

**An Exploratory Literature Review of Efforts to Help the Small-scale, Resource Poor Farmer in  
International Agricultural Development**

**by**

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Abstract

Since the 1979 World Conference on Agrarian Reform and Rural Development (WCARRD) and the 1992 United Nations Conference on Environment Development, international agricultural development organizations have been urged to strengthen their focus toward the sustainable development of the small-scale, resource poor farmer.

A recent report from the Food and Agricultural Organization of the United Nations (FAO, 1996) indicated that many small-scale farmers were not being reached by agricultural extension, although approximately 75% of the worlds' farmers are small-scale, resource poor farmers. The report suggested that in some instances agricultural extension services reported reaching one out of three farmers in Africa. In other areas such as the Near East, the report stated that one out of seven farmers had been reached by the extension services.

This study investigated the small-scale, resource poor farmer's ongoing level of participation, rate of adoption of agricultural technology, and the sustainable benefits of the implemented projects within the documents of several international agricultural development organizations to determine if the farmers can positively impact the forecasted food shortage expected during the early part of the 21st Century. To accomplish this, the methodology utilized the Light and Pillemer (1984) method of exploratory literature review. The Light and Pillemer method provided the foundation for data collection as well as numerical and narrative document analysis.

Data collection: Eleven key governmental and non-governmental international agricultural development organizations were contacted by the researcher and supplied the following types of documents: (1) unpublished completed projects reports, (2) unpublished annual reports, and (3) published news reports. A planned systematic investigation of the documents was carried out (Girden, 1996).

Numerical and Narrative Document Analysis: Both numerical and narrative data were collected from the documents. The Light and Pillemer (1984) method was used to determine the level of overall project change in those documents which

provided numerical or quantitative data. Meta ethnography and the QSR NUD.ist computer software (Qualitative Solutions and Research Pty. Ltd., 1996) were used to investigate themes and characteristics of the narrative data within the documents.

The findings of the study were placed in matrices which provided a systematic examination of the characteristics of the implemented projects of 51 international agricultural development organizations located within 38 developing countries. The narrative document analysis indicated the participation of the small-scale, resource poor farmers. The characteristic indicators of farmer participation were farmer participation in: farmers groups, select groups, community development, and in capacity building methods such as training, leadership development, and planning and decision making.

The findings of the study suggest that though many international agricultural development organizations claim that they are making some progress there remains a grave need for international agricultural research and extension to provide more documentation of project outcomes especially those outcome which are concerned with more than 75% of the worlds' farmers, the small-scale, resource poor farmer. For example, of the study's 51 projects, only six reported small-scale, resource poor farmers participation percentage. Seven projects reported numerical data on before and after rate of adoption of the technology. Sixteen of the 51 projects reported numerical data on sustainable benefits of the project to the small-scale, resource poor farmer.

Only one document reported data on both the adoption of technology and sustainable benefits to the small-scale, resource poor farmer. However, in light of the world impacting Plan of Actions (i.e. 1979 World Conference on Agrarian Reform and Rural Development held in Rome, Italy; 1991 Plan of Action for Peoples' Participation report of the Twenty-sixth Session held in Rome, Italy; 1992 Agenda 21 document a product of the United Nations Conference on Environment and Development held in Brazil; and the 1996 Plan of Action for Global Partnership in Agricultural Research held in Washington, D.C.) all of the documents should have indicated this type of essential data, and should be striving for a development which would be both productive and sustainable to the farmer.

The results of this study suggested that the impending need for improved global food production as we move into the 21st century through the more than one million small-scale, resource poor farmer participants within the projects of this study may not be met due to the low amount of evidence in the implemented project reports

of adoption of the technology, and the inadequate reporting of benefits essential to the small-scale, resource poor farmer.

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## Chapter 1

### Introduction

As we approach the 21st century, two major underlying questions within sustainable agriculture and development have been: a) In the midst of an expected global population increase to almost nine billion in less than thirty years, how can we meet the need for increased food production while maintaining the earth's resources and the environment?, and b) With approximately eighty percent of the global population increase expected to take place within the developing countries, how can this need for additional food requirements be met? To answer these concerns, many people within international agricultural development and extension are looking not only toward options for maximizing the agricultural production of farmers on established agricultural cropland but also toward options for improving the agricultural production and welfare of some of the world's poorest farmers, the small-scale farmer.

#### The Small-scale, Resource Poor Farmers in International Agricultural Development

The small-scale, resource poor farmers are those farmers with limited resources, that have difficulty obtaining sufficient inputs to allow them to adequately use the available technology (Shanner, Philipp and Schmehl, 1982); and that have less than one hectare of land for agricultural production (FAO, 1990). The small-scale farmers are located worldwide, in Asia, Africa, Latin America and the Caribbean. Though approximately 75-80% of the

world's farmers are small-scale farmers, they have not been the primary focus of agricultural development (FAO, 1990).

Agricultural extension has characteristically searched for and provided extension services for the innovative, progressive, wealthy, educated, commercial farmers. Agricultural research has sought out and generated technologies which were especially designed for the innovative, progressive, wealthy, and educated farmer and/or agriculturally favorable regions. Chambers (1983) has stated that,

. . . as is now much better recognized than a decade ago, decisions taken in agricultural research affect who benefits. Larger and more prosperous farmers can afford to obtain fertilizers, pesticides, irrigation water, and hybrid seeds. To many smaller and poorer farmers these are out of reach. Agricultural scientist have often regarded production as an end in itself, but they increasingly recognize that Who produces is at least as important as How much and with What risks, and thus the food supplies and incomes of millions of poor people. (p. 186)

#### Sustainability in Agricultural Development

Due to the global need to address world food production and the world environmental concerns, international agricultural research and extension are beginning to focus on the sustainable development of the small-scale farmer (see Appendix A). A sustainable development is one that enhances quality of life, while improving productivity, encourages conservation of natural resources while presenting economically improved solutions, and must be maintained by the farmers' community. Agricultural development organizations must therefore focus on and involve some of the poorest farmers, in the world, in a sustainable

agricultural development. Chambers (1983) has stated,

The village is the centre; You are peripheral. The micro-level is again and again out of focus; and when in focus it is seen from a distance, through the urban professional's telescope. To understand rural poverty better, and to judge better what to do, outsiders, of whatever persuasion, have to see things from the other end. (p. 46)

Historically, agricultural research and extension efforts have often not tried to "see things from the other end", i.e. of the small-scale farmer but, have imposed a unique system of agriculture which was outside of the traditional indigenous knowledge and culture of the small-scale farmer and the rural community.

Chambers (1983) suggested that,

From rich-country professionals and urban-based professionals in third world countries right down to the lowliest extension workers it is a common assumption that the modern scientific knowledge of the centre is sophisticated, advanced and valid and, conversely, that whatever rural people may know will be unsystematic, imprecise, superficial and often plain wrong. Development then entails disseminating this modern, scientific and sophisticated knowledge to inform and uplift the rural masses. Knowledge flows in one direction only-downwards-from those who are strong, educated and enlightened, towards those who are weak, ignorant and in darkness." (p. 76)

Davis and Soeftestad (1995) and Anholt and Zijp (1995) also reported that the farmer, farmers' culture, traditional agricultural knowledge, values, and the sustainability of the farm system were often not being considered in the development of local agricultural programs. Davis and Soeftestad (1995) reported that "at least 250 million indigenous or tribal people through 70

different countries have often been on the losing end of the development process." They suggested that even when development policies and programs have been designed specifically to improve the welfare of indigenous people, the approach has usually been paternalistic, seeking their cultural assimilation and ignoring the strength of indigenous institutions and knowledge (including environmental knowledge).

Anholt and Zijp (1995) gave an example of what has happened when the value of local knowledge had not been appreciated and incorporated into planning and decisionmaking. Anholt and Zijp reported an example where maize was promoted by extensionist in Ethiopia to replace the indigenous teff, despite the resistance and skepticism from local farmers. Many Ethiopians suffered unnecessarily when maize proved to be less drought resistant and the crop failed. The indigenous teff proved to be a more desirable crop, both for its drought resistance and for its superior food value.

In recent years, there has been a movement among development organizations i.e. Appropriate Technology International (ATI), Consultative Group on International Agricultural Research (CGIAR), Food and Agricultural Organization of the United Nations (FAO-UN), World Bank Organization (WB), and World Neighbors Organization (WN), to incorporate a more sustainable approach to agricultural development. A sustainable development approach implies utilizing the small-scale farmer in a more active role, as co-learner and co-participant. This change

in roles has come about primarily because the small-scale farmer has now been recognized as a primary player in a successful and sustainable agricultural development strategy. The small-scale farmer is being viewed, by development agencies, as one who not only is a beneficiary, client, and or co-learner in agricultural extension efforts but as one who is also a potential contributor of valuable cultural, traditional agricultural, and environmental wisdom which could define a more relevant technology and the successful adoption of the technology.

#### The Problem

Within international agricultural development, there has been reported a large number of farmers, often small-scale, resource poor farmers, who have never had contact with an extension service (FAO, 1996). FAO (1990) has stated that, "approximately 95% of all farmers in Asia, Africa, Latin America and the Caribbean attempt to make a living on less than one hectare of land. These small-scale farmers make up 75% -80% of the world's farmers" (p. 12).

The claims of the organizations who reported that they have been working with the small-scale farmers suggest that there is a movement within agricultural development to address the needs and concerns of the small-scale, resource poor farmer and to improve their production and welfare. For example, Bunch (1985) representing World Neighbors, reported on the recent history of

agricultural improvement, suggested that agricultural improvement among small farmers had been a relatively recent enterprise in human history. He reported that not until the early 1960s had a concerted effort been made to increase Third World agricultural production, and even then, most of the work had been directed toward the larger, more modern landholdings. Bunch suggested that World Neighbors' small programs provided both a unique and invaluable role in small farmer agricultural improvement and have met the specific needs of specific cultures, markets, and microclimates. These programs also tended to build upon existing local resources, such as traditional knowledge.

Another example of the movement to address the needs and concerns of the small-scale, resource poor farmer has been seen in the development of Farming Systems Research Approach. Shanner, Philipp and Schmehl (1982) as a basis of their text on the Farming Systems Development Approach provided guidelines which were to assist national governments interested in helping poor farmers primarily small-scale farmers with limited resources. Shanner, Philipp and Schmehl (1982) emphasized that, "research and development programs had often been undertaken without having small farmers in mind or without knowing much about them. In contrast the Farming Systems Research and Development approach starts and ends with small farmers and thereby focused specifically on their conditions and aspirations" (p. 3).

The Food and Agricultural Organization of the United Nations

(FAO) has incorporated within its' global mandate, "agricultural extension and the transfer of new knowledge to producers" (FAO, 1990). One of the conclusions of the 1989 FAO Global Consultation on Agricultural Extension was that all farmers -- especially those who are resource poor and operating at or below the subsistence level -- should receive equal attention from extension.

Anholt and Zijp (1994) representing the World Bank suggested that, "there is increasing recognition that if extension is to meet the diverse needs of modern farming, a fundamental change of approach is called for, towards educating and enabling farmers to define and solve their own problems, and to determine and take some responsibility for the extension service they require."

The Consultative Group on International Agricultural Research (Anderson, J., Herdt, R., and Scobie, G., 1988, p. 1) reported, "those who addressed themselves to the question of how to increase food production in the nonindustrialized countries after 1945 agreed that certain steps were vital." Millions of peasant farmers who raised subsistence crops needed better knowledge of how to grow more food and achieve greater crop stability. Extension services therefore had to be strengthened.

Anderson, et al. (1988) stated that, "farmers needed the financial wherewithal to purchase seeds and other needed inputs. Farm communities needed better roads, schools, health care, and sanitation. Farmers needed community leaders who were not wedded to the past" (p. 1). There was also a need for agricultural technology that was well suited to the agroecological circumstances of developing countries. Consequently, it was from this type of background and series of meetings that the CGIAR was established in 1971 to consolidate and spread the benefits of international agricultural research beyond Asia. . . (CGIAR, 1996). The mission of CGIAR (1996) has been to contribute, through its research, to the promotion of sustainable agriculture for food security in the developing countries.

The claims of the agricultural development organizations suggest that there is a movement within agricultural development to address the needs and concerns of the small-scale, resource poor farmer and to improve their production and welfare. Several of the active agencies do not publish their results. Consequently at this point there is no compendium of research, no systematic treatment of efforts and effectiveness of the agencies working in this area, and no summary of results with the farmer. Agencies seem busy helping, but often fail to document the benefits of their work in the literature.

### The Purpose

The purpose of this research was to provide an overview of the extent to which small-scale, resource poor farmers are participating and benefiting from the thrust from international agricultural development organization to adopt agricultural technology. This purpose was carried out through the examination of participation, adoption, and sustainable benefits of the

small-scale, resource poor farmer within 51 implemented project reports of 5 international agricultural development organizations.

To accomplish this purpose the researcher utilized the Light and Pillemer method (1984) of exploratory literature review. This method was utilized to form the foundation for examination of document reports of implemented projects from the following organizations involved with international agricultural research and extension: Appropriate Technology International (ATI), the Consultative Group on International Agricultural Research (CGIAR), Food and Agricultural Organization of the UN (FAO), World Neighbors Organization (WN), and World Bank Organization (WB).

Meta ethnography and the QSR NUD.ist computer software (Qualitative Solutions and Research Pty Ltd., 1996) were used in the narrative analysis of the documents. Quantitative data (Light and Pillemer, 1984) on small-scale farmers' adoption of the technology and sustainable benefits were collected to determine small-scale farmers' adoption of the technology and the level of effectiveness of the projects.

Meta-analysis of the quantitative data was planned, but sufficient specification could not be gained to permit the calculation of effect size.

#### Research Questions

The research questions addressed the participation of the small-scale, resource poor farmer and the sustainable benefits of adoption of the agricultural technology within implemented

projects of international development agencies/organizations.

The General Question: Are today's international agricultural research and extension organizations functioning at a level to assure the small-scale, resource poor farmer a more discernible participation and rate of adoption of agricultural technology as we move into the early part of the 21st century?:

The Specific Questions:

1. How are the small-scale farmers participating within the extension approach?
  2. What is the participation percentage across each project?
  3. What is the adoption percentage across each project?
  4. How effective were the projects?
  5. What are the characteristics of the exceptional program?

To answer these research questions, data were collected from 51 implemented international agricultural projects, representing 5 international agricultural development organizations which were located in 38 countries.

#### Delimitations

1. The study addressed the small-scale, resource poor farmers' participation, adoption and sustainable benefits within documents reporting implemented international agricultural research and extension projects.
2. The study focused on documents received from non-governmental and governmental international agricultural research and extension organizations.

