

THE AGRICULTURAL EXTENSION METHODS AND THEIR
APPLICABILITY TO THE UNDERDEVELOPED COUNTRIES:
WITH SPECIAL REFERENCE TO SOUTHEAST ASIA

by

SOMSALA JEERAPANDH

B.Sc. Kasetsart University, Thailand, 1956

A THESIS SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF SCIENCE IN AGRICULTURE

in the Department
of
Agricultural Economics

We accept this thesis as conforming to the
standard required from candidates for the
degree of ~~MASTER~~ OF SCIENCE IN AGRICULTURE

THE UNIVERSITY OF BRITISH COLUMBIA

February 1963

ABSTRACT

The thesis investigates the extent to which agricultural extension methods as used in the developed countries can be applied to the countries in Southeast Asia with particular reference to Thailand. The working hypothesis is that the peculiar conditions of agriculture in the underdeveloped countries restricts the total transfer of extension methods from the developed regions to the underdeveloped regions of the world.

The historical development of agricultural extension work in the developed countries of Europe and North America is traced, and the general theory and methods of agricultural extension are explored. Then the agricultural problems of Southeast Asia are studied, with a view to identifying the factors which will affect the agricultural extension work in that region.

It is concluded that the method of personal contact which is effectively used in the developed countries can be the main method for persuading farmers in Southeast Asia to accept improved techniques and training them to apply these methods efficiently. However, the personal contact method involves costly personnel, transportation and equipment. The meeting and demonstration methods tend to be effective also.

Mass methods of agricultural extension including radios, newsprint, magazines and circular letters would not be

effective, since few farmers can read and a still smaller number have radios. However, posters and farm exhibits are two types of mass media which would stimulate a great deal of interest on the part of the rural population.

Ideally, methods should be diversified. Meetings, demonstrations, discussions, films and slides can be used to complement each other. Their combination for best results varies with local conditions.

In Thailand, as in any other underdeveloped country, a complete agricultural extension program is required. This would necessitate a greater number of agricultural extension workers than the country now has and therefore a training program for extension personnel is in urgent demand.

The study also deals in some detail with the case of Thailand and conclusions are drawn for that country. To the extent that Thailand is representative of Southeast Asia, then conclusions can be generalized for the region.

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the Head of my Department or by his representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of Agricultural Economics

The University of British Columbia,
Vancouver 8, Canada.

Date 25th Feb. 1963

ACKNOWLEDGMENTS

I wish to thank Dr. W.J. Anderson, Dr. J.J. Richter of the Department of Agricultural Economics for their kind suggestions. I also wish to thank Dean B.A. Eagles and Dr. C. Verner, the members of the Committee.

The financial support from The Colombo Plan is gratefully appreciated.

TABLE OF CONTENTS

	Page
INTRODUCTION	1
AGRICULTURAL EXTENSION	2
The Meaning of Agricultural Extension	2
The Objectives of Agricultural Extension.	3
Agricultural Extension Methods.	5
The Theory of Communicating Information	7
Various Methods Used in Agricultural Extension. .	13
AGRICULTURAL EXTENSION IN EUROPE AND THE U.S.A.. . . .	17
In Europe	17
In the U.S.A.	19
AGRICULTURAL EXTENSION IN SOUTHEAST ASIA	23
Problems of Asia Agriculture.	23
Present Status of Agricultural Extension in Asia.	30
Principles and Methods of Agricultural Extension	
Which Could be Applied to Southeast Asia . .	38
THE APPLICATION OF AGRICULTURAL METHODS TO THAILAND	
AGRICULTURE	48
CONCLUSIONS.	57
BIBLIOGRAPHY	58

LIST OF TABLES

Table	Page
I Influence of the Various Methods of Presentation on the Attitude of the Farmers in the U.S.A., 1953.	8
II Comparison of Crop Yields Among Asia, Europe and the World Average for 1955.	25
III Rice Yield per Hectare 1958.	25
IV The Yields per Acre of Six Crops in the U.S.A. . .	26
V Ratio of Illiteracy of South and Southeast Asian Countries (Percentage).	28
VI Rural Youth Club Organizations and Membership in Selected Nine Countries, 1959	33
VII Number of Students in Technical Schools per Thousand of Population, 1953-56	34
VIII Agricultural College Graduates in Ten Countries 1950-59	35
IX Employment of Agricultural College Graduates in Selected Countries 1955-59.	36

LIST OF FIGURES

Figure		Page
I	Ratio of Famers to Field Extension Agricultur- ists in Selected Countries.	31
II	Headquarters, Provincial and Field Extension Staff in Selected Countries, 1959	32
III	Student Enrolment in Selected Countries, 1950-59	37

THE AGRICULTURAL EXTENSION METHODS AND THEIR
APPLICABILITY TO THE UNDERDEVELOPED COUNTRIES:
WITH SPECIAL REFERENCE TO SOUTHEAST ASIA

INTRODUCTION

The aim of this study is to investigate the extent to which agricultural extension methods, as practiced in the developed countries, can be applied to the under-developed countries and especially to the countries of Southeast Asia. In doing this the methods and applications of agricultural extension services in Europe and North America are explored. Then the agricultural problems in under-developed countries and the development of agricultural extension services are investigated. As a final step, this approach to the assessment of the transfer of agricultural extension techniques from the developed countries to the under-developed regions is based on the hypothesis that:

- A. There are important differences between the patterns of agriculture in these regions.
- B. These differences require the modification of agricultural extension of the developed countries before they can be applied in the under-developed countries.

AGRICULTURAL EXTENSION

The Meaning of Agricultural Extension

The Food and Agriculture Organization (FAO) of the United Nations (U.N.) defines agricultural extension as

An informal out-of-school educational service for training and influencing farmers (and their families) to adopt improved practices in crop and livestock production, management, conservation and marketing. Concern is not only with the teaching and securing adoption of a particular improved practice, but with changing the outlook of the farmer to the point where he will be receptive to, and on his own initiative continuously seek, means of improving his farm business and home.¹

In Southeast Asia, output could be increased with little or no additional capital expenditure by the use of new techniques which may be quite simple and would be adopted by many farmers if they knew about them.

Some simple farm techniques like the use of disease-resisting high-yielding strains, the control of breeding of domestic animals, the performance of simple veterinary tasks, bud-grafting and inexpensive conservation practices are some examples of methods which may result in increasing productivity. But in many cases, although these methods may give a good return to the farmers, it may not pay private organizations to develop the techniques to a practicable stage and sell the

1. Food and Agriculture Organization of U.N. The State of Food and Agriculture 1961, Rome, 1961, p. 114.

knowledge to the farmers. The costs of collecting fees are high where farming operations are on a small scale. Hence the major part of the work has to be provided by the state, largely without specific charges, and financed out of government revenues. Due to these facts, the agricultural extension in Southeast Asia could be defined as

A government effort to bridge the gap between agricultural research stations on one hand and the farming population on the other by establishing suitable teaching organizations at the various levels of administrations so that the results of research can be systematically extended to the farmers for wide application and so that their farm problems can be quickly brought back to the research station for study and solution.²

This definition, however, could not be valid in some countries like Denmark and Norway where the agricultural extension is sponsored through Farming Cooperative Organizations.

The Objectives of Agricultural Extension

In the United States of America (U.S.A.) the extension service is developed on a broad basis. It not only provides technical and economic advice to farmers but also attempts to broaden the farmer's interest in rural life and to raise his cultural level. It has been said that

....Whatever contributes to increased income, increased improvement and satisfaction of the rural family; whatever contributes to the growth and the development of the individual, his or

2. C.W. Chang, "Agricultural Extension in Asia", International Rice Commission, Newsletter, Vol. VII, No. 2, June, 1956, p. 12.

her personality, education or spiritual growth; whatever makes for good citizenship and love of country -- these things are proper matters for extension agents to carry to rural people....³

The variety and the all-embracing nature of these objectives seem to be different from the objectives of agricultural extension in Asia where the primary objective of extension is to secure increasing levels of production. Because of the low levels of production generally existing in Asia, the agricultural extension workers emphasize the adoption of improved farm techniques to the farmers.

In order for an agricultural extension service to make a real impact on the agricultural sector of the economy, so that the service becomes accepted at the "grass-roots" levels, certain conditions must be met. The International Rice commission discussed these requirements for the Asian case in the Newsletter referred to above as follows:

1. All agricultural research stations should be substantially strengthened and their research projects directed towards the pressing needs of the farmers, in the hope that they can generate a continuous flow of useful knowledge and skills to the extension workers for use in their work.

2. A department of extension service should be established in the government so that its views and needs can be heard and considered at the policy making level of the government, and so that extension education can be carried out adequately at the village level and on a nationwide basis.

3. There must be the kind of extension program that the local people can consider their own and in

3. Nuffield Foundation, Farming Advisory Service in North America, London, 1956, p. 50.

which they are willing to participate actively. At present, many countries in Asia have long range programs. The government will make the necessary provisions for extension supplies, but it is absolutely important that such programs be thoroughly discussed by the villagers themselves to the extent that they can understand it and are willing to support it.

4. Extension workers must be able to use as many different methods of extension teachings as possible to get their message to the people. The greater the number of contacts with a subject, the greater are the chances that workers will be able to put a recommended practice into general use.

5. Extension workers must be well trained and reasonably treated so they can stay on the job to ensure steady progress in extension projects.

