A STUDY OF THE APPLICATION OF A SELECTED EVALUATION METHODOLOGY IN AN EXTENSION SETTING

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BY
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Abstract

The purpose of this study was to select an appropriate evaluation methodology for application in the Fisheries Extension Program in Thailand, so that the methodology could be used by the Department of Fisheries, Thailand, to improve Training Program. The review of related literature provides various perspectives of and approaches to evaluation in both formal educational programs and extension education.

The Responsive Evaluation Model was selected for implementation, procedures included audience identification, concern and issues identification, and the establishing of standards. Qualitative data were gathered through classroom observation, interviews, open-ended questionnaires, and analysis of government documents. Data were compared with standards, and summary was presented in terms of various suggestions for program improvement.

Recommendations based on the implementation of the Responsive Evaluation Model were made, including recommendation for the further study of extension program evaluation and for improvements in the Artificial Fish Breeding Training Program.

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CHAPTER I

Background to the Study

Introduction

This study explored various approaches to the evaluation of extension programs, with a view toward selecting an appropriate methodology for application in the field. The study took place in Thailand, where a Department of Fisheries Extension Program in fish farming was evaluated in a number of settings using a particular methodology. The selection and application of an appropriate evaluation methodology is of assistance to the Department of Fisheries, in that it provides it with a way to determine the merit and worth of its extension programs, in terms of efficiency and effectiveness.

The Setting

Fisheries are one of the major renewable natural resources in Thailand. There are three categories of fishery: marine fishery, brackishwater fishery, and freshwater fishery. The Department of Fisheries is the principal government agency charged with supporting the development of aquaculture throughout the country (Kamolratana, 1985). The Department of Fisheries Report (1988) reviewed both traditional and strategic activities in fisheries extension. The focus was on future fish supply, through the promotion of aquaculture

to offset declining yield in the harvesting of wild fish stocks, thus preventing rapid decline of wild fish stocks through conservation measures.

According to the Department of Fisheries Report (1988), the Fisheries Extension Services was seen as a means of government endeavor to (a) educate interested individuals in aquaculture techniques, and (b) provide necessary inputs such as seed fish, fish farming implements on a loan basis, and low interest loans. In response to a fish disease outbreak in the fish farms over the past ten years, the Department of Fisheries has also provided assistance to compensate for fish losses. In addition the Fisheries Extension Services has had to provide increased training and assistance to meet the information needs of fishermen who were trying to re-establish fish farms.

Department of Fisheries Extension Work Plan

The Department of Fisheries (1989) set its policy in accordance with the Sixth National Economic and Social Development Plan (1987-1991). The main thrust of the policy is to increase fisheries products, including marine, brackish-water, and freshwater fish products, so that people's dietary demands can be met. To achieve its goals, the Department of Fisheries categorizes the policy plan and procedures as follows:

1. Fisheries knowledge;

2. Fisheries development;

3. Fisheries extension

The purpose of the fisheries extension plan is to assist farmers in knowing and understanding Departmental activities so that they understand the concept of fisheries conservation and so that they apply the right methods and techniques in fish farming. The thrust is to provide advice and assistance in increasing fishery products and aquacultural income.

According to the Department of Fisheries Report (1988) the detailed work plan of the Fisheries Extension Division includes responsibility for:

1. Evolving policies and plans to be implemented throughout the Department of Fisheries.

2. Producing audio-visual support materials for dissemination of knowledge on aquaculture and fish conservation.

3. Preparing annual budget for all fisheries extension activities.

4. Acting as intermediaries between fisheries technocrats and farmers.

5. Planning of farmer training in cooperation with provincial fisheries officials and local fisheries stations.

6. Promoting understanding between employees of the Department of Fisheries and people external to the department.

While much of the fisheries extension work does not

include direct involvement with the farmers/fishermen, the Training and Dissemination Section of Fisheries Extension Services does undertake direct field work. This section is responsible for planning training for the farmers, arrangement of the training courses, and preparation of the training curriculum. It has three subsections: training planning, demonstration, and mobile training (Department of Fisheries, 1988).

Fisheries Extension Evaluation

Von Blanckenburg (1984) reports that most extension services neither evaluate their work systematically, nor see the urgent need for evaluation activity. Program monitoring, a precursor to evaluation, is however used in extension work in many countries. The Thailand Department of Fisheries charges the Extension Planning Section with the responsibility for monitoring and evaluation of program activities. The main thrust of monitoring and evaluation activity is the preparation of annual reports on fish stocks and fish yields, rather than comprehensive evaluation of training programs as usually undertaken in educational contexts.

Design of the Study

The evaluation study undertaken as part of this thesis involved the selection of an appropriate evaluation methodology for trial in the Fisheries Extension Services Aquaculture Program in rural Thailand. An evaluation plan was devised, and it was implemented over three-month period with seven groups, including one pilot group, in various rural locations. The approach was qualitative and emergent, in accordance with guidelines delineated by Guba and Lincoln (1981), Stake (1975), and other program evaluation experts.

Significance of the Study

Poostchi (1986) states that Fisheries Extension Services are part of extension education. While extension education has its origins in aquaculture, broad objectives are the same whether the activities of extension programs lie in the areas of health, sanitation, aquaculture, forestry, or family planning. All extension programs, according to Poostchi (1986), have the goal of teaching and helping people to acquire knowledge and of inspiring them to take action.

Given that services have similar goals and broad objectives across program areas, it is evident that evaluation methodologies may have broad application. An evaluation methodology deemed appropriate for use in the fisheries

extension program may well be suited to programs in health, forestry and the like. The establishment of an appropriate approach to evaluation in the Department of Fisheries Extension Program, Thailand, then, could (a) help those in other extension areas understand the importance of evaluation to their work, and (b) provide them with a methodology which may, with little adaptation, prove appropriate to their settings.

Definition of Terms

For the purposes of this study, these terms were defined as follows:

Extension Education. "A system and process of service and education designed to meet the needs of people whether in urban or rural areas" (Poostchi, 1986, p. 457).

Extension Work. "An ongoing process of getting useful information to people (the communication dimension) and then in assisting those people to acquire the necessary knowledge, skills, and attitudes to utilize effectively this information or technology (the educational dimension)" (Swanson & Claar, 1984, p. 1).

Extension Methodology. "A means of creating desire for change, following an established pattern" (Juntarashote & Daosukho, 1986, p. 69).

Fisheries Extension. "An informal method of education ... working for the improvement of fishing techniques and

contributing toward raising the standard of living of the fishing family as a whole" (Juntarashote & Daosukho, 1986, p. 37).

Evaluation. "... the determination of the worth of a thing. It includes obtaining information for use in judging the worth of a program, product, procedure, or objective, or the potential utility of alternative approaches designed to attain objectives" (Worthen & Sanders, 1973, p. 19).

Evaluation Methodology. The appropriate procedures applied in doing an evaluation, based on the standards of utility, feasibility, propriety, and accuracy as delineated in the report of the Joint Committee on Evaluation Standards (1981).

Extension Evaluation. "A continuous and systematic process of assessing the value or potential of extension programs" (Seepersad & Henderson, 1984, p. 184).

Organization of the Study

The study is reported in five chapters. Chapter I has described the purpose of the study and provided background information on Fisheries Extension Services in Thailand.

Chapter II presents a review of the literature on program evaluation from an historical perspective, describes various approaches to evaluation of educational programs, traces the development of extension education in international settings,

and describes past and current approaches to evaluation of extension programs.

Chapter III describes the procedures of the study, the program which was evaluated, and the methodology to be applied.

Chapter IV presents a description of the implementation of the evaluation model, an analysis of the data in descriptive terms, and applies criteria and standards to the summarized data.

Chapter V presents a summary of the study, draws conclusions regarding the evaluation of extension programs, and makes recommendations regarding the future application of the particular evaluation methodology to extension education.

CHAPTER II

Review of Related Literature

Introduction

The purpose of this chapter is to trace the development of extension education in the international setting, to compare the similarities and differences of extension activities in many countries, and to provide a picture of how extension programs are operated. Various approaches to evaluation of extension programs are presented, from the past to the present day.

The historical development of program evaluation, which has a prominent role in educational evaluation, is reviewed. The review of the literature on program evaluation traces the various perspectives of evaluation from the past until the present time. Various approaches to evaluation in educational programs are examined, with a view toward understanding evaluation methodologies that may be applied in appropriate ways to produce effective evaluations.

Extension Education

Extension education is one of the largest problem-solving educational systems of the world. Mahmood (1988) states that it has become a powerful instrument of change through the socio-economic transformation of rural people, based on the

introduction of scientific and technological innovations.

Extension education can be defined in several ways, but however defined it has the same fundamental concept of improving people's knowledge, whether in urban or rural areas. Common definitions include:

> 1. Extension education is a behavioral science following a continuous, persuasive and discriminating educational process. It aims at affecting the behavioral components of people in a desired direction through conviction, communication and diffusion by its proven methods. Principles and philosophy [result] in learning involvement of both client and agent system.
>
> 2. Agriculture extension is a service or system which assists farm people through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their level of living and lifting the social and educational standards of rural people.
>
> 3. Extension education is defined as an educational process to provide knowledge to the rural people about improved practices in a convincing manner and to help them make decisions within their specific local conditions.
>
> 4. Extension is a continuous process designed to make the rural people aware of their problems and indicating to them the ways and means by which they can solve them. It involves not only the education of rural people in determining their problems and methods of solving them, but also inspiring them towards positive actions in achieving them.
>
> 5. Extension education is an applied science, consisting of content derived from research, accumulated field experience and relevant principles drawn from the behavioral sciences, synthesized with useful technology in a body of philosophy, principles, content and methods focused on the problems of out-of-school education for adults and youths.
>
> 6. Extension education is an applied behavioral science, the knowledge of which is to be applied for

> desirable change in the behavioral complex of the people. (Mahmood, 1988, p. 7)

Sompong (1987) notes that extension is an informal educational system designed to change knowledge, attitude and skills of target groups by encouraging and promoting innovation adaption for effective utilization in appropriate areas. The advantage is to help the target groups to improve their standard of living. Oakley and Garforth (1985) note that extension is an information or educational process directed to the rural population, providing advice and information to help them to solve their problems.

The philosophy of extension, stated by Julakasewe (1988) is making rural people healthy and happy through educational and socio-economic development, including teaching them to learn how to be as self-sufficient as possible. Moreover, according to the concept of extension defined by the Thailand Department of Fisheries (1986), extension education should be modified from the spreading of new knowledge, attitude, beliefs, and style of actions to sharing or making common appropriate information and effective actions among the farmers, community influentials and extension officers through strong interaction. Smitho (1986) notes that an extension system teaches people to know how to improve their living by using their ability, resources, power and raw materials with the least help from government.

In accordance with the main objectives of extension

education Poostchi (1986) notes that extension can become the main influence in rural areas, especially agricultural areas. Oakley and Garforth (1985) provide the rationale that the majority of the people of the world live in rural areas in developing countries--Asia, Africa and Latin America--they make their livelihoods in agriculture. Most of them are also still poor and dependent on agricultural practices with little modern technology. Therefore extension, as a process of working with rural people in order to improve their livelihood, is the link between improved practice developed through research, and its diffusion for application by the mass of the agricultural population (UNESCO, 1966).

Although extension, adaption and diffusion research had their origins in agriculture, Poostchi (1986) notes that the results describe a universal phenomenon. Extension education shares common goals and objectives, whether their activities are in the areas of health, sanitation, agriculture, forestry, water supply, family planning, or home making. There are four principal premises of agricultural extension as follows:

> 1. Self-sufficiency encourages farmers to operate their work in order to reach independence.
>
> 2. Working as a group in co-operative agricultures encourages farmers to gain advantages from and for their community.
>
> 3. Self-learning is self-fulfilling in that it can bring about change or human development.
>
> 4. Agricultural extension is achieved through voluntary participation. (Sompong, 1987, p. 2)

Agricultural extension is organized in different ways in order to accomplish a broad set of objectives (Swanson & Claar, 1984). However it often relies on the primary objective of increasing the efficiency of the farm and farm incomes, thereby improving the quality of life of the farming community (Ghose, 1982).

According to Jones (1967), agricultural extension is primarily concerned with improving the well-being of rural people. Its activities are performed in rural areas. They include communication and education, acting as an agent of change, and acting as a go-between. Since agricultural extension is providing suitable information and advice, it can regard its role as educational. Furthermore, agricultural advisors are change agents because they are the communicators of new ideas and information for farmers. Agricultural extension acts as a go-between creating interaction among the knowledge, the political and socio-economic systems of a society, and the individual farmer and his local community.

Historical Development of Extension

Extension has had a long history, dating back to the movement in education to apply science to the practical affairs of man in the 17th century. However efforts did not become formalized until 1873, when the University of Cambridge first instituted extension activities (Smitho, 1986). Swanson

and Claar (1984) note that this was the first actual use of the term "extension" within a system of university extension education. "It came, indeed, as an educational innovation--a discovery" (Prasad, 1982, p. 39). In describing this particular educational innovation, Swanson and Claar (1984) note that university extension education has as its objective the provision of the educational advantages of universities to ordinary people. This new notion was brought to other countries in Europe and North America over the past century (Smitho, 1986).

Swanson and Claar (1984) note that the system of university extension education developed in England was introduced through city libraries in the United States, especially in Buffalo, Chicago and St. Louis. Prasad (1982) writes that the United States had the distinction of developing a system that included extension education as one of the applied social sciences. For example, the American Society for the Extension of University Teaching was established in 1890. In 1891 the state of New York appropriated $10,000 for university extension, and in 1892 the Universities of Chicago and Wisconsin began organizing university extension programs (Swanson & Claar, 1984). There was much expansion during this period and the Land Grant Colleges were influenced by this movement. Through the land-grant university system, the Organization for Economic Co-operation and Development (OECD) notes that extension became a nationwide system funded and guided by a

partnership of federal, state, and local government in order to assist people to help themselves (1981). As a consequence there were 42 colleges in 39 states involved in extension activities, and some of them established departments of agricultural extension. By 1910, 35 colleges had their own agricultural extension departments, and over the next four years these programs grew rapidly in both scope and complexity (Swanson & Claar, 1984, p. 5).

Smitho (1986) notes the reasons why the United States had such great success in agricultural extension work:

1. The extension plan was developed from farmers with their co-operation. This is better than operating from a government level only. Also, it provides the opportunity for farmers to become involved in planning, managing projects and administering their extension programs.

2. Because the function of extension education is the responsibility of the administrators of university departments, it has the advantage of being supported by agricultural research work and other support services available in the university system.

3. Extension work is financially supported by formal agreements of federal, state, and local governments.

Swanson and Claar (1984) state that developments in Europe, Australia, New Zealand and Canada tend to parallel events in the United States, although their extension organizations developed somewhat differently. Because of the great

demands for extension services from the agricultural community, demands which could not be met, extension activities were organized in very few areas. Several of the Europe an extension systems included a co-operative dimension that provided support at both the national and local levels, especially through farm organizations.

World War II brought to world attention a large number of nations in Asia, the Pacific, Africa, and Central America, which were less developed or developing, and which became known as part of the third World (Roy, 1982). Swanson and Claar (1984) note that the majority of international agricultural extension organizations began working in Latin America and the Caribbean in the mid-1950s. Similarly these organizations became involved in extension work in African nations during 1960s and in Asia and Oceania in the 1970s.

UNESCO (1982) notes that agricultural extension service plays a very important role in rural development and community development. Therefore the priorities of agricultural extension services, which favor the rural poor, are very related to community development. According to Garforth (1982), the redefinition of rural development priorities has coincided with the concepts, philosophy, and effectiveness of traditional extension strategies and methods. Obviously this has meant that much of the effort has been devoted to agricultural extension, focusing on the small farmer and landless rural households.

Holdcroft (1982) notes that experiences which influence community development derive from adult education, community services and social welfare programmes in the United States and the United Kingdom. In the United States, these activities include the community services components of state agricultural extension services. Thus, it may be considered that the contributions to third world development from agricultural extension services and community development complement each other, having the same purpose of helping developing countries attain a better standard of living.

"The community development movement blossomed in the developing world during the decade of the 1950s. By 1960 over sixty nations in Asia, Africa, and Latin America had launched national or regional community development programmes" (Holdcroft, 1982, p. 214). During the early years of the twentieth century in the United States and developing countries, extension services attempted to motivate farmers to take advantage of available information, and to inspire them by using successful demonstration approaches (Rice, 1974). Rice notes that the United States overseas extension programmes in countries used the same approaches, however these approaches were not suited to the local settings in which they were implemented. As a result development moved more slowly than had been anticipated.

Chang (1963) notes that extension can be done through government development as in most countries, by farmers'

associations as in the case of Taiwan and China, or by farmers' organizations with government help as in Japan. In any event, the government cannot avoid the responsibility of providing extension services that can bring an adequate standard of development to the entire country. Chang suggests three different types of extension organizations currently operating in Asian countries:

1. **A divided type:** This type of organization is found mostly in Asian countries, in which each technical department has its own extension service.

2. **A consolidated type:** This type is found in Japan, in which all agricultural extension is consolidated under one administrator, with the exception of forestry, fisheries and sericulture.

3. **A unified type:** This type is found in the Philippines and the Republic of Korea. The extension organization is concerned with all technical information for crops, livestock, fisheries, sericulture and forestry.

"Most countries of the world provide special programmes and extension assistance to farmers" (Blackburn, Brinkman & Driver, 1982, p. 171). El Ghonemy (1984) writes that the ratio between extension workers and farmers has been extremely large in most developing countries. Therefore, the policies and programmes of agricultural extension and training in those countries have as a major focus small farmers and their families. El Ghonemy states,

> ... Asia and the Pacific Region, Bangladesh and Sri Lanka have a strong policy on reorganizing their agricultural extension services to reach more effectively the majority of small producers. Indonesia and Thailand have adopted the policy of experimenting in large areas [with] the participatory approach in agricultural extension. (p. 41)

Roy (1982) analyzed the developing world's extension systems (see Figure 1). Extension services represents,

> ... a 'downward' diffusion of technical innovations to a separate Department of Agriculture and perhaps a community (or local) Development Department, through their own state, district or sub-district layers, to a multipurpose or agricultural extension agent to the opinion or formal leaders of a village. (p. 73)

According to the World Bank (1985), the features of national extension systems are involvement of field-level extension personnel in informal education for the purposes of technology transfer. In India, village extension workers serve multipurpose tasks within the Community Development Program. In Kenya, Nigeria, and Turkey, agricultural extension workers are in charge of developing and running media campaigns to motivate farmers to use technological innovations. In Brazil, Morocco, and Thailand, centralized administration controls and defines the roles of extension personnel.