### Limitations

1. Since there were no systematic methods to get all studies and since many of the studies of interest are internal evaluations found by the agencies conducting the work, there is no guarantee that all studies were obtained.
2. Document reports were limited to published and unpublished reports from the following international agricultural organizations: Appropriate Technology International, The Consultative Group on International Agricultural Research, Food and Agricultural Organization of the United Nations, World Bank, and World Neighbors. World Vision International promised data but provided none.
3. The study was based on primary source data which at times included gaps in the description of data collection techniques and/or baseline status.

### Definitions

Several terms have been defined (see Appendix A).

## Chapter 2

### Review of Literature

In an effort to establish content and background information, the literature review consist of a mixture of research and polemics (i.e. bringing to light alternative opinions and principles). The literature review has been divided into four sections. The first section provides a history of events leading toward the development of several world impacting Plan of Actions which addressed the small-scale, resource poor farmer and international agricultural development. The second section examines challenges within international agricultural research and extension. The third section identifies several approaches to international agricultural extension. The last section (section four) determines characteristics of a successful international agricultural research and extension approach and identifies methods which are used to examine integral parts of the agricultural extension system and the local agricultural research and extension project.

The first section of the literature review begins with a quote from the Commission on Environmental Law of the World Conservation Union. The Literature review, then establishes a history of events beginning with statements which assist in defining the focus of the 1979 World Conference on Agrarian Reform and Rural Development, 1991 Food and Agricultural Organization of the United Nations' Plan of Action for Peoples' Participation, 1992 United Nations Conference on Environment and Development from which developed the Agenda 21 document and the Consultative Group on International Agricultural Researchs' Plan of Action for Global Partnership.

#### Developing Farmer Participation

The Commission on Environmental Law of the World Conservation Union (1993) reported that,

By the year 2024, they expected that 83% of the expected global population of 8.5 billion will be living in developing countries. The capacity of available resources and technologies to satisfy the demands of this growing population for food and other agricultural commodities remains uncertain.

#### The 1979 WCARRD

The 1979 World Conference on Agrarian Reform and Rural Development (WCARRD) which was held in Rome, represented a major effort to address the need to involve the poor farmer and rural community in agricultural development. This international plan of action, initiated almost twenty years ago, has acted as a catalyst for the reorganization and refocusing of agricultural extension efforts toward improved production and extension services for all

farmers with a unique focus on the low resource farmer.

The 1979 WCARRD emphasized the, "necessity for strong interaction between development personnel and the masses of small scale farmers, including rural women, and stressed the reorientation of extension efforts toward the goal of increasing production and equity" (FAO, 1990, p. 1)). Additionally, the WCARRD stated that, "low resource farmers merit increased attention from extension because many operate on marginal land that is undergoing serious environmental degradation. Working with these marginal farmers to provide appropriate technology is essential to broad-based, sustainable agriculture" (FAO, 1990). The WCARRD strongly emphasized the necessity to work with the small-scale low resource farmer.

#### Plan of Action for Peoples' Participation

The FAO (1996) stated that, "over the past two decades, many governments, development agencies and non-governmental organizations have recognized that the "top-down" approach characteristic of development strategies has largely failed to reach and benefit the rural poor. . . Many governments are looking for alternative approaches to development. In this search peoples participation as a mechanism for promoting rural development is of paramount importance" (p. 1). The People's Participation Programme began in 1980 as a progression out from WCARRD.

The Plan of Action for People's Participation in Rural Development (FAO, 1991) a report of the Twenty-sixth Session (Rome), suggested that, "people's participation implies the active

involvement in development of the rural people particularly disadvantaged groups that form the mass of rural population and have been excluded from the development process" (p. 1) The Plan of Action indicated that participatory approaches should be followed in the design, implementation and evaluation of large-scale projects. The Plan of Action also reported that, "peoples' organizations are enhanced at local level through the work of development NGOS (nongovernmental organizations) that aim at improving the social and economic conditions of rural people especially the poor" (FAO, 1991, p. 3)). The aim of the Plan is to ensure active participation of people in the achievement of sustainable rural development" (p. 4).

#### Agenda 21 and its' Emphasis on Sustainability

The 1992 United Nations Conference on Environment and Development (UNCED) held in Brazil, implemented a paradigm for sustainable development which emphasized a process toward new environmental and development ethics and implemented a global plan of action, referred to as the Agenda 21 document. This document, supported by more than 90% of the nations of the world, offers those involved in development, a comprehensive guide for a sustainable development, laying the foundation for grassroots, national and international environment and development actions into the 21st century (El Ashry, 1993).

Agenda 21 addresses farmer, rural and indigenous community participation and capacity building through the collaboration of government and non-governmental support, local agricultural strategies (including incorporation of farmer knowledge, practices, and tradition), improved extension services and the relevant technology development for small farmers. Several of the programs and activities of Agenda 21 have been listed in the Sitarz (1994).

#### Plan of Action for Global Partnership in Agricultural Research

The 1996 Global Forum on Agricultural Research held in Washington, D.C. consisted of representatives from the national agricultural research systems, regional and subregional organizations, universities and advanced research institutions, non-governmental organizations, farmers' organizations, the private sector, and international agricultural research centers. They implemented a Plan of Action which also emphasized the participation of the farmer.

Among the statements within the 1996 Plan of Action was the Declaration to: Mobilize the world scientific community in support of a global framework for agricultural research aimed at alleviating poverty, achieving food security and assuring sustainable use of natural resources; and to foster the participation in research collaboration by national agricultural research institutes, regional and subregional research organizations, international agricultural research centers, advanced research institutes universities, the private sector,

non-governmental organizations, farmers, and farmers' (p. 1) organizations.

The need to alleviate poverty, assure food security and the sustainable use of natural resources, while integrating participation and collaboration of research organizations and farmers and/or farmers' organizations has continued to be at the forefront of international agricultural development for the last two decades.

#### Challenges within Agricultural Development

The second section of the literature review begins with quotes from Whyte (1981), and FAO (1996) which indicate that these challenges remain today. The section continues with literature which seeks to provide an understanding of how these challenges have continued to prevail decades after the WCARRD and several world impacting plan of actions.

In 1981 Whyte reported that, "approximately 85% of the farmers worldwide have not benefited from innovations which most often have been designed for irrigated land.

In many parts of the developing world it has been reported that hundreds of millions of farmers are not yet being reached by agricultural extension services. This number represented the largest segment of the farming population (FAO, 1990).

Two out of three farmers in Africa have no contact with extension services. In Asia the number is three out of four. In Latin America it is six out of seven and in the Near East five out of six (FAO, 1996, p. 2)

The literature suggested that these challenges have continued to prevail due to: 1) inadequate extension strategies and services,

2) inadequacies with the extensionist, 3) inadequate technology development, 4) mis-perceptions concerning the researcher, extensionist and the small-scale farmer.

#### Inadequate Extension Strategies and Services

A FAO (1996) report stated that rural development efforts had failed to deliver on their promises (p. 1). The FAO report stated that a study on "poverty-oriented" projects worldwide showed that the poorest were excluded from activities and benefits. The FAO (1996) report stated that,

Recent years have seen growing criticism of rural development strategies followed, with only minor adjustments, for the past three decades. These conventional strategies have seen development primarily as a series of technical transfers aimed at boosting production and generating wealth. In practice, conventional projects usually target medium to large scale "progressive" producers, supporting them with technology, credit and extension advice in the hope that improvements will gradually extend to more "backward" strata of rural society. In many cases however, the channeling of development assistance to the better-off has led to concentration of land and capital marginalization of small farmers and alarming growth in the number of landless labourers (p. 1).

FAO (1996) report suggested that the basic fault in the conventional approach has been that the rural poor are rarely consulted in development planning and usually have no active role in development activities (p. 1).

Inadequacies within the agricultural extension organization and service suggest that the system itself has been too highly centralized, resulting in decisions being formed at the top with little input from field staff. The system often lacks adequate transportation, facilities, equipment for extension field staff (FAO, 1990); and often lacks coordination with research efforts (Shanner, Philipp, and Schmehl; 1982).

The literature suggest that many extension services have emphasized only the higher potential areas and well to do farmers, therefore developing insufficient links with small-scale subsistence farmers (Chambers, 1985; FAO, 1990). Extension services have been unresponsive to the variation in farmer needs (Anholt and Zijp, 1995). For example the International Service for National Agricultural Research (ISNAR) examined the development of on-farm research and extension in the Instituto de Ciencia y Tecnologia Agrícolas (ICTA) in the country of Guatemala (Ortiz, R., Ruano, S., Juarez, H., Olivet, F., and Meneses, A. 1991).

Ortiz, et al. (1991) reported that ICTA in a pioneer effort developed a five year national strategy for generating technology and transferring it directly to farmers through on-farm client-oriented research. ICTA was successful in meeting the needs of the domestic seed industry, produced primarily by the commercial sector, however those needs of the small-scale subsistence farmers remained.

ICTA found that it had been successful only in certain areas and with farmers operating under relatively favorable conditions. The major impact of ICTA had been on those resource poor farmers located in the coastal plains and inland valleys. Subsistence farmers located in more densely populated areas and/or producing under less favorable and more diverse conditions had not been successfully reached.

Schwartz and Kampen (1992) noting the effect of agricultural extension within East Africa, suggested that often extension has failed to reach resource poor farmers who lack access to land, reliable water sources, and credit. These farmers are often located in remote areas that are not well served by roads or accessible to markets."

#### Inadequacies of the Extensionists

These challenges within agricultural extension examine the inadequacy of the extensionist. The literature suggested that generally the extensionist has lacked close regular contact with farmers, has lacked ties with research, has had inadequate transportation, facilities, equipment (FAO, 1990). The extensionist generally has also lacked a single direct line of technical support and administrative control; lacked training; the extensionist has had a multipurpose role which often emphasized rural development, health, nutrition, and family planning, along with agriculture.

Generally, the extensionist concentrated on larger farmers because they cannot reach all farmers in their area and large farmers can often assist with housing and other amenities (Benor and Harrison, 1977).

#### Inadequate Technology Development

This inadequacy within international agricultural extension examines the (lack of) relevancy of the technology and adoption of the technology by the small-scale farmer. Bunch (1982) suggested that the gap between agricultural research, and the developing nation's small-scale, resource poor farmer has been increasing due to a decline in the technology generated which can actually be put to practical use by the poor farmer.

Shanner, Philipp, and Schmehl (1982) have reported that, "farmers with limited resources often do not adopt new technologies due to: " their conditions are not like those where the technologies were developed, they do not have resources to purchase the required inputs, the technologies do not apply to the crops grown or the livestock raised on their farms or the way they operate, or they do not know about the new technologies" (p. xv).

Much of the technology developed over the last few decades has not been appropriate for the poor farmer, but instead has benefited the comparatively wealthy or those farmers in better environments. Small-scale, resource poor farmers in marginal environments may not adopt new technologies due to: they lack resources to adopt and familiarity with the new technology; and desire to avert risk of new technology. Often the nonadoption

may be due to technology that does not use inputs that the farmer can produce from his own local resources.

#### Mis-perception of the Researchers and Extensionist

This challenge within international agricultural research and extension examines the focus of the researcher and extensionist.

Though international agricultural extension has formed the primary pathway for agricultural education, dissemination of information and feedback from the farmer and rural community; the extension message has tended to favor rural producers who were already in relatively advantageous agricultural environments, and who were adult, male, educated, established, innovators within the community, and who could withstand loss of production and income (Whyte, 1981).

Rogers and Shoemaker (1971) list characteristics of the traditional social system and those living within it. The traditional social system was characterized as: lacking favorable orientation to change, less developed or "simpler" technology; a relatively low level of literacy, education, and understanding of the scientific method; little communication by members of the social system with outsiders; a social enforcement of the status quo in the social system, facilitated by affective personal relationships such as friendliness and hospitality which are highly valued as ends in themselves, etc. The modern social system was characterized by: a well developed technology with a complex division of labor; a high value on education and science;

rational and businesslike social relationships rather than emotional and affective; cosmopolite perspectives, etc. (see Appendix B). Generally, these type of arguments have laid the foundation for directing the focus of much of the agricultural research, development, and benefits toward the medium and large scale farmers.

#### Mis-perceptions about the Small-scale Farmer

Another major contributor to non-adoption of technology by the small-scale, resource poor farmer has been the incompatibility of the technology and/or the extensionist, with cultural beliefs. In many countries women farmers are the primary producers of local staple food. Nevertheless, women farmers often are not approached by the male extensionist, and therefore do not receive the extension services and/or extension message, due to prohibitive cultural barriers. For example, FAO (1995) indicated that although rural women of the Near East were major contributors to the farming household, and were involved in crop production and certain aspects of farm animal production, extension services especially designed to target women farmers were limited. FAO described the extension service as consisting "largely male extension officers who dealt with almost exclusively male farmers since tradition often constrains interaction between women and outsiders" (FAO, 1995). Similarly, a World Bank Zambia Project (1990) reported that the extension workers were selecting the contact farmers (those responsible for aiding in the transfer of the extension message) with little consideration to representing

the farming community, i.e. the women farmers. Women farmer representation as contact farmers was reported as negligible (p. 4). Technology developed and disseminated under these types of cultural prohibitive environments generally does not meet the needs of those farmers who are actually in need of the technology. Often the extensionist and researcher have perceived the small-scale farmer as too illiterate to understand the technology, uncooperative and unwilling to change (Bunch, 1982). Cleaver (1993) emphasized that one reason for farmer non-adoption of the technology could be due to "farmers being treated like ignorant recipients of information rather than knowledgeable partners in technology transfer."

These kinds of critical challenges within international agricultural research and extension have contributed through the years toward a reduction in the potential increase in global agricultural production and development.

The third section of the literature review examines several approaches to international agricultural research and extension, in reference to how the approach generally works with or participates with the projects' beneficiaries.

Axinn (1988) suggest that an international agricultural extension approach, "stimulates and guides the system, its resources and its linkages." The extension approach defines how farmers should interact and link with extensionists, researchers or the research station.

The approaches examined are those which have been identified in the documents involved in this study: General Agricultural Extension, Training and Visit System, Farming Systems Research and Development, Entrepreneur Focused, and Participatory Approaches.

#### Approaches to International Agricultural Development

##### General Agricultural Extension Approach

The General Agricultural Extension Approach, the dominate approach for the last eighty years, is found in government organizations responsible for agriculture in almost every country (Axinn, 1988). This approach assumes that the technology and information are available which are not being used by farmers. The purpose is to help farmers increase their production, through planned programs administered by the government (Axinn, 1988). The flow of communication is basically one of classical technology transfer from government to rural people.

This approach is based upon the top-down model of communication which suggest that ideas and messages are developed centrally by government or researchers who know what is best (i.e. Ministry of Agriculture, Research Station) and are channeled to the target population (farming population). Farmers are passive recipients of generated technology.

This extension approach has been based upon the idea that the ministry knows what scientific agriculture (research knowledge) has to offer to agricultural production. The farmer, on the other hand does not have this type of knowledge. Generally changes in program planing are controlled by government and usually made on a national basis with some freedom for local adaptation (Axinn, 1988).