6. Extension workers must be assisted by a team of 'subject matter specialists' who can keep them informed of recent research developments and assist them in their technical teaching of the farm people. In so doing they will discuss new problems and pass them on to the research people for investigation and solution. In this way they tie the research and extension functions together and make both of them more effective.⁴

Agricultural Extension Methods

Agricultural extension work requires many methods and teaching tools. People are influenced to make changes in behaviour in proportion to their contact with several different methods. An extension worker is a salesman of knowledge. He seeks to change the reactions of people to problems. These reactions may be classified as follows:

4. C.W. Chang, Op. cit. p. 13.

1. Changes in things known -- knowledge
2. Changes in things felt -- skills⁵

Methods which reach a large number of people are called mass media. Smaller numbers are reached by group activities. The personal contact methods are very important and effective but are naturally most expensive in time and energy.

Agricultural extension workers spread information by four principal means: demonstrations, exhibitions and other visual aids, the spoken word and the written word.

To be effective, information must:

- be accurate,
- reach farmers concerned,
- be understood by them correctly,
- relate in such manner to farmers' problems or ambitions that they are encouraged to act on it.⁶

The information service is playing an important part in farm advisory programs. The agricultural extension workers must know the techniques and principles of dissemination of information to the farmers. Their knowledge will make their efforts more effective.

5. International Agricultural Study Center, Handbook on Methods of Agricultural Extension, Wageningen University, Holland, 1953, p. 70.

6. Organization for European Economic Corporation, "The Written Words in Agricultural Advisory Work", 1959, p. 8.

The Theory of Communicating Information

As it was said earlier, the agricultural extension worker, acting very like a salesman, seeks the adoption of his product not only by those directly exposed to his information through personal contact but essentially by a large number of people through demonstration and other effects. The extension worker wishes to induce changes in the way the people in his area react to problems.

To obtain this change of the audience, some facts which have to be kept in mind are as follows:

1. Oral presentation combined with a visual one is more impressive than either one by itself. More people will be reached in this way with better result.
2. Diagrams, pictures and other visual aids must be clear and simple.
3. If diagrams are simple but the subject matter is unfamiliar, such material should precede oral explanations or discussions. This is more effective than oral presentation followed by the visual aids.
4. The audience is moved more by what it hears, but more permanently by what it sees, so things shown are more remembered.
5. The more concrete and simple the material presented to the audience, the more uniformly it will be impressive.
6. There are more visual minded people than there are audio minded ones. The advantage of visual methods over oral presentation is larger as the audience is of humble intelligence, immature or inexperienced.
7. In oral presentation, emphasis can be given to certain keypoints by repeating them two or three times. The best way to repeat statements

is by telling the story first with a graph or a diagram, secondly oral and a third time with pictures.

8. The opening statement is the most impressive point in giving talks.

9. Even well educated audiences will forget about two-thirds of what they were told within a week. This can be improved by reviewing the argument before closing.

10. The amount of learning by the audience depends on the amount of thinking done by the audience. The amount of thinking again depends on the extent to which the audience takes an active part in the discussion. Stimulating discussions improve the effect of presentation.⁷

The influence of the various methods of presentation on the attitude of the farmers exposed to them have been studied in the U.S.A. The result of such study is presented in the following table.

TABLE I
INFLUENCE OF THE VARIOUS METHODS OF PRESENTATION ON
THE ATTITUDE OF THE FARMERS IN THE U.S.A., 1953

Methods of Presentation	Percent of Farmers Exposed that were Influenced		Practice change per Farm Attributed to Meeting	
	Index	Percent	Index	Percent
Lecture only	100	38.3	100	0.54
Lecture & discussion	123	47.10	121	0.68
Lecture and local leader's meeting	117	44.71	128	0.75
Lecture and chart	117	44.71	142	0.87
Lecture & Filmstrip	148	56.6	155	0.88

Source: Handbook on Methods of Agricultural Extension, International Agricultural Study Center, Wageningen University, Wageningen, Holland, 1953, p. 81.

7. Ibid., p. 71.

Some basic principles of the theory of communication which are involved here could be discussed under three main headings: 1. Audience, 2. Channel and 3. Treatment of the Information.⁸

Audience. The term audience in communication theory includes all listeners, readers and viewers, wherever they may be, at whom information is aimed. The agricultural extension worker can never safely assume that the audience will make the necessary effort to understand him. The audience may even be uninterested. It is the extension's responsibility to present the information in such forms, such places and at such times that the audience will find it interesting, easy to understand and timely for action. For this purpose it is necessary to understand the audience concerned. People vary much from one area to another. Some facts about the particular local situation are:

1. Education Level. Use the language of the farmer, not of the research worker, the administrator or the specialist. Avoid scientific terminology, symbols and codes.

2. Innate obstacles. Farming is a lifetime occupation for most farmers. As the average life span grows longer farmers stay longer on the land. Hence a very large percentage of the farming population are long past formal schooling. Their schooling received much less technological emphasis than present day schooling. These older people have different values, notions and knowledge from young people. This is important

8. Ibid., p. 72.

because extension workers have usually completed their education recently and are products of the new school of thought. Older farmers may dismiss these workers as "Youngsters" unless the latter make a conscious effort to overcome such misunderstanding.

3. Physical Obstacles. After the mid-teen years there is a gradual loss in visual and oral acuity. The average person has only forty percent of the visual acuity at seventy years of age that he had at the age of fourteen years. Physical strength begins to decline after twenty-five years. The man of fifty will be more weary at the end of the day, the reading time for men. Therefore, the farmer cannot then be expected to read long, difficult bulletins.

4. Psychological factors. The average age of an audience also involves certain psychological factors. The farmer who went to school twenty or thirty years ago is still much concerned with the world of that day.

5. Pressure of Other Work. Farmers are busy people. So keep advisory information brief, to the point and easy to follow.

6. Basic Appeals. The adult farmer deals and thinks in terms of his personal affairs. He is not very interested in the abstract. He prefers to read about his family, and the doings of his neighbours and acquaintances than about events in distant places with which he has little or no ties. Agricultural developments on the farms of neighbours gain his immediate interest.

The use of such appeals is common in commercial advertisements. Life insurance advertisements often show or picture happy family groups. This brings in several basic appeals -- those of children, home and security.

When the agricultural extension worker sets out to inform farm families, he can use basic appeals with sincerity. Some of the commonly used are: more profit, improved skill, increased prestige in the community, pride of ownership, recognition and praise, concern for children or for family, self-preservation and safety, improved health, and religion.

7. Sociological factors. The behaviour, attitudes and values of a person often reflect those of the group to which he belongs. If he is an active member of the group, the greater his influence upon the group. Extension workers often find it more successful to work through groups.

Similarly the greater the prestige a group member has in the eyes of other members, the greater the influence he can exert. This is an important point to remember in selecting a member of a group to conduct a demonstration, to be quoted in a written article, or to be interviewed on the radio.

Every social group or organization has an expressed or implied purpose and code of ethics. If agricultural extension methods conflict with these, the group tends to resist the change. If a group accept a new idea, it will directly and indirectly stimulate its adoption among the members. Thus information can often be fruitfully directed to people through the groups or organizations to which they belong. In the same

way that program planning is most successful when local people participate, so agricultural extension methods are most effective when they are participated by the farmers.

Chanel. In choosing the channel to be used, the following are some of the points to be considered:

1. Degree of Literacy. If a large number of people in the community do not read, or do not read well, it will be difficult to reach them directly by the written word. Some other teaching methods will be better.

2. By determining what newspapers, periodicals and other journals people read, the extension worker must know which of the various printed mass media to use.

3. Availability of radio and television. The emphasis on radio and television depends on the number of people who have these and on their development in the future.

4. Ability to Travel. If farmers have adequate facilities for transportation they are most apt to participate in meetings, tours, demonstrations and the like. When they can not travel so easily, other methods of communicating information become more important in extension work.

5. Membership of Organizations. When people belong to certain social, business or other organizations, it is possible to reach them through those organizations and the information media they operate.

Treatment of the Information. The following conditions are important:

1. The communicator must have something of interest to say to his audience. The more his material relates to their problems the more interested they will be.

2. He should be clear in his own mind not only as to what aspect of the subject he wishes his audience to understand, but also as to how he wishes them to react.

3. Action required on the part of the farmer should be appropriate to his expected circumstances at the time the action is supposed to occur.

4. The information must be so designed and delivered as to gain the attention of the intended receiver.

5. The treatment must involve language or symbols which have a common meaning for both sender and receiver.

Various Methods Used in Agricultural Extension

There is no best 'simple' method for the agricultural extension worker to use in spreading information to farmers.⁹ The agricultural extension worker must use his observation, experience and simple evaluations to determine which methods produce the greatest response under the particular conditions. The following are some of the methods presently used in agricultural extension in Europe and North America.¹⁰

1. The Press. Most people get their information from the newspaper. Thus it is possible for the extension

9. L.D. Kelsey and C.H. Hearn, Cooperative Extension Work, Comstock Publishing Co., Ithaca, New York, 1949, p. 231.

10. Much of this section was summarized from Ibid., p.231-300.

worker to communicate his ideas to the farmers by newspaper provided that the farmers can read and usually read the newspaper.

2. Radio. Radio is a mass medium of communication. It can reach large numbers of people at any given time, but calls for certain techniques.

The four principal uses of radio are:

1. To reach large numbers of people inexpensively
2. To reach people not reached by other means
3. To stimulate participation through all other media
4. To build enthusiasm and maintain interest.

