FARM MANAGEMENT EDUCATIONAL PROGRAM IN THE U.S.
AND THAILAND

By

Prayong Saiprasert

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By

Irayong Saiprasert

Michigan State University

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Frayong Saiprasert
Part I

1. Characteristics of U.S. Agriculture

Changing technology in agriculture

In the early agricultural period in the United States, land and labor represented about 85 percent of all resources used. Farms tended to be small, farmers had limited skill and experience in managing their farms. Each farmer produced food for himself and his family. Capital inputs represented about 15 percent of the total. About 5 decades ago a big change began in U.S. agriculture.

The most important events that influenced U.S. agriculture were as follows:

1) A Bill creating the U.S. Department of Agriculture
2) The Morrill or Land-Grant College Act
3) The Homestead Act

The combined programs in research and education of the USDA and the Land-Grant College resulted in discoveries of improved varieties of seeds and livestock, hybrid seed, fertilizer, new machinery, chemical for diseases, weed and insect control. The educational program provided modern agricultural information to farmers through extension workers. With changes in technology U.S. agriculture has grown more efficient, farms are more highly capitalized, mechanized and productive. Large quantities of capital are required to substitute for land and labor. One farmer can produce enough food to feed himself and

1. United States Department of Agriculture Centennial Year Washington, D.C. 1961 p.52
in 1966 thirty nine and a half persons. Changing technology in agriculture has affected size of farms, number of farms, capital requirements and management.

1) **Size of farm.** Capitalization and mechanization are introduced to agriculture as a substitute for land and labor. Here land is needed in order to utilize machinery with the highest efficiency. For example size of farms in Michigan is expected to increase somewhat faster than it has in the past - increasing from 142 acres in 1964 to about 220 acres by 1980. The average size of farm in the nation will have a tendency to more than double. (2)

2) **Number of farms.** As farms become larger the number of farms will decrease. Earl C. Heady indicated that the number of farms could be projected to decline from the present 3.2 million for the nation to 1.5 million by 1980. Accompanying farm employment could be expected to decline from 6 million persons to 3.5 million persons and still produce surplus quantities of farm products. Decreasing the number of farms is forcing surplus labor out of agriculture.

3) **Capital requirement.** One of the most important changes in U.S. agriculture has been the shift toward greater use of capital relative to land and labor. Increased capital came mainly from mechanical power equipment, fuel, fertilizer and insecticides. Many farmers will find it profitable to adopt the new inputs that result from future technological

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research and innovation. As Earl C. Heady indicated, in 20 years or less capital will represent 90 percent of all inputs used in farming and labor no more than 10 percent. The importance of the land and labor inputs will decline while the use of purchased capital per farm, per worker and per acre increases.

4) Management. As farms become larger and become more specialize and commercialize, management will become an increasingly important input. Successful farm operations will call for efficient farm managers operating on a large scale. There will be a substantial increase in the need for managerial services. Managers who are first to innovate receive a high payoff for innovations that are successful. Managers of larger farms undoubtedly will seek help and cooperate with personnel from agricultural colleges, farm machinery manufacturers and fertilizer and chemical companies.

5) Changes in Ownership and control. There will be decreased emphasis on full farm ownership. Farm managers will find that their best alternative may be to rent the land and to allocate most of their capital to the purchase of machinery and current inputs. There may also be an increase in farmers leasing of equipment and other capital items.

Needs for Management

Farming is an uncertain enterprise and dynamic. There are some tendencies for farm business to become more like

4. Ibid. p.20
non farm businesses. As land becomes less important, farms become more specialized, more of farm inputs are utilized and technological changes are more readily adopted. Change makes improved management necessary. Farmers must face the problem of when to adopt new ideas. The highly successful farmer today may become the break even farmer of tomorrow and will be obsolete the day after tomorrow if his techniques of production and management remain static. Managers of farms today and the future will need a high level of intelligence and training in managerial skills.

Successful farm management requires the ability not only to make decisions, but to make the right decisions.
II. What farm management is trying to teach

Individual decision-making is a highly complex and personal process. There are tools or aids available to the farmer that can improve decision making. Economic principles are helpful in telling farmers what types of information they need to collect and study.

Tools of farm management.

1) Farm records. There are two major types of records electronic, and regular book-keeping systems. A farm record is one of the most important tools. It provides a useful source of information about the farm business. Farm records may be used for several purposes such as to show profits made in the farm business, to discover weak points in farming operation and places to make improvements, to measure financial progress from year to year, and to provide information needed to secure credit and property insurance. It is necessary for farmer to keep more complete and accurate farm records, and to analyze and use this information in making decisions. It is impossible for a farmer to make a careful analysis of his farm business without complete and accurate farm records.