#### The Training and Visit System

The predominate approach to extension being pursued around the world since the 1980s has been the World Banks' Training and Visit System (T&V), developed by Daniel Benor (FAO, 1990).

The highly managed form of extension organization was designed to deliver selected and timely technical messages to farmers with strict regularity. The T&V was initiated in Turkey in 1967 and subsequently was used in Bank projects in Asian countries, particularly in India, and spread to all the Bank's operating regions (Purcell, 1994).

The Training and Visit System (T&V) has, "at the onset of its' emergence in 1980's accelerated the adoption of new technology through intensive, regular interaction between government extension agents and selected contact farmers to disseminate a package of key agricultural messages" (Anholt and Zijp, 1995, p. 1)). Of the 1,200 agricultural and rural development projects that the Bank has supported since the mid-1960's, 538 (45%) have included some form of extension component (Hayward, 1990).

Some of the deficiencies that T&V had been developed to address were reported by Purcell (1994). Purcell indicated that,

T&V had been developed to address the perceived limiting effectiveness and efficiency of public extension services: extension workers were charged with non-extension tasks which limited extension to technology transfer, often reported to more than one authority, were usually poorly trained, had little incentive for extension performance, had little contact with applied research those farmers having more resources rather than with poorer households, and frequently relied heavily on large demonstrations of high and complete input packages which were beyond the resources of most farmer. (p. 4)

T&V projects have reportedly tried to improve project sustainability by re-examining issues of farmer participation and farmer adoption of the technology (Zijp, 1997, p. 1)).

#### Farming Systems Research and Development Approach

This approach takes a holistic and systematic view of the client farmer and the farm household and its components i.e. animals, plants, soils, climate, access to markets, price policies, and any other relevant factors (Axinn, 1988). Shanner, Philipp, and Schmehl (1982) stated that Farming Systems Research and Development (FSR), "starts and ends with small farmers and thereby focuses specially on their conditions and aspirations" (p. 3). FSR involves research on farmers' fields as well as on research stations.

Farming Systems Research and Development assumes that the technology that fits the need of the small farmers is not available and that it needs to be generated locally, therefore clients with researchers work to identify needs of the clients and of the household in a participatory experimental process (Axinn,

1988; and Shanner, Philipp, and Schmehl, 1982). The approach is generally linked with other approaches.

The improved technologies generated under these circumstances is assumed to be more relevant, site specific, and applicable to farmers operating under similar conditions due to the strengthened link between research and extension, and to the work of research teams. The research teams are generally composed of researchers from various disciplines, i.e. sociologist, entomologist, agriculturist, and the participating farmers. The team identifies problems and opportunities on farmers fields and in areas representative of the selected subareas, (Shanner, Philipp, and Schmehl, 1982), designing technology that fits the need and is appropriate to the situation of the poor farmers, small farmers and the less-advantaged rural people (Axinn, 1988).

#### Entrepreneur Focused Approach

Entrepreneur focused approach is the approach used by Appropriate Technology International (ATI) to help small-scale producer -small farmers and entrepreneurs- build profitable enterprises.

ATI uses a business-like approach to enterprise creation and economic development based on the "value chain"- the steps of production, processing, storing and transporting of goods to market, along which value is added to products (ATI, 1995, p. 1). ATI, local partners, and producers themselves analyze the value chain in a given market to decide how best to address the stumbling blocks to their economic progress (ATI, 1995, p. 1).

Small farmers and businesses are frequently left out of much of the production process. They lose most of the value of their goods and services to intermediaries or to bigger businesses which can access credit, pay for expert advice and acquire new value-adding technologies. Entrepreneur focused approach to development helps small producers create modern businesses that capture more of the value of their products. For example, in Bolivia, ATI (1995) and its, "partners identified and implemented interventions throughout the alpaca fiber producers value chain, including credit and training, new technologies such as improved shears, parasite baths, and preventive inoculations; improved pasture management; the development of byproduct industries, and market outreach" (ATI, 1995, p. 2)

ATI is a not-for-profit corporation which was created by Congress and United States Agency for International Development.

Participatory Approach to Agricultural Extension

The Participatory Approach assumes that, "farming people have much wisdom regarding production of food from their land (indigenous knowledge system) and that much can be learned from the interaction of researchers and farmers, that effective extension cannot be achieved without the active participation of the farmers themselves, as well as research and related services" (Axinn, 1988).

A participatory approach actively involves the farmers and farming community at various levels, in their own agricultural development. Participatory approaches involve farmers as co-

learners and co-participants in a participatory action process (Lev and Acker, 1994). The extensionist within a participatory approach may have the role of a facilitator and stimulator-working together with the farmers, stimulating the farmers to organize group effort (Axinn, 1988). Anholt and Zijp (1995) noted that, "when the learning process-approach is adopted (participatory) the function of extension is not merely one of technology transfer but of ensuring effective two-way flows of information, with the aim of empowering farmers through knowledge rather than issuing technical prescriptions." Participatory approaches involve meeting and working: with farmers or farmer groups within the community; to identify relevant needs, relevant solutions; toward the goal of sustainability.

The fourth section of the literature review examines characteristics of a successful program with the small-scale, resource poor farmers, and identifies several methods used to examine integral parts of the agricultural extension system and the local agricultural extension program.

#### Characteristics of the Successful Program

Though no particular program may be successful under all circumstances Chambers (1985) and Bunch (1982) have suggested several characteristics of a successful program for the rural poor i.e. the small-scale subsistence farmers and their families, tenants, and the landless (see Appendix C). The characteristics of the successful program should include certain issues of "sustainability" in particular characteristics that will

strengthen the sustainability of the farmer, the community and the program. The primary focus must be that of the farmer.

Important features of successful programs include the development of farmer participation in community development and relevancy of extension methods used to support the continuance of farmer participation after project completion. However, a FAO (1996) project report from Ghana pointed out that participation cannot be viewed as the ultimate goal. The project report suggested that participation must be viewed as a method of improving the projects' ability to identify and produce locally recognizable benefits. These types of locally recognizable benefits may include reduced cost of inputs, improvements in yield, income, education, nutrition, health, and other indicators of improved quality of life.

#### Examining International Agricultural Extension

Several methods may be used in examining different aspects of an international agricultural research and extension system. For example, the use of qualitative or quantitative indicators, and/or the systematic review of multiple documents, i.e. studies, programs, and project reports may be used to examine conditions within international agricultural research and extension systems.

Indicators may be used to determine various conditions and trends in program outcome. Tschirley (1996) used qualitative and quantitative measures in addressing sustainability indicators to review conditions and trends within the developing community. The indicators included: policy adjustment, planning assistance,

strengthening human resources training, and institutional capacity, improved management of natural resources, and sound use of agricultural inputs. These indicators were incorporated into thematic areas of the Sustainable Agriculture and Rural Development section of the Agenda 21 document.

Swanson and Peterson (1989) developed a holistic systems approach to analyzing agricultural technology systems. Their model examined information collected from survey. The collected information examined: policy, technology development, technology transfer and technology utilization, adoption of the technology, extension farmer ratios, and linkages. Indicators were used as tools which aided in making a general appraisal of the system and its functional components (Swanson and Peterson, 1989). Both qualitative and quantitative data were collected and compared with norms that were being developed Swanson, (1989). This type of data contributed to the report of International Agricultural Extension for the 1989 Global Consultation of Agricultural Extension.

Agricultural research and extension documents may also be examined through methods of systematic reviews of multiple documents or literature i.e. Light and Pillemer, 1984; Noblit, 1984. Light and Pillemer (1984) outlined several techniques which involved summarizing existing knowledge from multiple research studies in the collection of data from both numerical and narrative sources.

Noblit (1988) used meta-ethnography to holistically synthesize and compare text of multiple studies through use of notes, matrices, preliminary descriptions, and analysis.

Computer software, such as the QSR NUD.ist (QSR, 1996) has provided another method for the qualitative systematic examination of multiple documents. The QSR NUD.ist computer program may be used to identify themes and characteristics of documents for qualitative analysis.

## CHAPTER 3

### Research Design and Methodology

This study utilized the Light and Pillemer (1984) model of Exploratory Literature Review to examine the participation, adoption, and sustainable benefits of small-scale, resource poor farmers within international agricultural research and extension organizations. The study provided an overview of the extent to which small-scale, resource poor farmers are participating and benefiting from the thrust to adopt sustainable agricultural technology. One reason for the study can be seen in the relatively hidden studies and the dearth of information on the field.

The study was based upon the target population of non-governmental and governmental documents, from Appropriate Technology International, Food and Agricultural Organization of the United Nations, World Bank, and World Neighbors Organization, which contained information about farmers who were categorized by the organization as small-scale, resource poor farmers. The Consultative Group on International Agricultural Research (CGIAR) was added and included in this study. The researcher contacted the above stated organizations several times in an effort to obtain documents which dealt with implemented sustainable agricultural projects. All of the organizations agreed to forward documents for the study. After repeated contact the researcher received documents from the five organizations. Several

international agricultural research projects did not respond. The following summary provides background information on the five organizations.

#### Appropriate Technology International

Appropriate Technology International is a not-for-profit corporation created by the U. S. Congress and United States Agency for International Development (USAID) which uses a business-like Entrepreneur Focused Approach to enterprise creation and economic development. The Entrepreneur Focused Approach utilizes the "value chain" identified as steps of production, processing, storing and transporting of goods to market, along which value is added to products and help is also provided to small producers. ATI programs help small producers to create modern businesses that capture more of the value of their products. The study included unpublished Annual Reports and published bulletins from Appropriate Technology International.

The Consultative Group on International Agricultural  
Research (CGIAR Centers)

The Consultative Group on International Agricultural Research (CGIAR) is an informal association of fifty-two public and private sector members, whose mission is to contribute through research to sustainable agriculture for food security in the developing countries (CGIAR, 1996). The CGIAR Centers provide a central link between international agricultural research and national and regional extension services in the developing countries.

The four cosponsors of the Consultative Group on International Agricultural Research are the: Food and Agricultural Organization of the UN, United Nations Development Programme, United Nations Environment Programme, and the World Bank (CGIAR, 1996). CGIAR (1996) reported that there were seventeen CGIAR members from the South, and twenty-one from the North; the remainder were foundations and international and regional organizations. The study included published Annual Reports and news reports from the International Agricultural Research Centers.

## Food and Agricultural Organization

The Food and Agricultural Organization of the United Nations, a non-governmental international organization, has within its' global mandate "agricultural extension and the transfer of new knowledge to producers" (FAO, 1990). Examples of the FAO approach to agricultural extension have been seen in the Strategic Extension Campaign (SEC), World Conference on Agrarian Reform and Rural Development (WCARRD), and the Peoples' Participation Programme (PPP). SEC provides a participatory basis for an agricultural extension service. SEC has been associated with the implementation of a participatory planning approach, intensive training of extension personnel, multi-media materials development, extension management and monitoring evaluation procedures.

The World Conference on Agrarian Reform and Rural Development (WCARRD) held in Rome in 1979 declared that disadvantaged rural people had to be organized and actively involved in designing policies and programmes and in controlling social and economic institutions. These type of ideals set forth in the WCARRD helped to form the basis in 1980 for the implementation of The Food and Agricultural Organizations' Peoples' Participation Programme (PPP).

PPP programs have generally involved the development of grassroots democratic informal groups, among the rural poor of 8 to 15 like-minded farmers, who through participatory tools are

able to pool their efforts and resources in pursuit of their defined needs and goals (FAO, 1996). This study included published FAO case studies of international agricultural extension, and published FAO case studies from the FAO Strategic Extension Campaign and the Peoples Participation Programme.

#### World Bank

The World Bank began supporting agricultural extension in 1964 and by 1990 had, "lent more than US \$2 billion for agricultural extension in 79 countries" (Hayward, 1990).

The World Bank has developed the agricultural extension approach called the Training and Visit System of agricultural extension, which works to aid in the adoption of the T&V approach as well as in the development of the management. This study included unpublished project performance audit reports, and unpublished completed project reports from World Bank.

#### World Neighbors Organization

World Neighbors Organization is a non-governmental non-profit organization working to eliminate hunger, disease and poverty among the poorest of the poor in Asia, Africa, and Latin America. World Neighbors is a grassroots development organization promoting self-reliance. The programs are created and promoted and maintained by the participants. World Neighbors trainers help participants recognize the root causes of their problems and develop an appropriate plan of action. World Neighbors program

priorities include food production, community-based health, family planning, water sanitation, environmental conservation and small business.

From more than thirty years of experience working with the Farmer First Approach and Methodology, a participatory approach, World Neighbors encourages a successful and sustainable adoption of new technology through incorporation of farmer participation, education and agricultural management. This study included unpublished Annual Reports, and published news reports from World Neighbors.

## Methodology

The study consisted of several selected documents from the following organizations: World Bank , Food and Agricultural Organization of the UN, World Neighbors Organization, Appropriate Technology International, and the International Agricultural Research Centers (CGIAR Centers). All selected documents indicated through descriptors or body of text that they addressed with the small-scale, resource poor farmers.

The samples were selected on the basis of the following document characteristics: non-governmental and governmental organization document reports from ATI, CGIAR, FAO, WB, and WN, which dealt with implemented agricultural projects, small-scale, resource poor farmers, technology adoption, and participation within a sustainable agricultural development. The collected documents were from published and unpublished sources i.e. project case studies, completed project reports, project performance audit reports, annual reports, and news reports.

Using the exploratory literature review model (Light and Pillemer, 1984) the researcher examined the participation, adoption and sustainable benefits of adoption through documents obtained from international agricultural research and extension organizations.

Document text analysis (Light and Pillemer, 1984; and Girden, 1996) involved: examination of each document, the systematic reexamination of each document for themes and characteristics. Codes which identified the themes to the

research questions were assigned. Narrative and numerical information compiled from the investigation was placed on data cards.

Documents were computer scanned and loaded into the QRS. NUD.ist computer program for document analysis. Documents were investigated for themes and characteristics (Light and Pillemer, 1984 and Girden, 1996). This type of narrative data was used to determine the characteristic farmer participation data or indicators for each agricultural project.

Numerical data were collected and used to quantitatively summarize the characteristics of each project. Information on the farmers' participation percentage was collected from documents that reported the total number of small-scale, resource poor farmers and the number of small-scale farmers involved in the project or extension method. Total number of farmers in each project was collected from documents that reported this type of data.

Numerical data taken from the before project and after project data on farmer's adoption percentage and the sustainable benefits of the project were used to determine the level of adoption of technology and the sustainable benefits to the small-scale, resource poor farmer, respectively. Overall project benefits were determined through the Light and Pillemer (1984) method utilizing:  $\text{After Project data} \div \text{Before Project data}$ . This method was used to indicated project outcomes which suggested a level of change and a reasonable amount of improvement

to the farmer. Project results indicated low, moderate and high overall project increase in benefits.