Radio is an excellent medium for doing extension work in the developed countries. In North America most rural people value radio highly. Radio is valued by rural listeners for its two great functions; as a source of news and other information, and as a source of entertainment. In underdeveloped countries however, few farmers own a radio. Therefore this method would not be a fruitful one. It is likely that a great deal will be achieved in the underdeveloped countries when radio goes into the presently isolated villages and homes.

3. Circular Letters. In the U.S.A., early agricultural extension workers used a "circular" or "newsletter" as one of their first means of mass communication. They wrote letters when they did not have time to make farm visits. As their work developed beyond individual and group methods, they wrote circular letters to tell of group meetings, to repeat and remind farmers about seasonal practices, and carry some of

the more simple ideas to the farmers. The circular letter still conveys some information better than the radio and newspaper.

4. Publications. The agricultural periodical is a valuable instrument in supporting and extending extension work. It brings into the farm announcements and details of agricultural research, news of extension activities, market and other topical matters, stories of farmers' experiences, and articles of agricultural information, discussion and controversy.

5. Demonstrations. Demonstration is a way of teaching new practices by showing evidence of success. This evidence is delivered by application of the new method in practice.

Extension activities of a demonstrative nature may be sub-divided in the following groups:

a. Result demonstrations in which the learners are shown the results of applying one or more related practices.

b. Method demonstrations, where the farmers are taught how a certain practice is carried out, for example, how to apply fertilizer, how to eliminate diseases, etc.

c. Field days. Field days are often organized to exhibit farm machinery, and often include agricultural competitions.

d. Tours. Farm tours which will help farmers to see some things developed in their neighbours' farms.

6. Meetings. The nature of a meeting is determined by its purpose. The different types of meetings are:

- a. General meeting with lecture
- b. General steering committee meeting
- c. Dissemination meeting
- d. Social interest meeting
- e. Work meeting
- f. Training meeting

Summary. Group methods are very useful in extension work. They are relatively cheap. However, the results of group methods, expressed in changes in attitudes, depend upon the audience. The success of various methods is determined by a large number of factors such as time and money involved. To date there has been no analytical investigation of what method is the best in agricultural extension.

AGRICULTURAL EXTENSION SERVICES IN EUROPE AND THE U.S.A.

In Europe

At the beginning of the 19th century, agricultural extension services were established in most European countries.¹¹ These services are now existing everywhere but show differences with regard to organizations, field of activities, staff and efficiency. In these European countries, agricultural extension services have been very much affected by historical, economic and social conditions prevailing amongst the various nations.¹²

The most common methods used in agricultural extension services in the European countries are individual methods such as farm visits, office calls and discussions, telephone calls; group methods such as lectures, classes and demonstrations; mass methods such as information circulars, popular bulletin and articles and radio talks. In some countries, in particular the United Kingdom and Germany, so-called information services, being a sub-division of the agricultural advisory services, have achieved much success in regard to the approach of a large number of farmers by using mass methods, with the aid of popular pamphlets (distributed by the advisory staff).

11. Provisional Report of the Organization of European Economic Corp., (OEEC), Agricultural Advisory Services in European Countries, Nuffield Foundation, London, 1956, p. 22.

12. Ibid., p. 23.

This information service also publishes notices in the press or articles in the daily and agricultural press, arranges and prepares lectures, information or brief advice for broadcast by wireless, preferably following the weather forecast, makes visual expedients intended for information such as lantern slides, film strips, articles, pamphlets, wireless talks and the use of visual expedients. Central information services of this kind have succeeded in arousing the interest of the public at large in agriculture.

Another method to advance efficient farm management is the formation of associations for cooperative advisory work with the intention to compare farming data under the direction of the offices of the extension service.

In most countries of Europe virtually no attempts are made to ascertain whether the extension service operates efficiently and whether it yields satisfactory results, although in this way a better idea would be obtained of the effectiveness of the various methods used.

The extension service in most European countries is in charge of the control of statutory provisions, much time being needed to discharge these duties.

In some countries in Europe the agricultural extension service occupies a rather minor position in the ministry of agriculture.

The European countries are showing a wide diversity as regards the participation of farmers and farmers' organizations in framing a working programme for the extension services.

It is rather striking that the extension services of most European countries cannot command sufficient financial resources and due to this need of funds, agricultural extension service has made little progress there.

In most European countries the general public does not realize sufficiently the significance of agriculture in the national economy.

In the U.S.A.

In appraising the American system of agricultural extension, it should be remembered that the agricultural industry in the U.S.A. shows very great differences with agriculture in Europe and other countries as it has developed itself under quite different social, political and economic conditions.

The extension service in the U.S.A. is a cooperative arrangement between the land-grant institutions and the U.S. Department of Agriculture.¹³ They are bound together through agreements in line with the basic federal extension legislation, the Smith-Lever Act. Each state extension service is, by law, a part of the land-grant institution for the state.

Agricultural extension in the U.S.A. concerns itself with the farmers' family.¹⁴ The service advises on domestic questions in the countryside and renders advice to the rural

13. L.D. Kelsey and C.C. Hearne, Cooperative Extension Work, Comstock Publishing Associations, Ithaca, New York, 1949, p. 41.

14. O.E.E.C. op. cit., p. 23.

youth. In the External Service, Department of Agriculture, three branches of the service are closely cooperating and coordinated to a one-head management. In this extensive field of operation of agricultural extension in the U.S.A., very good results have been achieved. Due to the activities of the service, the standard of living of rural families, and of the rural community as a whole, has been improved and due to this effect the service has built up a good reputation for itself. Another consequence is that the financial support afforded to this service is gradually increasing.¹⁵

The agricultural extension service in the U.S.A., both diverse and individual states, enjoys a high rate of independence. The executive of the national directorate in Washington does not interfere very much. The central management issues recommendations, supervises the budget and working programme. The extension service is paid from funds supplied by the federal government as well as by the individual states and the district councils. In many cases the extension service is also subsidized by the individual farmers who are organized in what they call "Associations for Cooperative Advisory Work". Such associations can appoint extra staff, but they work under the auspices of the country agent.

The extension service is charged with the supervision of the observance and enforcement of the statutory provisions. The agricultural college in each state is the place where college

¹⁵. International Agricultural Center, Handbook on Methods of Agricultural Extension, Wageningen University, 1953, p. 51.

education, agricultural research and extension are concentrated, have the consequence and strong influence on farmers, and program of these extension services.

In all districts there is an advisory committee on extension which, together with the staff of the extension service, design the working programme and administers the available funds contributed from within the district.

The high rate of cooperation between the agricultural extension service, agricultural cooperatives, private manufacturers and merchants is striking.

In the U.S.A. about fifteen percent of all farm requisites are supplied by cooperatives and about twenty percent of all farm produce is sold by cooperative marketing societies.¹⁶

Much attention is being paid in the U.S.A. to the training of staff for the extension service and to every five people engaged in advisory work, there is about one specialist.¹⁷

Another interesting feature of agricultural extension work in the U.S.A. is the highly developed mass methods of extension. There is an information service which is carried on by both the Federal government and the State government. The University or Colleges of agriculture have an important part in the extension service. There are good researchers in

16. D.N. Chang, Impression of Agricultural Extension Work in U.S.A., International Rice Commission, Vol. VII, No. V., 1958, p. 16.

17. Loc. cit.

the field of agricultural extension and other related fields. To get some idea of the development of the mass method in supplying information to the farmers in the U.S.A., it may be stated that each agent distributes some two thousand booklets annually. Each agent visits about four hundred farms each year while in the same period, on an average, one thousand farmers call at his office and one thousand telephone calls are made.¹⁸

Next to the development of research and education, the development of rural domestic advisory work is very interesting. The extensive advisory service to rural youth is organically a branch of agricultural extension as a whole. The 4H Club is playing an important role in the development of agriculture for the young people.

To sum up, the agricultural extension service in the U.S.A. is successful in helping the farmers with agricultural improvement. The methods and practices are highly developed. Some of them could be applied to the under-developed countries by adapting to local conditions. This application will be discussed in the following section.

18. Ibid., p. 17.

AGRICULTURAL EXTENSION IN SOUTHEAST ASIA

Problems of Asia Agriculture

In Southeast Asia the common feature among these countries is the dominance of the agricultural section of the population. The available figures show the percentage proportions of population dependent on agriculture in the area as follows: Burma 68: Indonesia 66: Philippines 69: Thailand 85.¹⁹ The same source indicates the proportions for various regions of the world as follows: North America 20: Oceania 30: Europe 33: South America 60: Asia 70: and Africa 74.

Low Productivity

With the prevailing techniques of production and the consequent low productivity per man, dominance of agriculture means low per capita national income. When countries are grouped by level of economic development on the basis of per capita national income as of 1950, all the six countries of Southeast Asia ... Burma, Indochina, Indonesia, Malaya, Philippines and Thailand, fall in the underdeveloped group.²⁰ Moreover, there is in Southeast Asia a surplus of population on the land which results in low productivity.

19. Food and Agriculture Organization, 1953 Yearbook, Vol. VII, p. 7.

20. E. Staley, The Future of Underdeveloped Countries, New York, Harper and Brothers Co., 1954, pp. 16 & 17.

The size of farms in Southeast Asia are generally small ranging from two to three acres in Japan and Indonesia to seven or eight acres in the Philippines and to about twelve acres in the central plain of Thailand.²¹ The farms are very much fragmented due to the old custom inheritance of land property. Such fragmentation of land not only creates hardship for the cultivator because he has to travel far to work in his farm but also such improvement as the installation of irrigation facilities or the adoption of some kind of farm mechanization is difficult.