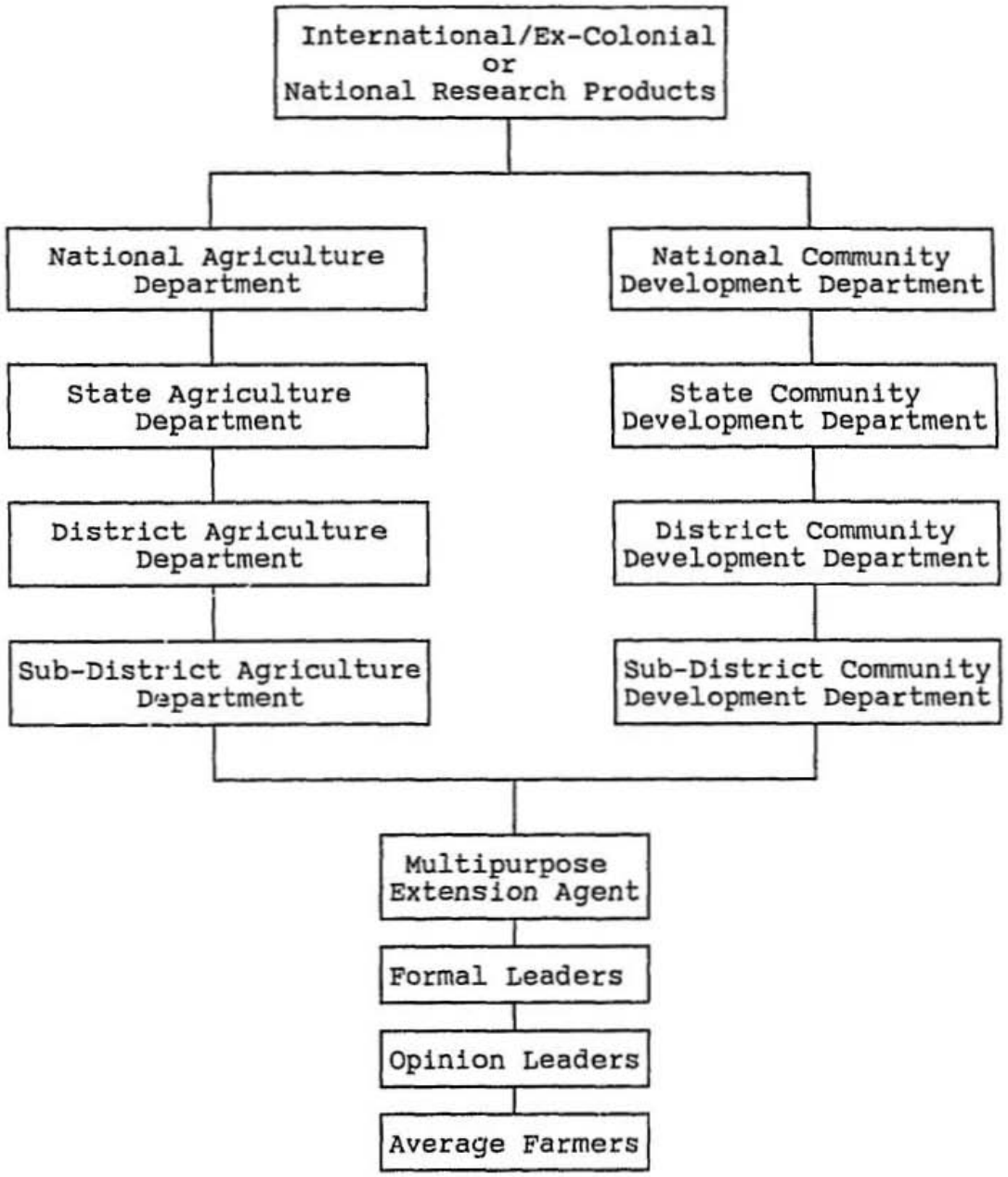

Figure 1 Typical structure of the extension system in developing countries (Roy, 1982, p. 74).

International Development of Extension Education

Extension System in India

"India had more well-documented experience about reconstruction and community development than any other single country in the world ... this served as a prototype for national programmes in other Asian countries" (Holdcroft, 1982, p. 210). The Community Development Programme was started in India in 1952 (Holdcroft, 1982). One year later, the National Extension Service adopted the same goals and programs as the Community Development Programme (Axinn & Thorat, 1972). Axinn and Thorat (1972) define a series of stages of development administration:

1. a pre-extension stage of three years;
2. a national extension service stage of three years;
3. a community development stage (an intensive phase) of three years; and
4. a post-intensive stage. (p. 25)

Von Blanckenburg (1984) notes that the organization of the agricultural knowledge system in India differs from other African and Asian countries. The reason is that the agricultural universities are in charge of most of the agricultural research, and these universities also have some extension activities of their own. For example, in Punjab and Haryana the agricultural universities have their own extension work,

which contributes to communication between both research and extension functions. Thus the majority of extension work that the state Department of Agriculture carries on seems to be as coordinator and cooperator. It might be considered that India has adapted its own form of extension service, influenced by the Land Grant University system. UNESCO (1982) notes that,

> At present, most countries have some form of extension service or other, greatly influenced by the American extension system. India has made its own contribution by adopting and advocating the "community development" type of extension service, which is presumably most suited to the developing nations. (p. 39)

Extension System in Taiwan

"Taiwan is one of the developing countries where agricultural productivity is increasing rapidly ... one major reason is that they have an effective linkage system between the agricultural research centres and the farmers" (Lionberger & Chang, 1982, p. 155). In examining the historical background of Taiwan, the influences that Taiwan experienced from the Japanese occupation can be seen in its well-developed agricultural productivity. According to Axinn and Thorat (1972) during the Japanese occupation of Taiwan, the farmers' associations were established in 1900. These were appointed by the Japanese in order to control the agricultural economy of Taiwan. These associations carried out agricultural extension. After Taiwan reverted to Chinese rules, "agricul-

tural extension was then carried out by various organizations, including the government, the farmers' associations, various trade bureaus, and the Joint Commission on Rural Reconstruction (JCRR)" (Axinn & Thorat, 1972, p. 74-75).

The role of JCRR was to established a pattern of methodologies and philosophy for reconstructing the agriculture of China. In 1955, a coordinated extension service was introduced by the JCRR. Extension agencies were composed of single crop organizations such as the Provincial Food Bureau, the Taiwan Sugar Cooperative, and the Taiwan Wine and Tobacco Monopoly Bureau. "In 1955 the JCRR introduced a coordinated extension education program that was designed through a single channel, to provide the farmers with practical information on a variety of subjects related to farming" (Axinn & Thorat, 1972, p. 75).

Von Blanckenburg (1984) analyzed the extension system in Taiwan and notes that "Taiwan has a dual extension system" (p. 19). First, a government service has a number of Agricultural Improvement Stations that work mainly in demonstration, showing farmers new developments in production and new techniques. Second, extension work is primarily done through the farmers' associations. They have as their main objective improving the situation of the farming population and developing the rural economy. The main concern of extension work is increasing agricultural production and implementing government food programmes (Lionberger & Chang, 1982). Also, their work

is directed to farmer education and helping farmers to learn how to use their farm resources.

Axinn and Thorat (1972) summarize the merits of the extension education system in Taiwan:

> Significant observations about extension work in Taiwan are: (1) that the most used and most influential branch of the extension services is one that farmers assume responsibility for through their own farmers' association; (2) that the high level of achievement has been accomplished by the use of extension advisors; and (3) farmers normally took the initiative in obtaining information from extension advisors, rather than waiting for it to be brought to them. (p. 87)

Lionberger and Chang (1968) conclude that "the Taiwan farmer has reached a level of sophistication and individual initiative not characteristic of farmers in all developing countries of the world today" (p. 80).

Extension System in Japan

The productivity of Japanese agriculture, following the typical pattern of small landholding in Asian countries, makes Japan an interesting agricultural extension study. Axinn and Thorat (1972) suggest that Japan's agricultural development should be good model for other non-Western countries. "A good deal of credit for the high agricultural productivity of Japan goes to the extension service, in the various stages of its development" (p. 47).

According to Axinn and Thorat (1972), the official extension system in Japan was started in 1893. The agricul-

tural extension work was conducted by prefectural agricultural experiment stations. In 1901, the Imperial Agricultural Asscciation was founded in order to advise the farmers on the improvement of crops and livestock. After World War II, the goals of the extension organization was changed from regimentation to education. The organization of the extension education service shows that there is an Extension Division in the Agricultural Administration Bureau of the Ministry of Agriculture and Forestry. "The Extension Division is Subdivided into an Extension and Education Section and a Home Improvement Section" (Axinn & Thorat, 1972, p. 54).

One of the important features of the extension services in Japan is the farm youth training program established around 1931. "The program is designed to develop the total personality of the youth and to impart technical agricultural information" (Axinn & Thorat, 1972, p. 57). Axinn and Thorat (1972) conclude that "Japanese governments have used various approaches ranging from the agricultural correspondence systems to the provision of guidance sections in the cooperatives as a part of their extension education systems" (p. 59).

Extension System in Thailand

Thailand carries out the unified type of extension service defined by FAO (Chang, 1963). In addition, some extension work can be analyzed as non-governmental community-based programs, combining planning services with primary

health care through volunteer workers (Burintratikul & Samaniego, 1978).

The major objective of extension work in Thailand is the same as in that of other developing countries, emphasizing effective extension services to farmers. Since agriculture in Thailand is regarded as a fundamental source of the national economy (Department of Agricultural Extension, 1985), the Ministry of Agriculture and Cooperatives is the organization directly concerned with the farmers in the process of national agricultural development, including several programs on on-farm irrigation, expansion of agricultural credit, improvement of extension delivery system, and creation of marketing facilities for crop, livestock, fishery and forestry production.

Thailand is currently in the stage of the Sixth National Development Plan (1986-1991), which aims at consolidating Thailand's strengths in agriculture, and natural and human resources. Emphasis is on improving existing production processes, technologies and marketing (CIDA, 1986-1990). To implement the Sixth National Development Plan, the Ministry of Agriculture and Cooperatives (1985) has developed an operational plan as follows:

> 1. To promote extension activities suitable to specific target population to meet the production targets set forth by the Sixth National Economic and Social Development plan. This can be done by means of promoting utilization of appropriate information and technology which would help farmers reduce production costs, respond to marketing

demand, and control quality of the product.

2. To motivate the population to establish organizations of the farmers, home economic, and youth groups as a means of achieving the country's agricultural development plan.

3. To select contact farmers, in addition to farmer leaders, to manage functions of technology transfer.

4. To participate in development committees of village council together with other development agencies.

5. To support the royal-initiated agricultural development projects.

6. To employ all possible means of extension farm information and techniques to reach ultimate users: effective communication channels and methods, audio-visuals aids, field trials, and demonstration plots. (p. 14)

The extension methodology chosen in Thailand is the same as in India (World Bank, 1985). However, Thailand has access to less manpower to implement extension work than has India. The World Bank (1985) notes that Thai extension officials have faced severe budgetary cuts, thus they are unable to substantially increase the number of extension workers. Therefore the same communication-oriented extension approach used in India has been modified for use in Thailand, in order to place more emphasis on communication equipment, rather than on manpower (World Bank, 1985).

Extension Evaluation

"Extension and evaluation both center on getting useful information to people" (Patton, 1983, p. 14). Extension provides information for improving farm productivity, nutrition and the quality of life. As Patton (1983) notes, evaluation provides information aimed at improving programs and assuring accountability. According to Poostchi (1986), evaluation performs the role, in extension work, of determining the progress of extension activity and whether or not the extension program has achieved the desired objectives. He lists the reasons that evaluation is necessary to extension work:

> 1. It shows to what extent specific objectives are being attained.
>
> 2. It provides accurate data on rural situations necessary for planning.
>
> 3. It improves and acts as a check on particular teaching techniques.
>
> 4. It shows that the programme is of value and can provide an appreciation and understanding to leaders and cooperators of what has been accomplished. (p.473)

Oakley and Garforth (1985) sees evaluation as the final stage of extension program planning:

1. Analyze the present situation,
2. Set objectives for the extension programme,
3. Develop the program by identifying what needs to be

done to reach the objective of achievement and then prepare a work plan,

4. Implement the program by putting the work plan into effect,

5. Evaluate the programme and its achievement as a basis for planning future programmes.

Andrews (1983) sees the potential for a more extensive role for the evaluation of extension programs:

1. **Program development:** Evaluation will clarify needs and identify learning styles for better, more relevant programs.

2. **Organizational management:** Normally, extension management decisions are based on informal evaluation processes using personal perceptions rather than evidence from analyzed data.

3. **Public relations:** The results of program evaluation can be used for public relation objectives--how individuals or groups derive benefits from extension programs--reinforcing and engendering support for extension service.

Patton (1983) describes the role of evaluation in extension. Effective extension work and effective evaluation both include attention to the real information needs of target groups. Both are research-based, providing valid information for decision-making. Furthermore both evaluation and extension share the basic principles or standards of utility, feasibility, propriety and accuracy.

Despite the potential role of evaluation in extension as described by the above authors, in actuality much extension programming is never evaluated, and on occasions when evaluation is done, it is done in a cursory manner. In fact, until the past decade, the role of evaluation in extension was based on a very limited definition of evaluation--that of examining the results of a project without determining whether that project met its objectives (Steele, 1975). Pigg (1980) states that evaluation has evolved through at least three different phases:

1. A change in the focus of evaluation from one which was primarily on objectives, addressing the question: Does this program meet its stated objectives?
2. A focus on needs of program consumers.
3. A focus on "impact evaluations."

Pigg (1980) refers to a more recent focus on "Consequence," as interests of the evaluation audience go beyond mere impacts.

The procedures used in evaluating extension programmes are very varied, depending on the nature, scope and complexity of the programmes and the resources available for conducting the evaluations (Seepersad & Henderson, 1984). Seepersad and Henderson (1984) identify common steps in evaluating extension programmes as follows:

1. Develop an evaluation plan.
2. Consider the need for the evaluation.

3. List the reasons for wanting to evaluate the programme.

4. List the audiences for the evaluation report.

5. State the criteria for evaluating the programme.

6. List the resources that will be available for the evaluation.

Seepersad and Henderson (1984) note that extension evaluation is undertaken in various forms, according to the different evaluation audiences and their need to focus on different aspects of programs.

Types of Extension Evaluation

"All of us are regularly involved in evaluations of one kind or another. These evaluation efforts may be so informal they aren't even recognized, or so formalized they take a good deal of time and effort" (Heckel, 1981, p. 6). Beginning with earlier extension evaluation, Frutchy (1967) points out that there are both casual, everyday evaluations (or informal evaluations) and extensive, formal evaluation studies. "Informal evaluations are unsystematic, the criteria and evidence used in making judgment are implicit. They can, therefore, be biased and misleading. The more systematic the evaluation, the more likely will it contribute to making useful decisions about an extension programme" (Seepersad & Henderson, 1984, p. 185).

Taylor (1976) defines formative and summative evaluation.

"Formative evaluation attempts to identify and remedy shortcomings during the developmental stage of a program. Summative evaluation assesses the worth of the final version when it is offered as an alternative to other programs" (p. 355). Swanson and Claar (1984) notes that evaluation in the past placed emphasis on the summative, almost exclusively, conducted after the completion of the program in order to assess the accomplishments--whether intended objectives were achieved. However more current practice places emphasis on formative evaluation, conducted before program completion or during program implementation.

Another common approach to evaluation in extension work is program monitoring. Cernea and Tepping (1977) state that monitoring systems are designed "as a management tool to ensure the extension organization is operating efficiently, to enable management to take corrective action when necessary and to provide policy makers with appropriate information" (p. ii). Monitoring systems use village extension workers to contact and visit farmers during the operation of extension programs (Swanson & Claar, 1984). Cernea and Tepping, cited in Seepersad and Henderson (1984), comment on program monitoring as a form of evaluation:

> - On-going evaluation is an action-oriented analysis of project effects and impacts, compared to anticipations, to be carried out during implementation.
>
> - Ex-post evaluation would resume this effort several years after completion of the investment,

> to review comprehensively the experience and impact of a project as a basis for future policy formulation and project design. (p.186)

While informal evaluation activities, performed by people within the program, can provide some useful information, Seepersad and Henderson (1984) lists reasons for carrying out formal evaluations:

> 1. Formal evaluations are indispensable where accountability is an important concern.
>
> 2. Formal evaluations can serve important public relations functions.
>
> 3. Formal evaluations can contribute to the development of professional attitudes in the extension worker. (p. 186)

Grabe (1983) identifies four aspects of and approaches to the evaluation of social-development programmes or projects:

> 1. Appropriate criteria for judging programs should be that they produce results that are efficient, and that have the intended impact.
>
> 2. Evaluation may be organized as an ongoing activity during the period of implementation of a project. Thus evaluation is often organized as an ad hoc study of ongoing projects and programs.
>
> 3. The principle objective of ex-post evaluation is normally to determine the point of departure for future activities in the same field.
>
> 4. Pilot-project evaluation or experimental design evaluation is often considered as a hybrid form of ongoing and ex-post evaluation. (p. 13-14)

Program evaluation methods and approaches have been

developed to increase the efficiency of extension programs. A survey of state Extension Services in Michigan in 1981 documented program evaluation practices and needs, and a limited image of evaluation emerged. "Evaluations generally were informal, ad hoc, and less scientifically rigorous than would be needed for organization-wide decision-making or external consumption" (Andrews, 1983, p. 9). As a result, evaluation methodology is changing from the experimental model to a more flexible and practical position of doing whatever meets the needs and constraints (Logsdon, 1975). Thus the concept of evaluation as a pluralistic phenomenon, being flexible to meet different kinds of program needs and conditions is extremely widespread, resulting in the application of a variety of evaluation models.

Voth (1989), Patton (1982) and House (1980) classify evaluation methods into four general categories:

1. Comparative, Goal-based designs:
   - Experimental
   - Quasi-experimental
   - Causal systems modeling
2. Noncomparative, Goal-based designs:
   - Discrepancy evaluation model
   - Logical framework
   - Measurable objectives
   - Team of experts
3. Noncomparative, Nongoal-based designs:

- Goal-free evaluation
- Responsive evaluation
- Consumer marketing model

4. Derived designs:
   - Policy simulation
   - Cost-effectiveness and cost benefit analysis
   - Impact modeling and assessment
   - Project economic and financial analysis

Lincoln and Smith(1985) recommends qualitative methods or naturalistic and/or responsive evaluation methods for extension work:

> Extension faculty have been using qualitative methods in their work for many years. In discussions with farmers ranchers, homemakers, volunteers, subject-matter specialists, and others, faculty have relied on questioning and observation to help them deliver better programs. To make these data-gathering techniques better serve the ends of decision making requires moving to a systematic and purposeful approach to data gathering. (p.7)

Moreover, Lincoln and Smith suggests that "two particularly appropriate situations in which to use the qualitative methods are needs assessment and for identifying unique impacts of programs" (p. 9).

Santo Pietro (1983) provides descriptions of some applications of new evaluation methodologies in extension and community development projects.

Heifer Project International (HPI) in the Philippines, with evaluation methods prepared by Armin Schmidt (1981), used

an approach consisting of four general stages: preparation; field survey; data analysis and presentation; and post-evaluation review and planning. The team used both quantitative and qualitative evidence to constitute an effective evaluation approach.

The Institute for International Development, Inc. (IIDI) evaluation, prepared by Stan Druben and Ricci Associates (1980), used methods consisting of intensive "question-and-answer sessions" between the consultants and IIDI leadership, open-ended interviews of stakeholders, a detailed questionnaire for project activities, and examination of project records.

Lutheran World Relief (LWR) used an evaluation prepared by Marilyn W. Hoskins and Fred R. Weber (1982), in Niger, Africa. It applied the principles of expert judgment, demonstrating the use of naturalistic inquiry tools, open-ended interviews, and observation within the evaluation approach. To provide standards for judgments the team used stated goals at both the level of the agency and the specific projects.

The Overseas Education Fund (OEF) (1982) used a goal-oriented approach to focus on issues of current concern to all principle stakeholders. They tried to implement an evaluation approach similar to that of the Stake Responsive model, using diverse, often naturalistic methods to gather information. However because of severe time restrictions (a

total of ten days) they were limited to only six of the twelve recommended steps, and the evaluation was carried out in only one site.

Patton (1982) provides an example of the application of utilization-focused evaluation in the Caribbean Agricultural Extension Project (CAEP), carried out in nine English-speaking Caribbean countries. The utilization-focused evaluation is aimed at "making it possible for decision- makers and information users to sup at the table of evaluation on a continuing basis, while making sure that the information they consume thereat is nourishing in accordance with their needs" (p. 98).

The changing concept of evaluation in extension programs effects not only the emergence and use of evaluation models but also the importance of criteria and standards for judgments. Poostchi (1986) lists the standards for effective evaluation methods: reliability, objectivity, validity, practicality and simplicity. Patton (1983) notes that evaluations were once considered "good" if they used carefully constructed measurement instruments. He suggests that new evaluation standards are directly relevant to extension evaluations. "Under the new standards, evaluations must still be valid and accurate, but they must also be useful, understandable, relevant and practical" (p. 17).

Worthen (1977) states that "no evaluation is complete unless it includes a thorough, detailed description of the program or phenomenon being evaluated" (p. 8). Bennett (1975)

notes "Extension program evaluation isn't an end in itself. It's worth doing only if it helps in making decisions about program continuation, priorities, modifications ..." (p. 11). Evaluation of extension programs should contribute to the decision-making priorities of extension management. In this way extension programs will eventually become more accountable.