Both narrative and numerical data were collected and placed in matrices. Results of the study were examined through matrices which provided a systematic synopsis of the following information: identification of the project and location, extension approach, extension methodology and farmer participation, number of farmers participating, farmers' adoption of technology, and sustainable benefits of the project.

## Chapter 4

### Results

This research used the Light and Pillemer method (1984) to investigate and examine the literature on international agricultural research and extension development in answer to the general research question: Are today's international agricultural research and extension organizations functioning to assure the small-scale, resource poor farmer a more discernible level of participation and adoption of agricultural technology as we move into the early part of the 21st century?

To answer this question, the researcher examined small-scale farmer participation and sustainable benefits of technology adoption within documents from implemented international agricultural research and extension projects. Published and unpublished documents were collected from several non-governmental and governmental international agricultural development organizations. The methodology involved: document collection, narrative analysis and numerical analysis.

Document Collection: The researcher contacted and requested information from several agricultural development and extension organizations on implemented sustainable agricultural projects. Several international agricultural research projects did not respond. Documents which were received and selected for the study included: implemented projects which dealt with small-scale, resource poor farmer participation, the adoption of technology, and farmer benefits. Additionally, all documents were published

in English.

Table 1 indicates how this type of information was collected from nongovernmental and governmental organizations.

Organizations were contacted by telephone, in person, and through electronic mail.

Table 1. Table of Document Collection\_

<u>Name of Organization</u>	<u>Telephone</u>	<u>Contacted by Personal Visit(s)</u>	<u>Email</u>
Non-governmental organizations:			
The World Bank	*	*	*
Food and Agricultural Organization of the United Nations	*		*
World Neighbors	*		*
The Consultative Group on International Agricultural Research Centers	*		*
Governmental Organization:			
Appropriate Technology International (United States Agency for International Development)	*	*	*

The researcher collected documents from eleven non-governmental and governmental organizations, representing five international research and extension organizations. The following types of documents were collected: case studies, completed and annual project reports, news reports, and project audit reports. The study contained documents representing projects that were implemented between the years of 1960 through 1997. The 51

projects were located in 38 different countries.

The target population included documents from the following non-governmental and governmental organizations: The World Bank (WB), Washington, D. C.; Food and Agricultural Organization of the United Nations (FAO), Washington, D. C. and Rome, Italy; World Neighbors (WN), Oklahoma City, Oklahoma; Appropriate Technology International (ATI), Washington, D. C.; and the following Consultative Group on International Agricultural Research Centers (CGIAR Centers): International Center for Tropical Agriculture (CIAT) Cali, Colombia; International Maize and Wheat Improvement Center (CIMMYT) Mexico City, Mexico; International Potato Center (CIP) Lima, Peru; International Center for Agricultural Research in the Dry Areas (ICARDA) Aleppo, Syrian Arab Republic; International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Andhra Pradesh, India; International Service for National Agricultural Research (ISNAR), The Hague, The Netherlands; and International Rice Research Institute (IRRI), Los Banos, Philippines. The target population of documents was broadened to include the International Agricultural Research Centers. Table 2 lists the type of documents collected from each organization.

Table 2. Type of Documents Collected for the Study\_

<u>Organization</u>	<u>Type of Documents</u>	<u>Number of Documents</u>
World Bank	Completed Project Reports	8
	Project Performance Audit Reports	2
FAO	Case Studies	8
	News Reports	2
World Neighbors	Annual Reports	9
	News Reports	2
CGIAR		
CIAT	News Report	3
CIMMYT	Annual Report	3
CIP	News Report	1
ICARDA	News Report	1
ICRISAT	Annual Report	1
IRRI	News Report	2
ISNAR	Discussion Paper	1
ATI	Annual Reports	8
	ATI Bulletins	2

—

The documents collected for the study included completed project reports, project performance audit reports, case studies, news reports, annual reports, bulletins, and a discussion paper. The study was based on primary source data which at times included gaps in the description of data collection techniques and/or baseline status. The following is a list of many of the unforeseen problems associated with the collection and selection of project reports: 1) difficulty in receiving project reports— several organizations promised reports but failed to provide them after repeated request; 2) nonuniformity in data recording— For example reports indicated target farming population, or number of beneficiaries in lieu of reports of active farmer

participation; 3) reports were not externally reviewed- Only two of the 51 project reports suggested that they had been externally reviewed; 4) documents were written as claim documents, not as research reports. For example, the projects often identified background data, strategy and/or, project results without indicating impact on farmers. WB Zambia reported that "A main omission in the report is an evaluation of the impact of the project on the intended beneficiaries. Who were the beneficiaries? What impact did the project have on their incomes and living conditions? Did the project reach the poorer strata of smallholders?" (p. 4); 5) numerical data for meta-analysis was incomplete. Difference scores were reported for documents that reported numerical data. Many documents only reported aggregated before and after technology or extension data.

#### Narrative and Numerical Analysis

For the purpose of this study both the narrative and numerical data were used to systematically examine the documents. Document text analysis involved the examination of narrative data for themes or patterns of information to see if the same themes or patterns existed in each document. Codes were assigned which linked the theme to the research questions. This information was placed on data cards for across project examination.

Narrative document examination involved investigation of background information and text analysis. The background information consist of the following characteristics: name of organization, source of data, project name, project location, project duration, target population, and environmental conditions. The background characteristics of the projects have been listed

(see Appendix D).

#### QSR NUD.ist Examination of the Documents

All printed documents required computer-scanning before entering QSR NUD.ist, for multiple document across project examination. Examination of the document involved: coding the documents for the QSR NUD.ist program, computer text searches, and examining and identifying text links to the specific research questions. The QSR NUD.ist program was used to develop across project text-characteristics which would provide detail about the specific projects.

#### Numerical Examination of the Documents

The participation percentage for the small-scale, resource poor farmer was collected from those documents which reported the total number of farmers and the number of farmers actively involved in the project or extension method. The number of farmers reached and participating in the project was collected in those documents which reported this type of information.

Numerical data was collected from those documents which:

- 1) reported before and after data on the percentage rate of adoption of technology by the small-scale, resource poor farmers;
- and 2) reported before and after data on the sustainable benefits of the project to the small-scale, resource poor farmers.

The numerical data was placed on data cards for across project examination.

Data was collected from 51 international agricultural research and extension projects and placed in matrices. Following

are the specific research questions which were addressed by the study: 1) How are the small-scale, resource poor farmers participating within the extension approach?, 2) What is the participation percentage across each project?, 3) What is the adoption percentage across each project?, 4) How effective were the projects?, and 5) What are the characteristics of the exceptional program?

Research Question 1. How are the small-scale, resource poor farmers participating within the extension approach?

This information was collected from narrative document analysis using the text characteristic data collected from the QSR NUD.ist program and from data cards. These characteristics or indicators of farmer participation included: small-scale, resource poor farmers participation in the projects through farmers' groups, select groups, community and village development, as microentrepreneurs, in leadership development, planning and decisionmaking, general and agricultural training, classes, and workshops. The matrix (Table 3) was used to synthesize data collected from the narrative examination of the documents. The matrix provides the following information: name of the organization, project location, and indicates small-scale, resource poor farmer participation within the implemented project where farmer participation was identified.

**Table 3. Participation of the small-scale resource poor farmers in the agricultural research and extension approach**

Organization	Location	Number Participants	Approach	Indicators of Participation									
				Farmer Groups	Select Groups	Community/Village/Family	Microentre.	Leadership	Planning/Decisionm	Training	Agricultural Training	Classes	Workshops
ATI	Bolivia	1200a	EF		*	*	*				*		
	Mozambique		EF				*				*		
	Tanzania		EF				*						
	Zimbabwe	60,000m	EF				*						
	Uganda		EF				*						
	Zambia		EF				*				*		
	Nepal	573 cl					*	*			*		
	Sri Lanka												
	Phillipines												
	India	1004c	EF								*	*	
CGIAR	Brazil	2500m	P	*	*	*		*	*				
	Rwanda		PB		*				*			*	
	Colombia		P		*	*		*	*				
	Mexico			*	*				*				
	El Salvador			*					*				
	Bangladesh	2370i	WF			*						*	
	Peru	100j			*			*				*	*
	Ethiopia												
	India		PRA						*			*	
	Laos				*								
VietNam		P	*		*		*				*	*	
Guatemala	80,000c	FSR	*	*			*	*			*		
FAO	Indonesia		P	*	*				*		*	*	
	Rwanda		P	*	*				*		*	*	
	China		G	*	*				*		*	*	
	Cyprus		G	*					*		*	*	
	Sierra Leone		PPP	*		*	*	*	*				
	Sri Lanka	2000m	P	*	*			*	*		*		
	Kenya		PPP	*									
	Sri Lanka	44f	PPP	*	*		*	*	*	*			
	Bangladesh		SEC										
Zambia	116e	PPP	*	*		*	*		*				

Table 3. Participation of the small-scale resource poor farmer in the agricultural research and extension approach

Organization	Location	Number Participants	Approach	Indicators of Participation									
				Farmer Groups	Select Groups	Community/ Village/Family	Microentre.	Leadership	Planning/ Decisionm	Training	Training Agricultural	Classes	Workshops
WB	Zimbabwe		T&V/FSR	*	*	*		*					
	Zambia		T&V/FSR		*							*	
	Rep. Yemen		T&Vmodified	*	*				*	*	*		
	Turkey		T&V									*	
	Nigeria	760,000m	T&V								*	*	
	Morocco	62,588m	T&V	*								*	
	Malaysia	490,000h	T&V	*	*	*	*	*	*	*	*		*
	Mexico		PLANAT	*					*				
	Kenya		T&V		*						*		
	Burkina Faso	833m	T&V		*		*					*	
WN	Haiti		P	*			*		*	*			
	Bolivia		P		*			*		*		*	
	HondurasEP		P	*		*		*		*	*		*
	700a												
	Togo		P	*	*	*	*	*	*	*	*	*	
	Ghana	25,000e	P	*		*	*		*	*	*		*
		10,000e											
	VietNam		P		*	*		*	*	*	*	*	
		1006e											
	HondurasCH	900b	P			*	*				*	*	*
	El Salvador	1,2000e	P		*	*		*	*	*	*	*	*
Nepal TSS	5817	P	*	*	*		*	*	*	*	*	*	
Nepal MAH	160,000e	P		*	*	*	*	*	*	*	*	*	
Peru	200d	P				*			*				

Abbreviations:

ATI-Appropriate Technology International; CGIAR-Consultative Group on International Agricultural Research; FAO-Food and Agricultural Organization of the United Nations; WB-World Bank; WN-World Neighbors; EF-Entrepreneur Focused Approach; FSR-Farming Systems Research and Extension; PPP- Peoples Participation Program; PRA-Participatory Rural Assessment; SEC- Strategic Extension Campaign; T&V- Training and Visit Extension Approach; T&VP- Training and Visit with Participation; T&V/FSR- Training and Visit with Farming Systems Research; T&V modified- T&V modified to include visits at DOA's and houses of field extension agents; P- Participatory; WF- Whole Family; G-General Extension; Microentre.-microentrepreneur development; Planning decisionm- planning and decisionmaking a-families; b-family members; c-small-scale resource poor farmers; d-women and families; e-people; f-individuals; h-farm families; i-marginal farmers; j-poor families; l-herders; m-farmers; n-subsistence farmers

Data compiled within Table 3 indicated the participation of the small-scale, resource poor farmers within each document. Additionally, data collected from the QSR NUD.ist text-characteristic provides rich insight into how the small-scale, resource poor farmers have participated within the implemented projects of the study.

Document analysis suggested the following indicators of farmer participation within the projects: farmers participation within farmers' groups and organizations, select groups, community, village and/or family, as microentrepreneurs, in leadership, planning and decisionmaking, general and agricultural training, classes, and workshops. The following section details text-characteristic data which indicates small-scale, resource poor farmer participation within each document of the study that reported this data.

#### Farmers Participation through Farmers' Groups

Small-scale, resource poor farmer participation in farmers' group and organization was indicated in 24 projects. Forty-seven percent of the 51 projects indicated that farmers participated through farmers' groups or small groups formed to help augment the extension message and process. The following narrative data reports the text-characteristic small-scale, resource poor farmer participation in farmer groups and organizations.

Appropriate Technology International (ATI)

The documents reviewed for ATI suggested that they did not use farmer groups.

Consultative Group on International Agricultural Research  
(CGIAR Centers)

CIAT Brazil (1997) reported setting up 20 committees in four states. Each group involved 30 - 100 farmers in community diagnosis of production problems assisted by scientist and extension workers.

In CIMMYT Mexico and CIMMYT El Salvador (1996) farmers were encouraged to form regional groups through which new methods would be taught. IRRI Vietnam (1996) indicated that groups of farmers participated in spraying experiments, which were designed to communicate delayed insecticide application. ISNAR (1991) indicated that farmer groups participated in the transfer days activity of the project. The remaining documents reviewed for the CGIAR Centers suggested that they did not use farmer groups.

The Food and Agricultural Organization (FAO)

FAO Indonesia (1990) grouped the participating small farmers, sharecroppers, and landless farm people into small functional learning groups (12-20) through which extension advice, activity planning, credit processing and handling, and other services were being channeled. FAO Rwanda (1990) indicated that the participating farmers were annually organized into 2,150

farmers' groups of 12 to 20 members. PPP Sierra Leone (1991), FAO China (1990), and Cyprus (1990) indicated organizing farmers and working through farmers' groups.

FAO Sri Lanka 1996) reported using groups of 8-15 small farmers, tenant cultivators or artisans whose household incomes were below the national poverty line. These farmers were organized into 225 groups and linked through 23 village unions and two district federations.

In PPP Zambia and PPP Sri Lanka (1996) several small farmer inter-group associations were established through the Peoples Participation Programme. The inter-group associations provided the following type of support and services: credit and savings, extension support, marketing and training.

PPP groups in Kenya (1991) reported increases in food crop production. The remaining document reviewed for FAO suggested that it did not use farmer groups.

#### World Bank (WB)

WB Zimbabwe (1993) reported using the grassroots group approach and contact to spread the extension messages. WB Republic of Yemen Project (1993) reported that the main extension focus was toward farmers covered by the cooperatives, extension support was based on individual farmer-member needs within the cooperative. WB Morocco (1992) indicated that though the farmer group and agricultural cooperatives were to participate in and benefit from the project activities that it was impossible to

organize informal farmer groups. WB Malaysia (1988) reported placing emphasis on the establishment of farmer groups (20-80 farmers) to facilitate agricultural technicians contact and extension service. The farmers were grouped on the basis of adjoining fields or in irrigated areas by common water supplies and drainage facilities.

WB Mexico (1990) indicated using farmer groups in planning and decision making. The remaining documents reviewed for WB suggested that they did not use farmer groups.

#### World Neighbors (WN)

WN Haiti (1997) reporting forming small farmer groups of 10-15 people to help families identify their needs.