Mostly the land is used mainly for the production of crops for direct human consumption instead of for feeding livestock. The farmer in Asia usually keeps only the draft animals. In Thailand, for example, every farm keeps buffaloes, in the Philippines, Carabaos and in India, bullocks. These animals are fed with by-products such as straw, oil cakes, weeds and grass taken from fields in normal cultivation.

The crop yields in Asia, as shown in Table II, (page 25), are low as compared with Europe.

Even in Asia the difference in crop yields between the various countries is very great. Table III (page 25), shows the rice yield per hectare in some countries in Asia.

This variation shows that there exists considerable room for improvement in these low yielding countries. This problem of low productivity is a crucial one for the agricultural

21. C.W. Chang, Agricultural Extension in Asia, International Rice Commission, Vol. V, 1958, p. 2.

TABLE II
COMPARISON OF CROP YIELDS AMONG ASIA, EUROPE
AND THE WORLD AVERAGE FOR 1955

	Yields per hectare (100Kg.)			Percentage of	
	Asia	Europe	World	European Average	World Average
Wheat	8.5	16.7	11.7	50.90	72.50
Rye	9.9	15.1	13.9	65.56	71.29
Barley	10.9	18.9	12.6	57.67	86.50
Oats	10.3	17.3	14.1	59.54	73.05
Maize	11.8	16.3	16.7	72.40	70.65
Millet & Sorghum	6.5	10.4	6.7	62.50	96.42
Rice (Paddy)	18.2	42.3	18.2	43.02	100.00
Potatoes	72.8	131.4	119.7	55.43	60.08
Sweet Potatoes & Yam	103.3	122.9	90.6	84.05	114.02
Cotton	1.5	2.3	2.4	65.22	62.50

Source: International Rice Commission, Newsletter Vol. VII, No. 2., June, 1958, p. 2.

TABLE III
RICE YIELD PER HECTARE -- 1958

Japan	4,810 Kilogram	South Korea	2,790 Kilogram
Indonesia	1,650 Kilogram	Burma	1,480 Kilogram
Thailand	1,430 Kilogram	Ceylon	1,420 Kilogram
India	1,260 Kilogram	Pakistan	1,240 Kilogram
Vietnam	1,230 Kilogram	Philippines	1,190 Kilogram

Source: Ibid., p. 3.

development in Asia. This is due to the important factor that there is not much improvement in farm technology. Comparing with North America and Europe, for example, the most significant economic development in agriculture is the great increase in skill with which the farmers apply mechanical and technological improvements to increase output per man in farming. The data available in Table IV show the yields per acre of the six crops designated as "basic" in the price support program of the U.S.A.

TABLE IV
THE YIELDS PER ACRE OF SIX CROPS IN U.S.A.

	Corn (bu.)	Wheat (bu.)	Rice (lbs.)	Cotton (lbs.)	Tobacco (lbs.)	Peanuts (lbs.)
Average 1939-43	31.2	16.4	2,101	249.7	985	703.8
Average 1952-56	41.1	18.7	2,693	404.9	1,333	952.3

Source: "Toward a Realistic Farm Program", A statement of the Committee for Economic Development, U.S.A., 1957, p. 11.

Population Pressure

Southeast Asia has been characterized by its rapid growth of population. Broadly speaking, the region has been until recently one of very thin population. It seems probable that the whole of Southeast Asia in the year 1800 contained only about ten million people. Malaya then contained about a quarter million people, Java about four million, and Burma

probably less than two million.²² It was, even at the end of the 18th century, a zone of labour shortage. But the last one hundred and fifty years brought great increases in population, causing people to move upon the more fertile areas, upon deltas and into areas where people had not lived before. By 1916-20, the total population of Southeast Asia had become eighty-four million, by 1936-40, one hundred and twenty million, and by 1946-50 it was nearly one hundred and forty-five million.²³ This rapid population growth has been a great concern to students in economic development who fear that these countries might not be able to expand their production as fast as the expanding population. This is a factor which is an obstacle to the economic development of countries in Southeast Asia.

Poverty Problem

Poverty is not new in Southeast Asia. What is new is the awareness of poverty and the belief that something should be done about it. All of the countries in Southeast Asia have within the past decade set up official agencies charged with planning and promoting economic development, and for international assistance to hasten it. Much of these works have been done by the United Nations, but it is too early to speculate on the outcome.

22. Janlekha, Kamol, A Study of the Economy of a Rice Growing Village in Central Thailand, Bangkok, Ministry of Agriculture, 1955, p. 10.

23. Loc. cit.

Together with the problem of poverty, the problem of education is also an important one for the agricultural or economic development of Southeast Asia. Following is a table showing the ratio of illiteracy of the people.

TABLE V
RATIO OF ILLITERACY OF SOUTH AND
SOUTHEAST ASIAN COUNTRIES (PERCENTAGE)

Country	Year	Age	Male	Female	Total
India	1951	Over 10 yrs.	70.4	90.6	82.1
Federation of Malaya	1947	Over 15 yrs.	43.0	83.4	61.7
Thailand	1947	Over 10 yrs.	32.6	59.0	46.3
Burma	1954	Over 10 yrs.	19.4	64.9	42.7
Ceylon	1946	Over 5 yrs.	29.9	56.2	42.0
Philippines	1948	Over 10 yrs.	34.8	40.7	37.8

Source: U.S. Statistical Yearbook, 1957, p. 17.

This low literacy rate in most of the Asian countries is an obstacle for economic development. Progress comes when the people are informed and able to be informed. Knowledge is worthless unless it is taken to those who can use it. This calls for development of an educational system to do the job. The system may take the form of an extension service operated through the schools, or it may require separate community or rural development programs.

Marketing Problem

A most important factor that has kept Southeast Asia economically underdeveloped is the small market in each of the countries in the area, which is due to the low level of their income. This small market has important effects on the volume of international trade and other economic activities.

Because of their low level of productivity and hence of low real purchasing power, the underdeveloped agricultural countries play a minor part in world trade. Nurske said:

... that business investment abroad has tended in the past to shy away from industries working for the domestic market in the underdeveloped area and to concentrate instead on primary production for export to the advanced industrial centres.²⁴

With special reference to Southeast Asia most writers on the subject of economic development assign the pattern to the commercial design of the colonial powers, which are not applicable in these regions.

This small market in Southeast Asia affects domestic as well as foreign capital. The first difficulty is that the volume of domestic saving is small or even negative, because of the low level of income. Although there is saving, it tends to go into unproductive forms such as gold, jewelry, commodity hoards and hoards of foreign or domestic currency.

24. R. Nurske, Problems of Capital Formation in the Underdeveloped Countries, Oxford, A.T. Broom and Sons, 1953, p. 25.

This unfortunate tendency is usually explained by inadequate financial organization or lack of education.

Present Status of Agricultural Extension in Asia

Agricultural extension as a regular government service is still in the early stage of development in most countries in Southeast Asia. The needs of farmers, in most of the countries, are not as yet adequately met by the extension services. Lack of funds is almost a general complaint. Both the limitation of the number of trained agricultural extension workers relative to the number to be served and inadequate transportation facilities are to be blamed for the limited assistance available to farmers. The shortage of extension personnel was much more acute immediately after the second World War. Since then, the number of agricultural extension staff has been increasing. Very few countries, however, appear to have reached a satisfactory level in quality and quantity in this respect.

Figure I, (page 31) shows the ratio of farmers to field extension agriculturists in selected countries of Asia compared with some countries in South America.

These data indicate the variation in the ratio of farmers to extension staff. Japan has the most favourable ratio. Thailand, at the other extreme, has not had time to build up an adequate extension staff for the new service developed in 1950.

Some countries realize the difficulties involved when a field agriculturist has to serve too large an area with many

FIGURE I
RATIO OF FARMERS TO FIELD EXTENSION AGRICULTURISTS
IN SELECTED COUNTRIES

	5,000	10,000	15,000
Thailand			1300
Ecuador		7000	
Bolivia		6000	
Chile		5000	
Argentina		4000	
South Korea		2500	
Taiwan		1500	
Japan		650	

Source: FAO, The Present Status of Agricultural Extension Development, 1961 Annual Report, p. 118.

farmers in it. Following are data available from FAO reports comparing agricultural extension services in underdeveloped countries with regard to the distribution of their staff among field, provincial and headquarter posts.