2) Farm budgeting. A farm budget is another important tool in determining (which enterprise is the best combination.) Using the farm budget method, farmer will need
to know about yield and production for the commodities produced. Each budget should be prepared using a different combination of enterprises. Each budget will show the net income expected from a particular combination. The plan which provides the highest net income should be selected. However, the plan should be flexible, for conditions may arise during the year that would make it necessary to adjust it.

Principles Utilized in Farm Management

Economic principles are also an important tools in farm management. There are many principles in economics which can be applied in agriculture as follows:

1) **Principle of Diminishing Return**  Diminishing return is one of the most important economic principles which can be applied in farming. This principle can be used and provided information that is useful in decision-making.

Diminishing returns may be defined as follows:

When a variable input is added to fixed inputs, a point will be reached where an additional unit of the variable input will add less to total production than the previous unit added. (5) After a farmer selects his enterprises he must decide how much of each to produce. In any production process, there is a best rate of operation. How much fertilizer should be added to an acre of corn? How much feed should a dairy cow receive? It is sometimes difficult to apply the principle of diminishing returns to the farm business.

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5. Dorries & Hamilton, Economics for Modern Agriculture
2) **Fixed and variable costs.** Fixed and variable costs are also important from the standpoint of decision making. At any stage in the production process, if additional inputs will result in returns greater than the variable costs associated with those inputs they should be applied. (6) If an action will result in unable to cover variable costs, then we don't need to take this step.

3) **Substitution principles.** Another economic principle that has application to many problems in agriculture is the principle of substitution. This principle will provide the farmer with a basis for determining the least cost method of production. In the production of agricultural commodities it is possible to substitute one factor of production for another. The principle states that if the quantity of output is constant, it is economical to substitute one factor of production for another factor of production if the cost of the first is less than the second. (7)

4) **The principle of enterprise combination** is concerned with the selection of enterprises for individual farms. In most areas more than one enterprise can be carried on. In selecting an enterprise for a farm, it is helpful to give attention to supplementary and complementary enterprises. Supplementary enterprises are those that make use of resources (land, labor, capital) when not needed for another enterprise. This is necessary to prevent conflicts and to keep the resources in use as much of the time as possible for example broilers.

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6. Castle and Bookor *Farm Business Management*

7. Ibid. p.69
would supplement a crop in the use of land. Complementary enterprises are those that are interdependent or have a direct effect on one another. Cattle and crops tend to complement each other.

5) **Specialization or diversification.** Each farmer wants the highest profit combination on his farm. He must usually choose between combinations of enterprise rather than just single enterprises.

There are advantages in a diversified farming program. Risk of crop failure and price changes is lessened, because it is spread over several enterprises. A diversified farmer is able to keep his labor and equipment in use during a larger part of the year.

In general farmer tend to be specialization. Specialization also has an advantage in increase efficiency in farming, and decrease cost of production.

6) **Equi-marginal returns** When capital is limited the farmer will not try to equate marginal cost to marginal revenue. This principle states that the last dollar spent on an enterprise or a fixed factor will yield a marginal return exactly equal to the last dollar earned from all other enterprises or other fixed factors. For example if $100 spent buying protein feed will return more than $100 spent on fertilizer, additional protein feed should be purchased until the last dollar spent on feed will return exactly the same as the last dollar spent on fertilizer. If the farmer is not limited
7) Opportunity costs. In equi-marginal returns lies the idea of opportunity cost. Opportunity cost is used to describe the value of the product that was not produced because resources were used for a different purpose. Almost every decision on a farm involves an opportunity cost. Every decision should be based on what will give the largest net income from the entire farm.

In operating a farm, the operator should be a good business man. Successful farming calls for keeping a close watch on business trends. Farm operators have to watch changes in the business cycle in order to sell their product at the best advantage. A farm operator should understand certain principles of economics which can be applied in farming, as well as a basic understanding of how to plant, how to use soil and how to raise an animal. A farm operator must be able to understand and be able to apply new techniques to his production. As mechanization continues to increase, it is very necessary for farm operators to understand and be able to operate equipment in the proper manner.

8. Ibid. p. 56
9. Ibid. p. 57
III. Methods of Teaching

The growth of modern farming has required more capital and more training in agriculture, especially college training. Farming now has become so technical and specialized that a college education is recognized as almost essential, especially in certain types of farming. While formal education is not a guarantee of success in farming, it will improve the chances for most people. Farmers with college training have a broader point of view and can adopt new ideas faster than non-college trained men.

There are several methods used in teaching U.S. farmers as follows:

1) Intensive farm management.