WN Honduras E.P. (1995) reported using organized farmers groups to select community leaders. WN Togo worked to establish and strengthen two village associations, addressing issues such as leadership, resource mobilization, needs assessment and self planning. WN Ghana (1995) indicated the organization of a farmers' association. Some of the activities of the farmers' association included: establishing a groundnut seed bank and opening an account with a commercial bank. WN Nepal-TSS (1994) reported forming and training farmer groups, and assisting them to carry out trials in their own fields with their own resources. Farmers who demonstrated additional motivation were selected and trained as community facilitator, animal health volunteer, or agroforestry trainer. The remaining documents reviewed for WN suggested that

they did not use farmer groups.

#### Farmers Participated in Select Groups

The characteristic farmer participation in select groups was reported in 26 of the 51 projects indicating that 50% of the 51 projects selected representative farmers to augment the extension contact, and to aid in the dissemination of agricultural messages. The narrative data reports the text-characteristic participation of the small-scale, resource poor farmer in select groups.

#### Appropriate Technology International

ATI Bolivia (1996) reported the formation of a partnership with the participant-producer owned organization Integral Association of Camelid Producers of the High Andes (AIGACAA) to improve alpaca fiber collection, production and marketing. The remaining documents reviewed for ATI suggested that they did not use select groups.

#### CGIAR Centers

In CIAT Rwanda (1995) women expert farmers participated at the research station, as evaluators in identifying and selecting promising bean cultivars. CIAT Columbia (1995) and CIAT Brazil (1997) reported involving 30 to 100 farmers in community diagnosis of production problems, coordinated by a network of local agricultural research committees.

CIMMYT Mexico (1996) reported using farmer to farmer dissemination of improved practices through which designated

contact farmers were trained and encouraged to form regional groups interested in learning more about the new methods.

CIP Peru (1994) indicated that representatives from the communities were trained and returned to villages to instruct others in the message. In IRRI Laos (1996) collaborating farmers participated with the project and researchers in on-farm experimentation with two non-rice crops interspersed among 1 hectare rice area.

In an effort to improve the quality and dissemination of new technology to an estimated 80,000 resource poor farmers in Guatemala, ISNAR (1991) reported, using among other strategies, the involvement of rural leaders and farmers (consultative groups) in the planning of all phases of the technology transfer effort. These "consultative groups" consisted of rural leaders assigned to one of the extension teams and at least one member from each of the farmer groups formed by the rural leaders (ISNAR, 1991). The rural leaders were recognized local leaders within the community, with basic mathematical ability and literacy, and were full-time farmers and land owners (ISNAR, 1991). The remaining documents reviewed for the CGIAR Centers suggested that they did not use select groups.

### Food and Agricultural Organization

FAO (1990) Indonesia, PPP Sri Lanka (1996), FAO Rwanda (1990), and FAO China (1990) indicated the participation of contact farmers to influence extensions' involvement with other farmers.

PPP Zambia (1996) and PPP Sri Lanka (1996) indicated that the PPP group elected two members as their representatives to the Area Action Committee (AAC) and the Village Board, respectively. FAO Sri Lanka (1996) reported that the participating farmers were members of a network of 225 self-help groups. Farmers participated as group representatives to attend arranged meetings with the local extension officer. The remaining documents reviewed for FAO suggested that they did not use select groups.

### World Bank

A select group of farmers referred to as contact farmers has been a characteristic feature of World Banks' Projects.

WB Zimbabwe (1993) indicated using grassroots extension and contact to spread the messages. WB Zimbabwe (1993) also reported that the farmers participated in the group approach and contact within two communal areas, radio listening groups within two communal areas, and indicated that farmers participated in cattle farmer groups and in the formation of saving clubs. WB Zambia (1990) indicated farmer participation as contact farmers. Though women were active in farming, the contact farmers were often

nonrepresentative of the farming community.

WB Kenya (1990) indicated that achievements were confined to the selection and training of those farmers who received credit and inputs.

WB Yemen (1993) reported focusing its extension efforts toward farmers previously covered by the cooperatives. WB Malaysia (1988) reported selecting a leader from among the farmers in every group and from a subgroup, the contact farmer was identified. WB Malaysia indicated that farm group leaders participated in 1-2 day meetings. Farmer group leaders also participated in workshops, seminars where issues specific to group needs were addressed.

WB Burkina Faso (1989) indicated that credit and inputs were channeled through already existing and operational village groups. Burkina Faso (1989) also indicated encouraging the selection of women who were rice producers. Nearly half of the rice producers in two of the villages were women. The remaining documents reviewed for WB suggested that they did not use select groups.

## World Neighbors

Participating farmers were selected to: represent the group, learn new technologies, implement them in their own lives, and then train others in their own or neighboring villages. These selected farmers were referred to as key farmers in WN Vietnam (1996), peasant farmer animators in WN Togo (1995), volunteer promoters in WN Bolivia (1997), and community leaders in WN El Salvador (1995). Similar roles were given to those self-selected and trained as i.e. Agroforester, Animal Health Volunteer, Adult literacy teacher, Community health volunteer, and Local Non-governmental office leader, who were responsible for training and sharing the knowledge with the community (WN Nepal TSS, 1995).

WN Nepal MAH (1995) reported that farmers participated through the use of field days during which people from other villages and districts visited the farms of ongoing program participants. Farm tours, field discussions, and farmer to farmer sharing enabled many people to learn from their peers about everything from transplanting, spacing, manuring, weeding to lopping the fodder and feeding practices. The remaining documents reviewed for WN suggested that they did not use select groups.

### Farmers Participated through Community and Village Development

This characteristic was reported in 17 projects. Thirty-three percent of the 51 projects reported that farmers participated in projects which were directed toward community, village, and/or family development. The following narrative data reports the text-characteristic farmer participation in community and village and/or family development within the document.

#### Appropriate Technology International

ATI indicated working in partnership with the Integrated Association of Camelid Producers of the High Andes, formed by 22 Aymara Indian communities within the Bolivian altiplano (ATI, 1996). Participating families raised alpaca, llamas, and sheep for production and sale of fiber, meat, and skins. ATI Nepal (1996) indicated that subsistence farmers and herders participated in the Community-Based Ecosystem Management Project, mainly concerned with developing small-scale community enterprises, that sustainably harvest and process wild plants. The remaining documents reviewed for ATI suggested that they did not use community, village and/or family development.

#### CGIAR Centers

CIAT Columbia (1995) and CIAT Brazil (1997) indicated the participation of farmer farmers in initial community diagnosis of production problems. CIAT Brazil (199) reported involving more

than 75 communities in cassava research through the identification of main problems, causes, probable consequences, and possible solutions.

CIMMYT Bangladesh (1996) indicated that the whole family (all those involved in wheat production) participated in a program designed to provide training especially to rural women, who traditionally have little access to training and information basic for improving crop production.

IRRI Vietnam (1996) reported that the husband and wife participated in program designed to manage insecticide spraying of rice. The remaining documents reviewed for the CGIAR Centers suggested that they did not use community, village, and/or family development.

#### The Food and Agricultural Organization

In the PPP Sierra Leone project (1991) small farmers in the PPP villages where the projects were completed, were involved in rural development- raising money to build schools, bridges, and grain stores; some groups began palm oil, groundnut, and vegetable production. The remaining documents reviewed for FAO suggested that they did not use community, village and/or family development.

World Bank

WB Zimbabwe (1993) indicated working with communal area (subsistence production) small farmers. The document was unclear in defining farmer participation in community, village, and/or family development. WB Malaysia (1988) indicated emphasizing farmer motivation, adult education, and community development. The remaining documents reviewed for WB suggested that they did not use community, village and/or family development. World Neighbors

WN Honduras EP (1995), used community leaders from organized farmers' groups to reach and share their knowledge with 10 communities. In the WN Ghana (1995) and WN Togo (1995) projects the farmers participated through village associations which were established to provide community leadership, organization and management.

WN Vietnam (1995), farmers participated through a village based communal project which assisted farmers in their experiments with agricultural technologies, promote native and introduced tree species, train farmers and district cadres and initiate a farmer-based extension system.

WN Honduras CH (1995) indicated farm family participation in community development issues, i.e. agriculture, health, environment, and community organization. Farmers participated in the development and organizing of a cooperative. WN El Salvador and the Salvadoran Association for Rural Health (ASAPROSAR), working together to enable communities to solve their own

problems, indicated that farmers participated through community and village.

Nepal-TSS (1994) and WN Nepal MAH (1995) identified and worked with select marginalized communities referred to as "focus communities" in an effort to find solutions to basic needs i.e. community health, family planning, drinking water, sanitation as well as agricultural productivity. The remaining documents reviewed for WN suggested that they did not use community, village, and/or family development.

#### Sustaining the Small-scale, Resource Poor Farmer

Small-scale, resource poor farmers participated in extension methods directed towards sustaining, equipping, and developing farmers and farming community through small-scale, resource poor farmer participation in microentrepreneur opportunities, leadership development, planning and decisionmaking, training, and in classes, and workshops.

#### Farmers Participated as Microentrepreneurs

The characteristic of farmer participation as microentrepreneurs was indicated in 18 projects: thirty-five percent of the documents indicated that farmers participated in activities designed to improve sales, income and develop markets. The following narrative data reports the text-characteristic farmer participation as microentrepreneurs within the documents.

### Appropriate Technology International

In the ATI Nepal Project (1996) subsistence farmers and herders, have participated in the development of small-scale community enterprises involved in the sustainable harvest and processing of wild plants into essential oils.

ATI partner Integral Association of Camelid Producers of the High Andes (AIGACAA), and 1200 Aymara alpaca herders have participated and implemented the development of an alpaca fiber production community enterprise (ATI Bolivia, 1995).

Farmers within these projects, ATI (1996) Mozambique, Tanzania, Zambia, Zimbabwe, and Uganda participated in market development by becoming oilseed producers and/or processors through their investment in the purchase of the ram press technology. The remaining document reviewed for ATI suggested that they did not use farmers participation as microentrepreneurs.

### CGIAR Centers

The documents reviewed for the CGIAR Centers suggested that they did not use farmer participation as microentrepreneurs.

### Food and Agricultural Organization

PPP Sierra Leone (1990) summarizing the continuing impact of a terminated PPP project reported that the small farmer groups continued to save, investing their capital in construction projects and in small businesses. In PPP Zambia and PPP Sri Lanka

(1996) several small farmer inter-group associations were established through the Peoples Participation Programme. The inter-group associations provided the following type of support and services: credit and savings, extension support, marketing and training. The remaining documents reviewed for FAO suggested that they did not use farmer participation as microentrepreneurs.

#### World Bank

WB Malaysia (1988) indicated that farmers participated in special projects, i.e. beekeeping, honey sales, and cottage industry to sell bee hives. WB Burkina Faso indicated that farmers had paddy rice sales. The remaining documents reviewed for WB suggested that they did not use farmers as microentrepreneurs.

#### World Neighbors

Farmers within the WN Ghana (1995) project have participated through the village associations in the establishment of markets to mobilize the local resources.

WN TOGO (1995) reported several income generating activities for the peasant association: collective fields, petty trade, cash livestock raising, sale of harvest and food trade.

WN Peru (1995), a handicraft cooperative composed of women, reported participation in a local fair that helped to sell inventory. The Coop also sent samples of their goods to the International Gift Show in New York. A film has been made of their work.

WN Haiti (1997) indicated that the small-farmer group composed of women were the pillar of Haitian system of distribution of goods. The women within this group participated in pooling their money to buy beans, which were planted, harvested and sold in market. WN Honduras CH (1995) indicated that participants set up a consumer store and maintained 4 grain storage collection centers.

WN Nepal MAH (1995) indicated that farmers participated in programs designed to improve animal production and animal sales. The remaining documents reviewed for WN suggest that they did not use farmer participation as microentrepreneurs.

#### Farmers Participated in Leadership Development

The characteristic small-scale, resource poor farmer participation in leadership was reported in 17 documents indicating that thirty-three percent of the documents reported small-scale, resource poor farmers participation in activities designed to improve leadership selection and development. The following narrative data reports the text-characteristic farmer participation in leadership development within the documents.

#### Appropriate Technology International

ATI documents reviewed suggested that they did not use farmer participation in leadership development.

#### CGIAR Centers

In Guatemala (ISNAR, 1991) rural leaders and cooperating farmers managed plots and acted as main spokesperson for the technological innovations to large groups of farmers during transfer day (an activity held at the transfer station for promoting technological innovations). ISNAR Guatemala (1991) reported that rural leaders were key to transfer and feedback.

CIP Peru (1995) reported that trained representatives from communities instructed farmers in new IPM procedures.

IRRI Vietnam (1996) indicated that the collaborating advanced farmers worked with the university and were ready to try out new ideas, such as delayed insecticide spraying.

In CIAT Columbia (1995) farmers participated in participatory research methods for adaptive technology testing. Locally elected committees manage and conduct research on behalf of the community as a whole. The local communities were responsible for the election of the committees, setting the research agenda, and helping evaluate the results. CIAT Brazil (1997) indicated that farmers participated in the evaluation of field experiments with technology options. The farmers also analyzed results and communicated them to other committees and communities. The remaining documents reviewed for the CGIAR Centers suggested that they did not use farmer participation in leadership development.

### Food and Agricultural Organization

In PPP Zambia (1996), FAO Sri Lanka (1996), PPP Sierra Leone (1996), and PPP Sri Lanka (1996), indicated that representative farmers were elected and served in leadership positions for one year. The remaining documents reviewed for FAO suggested that they did not use farmers in leadership development.

### World Bank

WB Malaysia (1988) indicated that farmer groups had been established with group leaders elected by the members and contact farmers nominated for each subgroup of ten. Group leaders were invited to seminars where issues specific to group needs were being raised and discussed. To overcome shyness of farmers toward government agents, farmer group leaders were invited to workshops, and seminars, where issues specific to group needs were raised.

WB Zimbabwe (1993) reported a farmer extension promoter project, which seemed to be linked with farmer groups and the extension workers.

WB Turkey (1992) indicated that key people in the project area (i.e. the Imam or Religious Head, and the Muhtar or Village Head) should be consulted so that they and the people over whom they have influence can identify themselves better with the project. WB Turkey did not indicate whether these key people were small-scale farmers within the community. The remaining documents reviewed for WB suggested that they did not use farmer participation in leadership development.

## World Neighbors

Key farmers were a designated farm leader group within the World Neighbors (WN) VietNam Project. The key farmers used their own farms which they developed (referred to as model farms) as a basis for sharing success and failures in the transferal of technologies. The key farmers also played a significant role in the training of other farmers and the transferal of technologies within this farmer based extension system.

WN Togo (1995) reported that several women were chosen to participate as leaders. Additionally, WN Togo (1996) reported that several farmers participated as peasant-farmer animators. These farmers were being prepared to hold training sessions, and to develop training modules on awareness raising, mobilizing local financial and human resources, and the benefits of functional literacy. Additionally, the peasant farmer animators received training on participatory techniques for monitoring, evaluation, planning, and self-evaluation. Similar to role of the peasant-farmer animator was the role of the volunteer promoter in WN Bolivia (1997) in learning new technologies, implementing them, and training others what was learned.