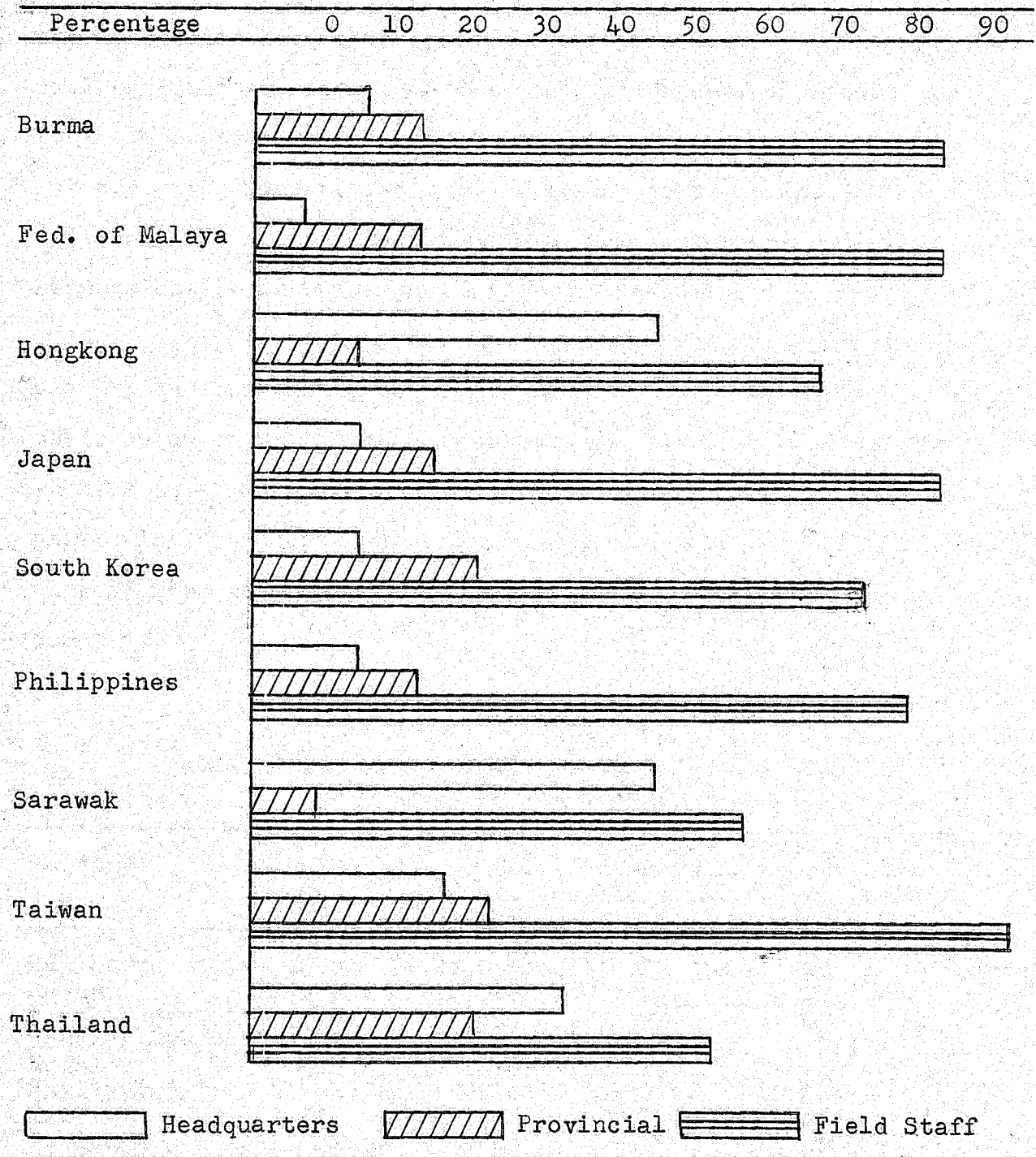
From Figure II (page 32), we could see that Burma, the Federation of Malaya and Japan are examples of the sound distribution of personnel.

The types of agricultural extension organization in Southeast Asia could be classified as follows:

a. Centralized types. This can be represented by Thailand, Burma and Ceylon, where all extension workers are

FIGURE II

HEADQUARTERS, PROVINCIAL AND FIELD EXTENSION STAFF
IN SELECTED COUNTRIES 1959



Source: The State of Food and Agriculture, 1961, FAO UN Rome, Italy, 1961, p. 119.

employed by the Central government and assigned to work in the provinces or other governmental sub-divisions as the case may be.

b. Decentralized types. This is represented by Japan and Indonesia where extension is the responsibility of the provincial governments, with some financial and technical assistance from the central government.

c. Cooperative type. This is found in India and Pakistan where the central government and the states assume full responsibility for extension by mutual agreement.

In Southeast Asia, the training of rural youth is playing an important part in the agricultural extension. The table below shows the number and membership of rural youth clubs in nine Asian Countries. The average membership per club and particularly the ratio of total club membership to total population figures may indicate the strength of the movement in each country.

TABLE VI
RURAL YOUTH CLUB ORGANIZATIONS AND MEMBERSHIP IN
SELECTED NINE COUNTRIES, 1959

Country	Number of rural youth clubs	Membership in rural youth clubs boys-girls	Average membership per club	Number of club members per 10,000 people
Ceylon	1,000	20,000	20	20
Japan	17,319	244,928	14	27
South Korea	3,729	142,594	39	63
Fed. of Malaya	7	300	43	0.5
Nepal	310	1,350	4	2
Philippines	4,708	115,828	25	48
Taiwan	3,571	43,471	12	44
Thailand	134	4,843	36	2
Vietnam	401	18,747	47	7

Source: Adapted from FAO Report, 1961, p. 122.

The inadequate number of agricultural extension workers is due to many reasons besides those previously mentioned. One is that education, including agricultural education, has been and still is very academic. It is usually said that "I am not equal to experienced farmers" or "Nothing you can do about it, anyway." Many agricultural graduates belong to this category and would not be of much help to the farmers in their daily farm activities. The other reason is that the importance of the ministry of agriculture or Department of Agriculture does not receive the proper recognition from the government. Either the government does not have enough appropriations for research, education and extension, or it is operating on a low pay scale and thus cannot keep men on its staff to insure continuity of the work.

The tables below show the number of students graduating from technical schools and agricultural colleges for 1953-56 and 1950-59 respectively:

TABLE VII
NUMBER OF STUDENTS IN TECHNICAL SCHOOLS
PER THOUSAND OF POPULATION, 1953-56-

Philippines	2.6
Thailand	2.0
Indonesia	1.1
Federation of Malaya	0.7
South Vietnam	0.5
India	0.4
Burma	0.3
Ceylon	0.2

Source: U.N. Economic Survey of
Asia and the Fareast 1958,
p. 45.

TABLE VIII
AGRICULTURAL COLLEGE GRADUATES,
IN TEN COUNTRIES 1950-59

Country	Number of Agricultural Colleges	Total Number of Graduates 1950-59	Number of Farm Population per Graduate
Burma	1	77	5,195
Ceylon	1	68	20,324
India	20	7,068	10,160
Indonesia	1	133	112,782
Japan	27	21,858	394
South Korea	13	5,855	427
Pakistan	3	708	22,831
Philippines	5	5,792	958
Taiwan	2	3,148	396
Thailand	1	437	10,069

Source: FAO Report "State of Food and Agriculture, 1961", p. 122.

Japan had the largest number of graduates in the 1950-59 period with the proportion of 1 to 394 farm people.

In general, graduates prefer to be government administrators or employees of large private concerns. Seldom do they return to private farming. From the table below it can be seen that in 1955-59, graduates from the agricultural colleges in Burma, Ceylon and Thailand are mainly in government services or teaching, while less than five percent went to farm work on privately owned units.

TABLE IX
EMPLOYMENT OF AGRICULTURAL COLLEGE GRADUATES
IN SELECTED COUNTRIES 1955-59

Country	In Govt. Services	Teaching	Commercial & Industrial	In Farming	Advanced Studies	In other Occupations
Burma	76.7	2.3	-	-	4.7	16.3
Ceylon	50.0	19.2	3.9	-	15.4	11.3
Japan	30.1	14.0	33.2	7.0	9.1	6.6
Thailand	58.6	27.3	1.2	5.9	4.1	2.9

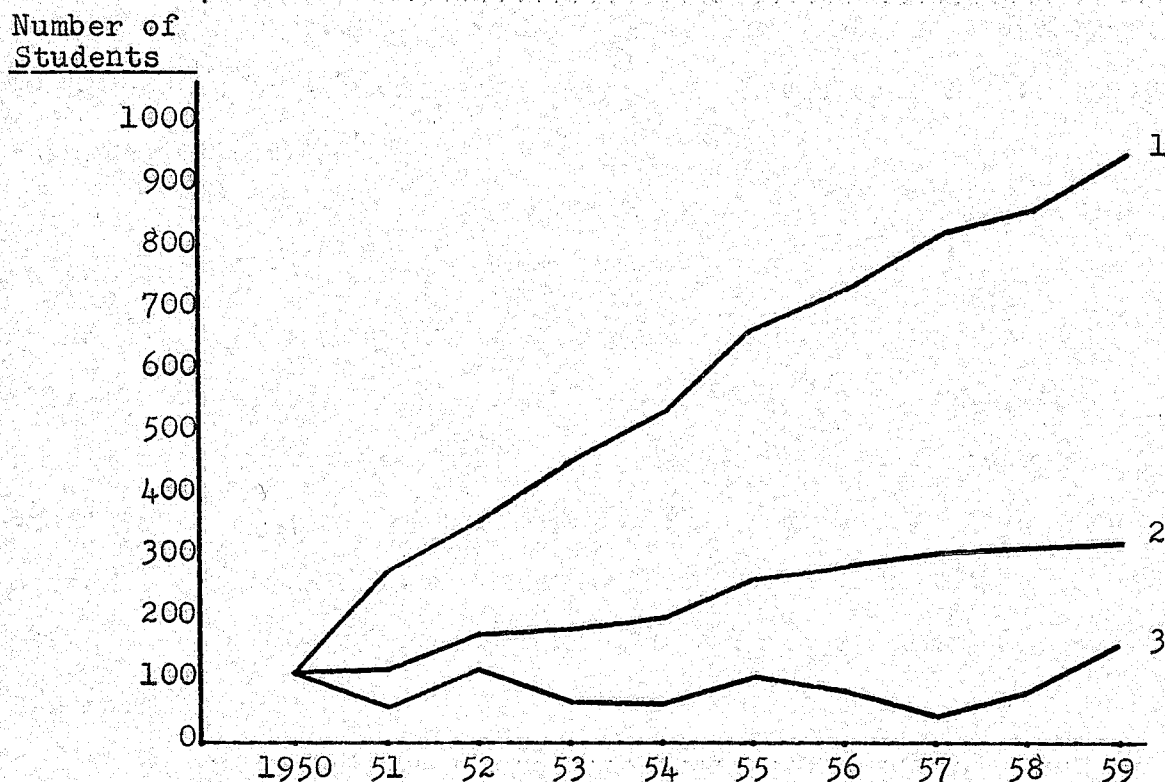
Source: Adapting from FAO Report 1961: The present status of agricultural extension development in Asia and the Far East, p. 126.