Many efforts have been made with individual farmers and small groups of farmers to teach them about simple economic principles which can be applied to the farm business—farm records, farm plan and farm problems. Close contacts along with small group meetings provide the useful information to the farmers. Home visitations by district farm management agents are also important.

2) Extensive farm management. Not only an intensive farm management techniques an important way of increasing farmers knowledge, but also extensive farm management techniques are also important. It is impossible for district farm management agents or any other farm management specialists to reach all
of the individual farmers, in order to increase the farmer's knowledge and encourage farmers to use good decision-taking principles. Examples of extensive techniques are farm management schools, farm management short courses, farm management tours, Farmers' week activities, general meetings with large audiences, radio presentations and publications. The over-all goal is to teach farmers basic management principles.

3) **Teaching by specialist staff.**

Specialists are already trained in a specific area. They also understand the general subject matter involved. They devote a considerable amount of time to work with farm business data and other information that can be adapted to use as an example in teaching. The sessions of teaching would be during seasons of little or no farm work. There are some problems involved with specialists doing all the teaching. A major fact is that they are too far removed from the individual farms and counties to assist with follow-up information on questions raised by workshop participants. Specialist staff have not enough time to get around to all the counties that would like to hold these meetings. However, many states are using the county staff for county workshops on farm management and feel they are quite successful. (10)

4) **Teaching by County Workers**

County workers are trained to the extent they are capable of teaching farm management to farmers. There are many advantages to this type of teaching. They are personally

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acquainted with many of farmers that would attend these workshops and know the types of farming for that area. Also they are aware of many of the problems on individual farms. Being located in the county they are in position to follow-up workshop meetings by visiting with the farmers and assisting them individually in implementing adjustments. Under this type of teaching the specialist's primary role is training the county worker and preparing program materials, visual aids, and other techniques of teaching to be used by the county workers.

5) Multi-County Workshops

In this approach in teaching farm management principles to county workers and farmers, counties are organized geographically in groups of three or four. Agents invite 3 to 10 families to attend the sessions, which are held at some central location. The specialist staff does all the teaching with their primary objective training county workers. There are several advantages to this. The major one is that including three or four counties in one sessions covers the state much sooner. At the same time the agents are receiving their training while key farmers are being taught the program material. This gives them an opportunity to see the program material demonstrated in teaching sessions, the type of questions that are raised, etc.

The next year the agents that receive this training join together and organize a workshop for other farmers on the same multi-county basis with the agent doing the majority of the teaching. Specialists are available if requested on one
or two of the more technical sessions. (11)

6) Record Project. Farm records is one of the most important tools in farm management. In Michigan in 1968 there are 1,484 farmers involved in the telfarm project. Farmers have to submit their information monthly about the farm business to the state office. States office will compute this information by computer and provide management information on reports sent directly to the farmers. An average fee for this project is about $106 per farm. Record projects not only work with individual farmers on overall management problems but also with specialized groups such as Dairy Herd Improvement Associations, etc.

11. Ibid. pp. 131-132
Part II

1. Characteristics of Thai Agriculture

Importance of Agriculture

The Kingdom of Thailand, with an area of 5.4 million hectares, extends some 1,900 kilometers from north to south and in width varies from only 15 kilometers in the peninsula to 800 kilometers through central Thailand. The heart of the kingdom is the central plain. In addition to the central plain, the kingdom consists of three other regions. These are the northeast, southern peninsula, and northern region. The northeast is a low, broad, flat to rolling plateau where conditions are favorable for cattle raising and growing of many upland crops. Conditions in the peninsula are favorable for rubber and coconut production. The northern area is dissected by mountains and valleys and has diverse agriculture.

Thailand for the most part has a tropical climate with definite wet and dry seasons. Annual rainfall averages 40-60 inches, except along the western slopes of the peninsula where it may average 165-200 inches annually.

The Thai economy is basically agricultural. Rice is the major crop, providing 75-80 percent of the total caloric intake in the diet and accounting for one-third of the value of all exports. There are about 30 million people in Thailand.

13. Ibid., p. 12
The population concerned with agriculture is about 75 percent. Approximately 90 percent of the exports come from agricultural products. It is evident that the Thai economy is basically agricultural. Farmers are considered the backbone of the country.

Due to the fact that rice is the basic food of Thai people, most of the lowland, which can hold sufficient water, is planted to rice. Consequently, it is often difficult to induce the farmers to grow other crops, unless there is a ready market for them. This is the main reason why Thai farmers who own an average of about 10 acres, grow rice in all kinds of soils. Rice is the most important crop as compared with others. Rice occupies the largest area of cultivated land, produces the highest total value among all agricultural crops, provides the best employment opportunity for the majority of the people, supplies more than enough staple food for the Kingdom, earns the top amount of foreign exchange, and yields the most stable revenue to the government. Rice takes up about 46 percent of the total value of exports, rubber 26 percent, upland crops 7 percent, forest products 3 percent, animal products 3 percent and fishery products 1 percent.