Program Evaluation

Glaser and Becker (1972) state that "program evaluation is a systematic effort to describe the status of a system and assess the efforts of its operations" (p. 56). Its purpose is to provide data useful in making decisions on the worth of a program, such as cost-benefit or goal attainment, or to provide data for program improvement. Pigg (1980) gives six reasons for program evaluation as follows:

1. Identify the needs of clients and/or future clients.

2. Help choose among alternative program activities.

3. Improve program effectiveness or help management.

4. Demonstrate program accountability.

5. Decide whether tc begin, continue, expand, "certify," or modify a program.

6. Obtain evidence to establish support for or opposition against a program. (p. 7)

In Abramson's (1979) view, the major emphasis of program evaluation should be to judge the program outcomes value.

Historical Perspective of Program Evaluation

"Evaluation is the process of delineating, collecting, and providing information useful for judging decision alternatives" (Committee on Evaluation, Phi Delta Kappa National Study, 1971, p. 40). Worthen and Sanders (1973) note "Evaluation is the determination of the worth of a thing. It includes obtaining information for use in judging the worth of a program, product, procedure, or objective or the potential utility of alternative approaches designed to attain specified objectives" (p. 19). Even though it frequently has the single goal of determining the worth or merit of the entity being evaluated, Scriven (1973) notes that this process plays a significant role in education. "Evaluation serves to identify strengths and weakness, highlight the good and expose the faulty, but not to correct the problem" (Worthen & Sanders, 1987, p. 9).

Evaluation has had a long history. It was evident in China as early as 2000 B.C. Guba and Lincoln (1981) report that the emperor of China instituted proficiency requirements of formal tests for his public officials.

According to Travers (1983), up to the mid-1800s there was little formal evaluation in American education. Worthen

and Sanders (1987) write that in the early 1900s, Edward Lee Thorndike, who was called the father of the educational testing movement, helped persuade educators that measuring human change was worthwhile. This testing movement was well established by 1918, with individual and group tests being used in making many educational and psychological decisions. Madaus, Stufflebeam and Scriven (1983) note that by the 1950s, the practice of standardized testing had expanded broadly. In 1954, the Technical Recommendations for Psychological Tests and Diagnostic Techniques was prepared by a committee of the American Psychological Association.

Guba and Lincoln (1981) express the view that evaluation as it is used today is less than a century old, and it has evolved through a number of forms during that time. Until the mid-1930s, measurement and evaluation were regarded as nearly synonymous, and the term "evaluation" was most often used to mean the assigning of grades or summarizing of students' performance on tests (Worthen & Sanders, 1987). According to Worthen and Sanders (1973), there were two developments which occurred during that period of time. First, Tyler and Smith designed and implemented an evaluation of the Eight Year Curriculum Study of Ohio Schools that made use of a variety of tests, scales, inventories, questionnaires, and checklists. Second, the accreditation movement, which began in the late 1800s, became stronger, and the establishment of formal accrediting agencies for schools and colleges, became institu-

tionalized as at least a quasi-evaluation process in American education.

In the 1950s and early 1960s, Bloom, Englehart, Furst, Hill and Krathwohl (1956) built on the Tylerian base of evaluation through their development of educational objectives. Taxonomy of Educational Objectives: Handbook 1: Cognitive Domain was a landmark work in the evaluation movement. Madaus et al. (1983) note that the Tyler approach to evaluation, requiring that objectives be stated explicitly, helped educators and other professionals to do a better job by actually using their objectives. The Tyler/Bloom approach was also used to train teachers in test development.

Guba, writing in 1969, noted that, since Ralph Tyler completed his formulations of evaluation during the decade of the 1940s, there had been no further theoretical evaluation advances to that time. Instead, evaluation researchers had to depend upon methodologies from other fields, in particular from general educational research methodologies.

According to Worthen and Sanders (1987), a dramatic change to an emphasis on educational evaluation resulted from the Soviet Union launching of Sputnik 1 in 1957. As a consequence of the initial success of the Soviet space program, federal funds for evaluating curriculum development efforts were made available in large quantities across the United States. This change affected the application of Tyler's model of evaluation drastically. Guba and Lincoln

(1981) note that Tyler's model was shattered by Sputnik and the ensuing flurry of evaluation activities which followed in the next decade. The Tyler model was from that time considered inadequate for evaluation of large complex projects. From that time on evaluators began to propose new approaches to evaluation and to rethink the underlining framework of evaluation.

Worthen and Sanders (1987) note that by 1970 new professional associations for evaluators were established and strengthened. In 1975, Phi Delta Kappa supported the evaluation Network. Through the 1970s and 1980s, there was significant growth in the professional literature of evaluation, including numerous evaluation textbooks, and journals such as Evaluation, Evaluation and Program Planning, Evaluation News, Educational Evaluation and Policy Analysis, Evaluation Quarterly, New Directions for Program Evaluation, and Evaluation Review. All of this literature received wide attention among educators, leading to increased emphasis on program evaluation in educational settings, using a variety approaches and methodologies.

Various Approaches to Evaluation

"One way of understanding evaluation is to compare the numerous evaluation models with one another" (House, 1983, p. 45). House states that there are many ways of comparison,

but each of them is related to the underlying theoretical assumptions that models are based on. House formulates a taxonomy of the major evaluation models into eight distinct approaches: system analysis, behavioral objectives, decision-making, goal free, art criticism, accreditation, adversary, and transaction. Worthen and Sanders (1987) adapted House's taxonomy of the major evaluation models and classified models into six categories as follows:

1. Objectives-oriented approaches;
2. Management-oriented approaches;
3. Consumer-oriented approaches;
4. Expertise-oriented approaches;
5. Adversary-oriented approcaches;
6. Naturalistic & participant-oriented approaches.

Guba and Lincoln (1981) note six separate models which exemplify these approaches to evaluation: Tyler model, context-input-process-product (CIPP) model, goal-free model, connoisseurship model, judicial model, and Stake's responsive model.

Tyler's Model

House (1980) states that in education the goal-based model was advanced by Tyler, who defined educational goals in terms of student behavior. Tyler (1941-42) viewed evaluation as a measure of the congruence between performance and objectives, especially behavioral objectives, that had been

stated prior to program implementation. Therefore Tyler's model became known as the "behavioral objectives" approach, or the Tylerian model of program development and evaluation.

Stufflebeam and Webster (1983) define Tyler's model as one of "objectives-based studies" and state that Ralph Tyler is generally acknowledged to be the pioneer in the objectives-based type of evaluation study. Abramson (1979) states that Tyler's objectives-based approach is one of the earliest and most important approaches to evaluation. He notes that the major steps in the Tyler approach--the definition of objectives in behavioral or operational terms, the specification of the situations appropriate to the achievement of the objectives, the selection of appropriate measures, the collection of student outcome data, and the comparison of the data with the behavioral objectives--provide evidence of success or failure of educational programs. Guba and Lincoln (1981) mention that Tyler's formulation of the evaluation process is based directly on the concept of objectives. Objectives are critical because they are the basis for planning, they provide an explicit guide for teachers, and they serve as criteria for the selection of materials, the content outline, and instructional development procedure.

Tyler (1941-42) states six purposes for a comprehensive program evaluation as follows: to make a periodic check on the effectiveness of the educational institution; to validate the hypotheses upon which the educational institution

operates; to provide information basic to effective guidance of individual students; to provide a certain psychological security to the parents; to provide a sound basis for public relations; and to help both teachers and pupils to clarify their purposes and to see more concretely the direction in which they are moving (p. 497).

According to Stufflebeam and Shinkfield (1985), the Tyler procedure for program evaluation is as follows:

> 1. To establish goals or objectives;
>
> 2. To place objectives in broad classification;
>
> 3. To define objectives in behavioral terms;
>
> 4. To establish situations and conditions in which attainment of objectives can be demonstrated;
>
> 5. To explain the purpose of the strategy to relevant personnel in the selected situation;
>
> 6. To choose or develop appropriate measurement techniques;
>
> 7. To collect performance data (in case of educational programs these would be of student performance);
>
> 8. To compare data with behavioral objectives. (p. 71)

Advantages of Tyler's model.

Worthen and Sanders (1973) state that Tyler's model makes it easy to assess whether behavioral objectives are being achieved and makes it easy for practitioners to design their own evaluations. House (1980) notes that the behavioral

objectives approach has not only been accepted in education, but also it has also been accepted in other fields. For example, this model can be applied to business and government organizations widely. It is the most commonly advanced idea for program evaluation.

Guba and Lincoln (1981) express the view that Tyler's model is very like the "systems" models of today, with strength lying in their rationality and their elegance. Stufflebeam and Shinkfield (1985) note that the Tylerian approach has been useful in classroom situations in terms of evaluating student learning. It supports the diagnosis and subsequent remedation of weaknesses in the learning process.

Limitations of Tyler's model.

Stufflebeam and Shinkfield (1985) note that the objectives-oriented approach makes evaluation a terminal event, allowing for final product judgment only. The opportunity is lost to use the data for the refinement of the program in its ongoing state. Similarly, Worthen and Sanders (1973) note that Tyler's model has a tendency to oversimplify programs and to focus on terminal rather than ongoing and pre-program information. The model's tendency is to focus directly and narrowly on objectives, paying little attention to the actual worth of the objectives. Guba and Lincoln (1981) state that Tyler's model is simply inadequate to deal with huge projects, because it is devised with a decentralized

concept of curriculum-making and teaching, focusing totally on the purposes of learning activities.

CIPP Model

The CIPP model is variably known as a decision-making approach to evaluation (House, 1980), a decision-oriented evaluation (Abramson, 1979), or context-input-process-product evaluation (Guba & Lincoln, 1981). This model was developed in the late 1960s by Stufflebeam and Guba (Stufflebeam, 1983; Popham, 1973). Abramson (1979) notes that Stufflebeam basically perceived evaluation as providing decision-making data. According to the Committee on Evaluation (1971) "Evaluation is the process of delineating, obtaining, and providing useful information for judging decision alternatives" (p. 25). House (1980) explains that the decision-making approach should be structured by the actual decisions to be made, making the decision-maker the sole audience to whom the evaluation is directed. Consequently, the CIPP model is intended to promote growth and to help responsible leadership and staff to obtain and use feedback in order to excel in meeting program needs (Stufflebeam, 1983).

Guba and Lincoln (1981) note that concern with decisions led Stufflebeam to an analysis of decision types and to generate a parsimonious taxonomy, with each element associated with a type of evaluation designed specifically for that purpose. Stufflebeam (1971) specified four kinds of deci-

sions, and four parallel types of evaluation, as follows.

Planning decisions determine objectives--this stage Guba and Lincoln (1981) called intended ends. Context evaluation provides a broad basis for stating the objectives of the evaluation and the surrounding conditions of a possible program (Asher, 1976). It also provides information about needs, problems, and opportunities in order to identify objectives and the supporting rationales. Context evaluation is implemented by using such methods as system analysis, survey, document review, hearings, interviews, diagnostic tests, and the Delphi technique (Stufflebeam & Shinkfield, 1985). These procedures aid in selecting educational goals (Popham, 1973). The result of context evaluation leads to a decision about whether to introduce change in the system (Stufflebeam, 1983).

Structuring decisions project procedural designs for achieving objectives. Input evaluation serves the needs of structural decisions. In input evaluation alternative instructional treatments are surveyed (Popham, 1973), providing information about the strength and weakness of alternative strategies for achieving given objectives. Worthen and Sanders (1973) note that the methodology of input evaluation is very varied, depending upon whether large or small change is needed, and whether high or low information is required to support the change. Stufflebeam and Shinkfield (1985) suggest methods for this stage of evaluation such

as inventorying and analyzing available human and material resources, solution strategies, and procedural designs for relevance, feasibility and economy. They also suggest using such methods as literature searches, visits to exemplary programs, advocate teams, and pilot trials. Stufflebeam (1983) notes that the result of input evaluation is used to decide whether a solution strategy warrants going on with its further development.

Implementing decisions, or actual ends, determine decisions in executing chosen design (Guba & Lincoln, 1981). Process evaluation serves the needs of implementing decisions. It is during process evaluation that the treatment is monitored (Popham, 1973). Process evaluation provides information about the strengths and weaknesses of a strategy during implementation. Moreover, Stufflebeam (1983) notes that this stage also provides feedback to managers and staff about the extent to which the program activities are on schedule, are being carried out as planned, and are using the available resources. Stufflebeam and Shinkfield (1985) suggest that methods for process evaluation should include monitoring the potential procedural barriers to the activity and remaining alert to unanticipated events by obtaining specified information, and by describing and observing the activities of project staff. Worthen and Sanders (1973) note that the results of process evaluation are used to provide decision-makers with information to anticipate and overcome procedural

difficulties, and to reinterpret project outcomes.

Recycling decisions, or actual ends, determine whether to continue, terminate, or modify a project (Guba & Lincoln, 1981). Product evaluation serves the needs of recycling decisions. The results of the treatment are appraised (Popham, 1973), providing information for determining whether objectives are being achieved and whether the procedures employed to achieve them should be continued, modified, or terminated (Popham, 1973). Abramson (1979) notes that product evaluation is concerned with the relationship between program outcomes and program objectives, and the relationship between these outcomes and the three prior evaluation data. Methods recommended by Stufflebeam and Shinkfield (1985) include defining operationally and measuring outcome criteria, collecting judgments of outcomes from stakeholders, and performing both qualitative and quantitative analyses. This evaluation is the essential stage: Stufflebeam and Shinkfield (1985) point out that product evaluation is related to decision-making and in fact determines whether to continue, terminate, modify, or refocus activities. It presents a clear record of effects, whether intended or unintended, positive or negative.

House (1980) elaborates on Stufflebeam's ideas:

> Whatever the type of evaluation, the evaluation design is focused by identifying the level of decision to be served, projecting the decision situation, defining criteria for each decision situation, and defining policies for the evaluator.

> After that, the requisite information is collected, organized, analyzed, and reported (p. 28).

Stufflebeam (1971) emphasizes that if the CIPP evaluation model is implemented properly it yields significant improvements over typical social accounting and standardized test information systems by providing information for both decision-making and accountability questions.

Advantages of CIPP model.

Worthen and Sanders (1973) note that the CIPP model provides a service function by supplying data to administrators and decision-makers charged with the conduct of the program. Specifically, the model allows for evaluation to take place at any stage of the program. House (1980) notes that it is also practically useful to shape evaluation in reference to actual decision-making considerations. Guba and Lincoln (1981) note that the CIPP model is the first to expand the list of available organizers for evaluation to other than objectives. Consequently, it has proved to be especially useful for programs or projects of large scope and multi-level organization. Also, the model fits well with the emergent interest in systems theory because of its rational and systematic approach. Finally, according to its clear operation and guidelines, it can be used in virtually every situation.

Limitations of CIPP model.

The CIPP model has limitations, as noted by Worthen and Sanders (1973). The CIPP model has little emphasis on value concerns, an unclear decision-making process, an undefined methodology, and only a few clearly delineated evaluation activities. Guba and Lincoln (1981) note that the CIPP model makes unwarranted assumptions about the rationality of the decision-maker, and about the openness of the decision-making process. It does not deal directly with value and standards questions, even though it emphasizes the need for "merit" determination. Finally, it is very difficult to manage and administer, and it is expensive to maintain.

Goal-Free Model

Goal-free evaluation is "the evaluation of interim and ultimate outcomes, regardless of whether they were intended" (Worthen & Sanders, 1987, p. 321). Scriven (1974) developed goal-free evaluation by concentrating on the idea of a methodology for avoiding over-favourable evaluations and for detecting side effects. He began to work on an alternative approach to evaluation--focusing on the evaluation of actual events against (typically) a profile of demonstrated needs--he called this goal-free evaluation. In Stufflebeam's opinion, Scriven introduced and described the concept of goal-free evaluation, where the evaluator intentionally ignored the program's written goals and instead searched for all possible

effects of a program (1974). Obviously the model is far from relying on objectives, as Guba and Lincoln (1981) note; in fact, evaluators have to avoid discovering what the objectives are.

House (1980) notes that "the goal-free approach is a direct reaction to the ubiquity of goal-determined evaluation" (p. 30). Scriven (1974) explains that goals are only a subset of anticipated effects. Thus it doesn't mean that evaluation, in terms of goals, includes all the anticipated effects. Scriven (1973) compares the goal-free evaluator as a hunter who goes over the ground very carefully and looks for signs of any kind of game, finally setting speculative snares when in doubt (p. 327).

Worthen and Sanders (1987) note that goal-free evaluation forces the evaluator into serious needs assessment. Scriven (1974) has developed the concept of "needs" as a basis for evaluation (House, 1980). According to House (1980), Scriven believes that needs, as opposed to mere wants or desires, are discovered through a needs assessment process. Needs provide the evaluator with an authoritative source of standards, by resting upon an analyses of consumer needs rather than producer goals. Worthen and Sanders define major characteristics of goal-free evaluation as follows:

- The evaluator purposefully avoids becoming aware of the program goals.

- Predetermined goals are not permitted to narrow the focus of the evaluation study.

- Goal-free evaluation focuses on actual outcomes rather than intended program outcomes.

- The goal-free evaluator has minimal contact with the program manager and staff.

- Goal-free evaluation increases the likelihood that unanticipated side effects will be noted. (p. 75)

Guba and Lincoln (1981) state that to conduct a goal-free evaluation, the evaluator has to generate two types of information: first, an assessment of actual effects; and second, a profile of needs against which the importance of these effects is assessed. Thus, if a program creates an effect that is related to a responsive need, it is assured that the program is useful and should be positively evaluated.

Worthen and Sanders (1987) describe the process of goal-free evaluation. Goal-free evaluation begins with actual field work to collect baseline and/or comparative group data during project implementation. At this stage, the evaluators can begin to formulate hypotheses about any changes that have been found. When field-data collection begins, all documents pertaining to the project are copied and should be requested and filtered by the project manager to the evaluators. Following the baseline observations, the evaluators should arrange multiple observations. As field reports are turned in, the project manager reviews and organizes them in order to write a preliminary report. The last step is the reversal phase; the goal-free evaluation staff inspects various program background materials and contrasts them with the goal-free

report, comparing what actually happened with what was originally intended.

Advantages of goal-free model.

Goal-free evaluation, as stated by Stufflebeam and Shinkfield (1985) is less intrusive than goal-based evaluation. It is better at finding side effects and less prone to social, perceptual, and cognitive bias. Scriven (1974) points out that goal-free evaluation has two great advantages for a program: it is extremely non-disruptive, and it is not tied to the original goals of the program because it is oriented toward final results.

Limitations of goal-free model.

Stake (1983) notes that Scriven designs evaluations that perhaps only Scriven can carry out. Guba and Lincoln (1981) agree with Stake's opinion and express the view that, at the operational evaluation level, Scriven's model is not helpful in describing how an evaluation should be carried out. Also, Scriven does not give definitive recommendations on how to generate a needs assessment, and his model ignores the question of how judgmental standards are to be derived.

Connoisseurship Model

The connoisseurship model proposed by Eisner (1979) explored the analogous model of an educational or curriculum

critic as a judge of educational programs. Eisner's idea did not adhere to the scientific paradigm as other evaluation approaches to that time did: rather, it used the concept of art criticism (Worthen & Sanders, 1987). Therefore, it seems like an important qualitative, humanistic, "nonscientific" supplement to more traditional inquiry methods in program evaluation. House (1980) notes that Eisner's conception sees criticism as essentially qualitative and not merely the negative appraisal of something.

Guba and Lincoln (1981) define the connoisseurship model from two aspects. First, it is one of a number of judgmental models that require the human being to act as a measurement instrument by including data collecting, analysis, processing and interpretation within the judgmental mind. Second, the connoisseurship model is based upon metaphoric analysis using the art critic metaphor as its basic concept. Guba (1978) notes that this model considers educational evaluation equivalent to educational criticism. And criticism depends on connoisseurship, the private act of appreciation based on awareness of characteristics and qualities.

