit. Extension workers could use the information in advising the farmers.

Illustration

To identify and manage the management factor, seventeen farmers were purposively selected, each having farm size of 15 acres. Crops grown were almost similar. Livestock enterprises were excluded from the analysis. Selection of farms of uniform size, having similar production conditions and growing nearly the same crops, facilitated comparison of managerial ability of the individual farmers. The economic criteria used in identifying and measuring the managerial ability of the farmer were (1) Net farm income, (2) Productive man-work units, (3) Machinery investment, (4) Fertilizer investment, (5) Crop-yield index, (6) Returns per rupee invested and (7) Expenditure on irrigation.

In Table 2. the farm business of two farmers having the lowest and highest net farm incomes are compared with income of all other farmers in the group. The net farm income on Farm A was only about Rs. 4520.00 while it was respectively Rs. 6135 and Rs. 5358 for Farm B and the group. It is true that part of this difference can be explained by factors such as the amount of investment, age of the farmers, good or bad agricultural year etc. But after allowance has been made for these unique circumstances, a great variation in income still exists which can only be explained by difference in managerial ability. For example farmer 'A' invested less capital which resulted in less return per rupee invested as compared to farmer 'B' as well as the group. Similarly, the cropping intensity and the investment on machinery was low on his farm, resulting in low employment of human as well as bullock power (Table 2.). This is a clear indication of poor managerial ability.

Table 2. Comparison of Measures of Management Efficiency of Farms A and B with the Average of the group

Measures of Management Efficiency	Farm A	Farm B	Average for similar group
Gross income per farm (Rs.)	10,677.00	13,804.00	11,904.61
Total cost per farm (Rs.)	6,156.88	7,688.62	6,545.98
Net farm income (Rs.)	4,520.12	6,135.38	5,358.63
Working capital (Rs.)	4,790.54	6,157.32	5,446.13
Returns per rupee invested (Rs.)	1.73	1.80	1.83
Cropping intensity (%)	161.50	179.82	169.76
Crop yield index (%)	103.95	111.48	100.00
Productive man-work units (Man-days)	728.05	1050.70	927.64
Bullock labor units (Bullock days)	231	294	251.32
Expenditure on manures and fertilizers (Rs.)	1,038.90	805.32	533.10
Expenditure on irrigation (Rs.)	Nil	72.00	53.85
Machinery investment (Rs.)	65.00	88.00	66.32

Source: Singh I.J., and Chowdhury T.K. (1968)ⁱⁱ

Another important measure of management is expenditure on manures and fertilizers. Expenditure on this item is highest on Farm A, as compared to Farm B and of the group. After the application of fertilizers a crop requires irrigation of water immediately. But Farm A invested on fertilizers without having provision for irrigation facilities on the farm. This again reflects poor management on this farm. Application of more manures and fertilizers on Farm A gave a slightly higher (about 4 per cent) crop yield index than the group, but the net income was lowest on this farm as compared to Farm B as well as the group. This indicates that about 12 to 30 per cent variation in gross farm income is explained by the management input (Table 2.). This illustration demonstrates and identifies management as one of the most important factors of production in commercial agriculture and efficient use of farm resources is highly correlated with superior management ability. These farm management concepts and tools are, however, used on a very limited scale by the agricultural extension workers to help farmers in their decision making in India. Nevertheless, this amply demonstrates the needs of farmers for farm management advice in general and more specifically for farm business advice in the present day commercially oriented agriculture.

ⁱ Singh I.J., (1971), *Identification of Problems in Farm Management Research, Modern Agriculture*, Vol.2, No. 11-12.

ⁱⁱ Singh I.J., and Chowdhury T.K., (1968). *Significance of Management Factor in commercial Agriculture, Agricultural Situation in India*, Vol. 23, No. 1.