Agricultural land holding. In general size of farms are small, there are also a few big farms, but the percentage is small when compared with small farms. The amount of land holdings per farm is about 10 acres broken up into many plots. Approximately 87 percent of the farmers are land owners.

Standard of living of farmers. The level of living of Thai farmers is very low. Annual income from farm sources is about $200 and off farm income about $80 per family. Farm income alone is insufficient to sustain the farm family. It is necessary for them to seek additional income from off farm to cover their expenditures.

Why is income of Thai farmer low? The income of Thai farmer is low due to two major important factors:

1) Low productivity
2) Low prices

Low productivity in production is due to farmers use of primitive tools and methods in farming. Farming depends upon climatic condition. They don't know how to use fertilizer insecticide select improved varieties of seed and livestock, the mono cropping system, and small size of farms.

Advising these farmers to change from traditional methods of farming to modern farming is a difficult task. In general farmers have a low educational background and some adult farmers are illiterate. Illiteracy holds them to continuing traditional methods of farming. The introduction of any desirable changes in farming system and practice would require the up-grading of the managerial abilities of these farmers.

Under employment. In general, farmers will operate their farm only in the growing season, which is the rainy season. Agricultural statistic indicated that farmer work only 100 days (16) in one year. Not only is there under employment in

16. Ibid, p.14
farming but also the utilization of labor in their farm is inefficient. For instance each farm hold only 10 acres but they have to use 3 or 4 men to operate their farm.

As I mentioned previously, agriculture plays an important role for Thailand's economy, providing employment to 75 percent of the nation's population. About one third of the Gross Domestic Product originates in the agricultural sector, consisting of agricultural crops, livestocks, fishery, forestry. The major exports of Thailand still remain the primary products, rice, rubber, tobacco, maiz, kenaf, cassava, oil seeds and upland crops which account for 90 percent of total foreign exchange earnings. Thailand's overall economic progress depends primarily on developing the agricultural sector in order to lay a sound basis for further development of the other sectors of the economy. The government has put major emphasis upon agricultural development in order to increase per capita income of people up to a certain level, and in turn to raise the standard of living of the people in rural areas. The primary objectives of agricultural development are to increase productivity, to diversify and balance agricultural production, and to develop the remote rural areas. Agricultural development depends upon the active initiative of the farmers and their ability to make production decisions. There are many types of programs for developing agriculture. Government activities include irrigation, forestry, research and experimentation in new agricultural techniques, through improved crops and more extensive
breeding of animals. As farms are changing from subsistence farms to commercial operations farmers are being faced with greater uncertainty and risk in agriculture. Farm management becomes more important.

Farm management has been considered one of the most important projects in agricultural development. The government through the Division of Agricultural Economics, Ministry of Agriculture has established a Pilot Farm Management Project at Ira-Buddha Fort Land Settlement Saraburi one hundred miles north of Bangkok in the year 1960. There were 100 farmers cooperating in this project. The result of this program was very satisfactorily. The farmers who worked under this project obtained more income than before. The success of the Pilot Farm Management Project in Saraburi Province encouraged the government to expand Farm Management Projects into 9 selected province in the North Eastern Part of Thailand in the year 1963. More fund have been appropriated for this project.

In each selected province there have been more pilot areas selected. In each area the farmers representing identical situations can be grouped. In each particular area there were 50 farmers selected by voluntary basis. The management team consisted of a crop specialist, plant pathologist, animal husbandryman, and farm management worker. They were sent to each particular area to work closely with the group of farmers in the area.
Before a farm management project could be started in an area, a team had to communicate with the key persons such as the head of the village and school teacher in the area concerned. A meeting among farmers who are interested in the farm management project was also necessary, in order to describe the objectives of the project, how the farm management project will operate, and how it will benefit the farmers. Success of the project depends on cooperation between the team and the farmers.
II. What farm management is trying to teach.

The primary objective of farm management is to increase farmer's income by reducing per unit costs of production. This depends on five methods as follows:

1) Try to convince farmers that new techniques in farming are better than the old ones and urge them to use new methods for their own benefit.

2) Advise farmers on the use of their own natural resources to the best advantage.

3) Help farmers to plan their works in farming.

4) Teach modern methods of agricultural production to farmers.

From these objectives one can see quite clearly that this project is different from other project work in farming which have been carried out. Previously we only wanted to know the problems in farming and try to find out the reason why the farmers had a very low standard of living, only net annual income $200 per household. (17) Now, we not only tackle the problem of farmers low standard of living, but also send a team of well-trained personnel in various fields of agriculture to help individual farmers to raise their income.