Explicating Eisner's (1979) idea, House (1980) notes that connoisseurship and criticism can be distinguished as follows: connoisseurship is the art of appreciation, whereas criticism is the art of disclosure. Connoisseurship requires that the perceiver has wide experience, enabling her/him to distinguish the significant subject matter. As a result, the consequence

of criticism is the development of connoisseurship in others. As Eisner (1976) notes: "Educational connoisseurship and educational criticism represent two modes through which we come to understand and express what we come to know; but these modes themselves represent only a small portion of the possibilities in the conduct of educational evaluation" (p. 346-347).

Connoisseurship methodology is different from other evaluation approaches because of its unique characteristics. To conduct this type of evaluation requires expert persons with refined perceptual apparatus, knowledge of what to look for, and a backlog of relevant experience (Guba, 1978). Consequently, Guba suggests that such evaluators should have the ability to recognize the skills, the form, and the imagination underlying the entity being evaluated. Also, House (1980) emphasizes that evaluators must have the opportunity to attend to happenings and to compare them by using critical review as a part of their methodology. Finally, Stufflebeam and Webster (1983) note that the methodology of connoisseurship includes the systematic use of evaluators' perceptual sensitivities coupled with their past experiences and refined insights. The evaluators' judgment helps the audience to appreciate and to understand the object under study.

Advantages of connoisseurship model.

As the first model to break cleanly with the scientific paradigm, as Guba and Lincoln (1981) note, the connoisseurship model can be credited with certain contributions. It can be used effectively as a nonscientific supplement to evaluation. It also demonstrates that the scientific paradigm is not essential as an evaluation approach. Stufflebeam & Webster (1983) state that the main advantage of the connoisseurship model is its exploitation of the special expertise of persons who undertake such evaluations. As a result of their expertise, they can provide an array of detailed information that is useful for the audience, providing a more insightful analysis than might otherwise be possible.

Limitations of connoisseurship model.

This model also has disadvantages in terms of subjectivity, bias, and corruption. Because the evaluation depends on the subject matter expertise of the evaluator, there is much room for such problems. Guba and Lincoln (1981) explain that the connoisseurship model has deficiencies in terms of providing operational guidelines for the evaluator. Also, it proposes a methodology that is not subject to the usual criteria for judgment.

Judicial Model

Adversary evaluation is an evaluation approach "in which

two teams do battle over the summative question of whether a program should be continued" (Patton, 1982, p. 37). This approach was developed in the early 1970s (Owens & Wolf, 1985). According to Owens and Wolf (1985), Thomas Owens was one of the early developers who applied the ideas of legal process in providing information for decision makers regarding the judgment of program effects. Wolf developed an adversary model in 1973, which he called the judicial model of evaluation. The model was tested in 1974 in the evaluation of a teacher education program at Indiana University, implementing the procedures of a court of law as evaluation methodology. Wolf (1975) provides a rationale for using a legal methodology:

> ... it offers a useful system of evidentiary rules and procedures aimed at producing alternative inferences from data prior to the rendering of judgment... Evaluators can develop a clear set of issues upon which to focus the inquiry, [and] rely on human testimony more than other evaluation approaches do. (p. 185)

Worthen and Sanders (1987) note that Wolf's intention is only to use the law as a metaphor for educational evaluation. He does not want to replicate legal procedures. Moreover, "the adversary procedure would not lead to productive outcomes in the educational setting" (Wood, Peterson, DeGracie, & Zaharis, 1986, p. 311). Arnstein (1975) states that the judicial model emphasizes confrontation, a sharpening of issues possibly to the point of distortion. Thurston (1978), who had had

experience working with this model, notes that the judicial evaluation model has components of thoughtful introspection concerning the analogy of the judicial process in educational evaluation. Moreover, Thurston concludes that the judicial evaluation model produces truth more often than epistemological and statistical evaluations. Certainly, with the openness of the adversary forum, it can provide an appropriate place to get a public airing on public policy.

According to Wolf (1979), the judicial evaluation model is categorized as a responsive approach. Wolf notes that "this method provides a means for all parties (parents, children, school personnel at all levels, taxpayers and community groups) to participate meaningfully throughout all phases of the evaluation process and in a variety of capacities" (p. 191). Furthermore, Wolf has developed an in-depth investigatory method and has simulated naturalistic inquiry methodologies. Wolf explains:

> In order to conduct the most in-depth judicial inquiry possible and to prepare a full and complete argument for each issue being evaluated, investigators need to become familiar with a wide range of naturalistic inquiry techniques. No case can be built without evidence, and no evidence can be identified, examined, and amassed without carefully executed in-depth interviews, observations, site analyses, document review (including both quantitative and qualitative information), and evaluation of existing data summaries. Judicial procedures rely heavily on the ability of each evaluation team to conduct broad, responsive naturalistic exploration. (p. 193)

Thus it can be stated that the identification of audience

issues is a crucial stage in implementing the judicial evaluation method. Wolf (1979) describes four stages of implementation: the issue generation stage; the issue selection stage; the preparation of argument stage; and the public hearing (clarification forum) stage. According to Worthen and Sanders (1987), these four stages are defined as follows:

> 1. Issue generation: identification and development of possible issues to be addressed in the hearing.
>
> 2. Issues selection: elimination of issues not at dispute and selection and further development of those issues to be argued in the hearing.
>
> 3. Preparation of argument: collection of evidence, synthesis of prior evaluation data to develop arguments for the two opposing cases to be presented.
>
> 4. The hearing: including prehearing discovery sessions to review cases and agree on hearing procedure, and the actual hearing's presentation of cases, evaluation of evidence and arguments, and panel decision. (p. 117)

Thurston (1978) describes five steps in the implementation of this model as follows:

> 1. Work through the issue definition. Judges would hear arguments from the adversaries about what the issues are and would help formulate and refine them. This stage could also involve broad publicity and much of the spectacle that the adversary hearing provides. After that, there would be clarification with the adversaries to consider these appropriate issues.
>
> 2. The adversaries would develop their arguments involving collecting and organizing the appropriate data, stipulating agreement, and developing arguments and theories to explain a particular position.

3. The adversaries would state their particular positions and use factual support in the preparation of written briefs.

4. Oral arguments would be made by the adversaries, outlining and summarizing the argument in the written briefs. The judges would probe the adversaries with questions.

5. The judges would render a written opinion stating their evaluation conclusion. The rationale for such an opinion should be well developed. (p. 6-7)

Advantages of the judicial model.

Wolf (1975) identifies the major strength of the model: it provides for a variety of perspectives to be displayed and illuminates the biases which operate in every evaluation setting. Wolf (1975) also suggests that this evaluation framework provides a healthy avenue to bring about an understanding of the program on the part of the program administrator.

Thurston (1978) suggests three strengths of this model: First, publicity surrounding the adversaries often effectively communicates what people are trying to do. Second, the format requires at least two sides of the issues be clarified, and adversaries can guarantee a range of interpretation to the jury. Finally, any type of evidence can be presented, if it is understandable and is a logical means of persuading the jury. Worthen and Sanders (1987) note that the strength of this approach is the interest it creates in the intended audiences, satisfying their informational needs in an inter-

esting, informative manner. Furthermore, this model is broad and pluralistic, and can be combined with other approaches such as responsive evaluation and naturalistic inquiry. Adversary evaluation also has a sense of a built-in "meta-evaluation." When adversaries use the collection, analysis, and interpretation of data to support any point of view it is criticized by those in opposition.

Limitations of the judicial model.

Wolf (1975) cautions evaluators who choose to implement the judicial model. He emphasizes: "the need for balance in the advocates' skills; the need to have clearly stated charges, instructions, and expectations for the panel; the need for adequate time for the proceedings [and] the need to be sensitive to the public nature of the forum" (p. 187).

Patton (1982) suggests a number of limitations of this model. It is quite expensive, requiring two separate teams of evaluators. "The approach works best in summative evaluations where the proposition to be debated concern continuation or termination of the program. The model is open to the same abuses that have occurred in the criminal justice system" (p. 250). It requires clear and concise debate, and sometimes evaluation issues and program decisions are too complex to be reduced as required.

Responsive Model

Responsive evaluation is "an emergent form of evaluation that takes as its organizer the concerns and issues of stakeholding audiences" (Guba & Lincoln, 1981, p. 23). Guba (1978) notes that Robert Stake updated his well-known Countenance model of evaluation which Patton (1982) called "early Stake." In 1975 Stake developed an evaluation model which he called "Responsive Evaluation." Patton (1982) referred to this as "Late-Stake."

Stake (1976) explains that responsive evaluation provides an alternative, based on what people do naturally about evaluation by their observations and reactions. There is much support for this stance. Guba (1978) notes that the major purpose of evaluation should be to respond to audience requirements for information, focusing on the value perspectives of each audience. Stufflebeam and Shinkfield (1985) state that the purpose of evaluation is "to help the people in the local service context to understand the functioning of their service activities and the degree to which the services are respected by experts and valued by the clients" (p. 53). Stecher and David (1987) agree with the responsive evaluator's goal--to facilitate efforts to understand the program relying on multiple perspectives.

Stake (1976) clarifies the concept of the responsive evaluation:

> An educational evaluation is responsive evaluation if it orients more directly to program activities than to program intents; if it responds to audience requirements for information; and if the different value perspectives present are referred to in reporting the success and failure of the program. (p. 116)

In Stake's responsive evaluation, the evaluator plays a major role in each step of evaluation. He/she starts with observation and the negotiation of the evaluation contract, and arranges for various persons to work on the observation of the program. After that he/she prepares brief narrative portrayals, product displays, and graphs; finds out what the various audiences require; gathers expressions about worth from various individuals who have different point of view. Then he/she checks the quality of his/her records and selects the program personnel to react to the accuracy of his/her portrayals. At this stage, the evaluator can get his/her authority figures to react only to the importance of various findings and he/she keeps a record of actions and reactions. The evaluator chooses accessible media for the various audiences, to increase the likelihood and fidelity of communication. The evaluator might not prepare a final written report, depending on the clients' agreement.

Stake's responsive evaluation does not use objectives to organize the evaluation as do many other evaluation models. Stake (1976) avoids using objectives or hypotheses and uses the word "issues" instead. He explains that "issues" better reflects a sense of contextual immediacy, and valuing. He

uses "issues" to build the structure for continuing discussions with clients, staff, and audiences throughout the data-gathering plan. These issues can be identified through systematic observations, interviews and given tests.

Patton (1982) identifies the main components of responsive evaluation as follows:

> 1. identification of issues and concerns based on direct, face-to-face contact with people in and around the program;
>
> 2. use of program documents to further identify important issues;
>
> 3. direct personal observations of program activities before formally designing the evaluation to increase the evaluator's understanding of what is important in the program, and what can/should be evaluated;
>
> 4. designing the evaluation based on issues that emerged in the preceding three steps, with the design to include continuing direct qualitative observation in the naturalistic program setting;
>
> 5. reporting information in direct personal contact through themes and portrayals that are easily understandable and rich with description; and
>
> 6. matching information reports and reporting formats to specific audience with different reports and different formats for different audience. (p. 38)

Stecher and Davis (1987) note that responsive evaluation is usually characterized by qualitative, naturalistic studies, not quantitative ones, relying on direct and indirect observation of events and impressionistic interpretation of these data. Stake (1976) explains his evaluation model in terms of

its functional structure. There are twelve recurring events which he diagrams in the form of a clock face (see Figure 2). Stake explains that on this clock the evaluator either can follow any event that might occur simultaneously, or he/she can return to each event, going back and forth many time before the evaluation is finished.

For instance, Stake (1976) notes:

> At twelve o'clock the evaluator will discuss many things on many occasions with the program staff and with people who are representative of his audience. He will want to check his ideas of program scope, activities, purposes, and issues against theirs, and will want to show them his representations (e.g., sketches, displays, portrayals, photographs, tapes) of value questions, activities, curricular content, and art products. Reactions to these representations will help him learn how to communicate in this setting. (p. 121)

Guba and Lincoln (1981) note that responsive evaluation uses methods that are subjective and qualitative rather than quantitative. Moreover, negotiation and interaction are essential parts of the methods that the evaluator uses. Stufflebeam and Shinkfield (1985) state that responsive evaluation is reflective of what people do "naturally": observe and interpret is the responsive evaluation methodology.

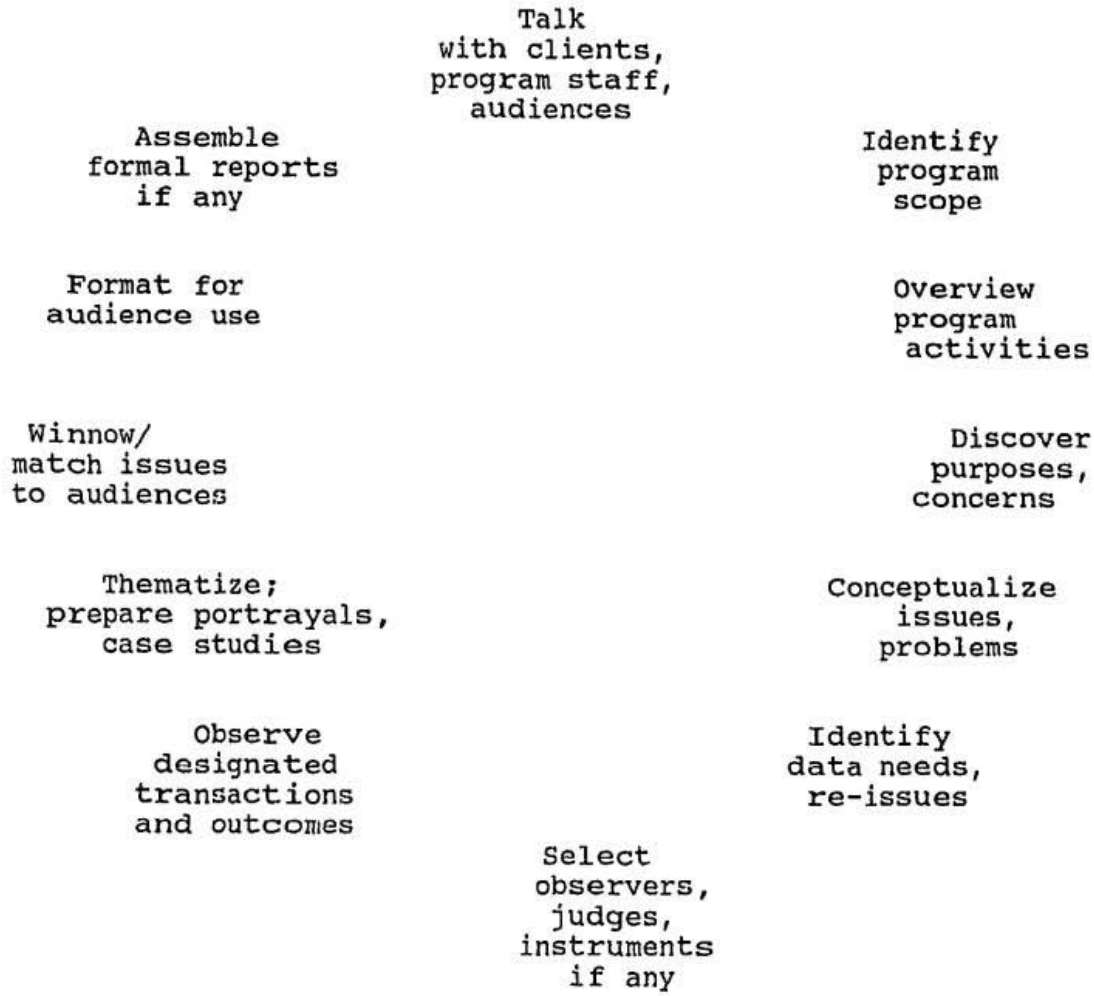

Figure 2. Prominent events in a responsive evaluation (Stake, 1976, p. 122).

Advantages of responsive evaluation model.

Stake (1973) explains the utility of responsive evaluation. It is particularly useful during formative evaluation

when the staff needs help in monitoring the program or when no one can decide what problems will arise. Also, it is particularly useful in summative evaluation, when audiences want to clarify a program's activities, its strengths, and its weaknesses. Worthen and Sanders (1987) and Guba and Lincoln (1981) state that the responsive evaluation model, while organized around concerns and issues, can accommodate a number of other organizers. As a result, Guba and Lincoln note that its flexibility makes the responsive model more powerful than any of its competitors. In Stecher and Davis' (1987) view, with its sensitivity to multiple points of view and the ability to accommodate ambiguous or poorly focused concerns, the responsive evaluation model is stronger than other approaches. Also, it facilitates the problem identification process, helping people to understand issues better. Stufflebeam and Shinkfield (1985) note that it is an action research approach, guiding people in the implementation of their own evaluation.

"From our perspective responsive evaluation is the most generally useful of the several models that have emerged so far" (Guba & Lincoln, 1981, p. 38). Responsive evaluation procedures provide information that serves audiences' needs. This type of evaluation sometimes sees important questions that no local audience thinks to ask. If some audiences want to see information relating to the achievement of objectives (a typical Tyler approach), that is permissible within the

responsive evaluation rubric because this evaluation can be interpreted to subsume all other models.

Limitations of responsive evaluation model.

Responsive evaluation has its legitimacy in the opinions of various people. House (1980) notes that responsive evaluation requires complex case studies, feature descriptions, and it involves a myriad of interactive variables (p. 40). Consequently, the data derived solely from personal observations makes this type of evaluation open to criticism about credibility, according to Stufflebeam and Shinkfield (1985). As a result, they note that it might be susceptible to bias on the part of people in the local setting because of their greater control over the evaluation. Moreover, since responsive evaluation is so broadly defined, it may lose its uniqueness and meaning (Worthen & Sanders, 1987). Finally, it is practically impossible to take into account the perspectives of all concerned groups in an evaluation, and the responsive model is reluctant to establish priorities or simplify information for decision-making (Stecher & Davis, 1987).

Naturalistic Evaluation

"Evaluations are not designed to establish universal laws, however, but to make possible judgments about some phenomenon" (Guba, 1969, p. 34). Guba (1969) makes a case

for broadening the alternative ideas of evaluation, rather than adhering to the more traditional view of evaluation. Guba noted that the primary task in evaluation at that time was the provision of sensible alternatives for the evaluator. The evaluation of educational innovations required the modernization and development of evaluation theory and practice. In reviewing evaluation of educational programs prior to 1970, Barnette (1983) notes that educational program evaluation was most frequently conducted using experiment design. Until the early 1970's, educational program evaluation tended to move toward methods of program judgment and accountability. Evaluations tended to provide more useful information relative to program antecedent conditions and program variables and their relationship with observed outcomes.

Late in the 1970's, proponents of evaluation attempted to find methods which could be applied in the natural setting; ones which would describe and interpret educational program effects. Among the developments in evaluation methodology, these general methods were labelled as naturalistic approaches to evaluation.

Guba (1978) suggests that naturalistic inquiry is an alternative mode of inquiry which differs from the traditional scientific approach along two dimensions: the degree of manipulation of conditions antecedent to the inquiry, and the degree of constraint imposed on outputs by subjects involved in the inquiry.