The enrolment in agricultural colleges has grown steadily during the past ten years. The rapid increase has been due in part to the growing emphasis laid by governments on agricultural development since 1945, which is reflected in increased appropriations for higher agricultural education. The graph below shows the number of student enrolments in selected countries 1950-59 (1950 = 100). (See page 37).

However, the development of a sound system of extension must necessarily be a slow process, as it involves the training of personnel, the setting-up of a workable organization, the appropriation of funds and the changing of attitude of the farming population.

Experience in countries with small farms in most of the Asian countries indicate that each field extension agriculturalist can serve effectively a number of farmers ranging from

FIGURE 3
STUDENT ENROLMENT IN SELECTED COUNTRIES 1950-59



1. College of Agriculture, Thailand.
2. Average for Ten Countries.
3. Department of Agriculture, University of Ceylon.

Source: The FAO Report 1961, p. 125.

six hundred to one thousand subject to the availability of transportation facilities, closeness of areas, the educational and technical level of the farmers and the methods used to contact and persuade the farmers.

To obtain maximum results, extension work should be concentrated on education and aimed sharply on the satisfaction of the farmers' needs. The major obstacles to progress appear

to be lack of funds, of trained staff, and of a clearly organizational structure which makes it possible for the decisions taken by the policy-makers to be carried out efficiently. When staff is being trained, greater emphasis might, with advantage, be placed on extension methods, technical subjects and practical experience.

Higher priority should be given to field work. Some extension services have attempted to improve their operations by adjusting the area assigned to a field worker to the size that can be effectively served, provided adequate equipment, supplies, transportation and other facilities which help the staff to give greater assistance to farmers, and by adjusting office and field work in order to make the maximum number of field workers free for demonstration and other activities with the rural population.²⁵

Fuller cooperation between extension and research education, credit, marketing and other services would be fruitful.

Principles and Methods of Agricultural Extension Which Could be Applied to Southeast Asia

The principles and methods of agricultural extension which could be applied to Southeast Asian countries are:

1. Study the cultural and economic background of the people to be served. In all regions in Southeast Asia, it

25. Summarized from the recommendations of FAO report on Agricultural Extension in Asia, Report FAO 1961, p. 137.

is important for an extension worker to recognize the local unit of society and use the best type of local leadership. Constant leadership training is required.

2. Use self-help technique whenever feasible with locally available materials and tools. Great improvements can be made by relatively simple and inexpensive means. Try to encourage the people to do things within their ability to help themselves.

3. Adapt the subject matter and the teaching procedure to the educational level of the people whose behaviour it is desired to change.

4. Emphasize teaching through demonstrations established by rural people themselves on their own farms or in their own homes, which will thus serve as teaching centers.

5. Carry on education work with adults at the same time that boys and girls are receiving instruction in schools. This is essential to ensure an effective educational program.

6. Personnel for the program of agricultural extension should be carefully chosen. They should possess a desire to serve, be able to get along well with people, especially rural people, be sympathetic in their attitudes and familiar with the customs and cultural background of the people they meet.

Due to the low educational level of the farmers, the inefficiency of farm techniques, the social organization systems and cultural habits, communication and transportation facilities, shortage of trained extension personnel, only few of the agricultural extension methods could possibly be used in Southeastern Asia.

Mass methods for extension teaching, including radio, news stories, magazines, bulletin and circular letters which are used so effectively in countries in Europe and North America, would not work in Asian countries because few farmers have radios or can read and therefore can not benefit from these methods.

The demonstration method like government demonstration farms could be used as an extension teaching device, but the effectiveness is in doubt. While the extension agriculturalist can stage an excellent demonstration on the government farm, the farmer usually does not come to observe it. But if he comes he finds conditions of operations unrealistic because on government demonstration farms work is done by hired labour, using facilities beyond the capacity of the farmers.

The personal contact which has been the main method used to persuade and train farm people is a practical method in Asia. In a country where the educational level is low, the personal visit of an extension worker to a farm and practical assistance given to a farmer in improving farm technique is effective. When the farmer becomes convinced that modern scientific methods are of practical value for the solution of his problem, when he finds from actual experience that the new methods bring him benefit, he gains confidence in the extension worker and believes in his assistance.

This method of personal contact, however, cannot be used to reach a large number of people because of physical difficulties. For this reason, demonstrations are considered

to be more efficient when a larger number of people are involved and are used to complement personal contacts and farm visits. Both farm visits and demonstrations require the agricultural extension workers to spend a large part of their time in the field, consulting farmers, cooperating with them in actual practice and showing them new modern farming methods which can be used.

In Asia, the problem which is the bottle neck in the future development of agricultural extension is the shortage of well-trained personnel for extension. This includes not only field workers, but administrators and specialists as well. In solving this problem, international cooperation is required. Some of the measures have been designed and some initiative works have been done by the FAO and the Economic Commission for Asia and the Far East (ECAFE) of U.N. The works of FAO and ECAFE could be summarized as follows:

Personnel Training

This could be discussed as follows:

1. A Regional Center or Centers for Training Extension Workers. It is desirable to have one or two regional training centres to which countries in the Region can send some of their senior extension people for training. They may then return to start national training centers and to train field workers in their home countries. The University of Philippines, College of Agriculture at Los Banos is now ready to make its training facilities available for this purpose. Many students from several of the Southeast Asian countries went to this training center.

The agricultural extension meeting was held in Bhopal, India in 1955. FAO conducted the agricultural extension training center for Asia and the Far East at Los Banos, Phillipines in 1958, with financial assistance from the Council on Economic and Social Affairs and U.N. Technical Assistance Board. It was attended by eighteen representatives of twelve countries in Asia. The purpose of the training center was to train extension teachers with the hope that, upon returning to their home countries, they could initiate national training programs for extension work under their local conditions.

2. National Extension Training Centers. National training centres should be attached to a regular training institute in a country, such as a college of agriculture or a secondary school of agriculture. This training institution having been strengthened by the operation of the short term course would be enabled to take up the training project later as part of its regular training program. It is common that short term courses are conducted separately from the training institutions. This indicates a lack of cooperation and co-ordination.

3. Agricultural Extension Study Tour. In 1957, FAO organized an agricultural extension study tour to cover Japan, the Phillipines and India for a total of six weeks, with twenty-one participants representing twelve countries in Asia. This study tour was considered successful. The participants could see all that they wished to see and there was discussion in each place and organization visited. This is useful in

exchanging ideas among the participants and observing the local conditions and organization of the places visited.

4. Regional Meetings. Following are the extension meetings held by FAO:

a. The First East Asian Extension Workshop was held in Manila and Baguio, Philippines in 1955, under the auspices of the International Cooperation Administration of the Government of U.S.A. It was attended by representatives of China (Taiwan), Indonesia, Japan, Korea, Laos, the Philippines, Thailand and South Vietnam.

b. The FAO sponsored Agricultural Extension Development centre for Asia and the Far East was held in Bhopal, India, 1955. It was represented by Ceylon, India, Indonesia, Japan, Federation of Malaya, Nepal, Thailand and South Vietnam. The meeting produced a series of recommendations. These recommendations serve as the guide lines for FAO to assist member governments of the Region in further development of their extension work.

c. The ICA sponsored Far East Rural Youth Conference was held in Bangkok, Thailand in 1957. It was attended by representatives of Cambodia, China, Indonesia, Japan, South Korea, Laos, Nepal, the Philippines, Thailand and South Vietnam.

Regional meetings, such as these listed above, could be very useful if they were planned and well conducted. For each meeting held, there must be a well thought out agenda, on which each item listed must be supported by a well prepared working paper to serve as a guide. If necessary, the attendance

could be broken up into groups for intensive discussion. During the meeting long speeches should be avoided. A few experienced people should always be present to serve as resource persons. At the meeting the participants should not only be able to exchange their experiences among themselves, but often new ideas or new methods would be involved as a result of the group thinking.

5. Extension Publications. Since extension is a comparatively new undertaking in the Region, there is a dearth of reading material on extension based on local conditions. Beginning from 1957, FAO has been issuing a semi-annual publication, "Extension in Asia", on the request of its member governments. This is the only regional publication of its kind. Previously "Asian Extension Newsletter" was published for two or three years by the Office of Agriculture and Natural Resources of the government of the Philippines, in cooperation with ICA of U.S.A., but it has been suspended. The usefulness of the FAO publication could be increased if FAO could circulate it as widely as possible among all the people concerned in all countries in the Region. It should reach not only extension workers, agricultural administrators, and agricultural teachers, but even legislators and politicians who are concerned with agricultural extension for financing and policy making. It would thus become a medium of education for all concerned.