Plan of work

Farm management is to be carried out in two steps.

Firstly, it is necessary to make a survey of an area concerned to find out the facts concerning farmers' income.

Secondly, a team of well-trained personnel can be sent to the area concerned in order to help individual farmers. The team consists of:

1) A crop specialist who will advise farmers as to use of new improved varieties of plants, preparation of soil for planting, and arrange an experimental plantation as an example for farmers.

2) A plant-pathologist and entomologist who will demonstrate to farmers how to protect plants and cure them from disease and will show farmers in curing plants by using fungicide and insecticide.

3) An animal husbandryman who will advise farmers on raising farm animals such as chickens and pigs. He will demonstrate how to build and maintain facilities and how to feed the livestock as well as how to prevent disease.

4) A farm management man who lays down the scheme for farming, makes budgets including debts and loans. He also forms and audits accounts of the farms.

5) The head of the team who is an agricultural economist. He will control, organize, urge and co-ordinate the personnel in the team. He is the one who help the farmers in deciding how to manage the farm.

The farm management team shows that the principle in solving the problem of farm management is to put together various branches of agricultural knowledge into the team so
that all problems in farming can be tackled successfully by the team. In other words, the farm management plan is an experiment of improving farmers' income by the co-ordination of personnel in various fields of agriculture.

Stages of the farm management project.

1) A farm inventory for each individual farmer who is concerned with the project is taken at the beginning of the crop year, including the amount of farm labor, size of farm, amount of animal raise, agricultural tools, cash on hand etc. in order to know the background of the individual farm operation.

2) A farm record book is distributed to selected farmers along with information on how to record the data. "The primary reason for keeping farm records is to provide financial and physical information about the farm business. Records can supply information helpful in decision-making."(18)

3) The farm record is checked by the team throughout the crop year. Individual farmers are checked once a week, to obtain the complete data.

4) The team works with individual farmers to plan and budget their farm, what kind of crops to be grown, how many acres to be plant what kind of livestock to be raised, how many livestock to be raised, helping the individual farmer in judging what would be the best combination of enterprise.

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5) The team advises the individual farmer in modern farming practices such as crop rotation, to maintain and improve soil fertility use of improved seed, fertilizer, insecticides and herbicides etc. which will provide them the higher yield than the traditional farming practices.

6) The team arranges for short-term and intermediate term credit to individual farmer who have inadequate credit for production purposes, such as buying improved seed and livestock, fertilizer, insecticides, herbicides, and agricultural tools.

7) The team instructs the farmers who have a good educational background to understand basic economic principles such as law of diminishing returns, substitution principles, fixed and variable costs etc. Agricultural economist in the team who has a responsibility should explain these principles in the simplest way by avoiding complicate explanation as much as possible.
III. Methods of Teaching

Agriculture is considered the most important sector for the Thai economy. Increasing productivity in farming is necessary by means of using improved seed and livestock, fertilizer, crop rotation, insecticide, fungicide, pest and insect control, farm planning and budgeting, labor utilization, appropriate management, and decision making, sufficient production credit.

Due to the fact that Thai farmers are illiterate, they are poor and difficult to educate. It is therefore a responsibility of the government to render assistance and to provide necessary basic services. The introduction of new technology in farming and introducing the results of agricultural research to farmers required adequate and qualified agricultural extension workers in various fields, a proper educational system equipped to perform their functions more efficiently.

Education plays an important role in motivating farmers to change. Education provides farmers with the tools and attitudes necessary for improved farm management. The results of research and experimentation can be brought to farmers by means of effective farm management teams. To gain the farmer's confidence in new ideas resulting from such research and experiments, demonstrations of their results are quite necessary. Farm management extension services based on adequate research and experimentation will promote better understanding of new
technique among the farmers. The farmers will change their attitudes and receive the new ideas only when they are convinced of their advantages. Farm management team must give attention to economic factors as well as technical factors. The farmers must have a better understanding of the relations between costs and returns, and the appropriate farm management practices to maximize their income from farming.

There are several methods in teaching farmers. Two general approaches are the following:

1) **Intensive farm management.** Many efforts have been made by farm management team by working closely with individual farmers. Home and farm visitation will be made with individual farmers once a week. A farm management team will advise individual farmer about farm problems, solution of farm problems, farm plans, farm records, technique in farming teaching them how to use improved variety of seeds, fertilizers, pest and insect control, crop rotation, how to manage their farm, operate proper combination of enterprise and other technique in agriculture. In order to encourage farmers to help themselves in utilizing improved techniques and services, farm management team can render effective agricultural services directly or indirectly by demonstrating the result of research and experimentation so that the demonstrated methods will be more practical and beneficial to the farmers. Meeting with small group of farmers are also necessary...
Movies and slides are also indispensable for farmers to get new ideas.