Naturalistic evaluation is not a model. Rather, it is an approach, or a family of methods, which can be applied in the implementation of various evaluation models. Naturalistic evaluation is defined in a variety of ways: there seems to be no systematic definition agreed upon by everyone (Guba, 1978). Guba (1978) interprets House's comments on naturalistic evaluation:

> I would label as "naturalistic" evaluation that evaluation which attempts to arrive at naturalistic generalizations on the part of the audience; which is aimed at non-technical audiences like teachers or the public at large; which uses ordinary language; which is based on informal everyday reasoning; and which makes extensive use of arguments which attempt to establish the structure of reality. (p. 3)

Stake (1978) explains that a naturalistic approach to evaluation builds on the tacit knowledge of how, why things are, how people feel about them. Sadler (1981) explains, in term of naturalistic approaches to evaluation, that

> ... naturalistic inquirers typically do most of their data reduction and analysis using a marvellously designed piece of apparatus, the brain. No device or system so far devised, irrespective of size or complexity, can match its ability to extract information from noisy environments. (p. 26)

Wolf and Tymitz'(1977) definition of naturalistic inquiry seems to focus on people as subjects of naturalistic inquiry, and the interactions of those people. Wolf and Tymitz (1977) suggest that

> Naturalistic inquiry attempts to present "slice of life" episodes documented through natural language and representing as closely as possible how people feel, what they know, how they know it,and what their concerns beliefs, perceptions, and understandings are. (p. 7)

Guba (1978) focuses on another aspect. He notes that naturalistic inquiry is determined by what the investigator chooses to do rather than by the nature or posture of the situation or the subjects. Moreover, Guba and Lincoln (1987) explain that one of the major roles of evaluation is to respond to an audience's requirements for information. Abramson and Banchick (1979) state that

> The evaluator's role is not only to measure previously stated objectives, but to serve as a naturalistic observer who conducts the evaluation based on what he/she observes. The evaluator is interested in process or how people interact, as well as in product or outcomes. (p. 548)

Naturalistic evaluation is characterized in a variety of ways, making this type of evaluation more broadly applicable than other approaches. Fetterman (1986) describes naturalistic evaluation in terms of generic approaches to many kinds of qualitative appraisals. He mentions as examples: naturalistic inquiry by Lincoln and Guba (1985), educational connoisseurship and criticism by Eisner (1977), and qualitative evaluation methods by Patton (1980). He notes that all of these approaches use similar tools and designs. However, they each have their own set of standards.

Patton (1982) states that naturalistic inquiry is

distinguished from experimental inquiry by its attempt to avoid controlling or manipulating the situation, people, or data under study. Guba and Lincoln (1982) list six of the most common postures for naturalistic inquiry:

1. **Preferred method.** Interview, observation, use of non-verbal cues and unobtrusive measure, and documentary and records analysis seem most appropriate.

2. **Source of theory.** Theory is more powerful in all events when it arises from the data rather than being imposed on them.

3. **Knowledge types used.** Naturalists prefer the use of the human being as the prime data collection instrument, because this instrument can build on tacit knowledge in addition to the explicit knowledge gathered.

4. **Instruments.** The naturalist prefers human-as - instruments because they have greater insightfulness, flexibility, and responsiveness.

5. **Design.** The naturalist prefers using emergent design.

6. **Setting.** The naturalist prefers natural settings.

Worthen and Sanders (1987) summarize the characteristics of naturalistic evaluation in term of reflecting multiple realities, use of inductive reasoning and discovery, and firsthand experience on site. Thus, naturalistic evaluation seems to be naturally occurring activities and processes (Patton, 1987). "These activities are (natural) in the sense

that they are not planned and manipulated by the evaluator as would be the case in an experiment (p. 13). ... Naturalistic evaluation focuses on capturing program process, documenting variations, and exploring important individual differences between various participants' experiences and outcomes" (p. 14).

While naturalistic evaluation might seem to be unsystematic in its methods, it does share common directions when applied in each situation. Biklen and Bogdan (1986) state that first the evaluator collects data in the natural setting, using himself or herself as the research instrument. Second, qualitative data are summarized in descriptive terms. They are called "data rich" because they are filled with descriptions, conversations, and reporting of first-person experiences. Third, evaluators focus on perspectives by studying educational issues as they are perceived and experienced by people. Finally, they discover which questions are important in the particular context. Only then is the evaluation focused more narrowly and the questions more specific.

Worthen and Sanders (1987) describe the naturalistic evaluation process as follows: identifying stakeholders, for it is their perspective that should be reflected in the evaluation; identifying concerns and issues from interviews with the stakeholders and from naturalistic observations; using field notes and records as the source of data; using description and judgement as a basis for the report.

Advantages of naturalistic evaluation.

Worthen and Sanders (1987) note that naturalistic evaluation provides the potential for gaining new insights and using new theoretical bases for evaluation. Its strength lies in its focus on description and judgment, its concern with contextual openness in evolving the evaluation plan, its use of inductive reasoning, its use of a wide variety of information, and its emphasis on understanding. Other advantages are its flexibility, its attention to contextual variables, and its multiple data-collection techniques to provide rich and pervasive information that is credible to audiences, who want to see a reflection of real understanding of their working with and problems experienced in the program. Williams (1986) notes that this approach is suited to process evaluation because observation of the program can reveal critical processes as they occur naturally. Moreover, the variations within the program can be investigated thoroughly over time.

Patton (1987) states that "naturalistic inquiry can capture whatever significant outcomes occur because the design is not locked in, looking at only predetermined variables and outcomes" (p. 14). House (1986) notes that the naturalistic approach is supported by two major centers for naturalistic evaluation study: the Centre for Applied Research in Education (CARE) at the University of East Anglia, and the Centre for Instructional Research and Curriculum Evaluation (CIRCE) at the University of Illinois.

Limitations of naturalistic evaluation.

Naturalistic evaluation has its limitations, as do evaluation models. Worthen and Sanders (1987) note that "because of their reliance on human observation and individual perspective, and their tendency to minimize the importance of instrumentation and group data, advocates of this approach have been criticized for loose and unsubstantiated evaluation" (p. 142). Moreover, Worthen and Sanders state that it is nondirective evaluation, and tends to be attracted by the bizarre or atypical. It also is potentially highly labor intensive and costly, and the potential for failure to reach closure is high.

Parlett and Hamilton (1976) note that naturalistic evaluation depends on open-ended techniques, and the progressive focusing in this approach can cause potential problems in terms of evaluation partiality. Sadler, cited in Worthen and Sanders (1987), states data-processing as a potential source of bias in naturalistic evaluations.

Kirkup (1986) notes that naturalistic evaluation is a very broad and vague concept which serves mainly as a useful umbrella for a number of different evaluation models. House (1986) describes Rob Walker's experience in terms of the difficulties he encountered in conducting naturalistic studies. They are categorized as follows: first, naturalistic evaluation is highly interventionist in effect; second, it often presents distorted views of the world one is trying

to portray; finally, it is a conservative evaluation because it portrays current practices and fixes them in time even though the actual situation changes before the report is written. Barnette (1983) states that

> With naturalistic evaluations, it may be more difficult to document the effects of the evaluation on program change or improvement. It is harder to generate specific, formal recommendations which may be easily implemented. Naturalistic evaluation recommendations will tend to be more complex and harder to implement than those for conventional evaluation. (p. 482)

Thus, the naturalistic approach to evaluation seems to be useful for evaluators who have much experience in doing evaluations. It requires time and experience for new evaluators to practice and learn ways to solve problems within the natural setting.

Application of Evaluation Models to Extension Education

The Joint Committee on Standards for Educational Evaluation, established in 1981, identified four important attributes of evaluations. These attributes--utility, feasibility, propriety, and accuracy--are applied in judging the efficacy of evaluation approaches. Using House's taxonomy as described earlier in this chapter, the author applied the Joint Committee standards to each category or model in an

attempt to identify the most suitable approach to evaluation of the Artificial Fish Breeding Training Program.

Tyler Model

According to this model, evaluation should determine the correlation between performance and objectives. The focus is on the collection and analysis of performance data, which is then related to specified objectives.

In terms of propriety and feasibility standards, Worthen and Sanders (1987) note that the efficacy of this model lies in its simplicity. It is easy to understand and to follow for implementation purposes. It also produces information that educators generally agree on because it is relevant to their needs and functions. However, this model requires a number of steps, including the diagnosis of needs and the formulation of specific objectives. While these steps are simple for evaluators, they are not simple for educators, especially the formulation of behavioral objectives. This is the core of the Tyler approach, but educators seem "unaccustomed to thinking or speaking in 'behavioral' language familiar to objective-oriented evaluators" (Worthen & Sanders, 1987, p. 74). Worthen and Sanders (1987) note that "training every teacher to use a receipe for translating every aspiration into a behavioral objective wastes time and resources and distorts what education should be" (p. 70-71).

If this model were selected for the Department of

Fisheries Training Program, it would not be feasible because training staff are unaccustomed to and unfamiliar with the writing of behavioral objectives. Furthermore, the outcomes of the Tyler evaluation model provide little direction toward improving training programs because it focuses narrowly on objectives achievement, ignoring audience needs and responses that could provide data to improve the program.

In terms of the accuracy standard, Tyler's model focuses directly and narrowly on objectives, paying little attention to the worth of the objectives themselves (Worthen & Sanders, 1973). Furthermore, the model lacks a real evaluative component and facilitates measurement and objective assessment rather than explicit judgments of merit and worth. It also lacks standards to judge the importance of observed discrepancies between objectives and performance levels. These tend to limit the evaluation's effectiveness and potential. Tyler's model also introduces the possibility of value bias in measuring outcomes (Stufflebeam & Shinkfield, 1985). There is also a danger of introducing lower level objectives, which are easily attained even in the absence of effective programs (Worthen & Sanders, 1987).

CIPP Model

The CIPP model, with its focus on decision-making, is a very complex model. In terms of utility standards, it is not suitable for many settings, because it requires a very

elaborate evaluation process. It includes surveys, needs assessments, case studies, advocate teams, observations and quasi-experimental and experimental designs. While it may be considered feasibile for evaluation experts, it is much to complex a process for practitioners. The CIPP model is advantageous only for those decision-makers who can afford the large budget required.

The CIPP model is also a collaborative effort between the evaluator and the decision-makers. This can introduce opportunities for biasing evaluation results (Stufflebeam & Webster, 1980). Because of the danger of such bias, evaluation results may not reach the standard of accuracy. Stufflebeam and Webster (1980) suggest external meta-evaluation to solve the problem of potential bias, but the cost of such a process would detract from the standards of utility and feasibility. The period of time allotted for evaluating the Department of Fisheries Training Program, limited to only three months, makes the CIPP model an unsuitable choice.

Goal-Free Model

Goal-free evaluation is "evaluation of outcomes in which the evaluator functions without knowledge of the purpose or goals" (The Joint Committee on Standard for Educational Evaluation, 1980, p. 152). Goal-free evaluation meets the standard of utility because it does not require clearly developed and stated goals and objectives (Scriven, 1974).

It examines the extent to which actual client needs are being met by the program, by answering the question "What are the actual effects of the program on clients" (Patton, 1982, p. 46). The focus of goal-free evaluation is client or consumer needs. Most extension training programs, in Thailand and elsewhere, are concerned with people's needs.

In terms of feasibility, the practical procedures of goal-free evaluation seem too difficult if extension workers should choose to do their own evaluation. Data gathering in particular is difficult, with many attainment variables and measuring devices to choose from, and with very little guidance provided.

The main concern with the standard of propriety is "how best to ensure that evaluators will identify and properly judge actual results, whether planned or not" (Stufflebeam, 1974, p. 44). The standard of accuracy is easily met if program managers are content to accept how the program seems to be operating, but there is a problem in justifying the standards applied in the rendering of such judgments. Goal-free evaluation is also costly if carried out well (Stufflebeam & Webster, 1980). This is an important consideration for the Department of Fisheries Training Programs because budgets and time lines for evaluation procedures are limited.

Connoisseurship Model

This model, because it is controlled by experts in a

given field who are capable of in-depth analysis, is not able to meet the standard of utility. Furthermore, feasibility and propriety standards cannot be met by evaluators who rely on describing critically, appraising and illuminating the particular merits of a given object. Evaluators use their own experience, rather than traditional techniques or systematic evaluation methodologies (Santo Pietro, 1983). There are no operational guidelines for practitioners who might want to follow this model (Guba & Lincoln, 1981).

The Connoisseurship model cannot meet the standard of accuracy, because this approach is solely dependent on the expertise and qualifications of the particular expert doing the evaluation. This point is criticized by Stufflebeam and Webster (1980) because of the real possibility of subjectivity, bias, and corruption. Moreover, the evaluation may be undertaken by unscrupulous evaluators as "quick and dirty" evaluation, accomplished in fairly short order (Santo Pietro, 1983).

The Connoisseurship model could only be used in the Department of Fisheries Training Program if an expert evaluator were available. While the model uses methods which include interviews, observations, and review of documents, these are all undertaken casually in a loose, unstructured approach (Santo Pietro, 1983).

Judicial Model

Adversary evaluation is an approach that brings the techniques of a law court to educational evaluation. In adversary evaluation emphasis is placed on illuminating all important aspects of the program being evaluated. The judicial model, the best known adversary model, "provides for the structured consideration of alternative arguments and inferences to keep the evaluation both intellectually honest and fair" (Wolf, 1975, p. 185). This model does not meet the standard of utility, in that it requires considerable expertise on the part of evaluators and clients.

In terms of propriety and feasibility standards, the judicial model provides for a wide spectrum of people interested in the program to express their points of view either directly or indirectly. It is practical for exploring the values of a new or existing curriculum, estimating the congruence between an innovation and the existing system (Owen & Wolf, 1985). However the process is very long. It takes more than six months for the whole judicial process (Wood, Peterson, De Gracie & Zaharis, 1986). Thus it is difficult to arrange time for everybody who is involved in the process. Moreover, it is not likely that this model can be used internally by practitioners in evaluating their own programs.

In terms of accuracy standards for the judicial model, Wood et al. (1986) note that there is no single means of measuring how successful the program implementation is. The

assumption is that the true measure of the program's success is the acceptance of the final jury recommendation by all concerned, but this provides no standard for judgment. While this approach "may resolve conflicts, its potential for enlightenment is limited" (House, 1980, p. 242).

The adversary approach, as epitomized by the judicial model, cannot be feasibly used for the Department of Fisheries Training Program because it requires two separate teams of evaluators and considerable expertise. It is quite expensive and time consuming. Also "many evaluation issues and program decisions are too complex to be reduced to an either/or choice" (Patton, 1982, p. 250).

Responsive Model

Responsive evaluation is an alternative based on what people do naturally to evaluate things, by observing and reacting (Stake, 1975). Stecher and Davis (1987) state that responsive evaluation is guided by the belief that meaningful evaluation seeks to understand an issue from the multiple points of view of people who are involved with the program. Responsive evaluation can be judged in terms of utility standards by its facilitating efforts to draw out issues and problems from staff, participants, clients, and other concerned individuals, and by acting like a counsellor in helping participants clarify their own understandings (Stecher & Davis, 1987).

In terms of propriety and feasibility standards responsive evaluation is very appropriate for use in formative evaluation when the staff needs help in implementing the program. It is also useful in summative evaluation when audiences want to know about a program's activities, results, its strengths and shortcomings (Stake, 1973). Also, according to its evolving design, "it is flexible rather than static" (Maxwell, 1984, p. 134). Thus, this approach can be adapted to unexpected program changes in order to react to new issues and challenges as needed (Stake, 1975). In the case of time constraints, "in a responsive evaluation setting quick preparations can be made for arranging observations and interviews and the data usually can be summarized almost simultaneously" (Lewy, 1977, p. 146-147).

From a utility and feasibility perspective, the responsive model provides clear guidelines so that practitioners can implement the model with little experience. While some expertise is needed in employing the methods used in such an evaluation, the process itself can be clearly communicated with ease (Stake, 1975).

In considering standards of accuracy for responsive evaluation, this approach seems very naturally wedded to the methodology of naturalistic inquiry (Guba, 1978). As a result, "there is no setting of antecedent parameters and no predetermination of output modes. The evaluator is guided mainly by whatever the audiences want to know ... and that

requires that he interact with them in their naturalistic setting" (Guba, 1978, p. 35-36). While this may create problems in terms of accuracy of evaluation results for the "scientific" evaluator, the prolonged interaction of the evaluator in the natural setting can also be seen as guaranteeing a truer, more accurate picture of the program.

The responsive model would be particularly useful in the evaluation of the Department of Fisheries Training Program, more so than other more conventional methods discussed previously. The model provides not only program results but it also responds to audience information needs, providing meaningful data from multiple perspectives.

This model is a feasible choice for the evaluation of the Training Program. The training program has many different audiences, including the fishermen who are, perhaps, the primary audience. This particular audience has a comparatively low literacy level, and this model provides the flexibility of choice of methods, instruments, and reporting procedures to meet diverse audience needs.

Naturalistic Evaluation

While this approach is too important to be omitted, it is not an evaluation model. Rather, it is an approach which can be implemented in whole or in part, in other models. The naturalistic approach has great variability for the educational context, and attempts to document such variability in

order to interpret program happenings and their relationships with program outcomes through investigation in the setting (Barnette, 1983). This approach tends to focus on description and understanding for the purposes of the discovery and verification of propositions in a holistic view of the system or program being evaluated (Barnette, 1983, p. 474). Dorr-Bremme (1985) notes that naturalistic approaches "are especially useful for gaining close-up, holistic, richly detailed information on programs, innovations, and routine institutional operations as they occur in the complexity of real-world contexts" (p. 81).

The naturalistic approach is criticized in terms of propriety and feasibility standards. Dorr-Bremme (1985) notes that it lacks an appropriate theory to link its goals and methods: this jeopardizes both the validity and usefulness of evaluation field work. Furthermore, "it has no formal, recognized and recognizable system for defining and locating participants" (Dorr-Bremme, 1985, p. 18). Barnette (1983) notes that the naturalistic approach tends to be more complex and harder to implement than conventional evaluations. As a result, "it can bias the evaluator to the point that important issues and concerns may be overlooked or be relegated to lower importance than they should" (p. 474).

Naturalistic evaluation has its own accuracy standards in term of truthworthiness. Guba and Lincoln (1981) have summarized the four major traditional criteria into four

questions that also hold for naturalistic evaluation:

> 1. Truth value: How can one establish confidence in the "truth" of the findings of a particular inquiry for the subjects with which-and the context within which-the inquiry was carried out?
>
> 2. Applicability: How can one determine the degree to which the findings of a particular inquiry may have applicable in other contexts or with other subjects?
>
> 3. Consistency: How can one determine whether the findings of an inquiry would be consistently repeated if the inquiry were replicated with the same (or similar) subjects in the same (or similar) context?
>
> 4. Neutrality: How can one establish the degree to which the findings of an inquiry are a function solely of the subjects and conditions of the inquiry and not of the biases motives, interests, perspectives, and so on of the inquirer? (p. 103-104)

Guba and Lincoln (1982) state that a naturalistic approach to evaluation may at least pinpoint what satisfies the evaluator in terms of criteria. The criteria can assist the evaluator in monitoring himself/herself and guiding the field activities. "The use of even all of these techniques cannot guarantee the truthworthiness of a naturalistic study but can only contribute greatly to persuading a consumer of its meaningfulness" (Guba & Lincoln, 1988, p. 85).

For the purposes of evaluating the Department of Fisheries Training Program, the naturalistic approach lacks the necessary prescription to be implemented as a model. However the techniques and methods employed in the implementation of the selected model can and should make use of this

approach.

The Selected Evaluation Model

This evaluation used the Responsive Evaluation Model of Robert E. Stake in the evaluation of the Artificial Fish Breeding Training Program of the Department of Fisheries, Thailand. The responsive evaluation model requires an emergent design, thus the procedures of the evaluation cannot be fully prepared in advance. Guba and Lincoln (1981) state "a responsive design cannot be fully specified except in general terms because each step in the process is determined at least in part by what has emerged prior to that point" (p. 36). Responsive evaluations require the extensive use of naturalistic methods and techniques. In accordance with Stake's guidelines, the researcher adapted the twelve recurring events of responsive evaluation to the setting--that of the Department of Fisheries Training Program in Thailand.

CHAPTER III

Methodology of the Evaluation

The Program to be Evaluated

Purposes of Training

The purposes of the Fisheries Extension Division, Training Section Program are as follows:

1. To provide knowledge of artificial fish breeding for farmers.

2. To provide understanding of fish conservation as a natural resource for farmers.

3. To conserve fish by using artificial breeding to improve fish stocks over time.

4. To promote techniques of fish farming as a business.

5. To help farmers to earn more income from the fishery.

6. To increase production in order to meet the expected increase in demand for local protein consumption of approximately 20 kilograms per person per year.

The Artificial Fish Breeding Training Program

The fishery products of both the marine and freshwater fishery in Thailand have been in decline. The decline in the marine fishery has been caused by both the 200 mile limit and the use of more efficient and effective fishing gear. The decline in the freshwater fishery has been caused by environ-

mental pollution, which destroys the fish hatchery areas. Moreover, as fish products have declined, there has been greater demand for food protein, particularly fish protein, because it is highly valued and is usually less costly than protein from meat.