WN Nepal MAH (1996) indicated that farmers tested new trees on their own land and noted the impact on animal production. During field days, people from other villages and districts visited the farms of the participants. These type of field discussions, farm tours, and farmer to farmer sharing enabled other farmers to learn how to manage and use new feeding practices

from their peers.

WN Honduras EP (1995) reported that community leaders were involved in leadership, organization, and organizational systems. Leaders also received training in reproductive risk.

WN El Salvador (1995) replaced the extensionist with a farmer extensionist. Farmer extensionist were local farmers, World Neighbors trained leaders and experimenters, responsible for encouraging the successful transfer of technology to other farmers. The remaining documents reviewed for WN suggested that they did not use farmer participation in leadership development.

Farmers Participated in the Planning  
and Decisionmaking Process

Small-scale, resource poor farmer participation was reported in 24 projects indicating that farmer involvement or participation through planning and decision making activities was indicated in 47% of the projects. The following narrative data reports the text-characteristic small-scale, resource poor farmer participation in planning and decisionmaking processes.

## Appropriate Technology International

ATI documents reviewed suggested that they did not use farmers in planning and decisionmaking processes.

## CGIAR Centers

While testing participatory breeding, CIAT Rwanda (1995) incorporated, the early on-station decisions of women expert farmers and breeders in the successful identification of bean variety characteristics for production. CIAT Columbia (1995) indicated that project farmers participated in the project through the formation of locally elected committees which managed and conducted research on behalf of the community as a whole. CIAT Brazil (1997) indicated that farmer committees were taking part in identifying main problems, their causes, probable consequences, and possible solutions. The farmer committees were also involved in the planning, implementation, evaluation of field experiments, and analysis and communication with other committees and communities.

CIMMYT El Salvador and CIMMYT Mexico (1996) reported the participation of smallholder maize farmers in organized policy workshops that brought together local-, regional-, and national-level stakeholder to develop a common vision toward productivity and sustainability problems.

ICRISAT India (1996) incorporated on-station farmer participation in the breeding of millet varieties to define farmer

preferences and decisions about individual traits and specific varieties.

ISNAR Guatemala organized consultative groups consisting of rural leaders and one member of each of the farmer groups to whom the research-extension team presented its proposed work plan for the coming season. The remaining documents reviewed for CGIAR Centers suggested that they did not use farmers in planning and decisionmaking processes.

#### Food and Agricultural Organization

FAO Sri Lanka (1996), an example of grassroots participation in local government, indicated using farmer participation in selection decisions on specific pigeon pea varieties. The farmers were trained at a local research station. Group members established demonstration plots, monitored growth and reported the results to the Sri Lanka's Ministry of Agricultural Development and Research and a team of ICRISAT scientist. After varietal trials were conducted, the farmers evaluated the test lines of pigeon pea and gave their decisions.

PPP Sri Lanka (1996) indicated that the farmers have participated in local government in many capacities including: on village councils, as chairmen, official positions in cooperatives, and sub-district consultative committees.

PPP Sierra Leone (1991) indicated that farmers were involved in participatory monitoring and evaluation and keeping record books. FAO Cyprus (1990) indicated that men and youth had

participated in planning activities. FAO-Indonesia, Rwanda, and China (1990) indicated that both women and men farmers, and the youth participated in planning activities. The remaining documents reviewed for FAO suggested that they did not use farmer participation in planning and decisionmaking processes.

#### World Bank

WB Malaysia (1988) indicated that farm group leaders participated in 1-2 day meetings. Farmer group leaders participated in workshops, seminars where issues specific to group needs were addressed.

WB Mexico (1990) reported using planning and decision making with the producer groups. WB Mexico indicated that the producer's groups did have a say in the projects investment program. WB Yemen (1993) indicated an improved research management which included reorganization of research to include: focus on outreach to farmers and feedback from farmers. The remaining documents reviewed for WB suggested that they did not use farmer participation in planning and decisionmaking processes.

#### World Neighbors

The WN Ghana (1996) encouraged group dialogue to reach a consensus decision in the creation of their own criteria for selecting village leaders. WN El Salvador, VietNam, Togo, and Nepal TSS indicated farmer involvement in Participatory Rural Assessment, a tool which encourages farmer interaction in planning

and decision making.

WN Togo (1995) indicated that the farmers prepared their own program plan. Farmers also participated in leadership development through self development and awareness training, resource mobilization, needs assessment and self planning. WN Haiti (1997) indicated that small farm groups were used to help families identify their needs. The small farmer groups consisted of meetings and learning exercises on themes such as reasons and methods for working together, group definition of their own priorities, rules, regulations, structures, and election of leaders.

In WN Nepal MAH (1996) farmers tested new trees on their own land, noting the impact on animal production. Farmers participated in farmer to farmer sharing which enabled learning from peers how to manage and use the feeding practice. The remaining documents reviewed for WN suggested that they did not use farmer participation in planning and decisionmaking processes.

#### Farmers Participated in Training activities

Small-scale, resource poor farmers participated in training activities in 45 of the 51 projects. Twenty projects reported farmer participation in general training i.e. training in non-agricultural areas. Thirty-nine percent of the projects indicated farmer participation in general training.

Small-scale, resource poor farmer participation in agricultural-related training was indicated in 25 of the 51 projects. Forty-nine percent reported farmer participation in

agricultural-related training. The following narrative data reports the text-characteristic small-scale, resource poor farmer participating training activities.

#### Appropriate Technology International

ATI Bolivia (1994) provided training for improved farm management, animal husbandry, shearing, sorting, classifying and weighing technologies for the herders of alpaca, llamas and sheep. ATI Sri Lanka (1995) reported holding training activities and demonstrations for resource poor farmers. ATI India (1996) held training activities in rhizobium handling and storage use for groundnut and mungbean resource poor farmers who were participating in the trials. ATI Philippines held orientation and technology dissemination activities for farmer representatives from 26 barangays.

ATI Zambia (1995) reported holding training sessions for small-scale farmers and entrepreneurs who were owners of the ram press. ATI Mozambique (1995) indicated that 3,130 participants attended demonstrations; the document did not indicate how many of the participants were farmers.

ATI Nepal (1995) provided training in proper drying, cleaning and sorting of the dried plant roots, leaves and berries to enhance the production and manufacturing of essential oils for market. The remaining documents reviewed for ATI suggested that they did not use farmer participation in training.

#### CGIAR Centers

IRRI VietNam (1995) reported holding short training courses on pesticide delay technique. A portion of the farmers' fields were devoted to insecticide experiments which were promoted by the research station.

ICRISAT India (1996) reported that the farmers participated in farmer managed trials to aid in the selection of millet varieties. CIP Peru Project (1994) held training classes in IPM for the representative farmers.

CIAT Rwanda (1995) indicated that women farmers and researchers worked together in on-station trials to encourage early farmer selection and adoption of bean varieties.

ISNAR Guatemala (1991) indicated the need to ensure full participation of the resource poor farmer in an on-farm research approach that linked research with extension. The training activities included: on farm trials, farmer managed trials, transfer days, communal gardens, farmers' tours, and meetings to discuss technical issues with the extension team.

CIMMYT Bangladesh (1996) reported the participation of the whole family (involving the husband and wife and two others) in training sessions which were designed to improve wheat production and increase access of information to women farmers. The remaining documents reviewed for the CGIAR Centers suggested that they did not use farmer participation in training.

## The Food and Agricultural Organization

FAO Indonesia (1991) indicated giving assistance to small-scale farmers, tenants and sharecroppers through training, demonstration, field days, agricultural extension, and research. FAO China and Cyprus (1990) indicated that farmers participated in demonstration field days.

FAO Sri Lanka (1996) indicated that the farmers participated in training in timing and correct use of spray pesticide. Additionally farmers conducted on-farm trials of pigeon pea lines for ICRISAT in India. The farmers received training at the local research station.

PPP Sri Lanka (1996) reported that training courses for the small farmer group members were organized by the village board. In many cases the training was given to the appropriate village board committee members who in turn organized and conducted the training for interested group members. PPP Zambia (1996) indicated that the Education Committee helped to plan needs-based training courses for members i.e. book keeping, control of meetings, nutrition, and literacy. The remaining documents reviewed for FAO suggested that they did not use farmer participation in training.

## World Bank

WB Zimbabwe (1993) indicated that the farmers participated in in-house training to farmers in areas of animal and crop husbandry, extension process, farm management, etc. WB Nigeria (1992) reported that farmers participated in training by mobile units, farm trials, and on-farm adaptive research. Television and radio messages were also broadcasted.

WB Malaysia (1988) reported training farmers at the training centers. Farmers were trained to appreciate and practice soil conservation. Farmers participated in trials, demonstrations, and extension meetings. WB Turkey (1992) reported that farmers were trained mainly at the village centers constructed by the project. WB Kenya (1990) reported selecting and training those farmers who received credit and inputs. WB Zambia (1990) indicated that farmers participated in on-farm demonstrations.

WB Yemen (1993) indicated that field days were held at the demonstration sites set up by researchers. Field demonstration plots were set up in conjunction with each research center and film shows, weekly radio and television programs were organized for the benefit of the farmers at the training centers.

WB Burkina Faso (1989) indicated that the rice farmers participated in several demonstration field days and study visits to different projects. Demonstration plots were established with farmers within two areas: areas of cowpea production; and in areas of sorghum, maize, and cowpea production.

WB Morocco (1992) indicated that comprehensive demonstrations were set up by the project on farmers' fields with their collaboration and participation; and that farmers participated in conservation farming. The remaining documents reviewed for WB suggested that they did not use farmer participation in training.

#### World Neighbors

WN Ghana Project (1996) held community training needs assessment through community meetings and discussions and Participatory Rural Assessment (PRA) sessions. Additional training was provided to identify and analyze problems: PRA methodology for animator trainers, PRA for 20 village volunteers and association members on a village by village basis according to community needs and availability, PRA training to enable each village to gain self confidence before attempting training in the group with other villagers.

WN Honduras EP (1995) farmers participated in training to: improve soil conservation, reduce pest/disease by use of natural insecticides or with pesticides of low toxicity, improve the nutritional condition of children, and prevent and manage respiratory infections. Participants also received training in reproductive risk.

WN Haiti (1997) participants took part in organizational training themes in a series of six meetings.

WN Nepal MAH (1995) indicated that farmers participated in

training for farmer-led experimental plots, and farmer collaboration-comprehensive demonstrations.

WN Togo (1995) participants attended a training module on awareness-raising topics. The Village Development Committee organized self evaluation training sessions. The peasant farmer animator trainers and the Village Development Committee received training on use of participatory methods: monitoring, evaluation, planning, and self-evaluation. Additional training included training on: how to fill out agricultural trials and follow-up, numeric, reading time and scale, accounting, basic bookkeeping, how to elaborate a program plan, training to upgrade skills and competencies in village associations animation and organizations, training on accounting, how to elaborate a program plan. Other training was held to improve village associations capacities-involving peasant community training, enlarged leadership, community awareness raising, staff, farmers, participating in community meeting, leadership training, and report writing.

WN Honduras CH (1995) implemented a demonstration farm for training men and women in agriculture, health, and nutrition and held training in health and nutrition, workshops as training to cooperative members, training in reproductive risk in workshops, and training at a national level for the analysis of crops adaptable to the region. Several members of the cooperative participated in intensive training. Families of the cooperative participated in health and nutrition training. Farmers participated in training workshops.

WN Peru (1995) held training in management, design, marketing and accounting.

WN Nepal TSS Project (1994), farmers participated in training in Participatory rural assessment, and training to carry out trials in own fields. Farmers participated in training programs for strongly motivated participants to become: Farmer-Agroforester, Community Facilitator, Adult Literacy Teacher, Community Health Volunteer, Birth Attendant, Animal Health Volunteer, Local NGO Leader.

WN El Salvador (1995) indicated that the farmers participated in leadership training. Community extensionist received training in integrated pest management. Farmers participated in environmental talks. Farmers participated in the networking of training centers on sustainable agriculture. Farmers participating as volunteer promoters in WN Bolivia (1997), learned new technologies, implemented them in their own life, then train others in their village to do the same.

WN VietNam Project (1995) farmers participated in training sessions on the design and establishment of plum orchards, soil conservation and establishment of hedgerows, nursery establishment, demonstrations on proper planting of trees which were distributed, and methods for farmer experimenter, on-farm demonstrations, and participatory rural appraisal.

### Farmers Participated in Classes

Small-scale, resource poor farmer participation in classes was reported in 8 projects. Fifteen percent of the documents indicated farmer participation within classes. The following narrative data reports the text-characteristic small-scale, resource poor farmer participation in classes.

#### Appropriate Technology International

ATI documents reviewed suggested that they did not use farmer participation in classes.

#### CGIAR Centers

IRRI VietNam (1995) reported that 150 farmers participated in five separate training courses offered by a an Integrated Pest Management (IPM) official. The courses were designed to encourage delayed insecticide application for green leaffolder damage to rice foliage. CIP Peru (1995) reported that representatives from communities after attending training classes instructed farmers in new IPM procedures. The remaining documents reviewed for the CGIAR Centers suggested that they did not use farmer participation in classes.

#### Food and Agricultural Organization

FAO (1990) Indonesia, Rwanda, China and Cyprus indicated that farmers participated in classes. Cyprus reported that 27% of the farmers participated in classes, Indonesia, Rwanda, and China reported 3%, 2% and 0.4% respectively of the farmers, participated in classes. The remaining documents reviewed for FAO suggested that they did not use farmer participation in classes.

#### World Bank

WB documents reviewed suggested that they did not use farmer participation in classes.

#### World Neighbors

WN Togo (1995) indicated that 23 peasant-farmer trainer animators from both village associations attended a refresher course on: How to prepare and hold a training session (developing training modules) and How to conduct animation. During the session, the participants prepared a training module on: the potential for mobilizing local financial and human resources within a process of self-development; and the benefits of functional literacy. Evaluation of the session suggested that most participants gained the skills and competencies required to prepare and lead discussions in their villages. WN Bolivia (1997) participants attended soil conservation classes on how to make rock wall barriers on the contour. The remaining documents reviewed for WN suggested that they did not use farmer participation in classes.

### Farmers Participated in Workshops

Five projects reported small-scale, resource poor farmer participation in workshops. Nine percent of the documents indicated this characteristic. The following narrative data report the text-characteristic farmer participation in workshops

The documents reviewed for Appropriate Technology International, World Bank, Food and Agricultural Organization, and the CGIAR Centers suggested that they did not use small-scale resource poor farmer participation in workshops.