2) Extensive farm management. Meetings with large group of farmers in certain periods of the year are necessary. Teaching will be concerned with general principles in farm management, simple economic principles, new techniques in farming practices, simple methods in keeping farm record and so on. Farm management tours, radio presentations and farm management publication are also important.
IV. Problems and Solutions

1) Social Problem. There are various problems concerned in agricultural development. The most important problem that I want to point out is the social problem, the resistance to change and acceptance of new ideas. In general, farmers in Thailand are similar to farmers in other underdeveloped countries. They use primitive methods and tools in farming which they pass down from generation to generation. Any technological method in modern farming introduced to them has not been accepted. Spicer stated that "People Resist Change" people tend to resist rather than accept change. People resist changes that appear to threaten basic securities; they resist changes they do not understand. II It is particularly true, farmers do not want to change from traditional farming practices to modern farming practices. The best way is to direct changes and lead the farmers in accepting new ideas and new methods of farming. (The relative speed which a new idea is adopted depends partially upon the characteristics of new ideas.)

The key person or the head of village, in co-operation with farm management team are considerably important to convey new ideas and modern farming practices to farmers. Advantages of new ideas and modern farming must be demonstrated before the farmers begin to adopt them. Demonstration should be carried out by the key person if possible. New products such as improved seed, improved livestock, fertilizer, insecticide farm implements

by careful testing in particular village before being introduced to the farmers are necessary.

2) **Insufficient water supply.** The major proportion of farming in Thailand depends predominately on climatic conditions. Only a few areas can obtain water for irrigation. Most farmers grow their crops without knowing whether the yield will be good or not. In some areas where there are sources of water available, small engine pumps are provided for individual farmer. Another possibility for some areas which are not suitable for rice growing because of insufficient water supply would be change to another crop that requires less water than rice such as kenaf and several kinds of upland crop such as corn sorghum and beans. The demand of the market for these crops is still open.

3) **Agricultural Education.** These farmers have low educational background which leads them to resist change. Any modern farming practices introduced to them have not been accepted. Here time is needed to change the farmer, his attitudes of the individual farmer, educational background, values, abilities, group memberships, social status and other farm business characteristics. Some farmers may accept new ideas very rapidly, and some farmers may accept new ideas very slowly. Using different technique to reach different groups of farmer require different approacher. Formal education and agricultural education can play an important role in motivating
Farmers have to sell their products to these middlemen with low price. That is why Thai farmers who are considered the backbone of country are still very poor. Government provided credit through co-operative Farmer's association and through Division of Agricultural Economics by Farm Management Team, but inadequate supplies complicate the regulations. Some farmers do not want to borrow money to invest in their farms, because farming depend largely on climatic condition. They will lose their money because of uncertainty of weather. Some farmers are reluctant to borrow money. They try to get out of debt and stay out. Older persons tend to be associated with conservative attitudes, diminishing farm enterprise and an emphasis on security.

The government should provide agricultural credit to majority of farmers who needs it in adequate supply, at a low rate of interest and with suitable term of repayment.

5) The Supplies of Input. Improved seed, improved breed of livestock, fertilizer, insecticide, are in small supply and relatively high in price. Livestock and seed experiment stations in the country should produce more improved seed and livestock breeds that would fit to the environment of particular areas and put them up for sale to farmers at relatively low prices.

6) Agricultural Marketing. In most parts of the country transportation routes from farm to the market are very poor. It take times in bringing farm products to the market, and the
cost of transportation is very high. Each farmer has a small volume of farm product to sell. Farmers have to sell their products through the middlemen in the village. The middleman takes a large profit and the farmers receive low prices. Farm management team will advise farmers on what kind of crop and livestock to produce, how to prepare products for market, when to sell or buy. Improvement in marketing may encourage increased production. The effect may work directly by reduced marketing costs.