In attempting to meet consumer demands and to protect the fishery, artificial fish breeding has become essential. The Department of Fisheries of Thailand started doing research on artificial fish breeding in 1951, and succeeded in 1966 by using hormone injections for fish breeding. At the present time the Department of Fisheries has an artificial fish breeding program based on hormone injections; this program produces marketable fish and protects species which have been over-fished, ensuring a renewable natural resource.

The Department of Fisheries has been actively engaged in the Fisheries Extension Program. The Fisheries Extension Division is responsible for the artificial fish breeding training program; this includes the preparation of training courses and training plans for farmers and other people. The Division is also the contact point for fishery stations and provincial fishery offices, and all other sections which deal with fisheries training.

The Training Section is one of six sections within the Fisheries Extension Division. This section is responsible directly for fishery training programs, including preparing training curricula and plans for aquaculture, and fishery

industrial development training, which implements the policy of the National Economic and Social Development Plan. The Training Section work plan in 1990 is focused on artificial fish breeding training, which is emphasized in a number of programs.

Freshwater aquaculture training program.

This program includes both natural fish breeding training and artificial fish breeding training. The program usually operates between February and May, and consists of a three-day course which is held in numerous rural areas. There are approximately thirty participants at each site. The freshwater aquaculture training program consists of two types of activities: two days are classroom oriented with emphasis on theory, and one day, usually the last day involves a field trip. Subject matter is as follows:

1. farming fish
   - feeding
   - kinds of fish for farming
   - select location for fish culture
   - fish farming preparation
   - food, preparation, and fish processing
   - fish diseases and prevention
2. freshwater aquaculture breeding training
   - description
   - demonstration

- conclusion and discussion
- evaluation
  - asking questions or questionnaires
  - random sample of agricultural trainees to check training outcomes.

Village fish pond training project.

This project encourages villagers to utilize water reservoirs to establish fish ponds, thus increasing the available protein for consumption. The project uses existing village organization to create knowledge and skills about fish farming for local committees and villagers. The thrust is the establishment of village fish pond committees, and the motivation of villagers to become involved. The three days training course is as follows:

1. training in fish culture for the village committee
   - select location for fish culture
   - kinds of fish for farming
   - food for fish and preparing food processing
   - artificial fish breeding
2. training in fish culture for committee and villagers
   - fish management
   - media presentation in fish culture to motivate villagers
   - artificial fish breeding
3. village Fish Pond administration and management

- the objectives of the project
- pond management
- committee management

The training emphasizes village fish pond management and fish culture in general. The artificial fish breeding training is presented only briefly in 1 to 2 hours, and there is not any demonstration or practise of artificial fish breeding.

Fishery volunteer training project.

This training project has three main purposes: to increase fish population in the water reservoirs, both freshwater and brackish water; to increase income for small scale fishermen so that they make a better living; to foster a positive attitude toward fishery conservation in people by releasing the fish from their own breeding farms to the natural reservoirs. The training course is five days, with subject matter as follows:

1. - fishery situation in the present time
   - pond management and use of fertilizer
   - fish culture and fish farming
2. - the law of fishery and fish management
   - food for fish and feeding
   - natural fish breeding
   - artificial fish breeding demonstration
3. - artificial fish breeding and demonstration

(continued from day 2)

- handling fingerlings
- giant freshwater prawn culture

4. - fish diseases and prevention
   - fish culture in appropriate location
   - panel and discussion

5. - field trip

The training program usually includes demonstration and practical training which takes place at a fishery station. Sometimes the staff cooperates with a provincial fishery office for special details.

<u>Tung Kula Ronghai fishery development training project</u>.

This project takes place in five provinces in the northeast region. The training project is designed to establish village fish ponds, increase the fish population in order to increase village protein consumption, transfer knowledge of fish culture and fishery conservation to villagers, and increase farmers' incomes from fishery occupation. There are four days for the training program. This subject matter is described as follows:

1. - fish culture in general
   - food for fish and feeding
   - natural fish breeding
   - demonstration and practise of natural fish breeding

2. - fish in the rice fields
   - fish delivery and transportation
   - artificial fish breeding
   - demonstration of artificial fish breeding
   - animal farming
3. - conclusion of day 2 lecture
   - practise of artificial fish breeding
   - integrated fish farming
   - evaluation of training
4. - field trip

The Training Population

This evaluation study took place in seven sites throughout the centre and northeast regions of Thailand. There were approximately 200 participants in the training program: of these approximate 30 took part in the pilot study of the evaluation. Following the pilot study at one site minor changes were made in instruments and observation schedules. The remaining group, approximately 170, participated in the study in six sites.

The participants in training programs operated by the Training Section, Fisheries Extension Division, are for the most part rural farmers who either are encouraged by government to become involved in fish farming or have already begun a small fishery business. Participants have low formal

education, and while they are literate they are likely to experience difficulty with technical language and subject matter. Most are middle-aged males, who are heads of families, and they operate small farms with the help of family members.

The government encourages farmers to become involved in fish farming in seasons when regular farming is not done. Those who participate are provided with incentives such as free meals, transportation, accommodation when appropriate, and a per diem allowance.

Some participants will have been involved in training programs prior to the present training. Their goal is to get additional knowledge and skill so that they can increase their fishery effort and expand their operation.

Procedures of the Evaluation

The evaluation study, using Stake's Responsive Model, followed the modified clock diagram indicating the various phases of the evaluation (see Figure 3).

Using interviews and brief written questionnaires, the various audiences and their concerns and issues were identified. The evaluator set the standards, which were then approved by all of the audiences at the implementation stage of the evaluation. An evaluation team of four people attended all training sessions, using naturalistic methods such as

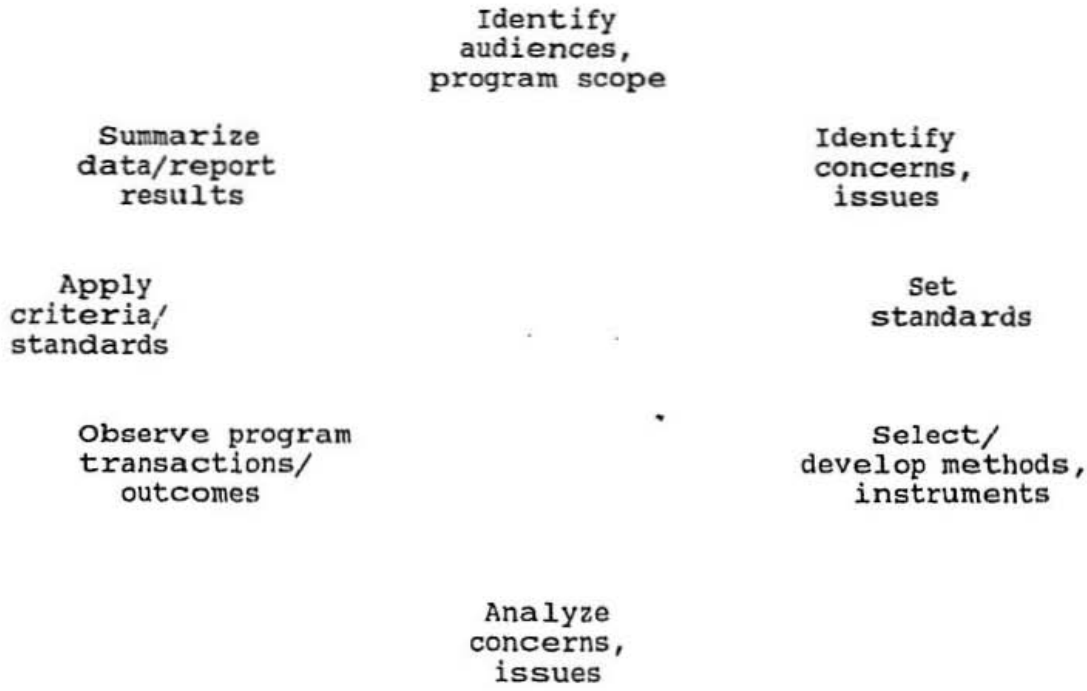

Figure 3 Adaptation of Stake's prominent events in the Responsive Evaluation (Stake, 1976) to the Artificial Fish Breeding Training Program Evaluation

observation, unstructured interviews, photographic recording, audio recording, and document and record analysis. Data were then analyzed qualitatively and the evaluation reports prepared.

Development of Instruments

While the responsive evaluation model is clearly emergent in design, it is possible to determine which data collection strategies will likely be employed, and to develop at least initial instruments. The evaluation of the Department of Fisheries Training Program used primarily four methodologies as follows:

1. interviews--structured and semi-structured
2. questionnaires
3. observations
4. document and record analysis

The Instruments

Interviews.

Lofland (1971) defines the interview as the act of perceiving what is being conducted between two separate points, or in the present case between two separate people. Two types of instruments were developed for interviews. Semi-structured interviews were conducted with the aid of an open-ended interview guide. The interview guide provided for flexibility, permitting the interviewer to add questions or change directions in accordance with the responses given. An interview guide was also developed for the structured interviews. It was deemed feasible to use the structured interview format when it could be anticipated, as in the case of the

trainers, what the responses were likely to be.

Questionnaires.

A questionnaire is another way of collecting information in a systematic way by deciding what information is needed (Santo Pietro, 1983). Open response questionnaires were designed for the evaluation: this type of questionnaire ensured that evaluators would avoid exerting influence or control on the answers given. Respondents were free to give their own opinions, in their own language.

Observations.

There are many reasons for utilizing observational techniques. Guba and Lincoln (1981) state that these techniques build on direct experience; they make it possible to record behavior and events as they occur and to build on both propositional and tacit knowledge; they enhance the observer's ability to understand complex situations and they also permit data collection in instances where other forms of communication are impossible (p. 192-193).

The evaluation used two types of observations. Running notes allowed the observers to feel free to record almost anything, using their own style. Using a camera to record ongoing events as they occurred provided another form of observational data, and also provided a degree of reliability to the evaluation.

Evaluation Schedule

A pilot of the evaluation procedure was conducted at Supanburi Fishery Station in the central region. The program, Freshwater Aquaculture Breeding Techniques ran from March 19-23, 1990. Following the pilot study, the schedule for evaluation was as follows:

1. Freshwater Aquaculture Breeding Techniques at Kanchanaburi Fishery District Office, March 26-28, 1990.

2. Fishery Development in Tung Kula Ronghai Project at Roi-Ed Fishery Station, April 1-4, 1990.

3. Village Fish Pond Project at Surin Fishery Station, April 25-29, 1990.

4. Freshwater Aquaculture Breeding Techniques in the Fishery Volunteer Project at Surin Fishery Station, April 30-May 4, 1990.

5. Freshwater Aquaculture Breeding Techniques in the Fishery Volunteer Project at Petchburi Fishery Station, April 30-May 4, 1990.

6. Freshwater Aquaculture Breeding Techniques at Kon Khan Fishery Research and Development Centre, May 2-4, 1990.

CHAPTER IV

Implementation of the Evaluation

Introduction

The evaluation was implemented over a three month period in various training sites in the central and northeast regions of Thailand. In implementing the evaluation, the researcher followed the modified clock diagram of Stake's Responsive Model (see Figure 3), beginning at 12 o'clock.

This chapter presents a description of the evaluation process itself as implemented and a qualitative analysis of the data gathered during the evaluation. In accordance with Stake's Responsive Evaluation Model, the data is highly descriptive of the program, and addresses the program concerns and issues raised by the various stakeholders--that is, the groups who were involved, in some capacity, with the training program.

Audience Identification

The researcher, through consultation with the Director of the Department of Fisheries, identified the various groups and individuals involved, in some capacity, with the Artificial Fish Breeding Training Program.

At the administration level, four directors were identified as follows:

1. The Director, Department of Fisheries, who is responsible for all projects in every Division;

2. The Director, Extension Division, who is responsible for the development and implementation of all extension programs;

3. The Directors of Fishery Stations who manage fishery biological research and who support the training efforts of extension programs;

4. The Director, Training Section, who is responsible for the development and delivery of all training curricula.

At the delivery level, the researcher identified the trainers as the sole audience. Trainers include fishery biologists at both the Training Section and Fishery Stations, Extension workers, and Fishery officers.

An important audience of all training programs is the trainees. The trainees of the Artificial Fish Breeding Training Program include farmers, fishermen, fishery business persons, and other accepted as trainees on the basis of the general interest in the program.

Another audience group was categorized as leaders. This group includes village opinion leaders, teachers and students from local colleges who would be expected on completion of the program, to assume a leadership role in the development of the fishery, and successful business persons in fish farming.

Concerns and Issues Identification

Guba and Lincoln (1981) state that "responsive evaluation produces information that audiences want and need. Responsive evaluation does not undertake to answer questions of merely theoretical interest; rather, it takes its cues from those matters that local audiences find interesting or relevant" (p. 38).

To identify concerns and issues of all audiences, the researcher used both interviews and checklists with representatives from the various audiences. From the interviews and checklists, six categories of concerns and issues emerged as follows:

1. Curriculum concerns/issues;
2. Target learner concerns/issues;
3. Knowledge transfer concerns/issues;
4. Program improvement concerns/issues;
5. Training schedule concerns/issues;
6. Training impact concerns/issues

Curriculum Concerns/Issues

Leaders were for the most part the audience group expressing these concerns. They were concerned about the need for more technical information about artificial fish breeding in the curriculum. Trainers raised the issues of the training program being too general, containing too many topics to be

adequately covered by the few trainers available to implement the programs.

Target Learner Concerns/Issues

Most audiences were concerned about the wide variety of knowledge levels among trainees, making it difficult to provide training which could meet all trainee needs.

Knowledge Transfer Concerns/Issues

All audiences expressed concern about the quality of instruction. They felt that instructors were required to provide training in subject areas where they lacked expertise, and they were concerned about the lack of knowledge about media utilization in training. An issue for all audiences was the ability, on the part of instructors, to bring about knowledge transfer.

Program Improvement Concern/Issues

In addition to instructors with broader knowledge and experience, concerns were expressed about the lack of adequate training equipment, audio-visual aids, and well-developed course outlines. An issues for directors and leaders was the need for more practical training. Concern was also expressed about the lack of consultancy with trainees regarding their information needs prior to the development of the training programs.

Training Schedule Concerns/Issues

Most of these concerns centered around the length of the training programs. Nearly all audiences felt that a longer training time was desirable. Concern was also expressed about setting the training schedule to occur in the breeding season, for demonstration purposes.

Training Impact Concern/Issues

Most audiences expressed concern about the trainees ability, at the end of the training program, to implement an artificial fish breeding program of their own, and to transfer their knowledge to others in their villages.

Establishing Standards

While responsive evaluation does not emphasize the necessity to formally establish standards (Stufflebeam & Shinkfield, 1985), the setting of standards is an important step in all evaluations. As Worthen and Sanders (1973) note, there can be judgments made in the absence of standards.

The researcher established standards, based on the audiences' needs, for the Artificial Fish Breeding Training Program, and, as demanded by all responsive type approaches, shared the standards with the training program audiences. Following approval by program administrators, the standards were applied in the rendering of judgments about the training

programs.

In establishing standards, the researcher considered seven separate training program components including

1. Curriculum
2. Organizational cooperation
3. Knowledge transfer
4. Knowledge gains
5. Instruction
6. Affective development
7. Facilities and resources

Standards for each of the program components are as follows:

1. Curriculum
    a) is appropriate to trainees' needs
    b) is comprehensible to trainees
    c) is well prepared
    d) is suited to the time allotted for training
2. Organizational cooperation
    a) meets the needs of program staff
    b) is flexible as required by the program
    c) provides for adequate trainee activities
3. Knowledge transfer
    a) instructors have adequate experience for training
    b) can occur regardless of trainees' knowledge level

c) is comprehensive

d) is matched to trainee needs

4. Knowledge gain

a) trainees are able to explain the artificial breeding process to others

b) trainees are able to demonstrate artificial fish breeding

c) trainees are able to apply knowledge to their work

5. Instruction

a) there is ongoing evaluation and improvement of training programs

b) instructors have the requisite knowledge to carry out the training program

6. Affective development

a) trainees demonstrate their belief in their ability by doing artificial fish breeding following the training

b) trainees develop a concept of fishery conservation

7. Facilities and resources

a) are in accordance with the budget

b) are adequate for training

c) are available as required by the curriculum

Data Analysis

Through program documents and records, extensive on-site observation, interviews, and open-response questionnaires and checklists, data were collected. Since the data were qualitative in nature, they were analyzed using semantic content analysis in accordance with guidelines as described by Krippendorff (1980).

The responsive approach "is an attempt to respond to the natural ways in which people assimilate information and arrive at understanding ... The analyst believes that separate examination of components lead to better understanding" (Stake, 1975, p. 23). The summary of the data is organized according to the seven program components for which evaluation standards were developed, as listed on p. 108.

Curriculum

Program documents revealed that the objectives of the Artificial Fish Breeding Training Program are as follows:

1. Trainees shall be able to utilize the knowledge gained correctly;

2. Trainees shall be able to demonstrate understanding of the artificial fish-breeding process.

Through interviews with selected representatives from each audience group, it was established that they felt that the curriculum for training was not appropriate. Some of the

courses needed to be improved to meet the trainees' needs. It was also expressed that the time allotted for implementation of the courses was unsuitable, being much too short.

According to program documents, the Training Section developed all outlines and objectives of each course in the Aquaculture Training curriculum. This section then provided fishery stations with course and lecture outlines, objectives, and support materials: the purpose of such centralized development was to attempt to ensure that the same training process would be used throughout the various regions.

Program documents revealed that the curriculum objectives emphasized the acquisition of practical skills in artificial fish breeding. It was expected that trainees, as a result of training, would be able to use the knowledge gained in their real world setting. But evaluators found that the course outlines provided by the Training Section were inadequate, because there was much emphasis on general knowledge of fish farming, and little emphasis on artificial fish breeding. In three to five days of training, approximately 75% of the training time was devoted to lecturing, and of that time only two hours was devoted to the topic of artificial fish breeding. In some cases, training programs had no practical or demonstration component, while in longer programs there might be much as one day emphasizing the practical elements of training. In all, only a maximum of 20% of training time

was practical in nature.

Observations conducted in the training settings provided evidence that the artificial fish breeding training component of curriculum was too brief for trainees to comprehend the process. At some training sites it was observed that there was no demonstration component of the process, because training was conducted away from the regional fishery station. Lack of demonstration made it very difficult for trainees to understand the breeding process.

From the random sample of trainees selected for indepth interviews, the following opinions were expressed:

> "I would like to have artificial breeding demonstration and trial."
>
> "They should have a demonstration so that I can see the actual event and practice it at the same time."

The trainees expressed their apprehension to the interviewers about their lack of understanding of the artificial breeding process, the way to calculate using hormones, the pituitary gland operation, the injecting of the hormones, and the mixing of eggs and milk. They expressed the following concerns:

1. The way to calculate use of the hormone is complicated.

2. They had no chance to practice pituitary gland operation.

3. They did not like the gland operation because it was too complicated.

4. How to inject the artificial hormone was not clear.

5. The process of squeezing eggs and mixing milk was not clear.

From the interviews with trainees more than 25% expressed concern about the time allotment for the implementation of the curriculum. Many noted that training days should be more than doubled, suggesting from seven to fifteen days. They noted that they needed details of the artificial fish breeding process, and that more practical training was desirable. In fact, they indicated the need for demonstration of every process.

Leaders also expressed the view that the training period for each course was too brief. They felt that was not enough time for trainees to learn the process of artificial fish breeding, and felt that the curriculum should place greater emphasis on details of the breeding process and on fish care and management.

From the on-site observations and open-ended questionnaires the evaluators considered the instructor preparation of the curriculum. It was obvious that some instructors were frequently unprepared for the various topics, through their inability to answer questions clearly. At times instructors skipped over questions, failing to provide answers as they were needed. Some instructors who did attempt to answer questions did so vaguely, providing disorganized information which indicated that they were not familiar themselves with

the subject matter.