FAO has been requested to prepare a textbook on extension for use in the Region. This will be a contribution to the development of extension.

6. Extension Supporting Measures. There are a few resources that will help to make extension work much easier.²⁶ One is the setting up of the farmers' organization which usually plays a very important role in agricultural improvement. This is particularly so in the Region where farms are small and numerous and extension workers are few.

As mentioned earlier, in Japan one extension worker will have to serve on the average six hundred farm households, while in India one multi-purpose village level worker will have to cover from eight to ten villages of about one hundred families each. In some other countries, even more farm families will have to be served by one extension worker. In view of transportation difficulties in most rural areas, this is a formidable task. It is impossible for the extension worker to make contact with all the farmers individually, and therefore he must work with them in groups.

Two kinds of farmer organizations can be used as examples. One is the agricultural cooperative association in Japan, and the other is the farmers' association in Taiwan. Both are bonafide farmers' associations systematically organized throughout the country. They are all for multi-purpose, handling credit, deposits, marketing farm supplies, storage and processing. In Japan and Taiwan, for example, these organizations handle seed distribution and sales of farm supplies such as fertilizers, pesticide and farm tools, thus relieving extension

26. C.W. Chong, "Agricultural Extension in Asia", International Rice Commission, Vol. VII, No. 2, 1958, p. 21.

workers of these responsibilities and enabling them to devote their full attention to educational activities.

In some other countries, the extension worker finds it necessary to organize some ad hoc farm groups, such as a farm study group or a farmer club. They are helpful but the ultimate goal should be for each country to have a suitable kind of permanent farmers' organization that would serve the needs of all the farm families.

Much of the extension workers' assistance to a village will be productive only in cooperation with such organization as mentioned above, to provide credit, supplies and other farm needs. Extension workers should be familiar with them and learn how to work with them. The local leadership is also very important. The following guide lines were given by the FAO Rural Institutions and Services Division at the International meeting on Methods and Program Planning in Agricultural and Home Economics Extension in July 1960 about the importance of local leadership:

.... The improved practices which the extension worker has to teach cannot take root in the lives of people nor become widely accepted unless representatives of local communities will come forward to set the example themselves. These are the lay leaders who act as the indispensable carriers of an extension program in different fields of activity in the farm and in the home.

One of the most important responsibilities in extension work is to be able to identify the potential for BONA FIDE leadership. It must create opportunities for true leadership to emerge to the fore and prove its worth in the eyes of the people.

The training provided to extension workers must make sure that they acquire competence in recognizing, encouraging and building up lay leadership.

The recognizable characteristics of a lay leader are these: He is a local resident, commanding the respect and confidence of his neighbours. Endowed with more than average intelligence, he would be more open than others to suggestions for new improvements and willing to try them out in his own farm and home. He has sufficient public spirit to wish others to share the benefits of his action by persuading them to follow his example. While a little ahead of other members of his community, he is yet not too far removed from them in social and economic status and not out of touch with their hopes and fears, problems and values....²⁷

²⁷. International Rice Commission Recommendation, Newsletter, Vol. V., 1960, p. 17.

THE APPLICATION OF AGRICULTURAL METHODS TO THAILAND AGRICULTURE

In Thailand agriculture is the mainstay of the economy. It provides livelihood for about eighty percent of the population, produces almost half of the national income and is the source of eighty-five percent to ninety percent of Thailand's export.

Agriculture techniques are still quite primitive. The farmers do not lack initiative, but his ambitions are modest and his knowledge is limited to the tradition and some religious rigidity. His patterns and methods of cultivation can hardly be expected to change without sound and adequate advice and guidance. In order to help him the sound and efficient agricultural extension methods have to be used.

In the Western World, the agricultural extension methods are fully developed and suitable to its circumstance. Mass methods like radio, television and newspapers cannot be applied in Thailand because most of the Thai farmers cannot read and very few have radios. Following are the methods which can be applied:

Personal Contacts. This method, which is mostly used in Europe and North America with an effective result, can be used in Thailand to persuade and train farmers. In Thailand where the education level is low, the personal visit of an extension worker to a farm to give the farmers practical

assistance in applying an improved farming technique would be effective. As a matter of fact, the most effective extension influence is the neighbour who is one step a head. Most farmers are unresponsive to organized talks or meetings, but are quick to learn from what goes on in the neighbouring fields. Therefore an extension worker must be a man of patience, prepared to spend considerable time with the farmers, to listen to their troubles and to win their friendship and confidence. With him the extension worker carries seed samples, some phosphate, mineral licks for the cattle, medicine for the pigs and chickens. In return for his help and company one farmer agrees to a trial of new seed, another to the use of phosphate on part of his land. These are some examples which agricultural extension workers should do and which should have an effective result. The personal contacts, as I said above, have some difficulties. This method cannot reach the large number of people because of its physical difficulty. It is rather expensive in its nature and it would involve a large number of agricultural extension workers. At the present time, there are less than three hundred extension officers in the whole of Thailand, including those who do some extension work incidental to the main assignment on the experimental farms. The agricultural extension staff should be about one thousand. There are four hundred and forty-eight districts in the whole of Thailand. Each district should be provided with two extension officers. To increase the number of extension workers, the first thing to do is to expand the training institutions and facilities. It will be necessary

to rely for the present on the existing senior vocational schools, and to provide a period of actual farming experience at the government's experimental farms which number about fifty and could provide practical field experience for the agricultural extension workers. These experimental farms could be training centers and the divisional headquarters to the local extension service. In rice areas, for example, major attention should be given to the improvement of rice production. Similarly in rubber areas the focus should be primarily on rubber. But more attention should be given to the training in cropping patterns and rotations that combine rice with other crops.

Demonstration Method. This method of extension is also a practicable one in teaching the Thai farmers. If we can get a large number of farmers to come and watch the new technique of farming, we can then show them the advantage and the profit of using the new technique. The disadvantage of using this method of demonstration is that the farmer often does not come. If he does come he finds that the conditions of the operation are unrealistic, because at a government demonstration farm work is done by hired labour, using facilities, equipment and practices beyond the financial and technical capacity of the farmer. To solve this problem, the demonstration has to be done properly, realistic to the local conditions which will convince the farmers to adopt the new technique.

Meetings. The meeting is another mass method which could also be practicable. It will be more effective if we

can show some films, slides concerning the subjects or the techniques which the agricultural extension workers try to introduce to the farmers. People are more impressed by what they have seen than what they have heard.

Ideally, methods should be diversified. Meetings, demonstrations, discussions, films and slides can be used complementarily. Their combinations have to be varied according to the local conditions.

Thailand Agricultural Extension Projects

Some projects in the field of agricultural extension for Thailand are as follows:²⁸

Field Crop Research and Experiment Project

Under the National Plan, the Farming Department is to undertake research and experiment in five agricultural stations that have already been established in the Northeast. Emphasis of these research stations will be placed on those crops which could be profitably marketed abroad, such as maize, kenaf, castor beans, kapok, cotton, tobacco, and various beans. Research and experiment will be taken along side with extension work. The number of extension workers will have to be increased for the purpose. Extension work represents, by and large, an attempt at educating farmers in the proper use of seeds and fertilizers in mechanization, and in crop rotation. This project is divided into the following projects:

28. The Government of Thailand, The Northeast Development Plan 1962-1766, Bangkok, Thailand, pp. 40-44.

a. Plant Disease and Pest Control Project. Three mobile units for suppression of plant diseases and pests will be established with a view to speedy eradication of plant diseases and pests, such as castor bean worms.

b. Stable Crops Extension and Improvement Project. The purpose of this project is to encourage people in the North-east to practice diversified farming. Since the fact that regional, provincial, and district extension officers are extremely busy with routine work represents the main obstacle in this connection, mobile extension units will be put into operation, with emphasis on major field crops which are highly demanded. In all cases, marketing problems will be taken into consideration to the farthest extent possible. Moreover, organization of farmers' groups will be encouraged.

c. Soil Fertility Survey and Research Project. Research will be undertaken with a view to encouraging proper use of soil and fertilizer by the farmer, consistent with conservation principles and practices. This project will operate in coordination with the land capability classification survey project. Attention will be given especially to the use of cover crops and fertilizer in cassava growing.

Northeast Agricultural Development Project

The Project aims at enabling the farmers to grow field crops properly in place of and in rotation with rice. It will operate through agricultural improvement centers where permanent staff carry out field demonstrations for the benefit of the farmer. The staff of the centers also performs the duty

of extension workers in encouraging the farmers to put what has been demonstrated to them into practice. The success of the project, therefore, depends largely on the quality of the extension staff.

Silk Research and Extension Project

Under the project, research, experiment, and extension will be carried out in the five silkworm culture stations. A successful operation of the project will prove extremely beneficial in view of the fact that silk is an export which has good and stable demand. In actual fact, the Ministry of Agriculture has been giving encouragement to silkworm rearing for many decades, but the effort put to the task was sporadic and the result has consequently been incomplete. The operation of the project under this plan involves introduction of Japanese silkworms and popularization of Italian mulberry trees. At the initial stages foreign experts will be requested and the silkworm culture station is to be the center of extension and research.