7) lack of knowledge in management. Thailand is not deficient in natural resources. Land resources are relatively plentiful and fertile. The scarcest resource is management and this is a resource which can be increased more easily than natural resources. An illustration among paddy farms with similar resources there is a wide range in efficiency. In Bangkhen village near Kasetsart University the yield of paddy on 14 farms averaged 383 kilograms per rai. On individual farm in this group yield ranged from a low of 236 kilograms to a high of 562. This variation occurred in a small area where natural conditions such as soil, irrigation water, weather etc., were quite similar. All other variable factors affecting yield can be altered by management. Increasing the efficiency of resource use among these farmers can be accomplished only by altering the management decisions made by the people who are operating these farms. Management and managerial

21. Ibid. p.34
* 2.5 rai = 1 Acre
ability are wasted. Farmers need more knowledge to help them make better decisions.

Three basic tangible factors which make a farm are land, labor, and capital. The supply of land, labor and capital are limited and scarce. Farming is greatly dependent upon climate and weather conditions. It requires personal interest and quick decisions by individual farmers. If the decisions are wrong, a farmer will waste all of his time and energy. The ability of taking wise decisions in utilizing available but limited farm resources for maximum profit is called management, the fourth basic factor of a farm. Farm management itself consists of the entire process of formulating and executing decisions in the organization and operation of farm business. Different from other three tangible factors, management is an intangible factor. It can be taught, improved and developed. Most farmers do not plan their farm operations due to the fact that most of them are illiterate. It leads them to misallocation of scarce resources then to low productivity in farming and then to low income and low level of living. The major point is the need for farm planning. Advising new agricultural technology requires farm planning. Agricultural economist in the farm management team should advise individual farmer and help them to prepare farm plans based on existing individual resources. The plan should be drawn up in advance. Having a plan, the farmer will know where to go and how to get there. A farm
production plan aims at maximizing the net farm returns. The plan will provide full details of land and other technical improvements to be adopted on the farm during the crop year. Preparation of new farm plan certain charges will have to be introduced particularly in the following:

1) Cropping patterns
2) Crop varieties and rotation systems
3) Intensity of cropping
4) Number and quality of livestock
5) Improvement of irrigation and drainage facilities
6) Adoption of technological innovations
7) Most profitable use of inputs
8) Farmer's ability in making decisions and executing the plan

To help farmer prepare production plan requires proper preparations. A large number of farm management people need in-service training on the techniques of farm planning and budgeting. Certain areas in the country have to be selected as pilot areas. In each pilot area the farmers representing identical situations can be grouped. The farm planning officer may help individual farmer prepare farm plan. The rest of farmers in the group can take guidance from this production plan and may adopt it or make some modifications to suit their requirements. The farmers themselves would learn how to prepare their farm plans. The main responsibilities of the farm management team are to make available the information on
technical coefficients, prices, wages, to point out the profitability of different alternatives for the farmer to make his own decisions. Experience shows that rapid increase in farm productivity is possible if certain measures such as improved seeds, fertilizers, insecticides, credit, irrigation and so forth can be provided at the same time.

3. **Insufficient funds and lack of well trained farm management officer.** The farm management project in North Eastern Part of Thailand has proven to be a successful tool in increasing farmer's income. This project is operating in a particular unit in certain provinces. It covers only a small portions of farmers in North Eastern part of Thailand. The major problems are insufficient funds and lack of well trained farm management officials. These officials may have university or vocational school educations. Some of them have limited experience in actual farming practices. The type of general suggestion by such officials are not specific enough to be used by farmers in the solution of their management problem of their individual farms. In rectifying this situation two steps are involved.

*First* Government should provide more funds for this project in order to expand in covering many areas throughout the country. Government should have exactly farm management project goal.

*Second* Sufficiently large numbers of farms management
team whose jobs concerned with farmers are needed. They should attend intensive training in many areas in agriculture farm management in certain periods not only in classroom but also have field training in the village in order to become acquainted with farmer. They should be willing to learn from farmer. Then by pooling the farmer's knowledge and the official's knowledge, both can work toward a solution of problems.

9) **Alternative method to reach the farmers.** Farm management introduced to Thailand about 10 years ago. The project was initiated by the Division of Agricultural Economics, Ministry of Agriculture. Farm management is considered one of the most important projects in increasing farmers' income. However, this project is operating in a particular area in certain provinces in North Eastern part of Thailand as a pilot project, due to inadequate funds and lack of well-trained farm management officers. The problems arise with an enlarged farm management project throughout the country as more funds and well-trained personnel are required. However, the government cannot afford this project to cover a major part of the country, because it is costly. There are other possibilities through which farm management projects can be carried out and reach farmers without large amount of funds. Farm management can work through co-operative societies and farmers associations. All of these societies and associations are located throughout the villages in Thailand. Rest of the government
officers are working closely with the farmers in the villages such as rice officers, agricultural officers, agricultural extension and community development workers.

There are many ways in training personnel for working in farm management. The training needs to be for four different groups of people.

1) Students in the college of agriculture. Students should be required to pass courses in farm management. Educating these students should spread the base of people in the country.

2) University students outside the college of agriculture whose work will require some knowledge of farm management. It is possible to be recruit and trained students who have educational backgrounds in agronomy, animal husbandry to become farm management specialists. Further schooling in farm management will be required for these students.