In interviews with the instructors the evaluators found that more than 25% expressed concerns about their problems in preparing for training courses. Some had little first hand knowledge of the more complex aspects of the curriculum such as operation of the pituitary gland, mixing and calculating hormones and selecting donor fish. Added to this lack of knowledge on the part of instructors was the further complication of receiving training outlines and materials too late to familiarize themselves with the curriculum prior to the onset of training.

Data summary: curriculum.

Through interviews, open-ended questionnaires, and observations the following points were made about the artificial fish breeding curriculum by the various audience groups:

1. Administrators
   - The program provides knowledge about fish breeding, fish farming and fish culture.
   - Program knowledge enable people to produce more fish to meet their needs.
   - Knowledge of fish culture will be spread to every area.
   - Manpower can be used year-round in the fishery.
2. Instructors

- I enjoy my work.
- I will be pleased if trainees are really interested in my training.

3. Trainees
   - I got new knowledge that I have never had before.
   - I am pleased to get more knowledge.
   - I got knowledge about fish farming.
   - I got a lot of knowledge from training.
   - It is a useful program to improve fishery management.

4. Leaders
   - It is a good program because we do not have to wait for the breeding season.
   - I only got theory about fish breeding.
   - The fish breeding and the artificial fish breeding knowledge are useful.
   - We got more knowledge from the training.
   - We got knowledge of the fishery in general.

Conclusions and recommendations.

The administrators of the Training Program had high expectations, anticipating that the objectives would be met. But while the curriculum is very useful, the ability of trainees to absorb complex knowledge is limited and requires a greater time allotment.

The centralized planning and development of course outlines and objectives fails to take into account trainees' background knowledge and education levels, and as a result trainees' needs are often not met. Furthermore, the curriculum is developed without considering the knowledge and ability levels of instructors, who are ultimately responsible for the delivery and knowledge transfer in the courses.

It was found that trainees spend a lot of time in the classroom being lectured on various theoretical concerns of aquaculture. For trainees with low formal education levels lecturing is not the preferred methodology for knowledge transfer. There should be more practical training, where trainees have the opportunity to learn through first-hand experience. The curriculum should be reviewed so that it can meet program objectives.

In term of standards for curriculum, the training program is not appropriate to trainee needs. Furthermore the more complex subject matter is not comprehensible to trainees, being presented solely through the lecture method and lacking demonstration and practice. While the curriculum is well-prepared, it is prepared in isolation from the trainees and the instructors, hence it is often poorly implemented. The curriculum also is too detailed for the training time allotted, resulting in lack of time for the trainees to absorb the information being presented. Thus, despite positive opinions about the curriculum expressed by program

administrators and the trainees themselves, it does not meet the standards established by evaluators.

Organizational Cooperation

Based on the workplan document of Fisheries Extension Division, planning of aquaculture training is the cooperative responsibility of fishery stations, provincial fishery offices, the Training Section and other agencies. All of these agencies must work cooperatively in order to develop the training schedule and to deliver training to the various regions.

From observations, interviews and open-ended questionnaires it was found that the responsibility of the Training Section is that of cooperative administration rather than delivery of training. One administrator expressed concern regarding this cooperative administration role. The time lines of the Training Section and those of the fishery stations and/or provincial fishery offices are frequently incompatible, because each unit has its own work to manage. There are times when the Training Section wishes to implement training, but the other agencies are scheduled to undertake their own responsibilities over and above the training function. This requires that the Training Section adjust its time lines. A further complication is the seasonal nature of fish breeding. For training to have a demonstration component it is required that training programs operate at the

appropriate time of year, but because of the varied work of fishery stations it is often not possible to adhere to such schedules.

A further concern regarding organizational cooperation is the use of educational media in training. The Media Section of Fisheries Extension Division develops much support material for the aquaculture curriculum, but instructors working in the various agencies often lack the necessary experience to use the media effectively for training. Classroom observations indicated that most of the instructors did not use the support materials to illustrate complex procedures such as injection of hormones. Some instructors who did use the media selected the media inappropriately--for example projecting overhead transparencies onto the blackboard and using videotaped lectures for two hours at a time.

Data summary: organizational cooperation.

Through interviews, open-ended questionnaires, and observations the following points were made by various audience groups about the organizational cooperation component of the Artificial Fish Breeding Training Program.

1. Administrators
   - Cooperation for the training effort is very important because of shared responsibilities of various agencies.
   - Cooperation among agencies allows for exchange

of opinions regarding all aspects of aquaculture training.

2. Instructors

- Flexibility of cooperation effort helps in the sharing of media equipment.
- Cooperation effort provides for greater organization of training.
- Through cooperation of training effort expertise and staff is available for the delivery of specific subject matter.

3. Trainees

- We can help each other, if we have problems with fish farming after the training.
- I feel pleased to get knowledge that I can transfer to other people.
- We are willing to cooperate in our work in order to have enough fish in our villages.

4. Leaders

- Cooperation with the fishery officers can bring knowledge about the fishery to our village.
- We are all enthusiastic about the artificial fish breeding training because instructors are very friendly.

Conclusions and recommendations.

The training program is a cooperative effort of a number

of divisions and agencies. Cooperation is required among organizations, since no one division or agency can manage the aquaculture training program throughout the various regions. While the administrative structure for organizational cooperation exists, various divisions, because of their many responsibilities in addition to training, often fail to meet the Training Section's needs for program delivery. One such example of this failure results in training being carried out at times other than the natural breeding season, when demonstrations and field trips could be included in the training. In terms of standards for organizational cooperation, the training program meets the needs of Training Section staff, but frequently is disruptive of the on-going work of the staff in other divisions and agencies. While there is some flexibility in terms of the cooperative effort, greater flexibility would enhance program delivery. The cooperative effort certainly fails to provide the trainees with appropriate activities--at certain training sites there was little or no opportunity for breeding demonstration and practice because of the seasonal nature of breeding of various fish species. Thus while there is evidence of organizational cooperation among the divisions and agencies concerned with the aquaculture training program, greater cooperation would result in better, more successful training. In terms of organizational cooperation, the standards established by evaluators have been partially met.

Knowledge Transfer

Bruce (1968) states that an essential element of extension education is the effort required to put information into the hands of clients with different levels of knowledge and education. For knowledge transfer to occur, training must be geared to the entry level of trainees; otherwise new information and knowledge will lie beyond the comprehension of trainees.

Based on observations in the training setting and interviews with the sample group of trainees, evaluators established that very few instructors had adequate subject matter expertise and/or experience in the presentation of information in a training setting. Trainees' reactions to classroom training sessions demonstrated boredom, disinterest, and general lack of attention, as evidenced in such behaviors as talking to each other during training, day-dreaming, gazing through window openings, and sleeping.

Problems of inattention were caused by overuse of the lecture method for extended periods of time, use of technical words beyond the comprehension level of trainees, and inability to explain clearly complicated formulae and procedures.

With at least three categories of trainees in each training program, including school teachers who are expected to function as leaders, well educated farmers and fishermen, and poorly educated farmers and fishermen, knowledge transfer

is difficult to achieve. Classroom observations established that questions raised by trainees during instruction came mainly from the school teacher group, and occasionally from the well-educated farmers and fishermen. In all classroom interactions it was clear that the poorly educated farmers and fishermen did not know enough to ask appropriate questions. Only those who could follow the subject matter as the instructors explained it took part in discussions.

The instructors were aware of the difficulty in providing suitable instruction for the transfer of knowledge among the diverse trainee group. Some instructors realized that they needed more training and experience to be able to deal with the various entry levels of trainees.

According to Mijindadi (1978) extension programs fail because the needs of the people are not adequately met. In addition to the different knowledge levels of trainees on entering the training program, trainees also have different information needs. Through interviews with a sample of trainees in each site it was established that there were needs for knowledge about fish in general, knowledge about the artificial fish breeding process, and knowledge about natural fish breeding processes. While each of these subject areas is included in the program, not all trainees are interested in each area. Classroom observations established that most trainees pay attention to each lecture, whether or not it is a subject of specific interest to them. Trainees seem

enthusiastic about every lecture, regardless of its application to their particular information needs.

Data summary: knowledge transfer.

Through interviews and observations the following points were made about knowledge transfer in the Artificial Fish Breeding Training Program.

1. Administrators
   - There should be more training, seminars, and exchange of knowledge among instructors so that they can better develop their training program.
   - Training Section instructors and on-site instructors need to be trained to manage their own training programs.
2. Instructors
   - More training is needed to improve knowledge and to improve use of extension media in training.
   - Each training program should be of real use to farmers.
   - There should be monthly meeting of instructors to share opinions and problems and to check training progress.

Conclusions and recommendations.

Three main factors influence knowledge transfer in the aquaculture training program. Instructor experience in

training techniques is one such factor. Since trainees are mostly farmers and fishermen they are not accustomed to the procedures of regular schooling. Hence they need to be motivated and to be provided with alternative methods to being lectured at. Use of media and the personalization of information through the sharing of instructors' experiences in aquaculture would do much to improve trainees' attention to the knowledge being presented.

Another factor influencing knowledge transfer is the beginning knowledge level of trainees. The evaluators found that administrators who selected trainees often did so with little consideration of trainees' knowledge levels, their interests in the particular courses, or their participation in the most appropriate course. As a result, each course would have trainees with diverse knowledge levels, and in fact some trainees had little interest, but were included because spaces were available in the particular program.

The third factor is trainee needs. Most trainees have specific reasons for participating in the aquaculture training programs, based on their information needs to become involved in fish farming. Frequently the course outlines are broad and general, covering a multitude of topics about fish farming. Trainees might, in three days of training, be exposed to a number of lectures which go beyond their specific knowledge needs. It is recommended that the Department consider redesigning the training curriculum so that courses are more

in line with trainee needs. It is felt that this would improve knowledge transfer.

In terms of standards for knowledge transfer, the training program is inadequate. Instructors do not have adequate subject matter expertise or training experience, and they are unable to exhibit the flexibility required to ensure that knowledge transfer occurs across all trainee groups. Some trainees, particularly those with low education and knowledge levels, are unable to understand the knowledge being presented. While general knowledge of aquaculture is transferred readily, more complex and technical knowledge, presented usually through lecture format with little media support or illustration, is not transferred to all trainees. Knowledge transfer, then, is not matched to trainee needs. Despite the fact that general knowledge of aquaculture is transferred to all trainees, specific, complex knowledge seems to be transferred to the teacher trainee group only. Thus the training program does not meet the standards set by evaluators in terms of knowledge transfer.

Knowledge Gains

All educational programs have as a focus the impact on learners in terms of gains in new knowledge and skills. Observations and interviews conducted during the implementation of the aquaculture training program focused in part on the acquisition of knowledge and skills.

One objective of the aquaculture training program stated that participants should be able to explain and demonstrate the various fish farming procedures to others. In the case of the training program offered in two sites, no demonstration and practice component was included. Hence trainees were unable to comprehend the process as described in lectures. In interviews conducted at these two sites, it was determined that only three of ten participants were able to explain the artificial fish breeding process to others. The remaining seven participants interviewed were unsure of their ability to perform this task. The ability of trainees to demonstrate artificial fish breeding is a training outcome of learning by doing, hence demonstration and practice is crucial to the development of the skill.

The evaluation took place in seven training sites. Most sites included a demonstration component in the training program. The importance of the demonstration component can be seen in the knowledge gain concerning ability to explain and demonstrate fish breeding processes to others. In those sites with a demonstration component, two thirds of participants indicated that they would be able to demonstrate the processes for others, whereas in the two sites with no demonstration component less than one third indicated their ability to demonstrate the processes.

Juntarashote and Daosukho (1986) note that the ability of learners to apply their knowledge is part of the cognitive

domain of learning which describes the progressive development of learners' mental activity. Data gleaned from interviews with trainees indicated that the majority were able to apply the knowledge to their own work in aquaculture.

Data summary: knowledge gains.

According to observations and interviews, the following opinions were expressed by the various groups.

1. Administrators
   - All trainees should know about fish farming.
   - Trainees can use the new knowledge to improve their work.
   - Teacher trainees should be able to transfer their knowledge to students.
   - Most of the trainees should be able to use their knowledge of artificial fish breeding.
2. Instructors
   - Trainees should get knowledge from demonstrations.
   - Trainees should be able to use the new knowledge in their work.
   - They should know the process of fish breeding.
3. Leaders
   - Trainees should get guideline to carry out fish breeding.
   - They should be able to utilize knowledge and

put it into practice.

- They will benefit from a general knowledge of the fishery.
- They should know all of the specific processes involved in fish farming.

Conclusions and recommendations.

Demonstration is crucial to the training process, if knowledge gains are to be realized. It aids in motivating trainees, in their ability to perceive and to understand the knowledge, and in their ability to apply the knowledge. For knowledge gains to be achieved, the Department of Fisheries must ensure that all training programs include a demonstration component.

In terms of standards for knowledge gains, the training program did provide the majority of participants with the ability to explain the artificial fish breeding process, to demonstrate the process to others, and to apply the new knowledge to their work. However it should be realized that nearly one third of trainees were inadequately prepared to undertake all three of these tasks. The evaluators, while aware that there is room for improvement, feel that the standards for knowledge gains have been met.

Instruction

The delivery of instruction in the Artificial Fish

Breeding Training Program is the responsibility of a varied group of instructors, including fisheries biologists, Training Section staff, and extension workers. While these actually do the training in the various sites, the training courses and materials are designed exclusively by the Training Section.

Through classroom observations and interviews with the various audiences, a comprehensive picture of the instruction was developed. The instruction, as originally conceived by the Training Section, was rarely delivered. The Training Section's emphasis, from a development perspective, was totally on the subject matter, resulting in comprehensive course outlines and subject matter support materials. But no materials or directions regarding instructional methods or guidelines for delivery were included. The evaluators concluded, through observations, that the focus was one of curriculum development, rather than instructional development. Given that instructors themselves have very little experience or knowledge of instructional methods, there is a need for extensive instructional design or development activity in preparing the training programs.

Through observations it was also established that the constraints of the various instructional settings impacted on the actual instruction. In many cases constraints such as inadequate lighting, lack of air flow, placement of the site in close proximity to the road, room size and/or shape, and inappropriate demonstration space negatively influenced the

quality of instruction.

Through interviews it was established that the trainees liked and admired the instructors, and attributed flaws in the instruction to sources other than them. However, evaluators noted that some instructors lacked the necessary subject matter knowledge, and many of them were inadequately trained in instructional methods and use of media in instruction.

Data summary: instruction.

According to observations and interviews, the following points were made by the various audience groups.

1. Administrators
   - There needs to be regular meetings so that problem occurring on site with instruction can be rectified.
   - Instructor training is needed so that they have more techniques.
2. Instructors
   - Other works routines interfere during the training.
   - More time is needed for the training programs.
3. Trainees
   - There is too much lecture and theory.
   - There is too much detail for some topics.
4. Leaders

- Trainers need more experience to explain some topics.
- There should be more use of media to motivate trainees.

Conclusions and recommendations.

The instructional component of the aquaculture training program, while well planned from a subject matter perspective, was not developed in terms of instructional methods and techniques. As a result, media that had been designed for use in the training program was frequently overlooked or used poorly, and trainees for the most part were required to sit through long lecture periods with little visual illustration or stimulation.

The observations in the classroom indicated that approximately half of the instructors intended to use lectures only. Their method of presentation to trainees indicated that they were not well prepared. Some instructors simply read information for the trainees, rather than providing explanations. Moreover, they lacked confidence in answering some of the questions posed. Some instructors had experience in the fishery, so they assumed that there was no need to use illustrative techniques for training. They felt that they could entertain trainees through their own experiences, forgetting that they needed to link the subject matter together so that trainees could understand the content.

Instruction also suffered from constraints of the various settings. In some cases where demonstrations were carried out, the viewing area was much too small to accommodate the full group of thirty, and only approximately one-third of the trainees were able to see what was occurring. Time limitations, too, hampered instruction, as did, in some cases, lack of instructor knowledge and expertise. In order for the instructional component of the training program to be improved, a comprehensive instructional development plan would have to be implemented. The Department of Fisheries should implement such a plan.

In terms of standards for instruction, the training program is not evaluated and improved formatively as it is implemented in the various sites. There is little effort to establish what is occurring, or to solve anything but urgent problems with the instruction. Some instructors are not adequately versed in instructional methods and techniques, and in the subject matter. As a result the instruction in some sites is inadequate. The instruction fails to meet the standards established by evaluators.

Affective Development

According to Juntarashote and Daosukho (1986) the affective domain is related to attitudes and values. While the focus of training is usually the cognitive domain, if the goal of training programs is to encourage participants to act

on knowledge in the future, affective development must be included in the training effort.

Interview data disclosed that prior to the training program approximately half of trainees expected to gain knowledge of the artificial fish breeding process. Following the training more than half of the trainees expressed their intention to do their own artificial fish breeding, indicating the development of a commitment on their part. Development of commitment is level four of the affective domain.

Concerning fishery conservation, interview data indicated that most trainees were cognizant of the advantages of fishery conservation. They were able to understand the benefits to themselves and their families of conservation measures, thus they had developed a positive attitude about such practices.

Data summary: affective development.

From interview data the following points were made by the various audiences:

1. Administrators
   - As a result of the training in artificial fish breeding, the fishery culture will spread to every region.
2. Instructors
   - The training develops positive attitudes which lead to increase in fish production for farmers.
3. Leaders

- Trainees should be able to do fish breeding without waiting for the breeding season.
- They can get more fingerlings than through natural breeding.

4. Trainees
   - Artificial fish breeding can solve the problem of lack of fish in the non-breeding season.
   - Artificial fish breeding can improve our fish farms.

Conclusions and recommendations.

Interviews with trainees indicated that they were very positive about their ability to use the process learned in training to improve their fish farms. In affective development it is important that behaviors follow attitude formation, and over half of the trainees indicated that they would be implementing processes learned in the future. It seems that the training program fostered a commitment to artificial fish breeding and fishery conservation on the part of participants. In terms of standards for affective development, the training program met the standards set by evaluators.

Facilities and Resources

The training program is short term training for specific knowledge only. Thus instructors made use of temporary

training accommodations which have multiple uses at other times. As a result the facilities were not designed with training needs in mind. Classroom observations disclosed that trainees were not usually comfortable, especially considering that they were seated in stationary positions almost all of each day. Furthermore, most of the training sites were inappropriate, being too small, too hot, having no electric fans provided, being too noisy because of close proximity to the main road, and having inadequate lighting. Some training sites used a hatchery area rather than a classroom. In all, there was only one appropriate room for training, with the proper setting for the use of educational media.

The resources for training included two types: educational materials and breeding equipment. The instructors did not make good use of educational materials for the most part, and showed lack of preparedness using available materials such as posters, photographs, pictures, slide projectors and projection screens. Some of them gave only lectures, and if they were called on to explain specific details they resorted to drawing on the blackboard or letting trainees imagine what fish species looked like.

Breeding equipment for demonstration created problems because it could not be provided for all trainees. Thus some trainees had no opportunity to practice the breeding process. Moreover, the places for viewing demonstrations were not adequate because all of the trainees could not possibly see

the demonstrations with overcrowding.

Interviews, questionnaires, and program documents provided information about the training budget. Administrators noted that they lacked adequate funds for equipment so that all trainees could practice the experiments. In addition transportation was inadequate, making it difficult to transport media equipment for training. Most instructors expressed concerns about problems of deficiency of both educational media and demonstration equipment. They were also aware that the breeding samples provided for experimentation were inadequate.

Data summary: facilities and resources.

According to observations, interviews, and analysis of documents the following points were made by the various audience groups:

1. Instructors
   - The Department should provide enough equipment for training and staff.
   - There is a need for more educational media.
   - Accommodation should be provided for trainees to get to know each other.
   - They should divide trainees into groups of five for practice purposes.
   - More modern technology should be used in educational media programs.

2. Trainees

   - There should be slides and videotapes for training.
   - There should be accommodation to stay over night here in order to see all of the experimental processes.