### World Neighbors

WN El Salvador (1995) indicated giving workshops in several communities on the preparation of velvet bean products. WN Ghana (1995) organized four workshops between communities and external agencies to enhance community information gathering about agency service availability. WN Honduras EP (1995) indicated that 173 families in 23 communities participated in workshops regarding medicinal plants. WN-Honduras CH (1995) reported that 50 cooperative members participated in 6 training workshops. The remaining documents reviewed for WN suggested that they did not use farmer participation in workshops.

Two documents, ICARDA Ethiopia and SEC Bangladesh did not specifically identify small-scale farmer participation within the project.

An overview of the narrative text-characteristic data has been provided in Tables 4 and 5. Table 4 list specific

characteristics of farmer participation within each international agricultural research and extension organization and respective approach. Document reports of farmer participation within a farmer based extension system and as experimenters were specific to World Neighbors. Utilization of a family approach (husband and wife, etc.) was specific to CGIAR. Table 5 list the number and percentage of projects that reported the indicators of farmer participation.

Table 4. An Overview of Farmer Participation within International Agricultural Organizations

<u>Extension Approach/Organization</u>	<u>Farmers' Participation</u>
Training and Visit (World Bank)	Farmer groups Select groups Leadership, Microentrepreneurs, Planning and Decisionmaking Community/Village Development Training, Agricultural Training
Farmer to Farmer Participatory (World Neighbors)	Farmer groups, Farmer based Extension System, Farmer Experimenters, Select groups Focus Communities/Development Farmer associations, Nutrition, Family, Microentrepreneur, Training/Agricultural, Leadership Planning and Decisionmaking, Classes, Workshops
General Extension (FAO case study)	Farmer groups, select groups Planning and decisionmaking Agricultural Training Classes
Participatory (FAO case study)	Farmer groups, select groups Planning and decisionmaking Agricultural Training, Classes
Peoples Participation Programme (FAO)	Farmer groups, select groups Community/Village development Planning and decisionmaking Leadership, Training/Agric. Microentrepreneur
Strategic Extension Campaign (FAO) Entrepreneur Focused Approach (ATI)	Indicators not used by project Select groups Training/Agricultural Community/Village development Microentrepreneur
Participatory CGIAR Centers	Farmer groups, Select groups Leadership, Agric. Training Family/Community development Planning and decisionmaking Workshop

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Table 5. Numerical overview of indicators of small-scale resource poor farmer participation across projects

<u>Indicators</u>	<u>Number Projects</u>	<u>% Projects</u>
Farmers groups	24	47
Select groups	26	50
Community/village/family	17	33
Microentrepreneurs	18	35
Leadership development	17	33
Planning, decisionmaking	24	47
Training general	20	39
Training agricultural	25	49
Classes	8	15
Workshops	5	9

The most common indicators of small-scale, resource poor farmer participation across organizations included the participation of small-scale, resource poor farmers within select groups, farmer groups, agricultural training, and in planning and decisionmaking. Less common were indicators of farmer participation in general training, community, village and family development, leadership development, and as microentrepreneurs. Classes and workshops were the least common indicators of small-scale, resource poor farmer participation in the projects.

Research Question 2: What is the participation percentage across projects?

For the purposes of this study the participation percentage was defined as the number of small-scale, resource poor farmers actively involved in the project divided by the total number of small-scale, resource poor farmers. This measure indicated the number of actively participating farmers in relation to the total number of farmers.

FAO (1990), WB Malaysia (1988) and WN Ghana (1995) provided data on farmer participation percentage. The FAO document reported attendance of farmers in demonstration field days and farmer classes for Indonesia, Rwanda, China and Cyprus. The total farming population for Indonesia, Rwanda, China, and Cyprus was reported as: 1.8 million small farmers, sharecroppers, and landless producers; 180,200 with a prevalence of small-scale farmers; 4.3 million farmers practically all of which were small-scale farmers; and 48,046 farmers, most of which were small-scale farmers, respectively.

The percentage of farmers that annually attended the demonstration field days and farmer classes within: Indonesia were 0.6% and 2.2%, respectively; Rwanda reported 14.0% and 0.4%, respectively; China reported 0.03% and 3.1%. respectively; Cyprus reported 1.4% and 26.7%, respectively (FAO, 1990).

WB Malaysia reported that about .49% of the farm families had participated in group activities during the project. One million rural families were reported as project beneficiaries.

The number of project beneficiaries may not provide an indication of the total number of farmers participating in the project.

WN Ghana indicating the percentage of people directly reached by the project, reported that the project directly reaches 10% of the people (10,000) in 4 villages. Total population within the district was reported as 100,000 people.

Alternative means of reporting number of farmer participants were indicated in the documents. Some documents reported number of participants and the project activity. For example, WB Burkina Faso reported that in 1985, 833 farmers had participated; 100 to 300 farmers received training outside of the perimeter of the project. Four hundred and fifty farmers had received training on the main perimeter. Total number of farmers was not provided. WB Nigeria (1992) indicated that 760,000 farmers had been reached by the extension service; 760 farmers were assisted, 418 farmers adopted the technical package. Total number of farmers was not reported. The term "reached" was not defined. The number of farmers "reached" may include broadcast media presentation as well as active farmer participation.

Several documents reported the number of project beneficiaries. The term "project beneficiaries" was not defined and does not indicate the number of active participants. Number of farmers actively participating was not indicated in many cases, however, in some cases the number of farmers was much less than claimed (page 94). In WB Kenya (1990) the expected beneficiaries were 40,000 smallholders; WB Mexico (1990) reported the number of

target beneficiaries as 126,699; and, in WB Turkey (1992) the target beneficiaries were 353,000 within the poorest region. ATI Bolivia (1994) reported 12,000 families as beneficiaries.

Documents also reported the number of small-scale farmer participants within the project. Table 6 list the 33 documents that indicated the number of small-scale farmer participants.

Table 6. Documents that Reported the Number of Farmer Participants within the Project

<u>Project Location</u>	<u>Number of Participants</u>
FAO	
Sri Lanka	more than 2,000 farmers
Zambia	116 people
Sri Lanka P	44 individuals
World Bank	
Morocco	62,588 farmers
Nigeria	760,000 farmers
Burkina Faso	833 farmers
Malaysia	4,900 farm families
World Neighbors	
El Salvador	1,200 people in 27 villages
Ghana	10,000
Honduras CH	900 family members
Honduras EP	700 families in 35 villages
Peru	200 women and families
VietNam	1,006 people
Nepal MAH	160,000 people
Togo	25,000 people in 37 villages
Nepal TSS	5,817 people served
CGIAR Centers	
CIP Peru	100 poor families
ISNAR Guatemala	80,000 resource poor farmers
CIMMYT Bangladesh	2,370 mostly marginalized small-scale families
CIAT Brazil	2,500 farmers from 75 communities
Appropriate Technology International	
Nepal	573 subsistence farmers, herders
India, Sri Lanka, Philippines	1,004 small-scale, resource poor farmers
Bolivia	1,200 families
Oilseed Producers	60,000 farmers

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Approximately one million small-scale, resource poor farmers were reported as participants within the 33 projects that reported the number of farmer participants. The project participants were identified within the documents farmers, persons, individuals, people in villages, family members, women and families, resource poor farmers, marginalized small-scale families, farmers from communities, and subsistence farmers and herders.

Research question 3: What is the adoption percentage across each project?

For the purposes of this study the adoption percentage was used to provide an indication of the small-scale, resource poor farmers' level of adoption of the recommended technology. Four documents provided data on before and after level of adoption of the technology for the small-scale, resource poor farmer. In Table 7 are reported the percentage rates of small-scale, resource poor farmer adoption of the several recommended technologies.

Table 7. Adoption rate of small-scale, resource poor farmers across each project

<u>Project Location/Approach</u>	<u>Before (%)</u>	<u>After (%)</u>	<u>Technology</u>
FAO			
Indonesia	50	75	Imp.Cereal Seed
Participatory	50	75	Chem.Fertilizer
	25	50	Insecticides
	50	80	Irrig. Prac.
Rwanda	4	26	Imp.Cereal Seed
Participatory	0	36	Chem.Fertilizer
	0	12	Insecticides
	4	53	Imp.Hort Seed
China	87	87	Imp.Cereal Seed
General	100	100	Chem.Fertilizer
	100	92	Insecticides
	0	27	Imp.Hort
	90	90	Soil Till Prac.
	0	20	P-Harvest Hand.
Cyprus			
General	90	88	Imp.Cereal Seed
	100	74	Chem.Fert
	100	77	Insecticides
	90	85	Imp.Hort Seed
	80	90	Soil Till Prac.
	75	75	Irrig. Prac.
Bangladesh			
Strategic Extension Campaign	41	63	Rodent Control
CGIAR			
CIMMYT El Salvador	0	100	Conservation Tillage
WN			
Nepal			
Participatory	85	90	Fodder trees

Irrig. Prac.- irrigation practices; Imp.- improved, Chem.- chemical, Hort- horticultural, P-post harvest handling, and Soil Till Prac.-soil tillage practices.

Document analysis of the percentage rate of adoption of the technology suggested that the highest levels of improvement was seen in CIMMYT El Salvador, reporting that 0% farmers had adopted the recommended technology (cultivation practice) before extension to 100% farmer adoption of technology after extension approach. The document did not include information on the extension approach.

FAO Rwanda reported an improvement reporting a 0% level of adoption of chemical fertilizer before the participatory approach and 36% after the approach had been used. Farmers' adoption of improved cereal and horticultural seeds increased from 4% before the participatory approach to 26% and 53%, respectively, after the approach.

FAO Indonesia's initial adoption level was higher than FAO Rwanda for improved cereal seeds, chemical fertilizer usage, and irrigation practices. Before and after the participatory approach, ranged from 50% to 75% and 80% of the farmers adopting the technology. These results indicated an increase in the level of adoption of the technology after the approach was utilized.

Generally, the initial percentage rate of farmers' adoption (before General extension approach) of improved cereal and horticultural seeds for FAO Cyprus and China was quite high. However, the level of farmers' adoption of the technology may not have essentially improved after utilization of the General extension approach or the technology. Cyprus reported a decrease in all areas except soil tillage practices and irrigation

practices. These low levels of technology adoption may indicate alternative or more relevant technologies being used by the farmer or may as well suggest that the recommended technologies have lost relevancy to the farmer and farm.

FAO Bangladesh reported that 41% of the small-scale farmers had adopted the rodent control practice before the strategic extension campaign. Sixty-three percent were reported to have adopted the technology (rodent control practice) after the strategic extension campaign; indicating an increase in the use of the rodent control practice after the extension approach was used.

WN Nepal MAH reported that after the participatory approach, and continued use of the technology, 90% of the households were using leucaena as a primary fodder tree an increase from the 85% previously reported.

Table 7. also provided an indication of the different types of technology recommended to the farmer. The four FAO case studies reported a package of technologies that had been utilized during the project. These technologies included improved seed, chemical fertilizer, insecticides, irrigation practices, soil tillage practices, post harvest handling practices. The remaining documents reported single focused technologies, including rat control practices, cultivation practices, and agroforestry.

Four documents provided data on the small-scale, resource poor farmers' percentage rate of adoption, before and after the approach and/or utilization of the technology(s). The following projects indicated improvements in percentage rate of adoption of

several of the recommended technologies: CIMMYT El Salvador, FAO Indonesia and Rwanda, SEC Bangladesh, and WB Nepal MAH. FAO China indicated high initial levels of small-scale farmer adoption of the recommended technologies at the time of the project report possibly due to the mandatory participatory nature of the agricultural program. FAO China reported an increase in improved horticultural seed and post harvest handling. FAO Cyprus indicated high initial levels of farmer adoption; however, at the time of the project report farmer adoption of many of the recommended technologies had declined. FAO Cyprus reported an increase in farmer adoption of the recommended soil tillage practices.

Data provided in Table 7 suggested that of the seven projects, farmer adoption of technology at a level of 20% or more was indicated in 13 of the 24 recommendations for technology.

#### Research question 4: How effective were the projects?

The researcher examined the narrative and numerical project data on small-scale, resource poor farmer's adoption rate of the recommended technology. For the purposes of this study, project effectiveness to the small-scale, resource poor farmer was determined by subtracting Before Technology data from the After Technology data. An adoption rate yielding a positive increase suggested a level of improvement to the farmer. Narrative data from the projects provided background and insight into each project that reported this data.

The results of this study indicated that CIMMYT El Salvador yielded the highest increase in farmer adoption of the technology. This high level suggest an improvement for the farmer and level of success for the project. CIMMYT (1996) reporting on the spread of conservation tillage practice in Guaymango, El Salvador, indicated that in 35 years (from 1960 to 1995), the practice spread from 0% of the farmers to 100% of the farmers. Important information regarding number of farmer participants, total number of farmers, yield, etc. and additional background information (i.e. environment, extension method) was not provided within the CIMMYT Annual Report (1996). The remaining projects also reported a level of increase in several of the recommended technologies.

WN Nepal MAH yielded the lowest increase, actually indicating an increase from 85% level of adoption of the technology while the participatory approach was being used in 1986 to 90% adoption of the technology at the time of the report in 1989. Though the increase was small, the level of adoption was already at a beneficial state for the farmers. The WN Nepal MAH project had a duration of 12 years at the time of the report. About 160,000 people participated in the project.

FAO Rwanda and Indonesia reported using the participatory approach for 5 and 7 years, respectively. Both projects suggested improvements in the level of farmer adoption of the technology. Several comments from the projects on the low rates of adoption of the technology have been reported (see Appendix E).

Seven projects reported percentage rate of small-scale,

resource poor farmer adoption of the technology. Project results in FAO Indonesia, Rwanda, and SEC Bangladesh using participatory approaches suggested improvement to the farmers. China and Cyprus, using the General approach, suggested less improvement, however most of the farming population had adopted portions of the technology. The low increase may suggest possible alternative technologies being used/introduced, or perhaps the need to change the technology and/or approach in order to better assist farmers. The results of project CIMMYT EL Salvador suggested an improvement and success for both the farmer and project. CIMMYT El Salvador did not provide information on the farming population, yield data, and approach being used.

Forty-four projects did not provide numerical data for this characteristic.

### Sustainable Benefits

The study examined the projects reports for numerical data on the before and after project benefits to the small-scale, resource poor farmer. Tables 8a and 8b report the 16 projects that indicated sustainable benefits. The term sustainable benefits refers to those benefits to the small-scale, resource poor farmer which have continued through project duration and are hypothesized to continue after project closure.