3) Government officers in the area of agriculture such as rice officers, agriculture officers, agricultural extension co-operative extension, community development worker whose work involves dealing with farmers in the village need to be trained in farm management, not only in class but also in field work.

4) Farm leaders or leaders of farmer's association short courses in simple farm management and farm management training centers are necessary. Lectures in farm management should avoid complicated explanations. The course should
emphasize practice rather than theory. Tour to visit many types of successful farms are also necessary in order to give farmers broader ideas.

I believe that government officers in the area of agriculture and farmer's leader whose work involved with the farmers are the most important persons to change farmers' attitude and begins to adopt new farming practices.
V. Comparison Between United States and Thailand

United States agriculture is different from Thailand. Agriculture in many respects, for instance, size of farms, method in farming, type in farming, capital investment on farm, educational background of farmer and so forth. Technological methods in farming of U.S. are much more advanced than Thailand Agriculture. Most technological methods in farming which have been successful in the U.S. might not necessarily be successful in Thailand because of differences in culture, environment and differences in many respects mentioned above. It takes a long time to introduce new methods in farming from Western country to Thailand.

By the same token most farms in Thailand are subsistence farmers. These farmers grow crops or raise livestock for home consumption and have very little for sale. Now farming is changing from subsistence farming to commercialized farming. Management is necessary in operating a farm in Thailand. Farm management was introduced to Thailand about 10 years ago. Tools in management for instances economic principle, farm record analysis and farm planning are considered to be new method for Thai farmer. Tools in management for U.S. farmer that can be adopted to Thailand are simple farm record. There are only a few transactions in farm record such as receipt, expense, labor use on farm and so forth. We try to avoid complicated transaction in order to fit to educational background of farmers. Farm
planning has been taught to individual farmers by means of farm management teams in co-operate with individual farmers, advising farmers how to prepare simple farm plans, for example, what types of crops and livestock farmers want to raise, how many acres of crops and how many livestock they want to raise, estimate the cost of production, estimate yield of crop and livestock and expected return. method in farm planning based on resource on individual farms.

Economic principle for example law of diminishing return, principle of comparative advantage, principle of opportunity cost, principle of substitution can be teach only to leading farmers who has good educational background.

Mail-in record. According to farmers has low level of education, mail-in record cannot by employed in Thailand. Probably it can be done in the next 20 or 30 years.

Linear Programming. Linear Programming is one of the most useful method of combining resources for the farm enterprise. Division of Agricultural Economics Ministry of Agriculture are now being initiated to use linear programming for analyze various combination of enterprises. There are many problems involved because of inadequate well trained personnel to handle this process, and inadequate machine. More funds should be provided to buy machine more well trained personnel are required for in-service training in order to handle this process. The result should be interpreted in the simplest way for the layman can understand.
Farmers, especially the more influential ones, can be selected to attend this tour and visit various types of farms, visit demonstration plots, in order to encourage them to adopt new practices in farming, accept new ideas and adapt new ideas and put into effective practices. After the tour, the farmers will return to their village, adopt new farming practices, new ideas to neighbors and other people in the village.
VI. Conclusion

Thailand is an agricultural country. Agriculture is considered the most significant source of national income. About 75 percent of the total population are farmers who are living in the village throughout the country. The standard of living of farmers is still very low. Farmers receive low income due to poor soil management, climatic conditions, using primitive tools, and methods in farming; one cropping system, small size of farms. Most of farmers do not know how to manage their farm with efficient procedure.

Changes from traditional farming practices to modern farming practices require agricultural credit both short term and intermediate term for productive purposes such as for buying fertilizer, improved seed and livestock breed, insecticides, tools and implements.

Increasing farmers' income requires an integrated scheme of farm management extension, agricultural credit, agricultural education, co-operative marketing, improved transportation, organization of supply services (fertilizer, insecticides, improved seeds etc.) New farming in Thailand is becoming commercialized. Farm management has been considered one of the most effective tools to guide the change in farmers' attitude towards technological improvements in their farms. Even though, changing farmer's attitude is a difficult task.
Many attempts have been made by farm management extension teams to direct the changes in the village by means of using "resource persons" such as the head of the village, school teacher, and demonstration of modern farming practices. Advising them how to use fertilizer, insecticide, improved seed and livestock improved farm tools and farm implements crop rotation how to keep livestock and poultry, how to record farm book-keeping, farm planning and budgeting, teaching them how to make a proper decision-making.

Past experiences in working in farm management in North Eastern part of Thailand has shown that the farmers are gradually accepting modern methods of farming. The income of the farmers who work closely with farm management team are gradually increasing as compared to others farmer. Farm management has been considered as one of the most important tool in increasing farmers' income in this area.
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