3. Leaders

   - The instructors should use appropriate areas for demonstration.
   - They should provide enough equipment for demonstration.
   - The instructors should be prepared to use media equipment.
   - The instructors should provide appropriate training rooms.

Conclusions and recommendations.

The Department of Fisheries is responsible for the training budget. It should be increased so that adequate training can be offered, and the Department should realize that it is to their benefit to provide the most effective training programs. With more appropriate facilities, trainees who hope to gain knowledge would be able to concentrate on each subject. They would not experience discomfort because of an inappropriate environment.

Resources for training require greater monetary

expenditure if the training program is to be implemented properly. The Department needs to re-examine its priorities regarding training. They at present are faced with two possibilities: save from a budgetary perspective but fail from a training perspective, or increase the training budget and succeed in the training program.

In terms of standards for facilities and resources, the training program is inadequately supported. While the cost of facilities and resources is within the training budget, it is obvious that the training budget should be increased. Neither facilities nor resources are adequate for the training effort, and as a result the quality of instruction suffers. It is not possible, given the facilities and resources available at the various sites, to implement the curriculum as developed by the Training Section. Facilities and resources do not meet the standards established by evaluators.

Summary

The evaluation of the Artificial Fish Breeding Training Program, Department of Fisheries, Thailand, was conducted in accordance with the modified clock diagram of Stake's Responsive Model (see p. 99). Concerns and issues as expressed by the various stake-holding audiences guided the data collection activities, and summarized, descriptive data were compared with standards set by evaluators and ratified

by program administrators.

The evaluation relied heavily on qualitative research methods, including observation, unstructured interviews, and document analysis. Through prolonged interaction in the program setting, evaluators developed a comprehensive picture of the Training Program as implemented. Standards were established for seven program components, and summarized data were compared with the standards prior to the formulation of judgments about the program effectiveness.

Evaluators found that the Training Program failed to meet the majority of standards. Only one program component, that of affective development was judged to be adequate. Two other components, organizational cooperation and knowledge gains, partially realized standards set by evaluators.

From the failure to meet even half of the standards, it is obvious that there is much need for improvement of the Training Program. However, this does not mean that the program provides no benefits to participants. In fact there is evidence that trainees do gain in knowledge and skills, and exit the program with a desire to utilize what they have learned. Evaluators feel that the Training Program should continue, but they are cognizant of the areas in need of improvement. Because of the depth and breadth of the data derived through the application of the responsive model of evaluation, program administrators now have a detailed list of areas in need of improvement and recommendations regarding how to improve the program.

CHAPTER V

Summary, Conclusions and Recommendations

Summary

The researcher chose the Stake Responsive Evaluation Model for implementation in the Artificial Fish Breeding Training Program operated by the Department of Fisheries, Thailand. She did so after a review of numerous program evaluation approaches and in-depth analysis of six evaluation models. The Responsive Evaluation Model was chosen because: (a) it makes extensive use of naturalistic methods, hence is applicable in the natural setting where most programs are implemented; (b) it addresses the diverse information needs of all audience groups; and (c) its emergent design permits the evaluator to respond to data as it is being collected, leading to more meaningful and relevant evaluations.

Advantages of Responsive Evaluation Model for Extension Training Programs

The Responsive Evaluation Model provides the flexibility required of evaluation models which are to be implemented in an extension setting. Audiences of extension programs include government administrators, village leaders, uneducated rural citizens, technical trainers, and scientific experts. Each audience, according to Stake, must have a voice in the focus of the evaluation through the eliciting of concerns and

issues, and each audience deserves to be informed in the manner which best suits the level of education. The Responsive Evaluation Model provided the opportunity for the farmers and fishermen at the village level to have input in the evaluation process, as well as the centralized program administrators.

The Responsive Evaluation Model, relying heavily on naturalistic methods, gave evaluators the opportunity for prolonged interaction with and exposure to the training program. Evaluators observed the programs as implemented over a six week period in seven different sites. Such prolonged interaction gave them a true picture of the program, and dissipated the possibility of events as observed being an isolated occurrence.

The Responsive Evaluation Model provided a surfeit of data, gleaned from the application of a variety of data gathering techniques. Rich data, according to Guba and Lincoln (1981) are one of the major advantages of the Responsive Evaluation Model. Evaluators estimated that they gathered approximately ten times the amount of data which was actually summarized in the evaluation report. Much of the extraneous data served the purpose of grounding and triangulation. Data collected through one technique or source were compared and contrasted with data from other sources, establishing validity and consistency.

The Responsive Evaluation Model permitted evaluators to

consider and react to unanticipated data because of its emergent design. Frequently, in the process of evaluation, evaluators discover facts which they had not anticipated. In more scientific approaches, such discoveries must be ignored because of the necessity to adhere to the original design. The use of an emergent design is very important to program evaluation, where programs are implemented in real world settings and each program context exerts its own influence on the shape of the program.

The Responsive Evaluation Model, with its emphasis on detailed description of all program components as opposed to emphasis solely on program outcomes, is of considerable use to program administrators. In most cases where program evaluation is implemented, the purpose of program administrators in evaluating the program is not to determine whether it should be continued or discontinued, but to seek means of improving the program. Evaluations which rely heavily on description provide program administrators with detailed data on program strengths and weaknesses, and on areas in need of improvement.

Limitations of the Responsive Evaluation Model for Extension Training Programs

To properly implement the Responsive Evaluation Model requires an inordinate amount of time. Evaluators spent seven weeks in the field and an additional five weeks doing

preliminary evaluation planning and development. Such lengthy procedures, while guaranteeing the relevance of the evaluation data, also resulted in a heavy budget for evaluation.

The Responsive Evaluation Model is expensive to implement. Normally more than one evaluator is needed, since data collecting methods and techniques such as observations and interviews are very labour intensive. In addition, for extension programs travel is usually required, and salary and accommodation costs for two to four evaluators add considerably to the evaluation budget.

Since the Responsive Evaluation Model relies heavily on naturalistic methods, it is recommended that multiple approaches to data collection be used to guard against evaluator bias and to establish some measure of reliability and validity. One such reliability check is step-wise replication, requiring that two evaluators collect similar data from different sources and cross check results. Such a step requires that two evaluators operate in the field, as opposed to a single evaluator, and this, of course, doubles the expense.

While the gathering of large amounts of extraneous data for the purposes of establishing rigor might be viewed as an advantage of the Responsive Evaluation Model in that an extremely rich data pool exists, it can also be viewed as a disadvantage in terms of data analysis.

Evaluators of the Training Program collected huge piles

of descriptive data from the various sites. Analysis of such data is arduous, difficult, and extremely time-consuming. It requires concentration, patience, and weeks of work, adding to the cost of conducting this type of evaluation.

Responsive evaluations, because they contain data given in the participants' own language, can be blunt and tactless. Very often the evaluator is faced with the dilemma of inserting in the evaluation report statements which are, to say the least, politically unwise. Yet the strength of the responsive approach lies in its ability to communicate about evaluation matters in the participants' own language. It would be wrong for evaluators to omit opinions which are not couched in more innocuous speech.

Conclusions

The application of Stake's Responsive Evaluation Model to extension education as represented by the Artificial Fish Breeding Training Program led the researcher to the following conclusions.

1. Despite the limitations of the Responsive Evaluation Model, as presented on pp. 142-143, this is a good model for the evaluation of extension programs. It is flexible, making it useful in diverse settings with diverse audience groups. It provides detailed descriptive information for program administrators, program developers, and program implementors.

It has the advantage of permitting participants to communicate in their own language, and to feel that they are a part of the evaluation process.

2. While the model is suited to the extension setting, it is both time-consuming and expensive to implement, hence program administrators must be committed to the evaluation effort in order to provide for the necessary funding in their budgets.

3. The Responsive Evaluation Model makes extensive use of naturalistic approaches and methods, including observation and interviews. To the initiated such methods might appear to be easy to implement and require little training. But for those knowledgeable in these methods it is obvious that considerable training and expertise is required, and such training is not usually provided in preparatory social science programs. Hence this type of evaluation might not be feasible in cases where people with such expertise are in short supply.

Recommendations

As a result of the application of Stake's Responsive Evaluation Model to the Department of Fisheries Training Program, the following recommendations are made by the researcher:

1. That the Responsive Evaluation Model be implemented in the evaluation of other extension programs in Thailand in

order to provide a further trial of the model.

2. That the Responsive Evaluation Model be implemented in the Department of Fisheries Training Programs by an external evaluation team for meta-evaluation purposes.

3. That other selected program evaluation models, as described in the literature, be implemented in the evaluation of extension programs in Thailand for the purposes of comparison of evaluation models and their application to the extension setting.

4. That the Department of Fisheries, Thailand increase the evaluation budget so that training programs can be evaluated on a regular basis.

5. That the Department of Fisheries, Thailand make use of the data provided through this evaluation to improve the Artificial Fish Breeding Training Program.

6. That the Department of Fisheries, Thailand implement a system of program evaluation for all of its programs, including those other than training programs.

7. That the Department of Fisheries, Thailand, following trial of other evaluation models, select the most appropriate model to be implemented on a regular basis.

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APPENDIX A

Agricultural Training Project

(Translated by Puntip Lertpradist)

Extension Division

Department of Fisheries of Thailand

AGRICULTURAL TRAINING PROJECT

Course

Technical Level Aquaculture

Project Proposal

We know that the population is increasing, thus the quantity of food has to be increased according to need. The fish protein from natural resources was especially decreased because of overfishing, thus the rest of the fish could not mature to meet the people's demands. As a consequence the Department of Fisheries attempts to solve these problems by increasing the fishery productivity as a natural resource, and by encouraging farmers to pay more attention to aquaculture in order to produce fishery products with efficiency.

The agricultural training program is presented in terms of knowledge transfer and practical training, in order to train farmers to become more knowledgeable, so that they practice aquaculture in the best fishery process. Such practice will help to resolve problems, to reduce the initial investment and the marketing investment in order to strengthen the structure of the fishery business in the long run.

Goals and Objectives

1. To increase knowledge and understanding, including to propose the appropriate ways of aquaculture to farmers in order to manage it efficiently.

2. To exchange knowiedge and experiences with each other.

3. To reduce problems and to build confidence about aquaculture careers for farmers.

4. To increase national fishery products and to lengthen the fishery lifespan.

Curriculum/Course

	Theory	Procedure	Time
1.	Local fishery	Lecture	30 Min
2.	Types of fish for farming	Lecture/Slide/Video	60 Min
3.	Types of farming	Lecture/Slide/Video	90 Min
4.	Selecting location and preparing fish areas	Lecture/Slide/Video	120 Min
5.	Fish farming preparation	Lecture/Slide/Video	30 Min
6.	Food, preparation, and feeding	Lecture/Slide/Video	90 Min
7.	Fish diseases and prevention	Lecture/Slide/Video	120 Min
8.	Freshwater fish breeding	Lecture/Slide/Video	120 Min
9.	Conclusion-discussion	Question-answer/ questionnaires	60 Min

Field Trip

The field trip might be to a fishery station or to a

freshwater research and development centre, and/or private fishery farm in the area or near the area.

Characteristics of Trainees

1. Farmers who already have a career in freshwater aquaculture.

2. Farmers or people who are interested in a career in freshwater aquaculture.

Number of Trainees

There are 33 areas. Each area requires 30 persons per time.

Place

Community halls, public halls or other appropriate places.

Process of Training

Lecture, slide, video, demonstration, question-answer, and field trip.

Lecturers

Lecturers are officers in the Department of Fisheries, either in the department centre or other fishery stations or in the freshwater research and development centre.

Project Authority

The Training Section, Extension Division.

Training Responsibility

The officers of the Training Section, Extension Division as co-ordinators, and the officers in every region (Fishery Provincial officers or Fishery sub-regional officers).

Follow-up and Evaluation

1. Asking-answering questions and having a panel after training.

2. Sampling questionnaires after 3 months of training.

Guidelines or Procedures

1. Inform fishery regional office, including offices in the department authority and co-operative offices, of the goals of training.

2. Get permission for the training project.

3. Get permission for the training budget from the Ministry of Finance.

4. Co-operate with the section that is involved in training and setting the training schedule.

5. Prepare the printed matter and educational media.

6. Carry out the training.

7. Evaluate the training outcomes.

Training Schedule

Course Technical Level Aquaculture

Province .....

Date .....

Date/Time	Subject	Lecturer
Date		
08.30-09.00 am	- Opening ceremony	
09.00-09.30 am	- Local fishery	
09.30-10.30 am	- Types of fish for farming	
10.30-12.00 am	- Types of farming	
12.00-13.00 pm	- Lunch break	
13.00-15.00 pm	- Selecting location and building the fish area	
15.00-16.00 pm	- Fish farming preparation	
Date		
09.00-10.30 am	- Food, preparation, and feeding	
10.30-12.00 am	- Fish diseases and prevention	
12.00-13.00 pm	- Lunch break	
13.00-15.00 pm	- Artificial breeding	

15.00-16.00 pm - Conclusion-discussion
and training evaluation

Date

08.00 am – 17.00 pm - Field trip

APPENDIX B

Evaluation Instruments

1001

Trainer Checklist for

Artificial Fish Breeding Training Program

This questionnaire is to be used as part of a thesis study entitled "A study of the application of a selected evaluation methodology in an extension setting." Your answers will be confidential and they will not be identified or related to your position. Please give your true opinions.

1. Name _____ (approximate age) _____
   Career position _____
   Work responsibility _____
2. What is your education level (high school, college, university)? Where and when did you last attend?
3. What degrees, if any, do you currently hold?
4. How long have you worked for the extension training section?
5. Would you outline your work experience in training?
6. How many times have you worked for the extension training program?
7. How do you feel about working for the extension training program?.
8. What kinds of programs do you prefer to use in training?

9. What kinds of programs do you prefer not to use in training?
10. How many times have you worked for the artificial fish breeding training program?
11. How do you feel about the artificial fish breeding training program?
12. What problems and difficulties have you found in implementing the artificial fish breeding training program?
13. What are your suggestions for improvement of this training program?
14. What are the benefits of this program for your trainees?
15. Does this program also benefit you? If yes, how?
16. How do you plan your training approach?
17. Are you familiar with writing course outlines and instructional objectives? If yes, which method do you use?
18. Do you have course outlines for the subjects you are delivering as part of the training program? If yes, what kind of course outlines do you have?
19. Do you have the course objectives written down before you begin training? If yes, what kind of objectives do you have?
20. What materials do you use for training?
21. How do you plan to evaluate your trainee's progress?
22. Do you have course evaluations prepared prior to the beginning of training? If yes, what type of evaluation

instruments do you have?

23. How often do you use evaluations after completion of the training program?

24. Describe the methods you use to evaluate your training program?

1002

Director

Interview Guide

This interview is to be used as part of a thesis study entitled "A study of the application of a selected evaluation methodology in an extension setting." Your answers will be very useful in improving the training program.

1. Describe your specific knowledge and background in the fisheries?
2. What are the objectives of the artificial fish breeding program?
3. For which types of the people do you think the artificial fish breeding program might prove useful?
4. How do you expect the learners to benefit from the program?
5. What are some of the problems of the artificial fish breeding program?
6. Do you have any ideas as to how to solve these problems? Please explain.
7. Trainees currently attend 3 days of training. In your opinion, is this time allotment suitable? If not, please indicate the suitable time allotment.
8. What kind of on-going and follow-up activities should

learners receive about extension work when they finish the training program?

9. How should learners be evaluated in the program?
10. What do you believe to be the standards for evaluating the program itself?
11. Could you comment on the strengths of the program? Weaknesses?
12. What level of knowledge do you expect that learners should get from this training program?
13. What changes would you make to improve the program next year?
14. Comments.

1003

Agriculture Leader Interview Guide

This interview is to be used as part of a thesis study entitled "A study of the application of a selected evaluation methodology in an extension setting." Your answers are confidential. Please give your true opinions. Information provided could help the program staff to improve the training program.

Name _____ Age _____

Address (currently) _____

Tel. _____ Convenient time for contact _____

Career _____ Experience _____

1. What has been your experience with the program: activities? reactions? products? work performed?
2. What are your current work skills?
3. What things can you do that are marketable?
4. If you do fish farming:
   a. What kind of fish farming do you do?
   b. Which method of managing fish farming do you use?
   c. Any problems?
   d. When did you start fish farming?
   e. What is your motivation for doing fish farming?
   f. Whom did you get your advice from?

5. Have you ever taken part in artificial fish breeding training?

   a. If no, do you plan to participate in this training in the future? When?

   b. If yes, do you think you will be able to explain to your neighbours/friends about the artificial fish breeding process?

6. What kind of training program do you think would be useful for you and other trainees?

7. What kind of media, in training, do you think would interest you or your neighbours/friends? Why?

8. What do you expect that you and your friends/neighbours will get from this training?

9. What do you think about program..strengtn? weakness? things liked? things disliked?..why? things that should be changed?

10. Do you think the length of time for training is appropriate?

    a. If no, what would be a suitable time allotment.

11. What kind of on-going and follow-up help, in the way of technology, might you need?

12. If you have any problems about fish farming or artificial fish breeding, who would be the first person you would ask for assistance? Why?

13. If your friends/neighbours need help with fish farming or artificial fish breeding, would you be able to help

them? a.If no, whom would you suggest?

14. Comments.

1004

Trainee Interview Guide for

Artificial Fish Breeding Training Program

This interview is to be used as part of a thesis study entitled " A study of the application of a selected evaluation methodology in an extension setting." Your answer are very important so that program staff may improve the training program. Your answers are confidential. Please give your true opinion.

Name _____ Age _____

Address (Currently) _____

Tel. _____ Convenient time for contact _____

Career _____ Experience _____

1. Have you ever been in any training program before?
   a. If yes, which program(s)?
2. What have you done in the program(s):
   a. activities?
   b. reactions?
   c. products?
   d. work performed?
3. What are your current work skills?
4. What things can you do that are marketable?
5. If you currently do fish farming:

a. What kind of fish farming do you do?

b. Which method of management do you use?

c. Any problems?

6. Why did you want to take part in this particular training program?

7. Who suggested that you participate in the training program?

a. If nobody, how did you find out about the program?

8. What do you expect to get from the training program?

9. How have you been affected by the program in areas other than job skills.

a. feeling about self?

b. attitude toward work?

c. aspirations?

d. interpersonal skills?

10. What are your plans for the future.

a. work plans?

b. If in fisheries ... in what way?

c. Do you want to do your farming by using your own artificial fish breeding?

If yes, how?

If no, why not?

11. What do you think about the program.

a. strengths?

b. weaknesses?

c. things liked?

d. things disliked? ... why?

e. best components?

f. poor components?

g. things that should be changed?

12. If you were asked to demonstrate artificial fish breeding, could you do that?

a. If no, what additional information would you need in order to demonstrate?

13. Which processes do you find too complicated for you?

14. What do you think about the length of time for training?

a. enough?

b. If no, how much time is need?

15. What kind of on-going or follow-up help, in the way of techniques/technology, might you need?

16. If you have any problems with artificial fish breeding who would be the first person you would ask? Why?

17. If you need more information about various techniques of artificial breeding, whom you would ask? Why?

18. If your neighbours/friends would like to know about artificial fish breeding, would you able to explain it to them?

19. What part of the training did you really enjoy?

20. Did you feel bored at any part of the training? If yes, which part?

21. What part of the program was helpful to you?

22. What part of the program was not helpful to you?

23. Which skills that you learned in the training experience were you able to apply?
24. Do you think that, as a result of this training program, your work will improve?
25. What is your overall opinion of the training program?

APPENDIX C

Photographic Record of Evaluation

Trainees' reactions to the classroom training sessions.

Trainees' reactions to the classroom training sessions.

A training site has a small and narrow room.

A training site has a small and narrow room.

Trainees were seated in stationary positions almost all of each day.

Trainees were seated in stationary positions almost all of each day.

A training site used a hatchery area rather than a classroom.

The placement of a training site in closs proximity to the road.

Inappropriate demonstration space.

Overcrowded trainees in the demonstration process.

Trainees are in the process of selecting the donor fish.

The school teacher takes part in discussions.