Rural Education

In Thailand, the sons of the farmers have been taken from school at an early age to help on the farms. These boys should have stayed longer and received more training particularly for the farm practice. The idea of 4H clubs, which are playing an important role in the education of the rural youth in the West, will be considered. The existing cooperative organization activities should be expanded. These cooperative associations

would be a great help in the expansion of the rural youth education. The idea of having training extension schools for the farmers to give them some practical training is also worthwhile.

Rice Extension

A steady expansion of rice production has been one of the main targets for improvement of Thailand agriculture. More emphasis should be put on the extension work connected with rice production. Various methods such as suggestion, persuasion, demonstration, and supporting assistance to the farmers must be employed. The main problem lies in the fact that agricultural officers have to do regular office work in the province and district, having little time for technical field operations. In solving this problem, a large number of extension workers should be engaged to perform technical duties as distinct from administrative ones. The mobile units are needed to send these extension workers to the fields. The principle of extension work will be altered with greater emphasis on demonstration, since distribution of publications would not be effective. The mobile units should have vehicles and equipment necessary for extension operation and also seed for distribution to the farmers. In facilitating the task, the farmers should be encouraged to organize voluntary farmers' groups for the purpose of extensive work and seed distribution.

Fishery Extension

Fish is the main diet of Thai people. Something should be done to expand the fish industry. The fishery extension, which aims to encourage people to raise fish, build fish dams and improve fish habitats, has to be carried on extensively. In achieving this goal, the Fishery Department should expand fish breeding in irrigation tanks and canals, and build fish dams in public waters. There should be coordination with the work of community development in encouraging the people to build fish ponds. It is anticipated that fish in natural waters will be depleted in the near future. Steps should be taken to promote fish culture to such a wide extent that the fish raised would be enough for future consumption.

Problem of Agricultural Extension in Thailand

The crucial problem of agricultural extension development in Thailand is the lack of qualified and sufficient extension workers. In the western world, for example in the U.S.A., the Land-Grant-College system is playing an important role in developing the American agriculture. In Thailand, we have one agriculture college, Kasetsart University, with the number of annual graduates about two hundred. The concentration should be put more on improving the quality of instruction by adding more staff; on providing more adequate classrooms, laboratories and student quarters; and especially on adding facilities for instruction and experience in applied crop and animal husbandry at field stations in both the Bangkok area and at selected up-country locations.

The agricultural extension course should be added to the curriculum of the University. There should be an agricultural extension staff to provide the technical instruction needed for effective extension service and further practical training under actual farming conditions to prospective extension officers.

The number of agricultural vocational schools is still not sufficient. The agricultural curriculum in these agricultural vocational schools should be strengthened. These vocational schools would be the place for training agricultural extension workers.

The problem of transportation of extension workers is also an important one. There must be adequate provision for the local transport of extension workers, so that they can be on regular duty tour. Probably in many districts bicycles or motor-scooters would serve the transportation needs, but in most districts it would be desirable to assign a jeep to the extension office.

The Thai government should spend more money in the field of agricultural extension services. In the past, only a small part of the budget has been allocated to the development of agricultural extension services. The lack of funds has also been a big obstacle to the expansion of these services to the farmers.

CONCLUSIONS

The previous section has suggested some areas where agricultural extension could be most effective by outlining some agricultural extension projects for the development of Thailand agriculture. The solutions to the problems of agricultural extension services are also given.

In actual fact, agricultural extension work in Southeast Asia is still in the primary stage. The lack of extension workers is an important problem. For the further development of agricultural extension work in Southeast Asia, international cooperation is required in order to provide technical advice and financial assistance as well as inspiration. Training of agricultural extension workers is also an important factor contributing to the success of the extension work.

BIBLIOGRAPHY

- Abell, H.D., "The Farm Family in Canada", Economic Annalist, June, 1959.
- Anuman, Radhaton, The Life of the Farmer, In Thai Language, Translated by William J. Gedney, Bangkok, 1951.
- Baker, H.R., "Research in Extension, Present and Future", Agricultural Institute Review, October, 1960..
- Baker, W.B., and Solomon, D.D., "The Role of Agricultural Extension in Comprehensive Resource Development", Resource for Tomorrow Conference Paper, Vol. 1., Ottawa, Queen's Printers, 1961.
- Bauer and Yamey, The Economics of the Underdeveloped Countries, Cambridge, James Nisbet and Co., 1959.
- Beers, H.W., "Program Evaluation in India", Rural Sociology Review, December 1960.
- Belshaw, H., Agricultural Credit in Economically Underdeveloped Countries, FAO, Rome, 1956.
- Brown, E.J., and Beekens, "Roles of the Extension Specialist", Rural Sociology Review, October, 1960.
- Carpenter, G.A., "Developing Educational Work in Agricultural Policy", Journal of Farm Economics, Vol. 35, 1953.
- Chang, C.W., "Agricultural Extension in Asia", International Rice Commission, Newsletter, Vol. VII, No. 1, 1958.
- Chang, C.W., "Impressions of Agricultural Work in the U.S.A.", International Rice Commission, Newsletter, Vol. VII, No. 2., 1958.
- Chang, H.T., "Land Reform and Other Factors Contributing to Rice Production Increase in Taiwan", International Rice Commission, Newsletter, Vol. VI, No. 3, 1957.
- Chanleka, K., A Study of the Economy of a Rice Growing Village in Central Thailand, Bangkok, Ministry of Agriculture, 1955.
- Dobby, E.H.G., Southeast Asia, London, University of London Press, 1951.

- Emery, F.E., and Oeser, O.A., Information, Decision and Action, Victoria, Melbourne University Press, 1958.
- Food and Agriculture Organization, The 1953 Yearbook, Vol. 7.
- Food and Agriculture Organization, F.A.O. Annual Report 1960, FAO/UNKRA Mission, "Rehabilitation and Development of Agriculture, Forestry and Fishery in South Korea", 1954.
- Gould, J.S., "Estimates of Gross National Product and Net National Income of Thailand, 1938-39, 1946, 1947 and 1948". Mimeo, Bangkok, January 1950.
- Hadley, N.S., "Evaluation of Extension Methods Used in Farm and Home Development in the Midwest", Journal of Farm Economics, Vol. 37, 1955.
- Hardin, D.M. Freedom in Agricultural Education, Chicago, The University of Chicago Press, 1955.
- Harrison, B., Southeast Asia, London: Macmillan and Co., 1954.
- Heady, E.O., "Adaptation of Extension and Auxilliary Aids to the Basic Economic Program of Agriculture", Journal of Farm Economics, Vol. 39, 1957.
- How, R.B., "Extension Opportunities in Marketing", Canadian Journal of Agricultural Economics, Vol. IX, 1961.
- International Agricultural Study Center, Handbook on Method of Agricultural Extension, Wageningen University, Holland, 1953.
- Kelsey, L.D., and D.D. Hearne, Cooperative Extension Work, Ithaca, Comstock Publishing Co., 1949.
- Khan, T.M., "Consumption Patterns in Underdeveloped Countries", Dissertation Abstract, Ann Arbor, Michigan, Vol. XXI, No. 12, 1961.
- Leake, A.H., The Means and Methods of Agricultural Education, Boston and New York, Houghton Mifflin Co., 1915.
- Martin, A.B., "What Kinds of Economic Information Do Farmers Want", Journal of Farm Economics, Vol. IX, 1961.
- Mosher, A.T., Inter-relationships Among Agricultural Development, Social Organization and Personnel Attitudes and Values, New York, Council of Social Work, 1959.

- Nielson, J., "Evaluation of Extension Methods in Farm and Home Development, Journal of Farm Economics, Vol. 37, 1955.
- Nuffield Foundation, Farming Advisory Service in North America, London, 1956.
- Nuffield Foundation, Agricultural Advisory Services in Europe and North America, Paris, 1961.
- Organization for European Economic Corporation, The Written Words in Agricultural Advisory Work, 1959.
- Phipps, L.J., Handbook on Teaching Vocational Agriculture, Illinois, Interstate Printing Co., 1952.
- Pringle, Richard, "Report on Co-op in Thailand", (U.S. Special Technical and Economic Mission to Thailand), Mimeo, Bangkok, 1951.
- Putnam, P.L., "Evaluation of Extension Methods Employed in Farm and Home Development in Northeast", Journal of Farm Economics, Vol. 37, 1955.
- Ratchford, C.B., "Improving Agricultural Economic Extension", Journal of Farm Economics, Vol. 36, 1954.
- Sanitwonyse, Yai S., An Outline of Rice Cultivation in Siam, (Thailand, Ministry of Agriculture), Bangkok, 1911.
- Smith, C.B., "Development of Agricultural Extension Work", Journal of Farm Economics, Vol. 23, 1931.
- Thailand, Ministry of Agriculture, Annual Report for the Year 1950 to the FAO of U.N., Bangkok, 1950.
- Wertz, V.R., "Economic Information in Farm Management", Journal of Farm Economics, Vol. 21, 1939.
- Williams, M.S., "Evaluation of Extension Methods Employed in Farm and Home Development in the South", Journal of Farm Economics, Vol. 37, 1955.
- Wittich, W.A., Audio-Visual Materials: Their Nature and Use, New York, Harper & Brothers Printers, New York, 1962.
- Zimmerman, D.D., Siam, Rural Economic Survey, 1930-31, Bangkok, Bangkok Times Press Ltd., 1931.