Table 8a. Documents that Reported Sustainable Benefits

Project Location and Approach	Sustainable Benefits	Level of Project Change	Criterion Units
FAO Kenya PPP	Increase Savings	4.8	US Dollars
	No. of children Attending class	4.7	No. children could afford fees
	Increase maize	2.0	bags/acre
ATI Bolivia EF	Increase annual family income	2.17	US Dollars
Sri Lanka, India	Increase yield	1.43	kg/hectare
Tanzania Dollars	Total monetary benefit	1.22	US
Uganda Dollars	Total monetary benefit	2.93	US
Zimbabwe Dollars	Total monetary benefit	2.27	US
World Bank Zimbabwe T&V/FSR	Increased Yield: maize sorghum cotton soybeans groundnuts	1.21	mt/hectare
	Increased Livestock Population cattle sheep goats	1.41	No. livestock
Burkina Faso T&V	Increased Yield paddy rice	1.06	kg/hectare
Morocco T&V/P	Increased Yield: Durum wheat Bread wheat	1.40	t/hectare

Table 8b. Documents that Reported Sustainable Benefits

<u>Project Location and Approach</u>	<u>Sustainable Benefits</u>	<u>Level of Project Change</u>	<u>Criterion Units</u>
WB Nigeria T&V	Increased Yield: maize sorghum millet cowpeas rice groundnuts	1.19	kg/hectare
Turkey T&V	Increased Yield: potato barley sugar beets wheat alfalfa Improved wool production	0.64     5.50	t/hectare     tons
CGIAR Guatemala FSR	Increased Yield: maize sorghum rice wheat beans maize system sorghum system potatoes vegetables	1.96	kg/hectare
WN Francs Togo P	Income generating  activities: village associations	5.62	CFA
WN Nepal MAH	Sale of animals	9.00	Heads/year
WN Peru	Increase in sales	1.40	Dollars

— Abbreviations for Approaches: EF- Entrepreneur Focused, P- Participatory, PPP- FAO People's Participation Programme, T&V- World Bank's Training and Visit, FSR- Farming Systems Research and Development.

Abbreviations for Criterion units: No.- number, kg- kilogram, mt- mt-metric tons, t-tons

Document analysis suggested that sustainable benefits were indicated in 16 of the 51 projects. The sustainable benefits were increased yield, income, education, decreased animal mortality, increased visits by the village technicians, increased wool production, livestock production and improved pest management. Eight of the 16 projects reported farmer benefits in terms of crop yield; eight reported benefits in terms of increase in savings, income, and monetary benefit; one project reported benefits in terms of an increase in the number of children attending classes, one project reported in terms of increased livestock population, one project reported benefits in terms of increased wool production, two projects reported in terms of decreased animal mortality, and one project reported in terms of improved pest management.

Projects also reported sustainable benefit in terms of farmer participation. For example PPP Sierra Leone reported farmer self-sustainability. Farmers remained active in rural development three years after project termination. Farmers continued to save, invest their capital in construction projects and in small businesses (p. 67). Another project, FAO Sri Lanka reported the continuance of the non-governmental grassroots participatory extension system comprised of a network of small self-help groups linked through village unions and district federations (p. 55).

Light and Pillemer (1984) method was used to provide an indication of the level of overall project benefits to the farmer from documents reporting both after and before project data. After Project data divided by Before Project data indicated overall project outcomes which suggested a level of change. Results greater than one may suggest improvement to the farmer. Narrative data provided comments and insight on the projects.

Project results indicating a low to moderate overall project increase (suggesting a lower benefit to the farmer participant) were: ATI Tanzania, Sri Lanka and India, Zimbabwe, Bolivia and Uganda. ATI using the Entrepreneur Focused approach, yielded 1.22 and 1.43 for ATI Tanzania and Sri Lanka and India, respectively. ATI Bolivia, Zimbabwe, and Uganda yielded 2.17, 2.27, and 2.93, respectively.

World Bank Nigeria using the T&V approach yielded 1.19. WB Nigeria project comments indicated that,

More emphasis should have been given at the beginning of the project to the development of appropriate technological messages for the dominant mixed crops cultivation systems; prior testing under smallholder conditions and full appreciation of farmer financial circumstances should have been important prerequisites (p. 10).

WB Turkey had mixed results with of 0.64 (yield) and 5.5 (wool production) the level of overall improvement to farmers was low.

WB Zimbabwe using a modified T&V approach, with Farming Systems Research, and aspects of media broadcast yielded 1.21 and 1.41 for increased yield and livestock population, respectively. WB Zimbabwe reported that,

The technical recommendations particularly for hybrid maize, cotton, and sunflower (all crops of major importance in the large-scale commercial sector), began to be made on a widespread scale to communal area farmers (particularly those in more fertile zones). However, it soon became clear that extension recommendations were often irrelevant to the large mass of communal area farmers. Thus, the Department of Research and Specialist Services decided to carry out more diagnostic surveys before agreeing to new extension sub-project activities, and to evolve a better mechanism to improve research-extension linkages (p. 6).

More sensitive extension supervisors and field workers did adapt messages especially with regard to fertilizer recommendations, but many did not (p. 8).

There are hardly any extension messages of direct relevance to the poorest 30% of all farmers, especially to single-headed households with limited labor and no access to draught power (p. 8).

WB Morocco using a modified T&V with participatory methods yielded 1.41. WB Burkina Faso using a pilot T&V extension approach yielded 1.06. WB Burkina Faso project comments indicated that,

The intervention of the Prefect was needed to control the farmers who had plots allocated to them, seeded them, and then abandoned them. In certain apparently infrequent cases, the idea of occupying lands was to prevent them from being settled by their immediate neighbors. A more frequent problem was that of farmers volunteering to participate in the project only in order to qualify for World Food Program rations. Once sowing was finished the beneficiaries disappeared, never to be seen again. . . .these desertions eventually, almost completely ceased. (p. 12)

ISNAR Guatemala, using the Farming System Research and Development approach yielded 1.92. FAO Kenya using the Peoples Participation Programme approach yielded 4.87, 4.75 and 2.0. These project results suggested a reasonable amount of change and large overall improvement in generating increased savings, increased

number of children attending class and maize yields- sustainable benefits for the small-scale, resource poor farmers.

WN Nepal MAH and WN Togo yielded the highest increase (9.0 and 5.62, respectively) suggesting large improvements and a level of success in the sale of animals and income generating activities for the village associations, respectively. WB Turkey yielded 5.50 for increased wool production however, project results did not suggest an overall improvement to the farmer. WB Turkey commented that,

The local cultures and preferences (religious beliefs, diet biases, etc.) should be taken into account. For example the introduction of a new variety of wheat by the project failed because it was unsuitable to the local taste and the artificial insemination of sheep was abandoned when it met stiff cultural opposition. (p. 13)

Additionally, WB Turkey reported,

The beneficiaries and key people in the project area such as the Imam (Religious Head) and the Muhtar (Village Head) should be consulted so that they and the people over whom they have influence could identify themselves better with the project (p. 13).

FAO PPP Kenya results suggested a large overall project increase in sustainable benefits to the farmers in the following areas: increased savings, number of children attending class, and increased maize yield. WN Togo results suggested a large overall project increase for village associations participants (25,000 people) in income generating activities. WN Nepal MAH project results suggested a large increase for the 160,000 people served by the project. Table 9 list four documents that reported farmers' sustainable benefits in percentage data.

Table 9. Sustainable Benefits

Project Location/ Approach	Sustainable Benefits	Before %	After %
—			
ATI Bolivia EF	Decreased animal mortality	40	30
WB Turkey T&V	Decrease animal mortality	8.5 9.8	1.8 3.4
	Increased visits by village group technicians	48	74
CGIAR CIP Peru	Pest management	44	5

—

CIP Peru reported that the damage to potato crops was as high as 44% before an integrated pest management technology was used and 5% after use.

WB Turkey reported that before the T&V approach approximately 48% of village group technicians visited and delivered extension services, however at the end of the project the number had increased to 74%. The mortality rate decreased from 8.5% to 1.8% and 9.8% to 3.4% for bovines and ovines, respectively. WB Turkey reported an increase in yield of food and feed crops of only .64 tons/hectare at the project completion. WB Turkey suggested that there were increases in visits and extension services, decrease in animal mortality and increase in wool production. The increase in yield and impact on the farmer was very low. The project suggested that these low results may have been the result of not participating with the farming community. In hindsight WB Turkey reported that,

The local cultures and preferences (religious beliefs, diet biases, etc.) should have been taken into account. For example the introduction of a new variety of wheat by the project failed because it was unsuitable to the local taste and the artificial insemination of sheep was abandoned when it met stiff cultural opposition. (p. 13)

Additionally, WB Turkey reported,

The beneficiaries and key people in the project area such as the Imam (Religious Head) and the Muhtar (Village Head) should be consulted so that they and the people over whom they have influence could identify themselves better with the project (p. 13).

ATI Bolivia using the Entrepreneur focused approach reported that the animal mortality rate was up to 40% before

project. The animal mortality rate had decreased to about 30% about 4 years later.

PPP Kenya project, using a participatory approach, indicated sustainable benefits of increased savings, in maize production, and in the number of children being able to attend classes at school to the farmer. PPP Kenya document did not provide adequate information on the following: farmer participants, total number of farmers, and adoption of technology.

WN Togo project, using a participatory approach indicated improved income generating activities within the village association. WN Nepal MAH project results indicated an improvement in the sale of animals to the farmer. WN Nepal MAH using a participatory approach introduced an improved animal fodder (technology), along with a focus on other aspects of community development.

Since all projects did not report numerical data, only those which showed large and moderate improvement in numerical benefits were considered as an effective project. Three projects suggested a reasonable amount of change and improvement to the farmer: PPP Kenya, WN Togo, and WN Nepal MAH.

Research Question 5. What are the characteristics of the Exceptional Program?

Both narrative and numerical characters of the unusually successful project formed the basis for determining projects which had an exceptional program.

A limitation in this type of study has been the unavailability of specific data within the document reports. This limitation was true of the CIMMYT El Salvador, PPP Kenya, and WB Malaysia. CIMMYT El Salvador yielded a high rate of adoption of technology, but the document report lacked sufficient narrative and numerical data for examination of farmer participation, farmer participation percentage, and indication of yield and the sustainable benefits to the small-scale, resource poor farmer.

PPP Kenya project yielded meaningful results in the document report of sustainable benefits to the small-scale, resource poor farmers. The project reported increases in savings, number of children attending class, and in maize yield. However, the document lacked sufficient narrative data to examine the specific project characteristics, i.e. number of farmers and participants, farmer participation, and adoption of technology.

WB Malaysia reported narrative data detailing farmer participation and provided data on farmer participation percentage but lacked numerical data indicators of adoption of technology and sustainable benefits to the small-scale farmer.

The study has identified several indicators of farmer participation. These indicators have been utilized to identify

characteristics of each project and have laid the foundation for identification and selection of an exceptional program. These narrative and numerical indicators included: 1) identification of farmer participation, 2) small-scale, resource poor farmer participation percentage or number of farmer participants and total number of small-scale, resource poor farmers; 3) project data indicating before and after percentage rate of adoption of the recommended technology, and 4) project data indicating before and after project benefits to the small-scale, resource poor farmer. More specifically these indicators are:

1. Farmer participation. Not solely indicating farmers working in groups or select groups but additionally indicating the active participation of farmers within capacity building efforts i.e. as microentrepreneurs, in leadership development, planning and decisionmaking, and general and agricultural training, etc. Capacity building efforts help to ensure farmer active participation and involve related skill development which may help to sustain project benefits of the small-scale, resource poor farmer.

2. A related indicator is the farmer participation percentage. This indicator of farmer participation provides the number of small-scale, resource poor farmers that are actively involved. This type of information should be provided for each project activity that involves the participation of the small-scale, resource poor farmer.

3. Increased farmer percentage rate of adoption of the

recommended technology. This indicator presupposes that the projects have relevant technology available to the small-scale, resource poor farmers. If relevant technology is in place and available, then the farmer percentage rate of adoption of the technology may provide an indication of small-scale resource poor farmer level of adoption of the recommended technology.

4. Sustainable benefits to the small-scale, resource poor farmer. This indicator of participation really gets at the heart of sustainable development of the small-scale resource poor farmer. This indicator suggest that during the duration of the project has emerged (through the active participation of the farmer) an improved quality of life (which maybe observed, measured, and reported (by both the projects' extensionist or researchers and farmers) in terms of improved production, conservation, economic opportunity, training, education, etc.) i.e. the sustainable benefits. Sustainable benefits as they are termed within this study are those project outcomes which have impacted and improved the quality of life of the small-scale, resource poor farmers and have been hypothesized to continue to do so. Therefore, sustainable benefits must be farmer-maintained. If before project and after project indicators are provided for each participant and the number of participants are reported, effect sizes can be computed for each benefit.

Two of the 51 projects within this study held exceptional characteristics. Table 10 details an overall summary of project results from both the narrative and numerical analysis.

**Table 10. Summary Data Analysis and Across Project Characteristics and Quantitative Results**

Indicators of Participation														
Organization	Location	Number Participants	Approach	Farmer Groups	Select Groups	Community/Village/Family	Microentre.	Leadership	Planning/Decisionm	Training	Agricultural Training	Classes	Workshops	Sustainable Benefits
ATI	Bolivia	1200a	EF		*	*	*			*				2.17
	Mozambique		EF				*			*				
	Tanzania		EF				*							1.22
	Zimbabwe	60,000m	EF				*							2.27
	Uganda		EF				*							2.93
	Zambia		EF				*			*				
	Nepal	573 cl				*	*			*				
	Sri Lanka													
	Phillipines													
India	1004c	EF								*	*			1.43
CGIAR	Brazil	2500m	P	*	*	*		*	*					
	Rwanda		PB		*				*			*		
	Colombia		P		*	*		*	*					
	Mexico			*	*				*					
	El Salvador			*					*					
	Bangladesh	2370i	WF			*						*		
	Peru	100j			*			*			*	*		
	Ethiopia													
	India		PRA						*			*		
	Laos				*									
	VietNam		P	*		*		*			*	*		
Guatemala	80,000c	FSR	*	*			*	*		*				1.96
FAO	Indonesia		P	*	*				*		*	*		
	Rwanda		P	*	*				*		*	*		
	China		G	*	*				*		*	*		
	Cyprus		G	*					*		*	*		
	Sierra Leone		PPP	*		*	*	*	*					
	Sri Lanka	2000m	P	*	*			*	*		*			
	Kenya		PPP	*										
	Sri Lanka	44f	PPP	*	*		*	*	*	*				
	Bangladesh		SEC											
Zambia	116e	PPP	*	*		*	*		*					4.8

Table 10. Summary Data Analysis and Across Project Characteristics and Quantitative Results

Indicators of Participation															
Organization	Location	Number Participants	Approach	Farmer Groups	Select Groups	Community/ Village/Family	Microentre.	Leadership	Planning/ Decisionm	Training	Training Agricultural	Classes	Wkshop	Sustainable Benefits	
WB	Zimbabwe		T&V/FSR	*	*	*		*						1.21	
														1.41	
	Zambia		T&V/FSR		*						*				
	Rep. Yemen		T&Vmodified	*	*				*	*	*				
	Turkey		T&V								*			0.64	
														5.5	
	Nigeria	760,000m	T&V								*	*			1.19
	Morocco	62,588m	T&V	*								*			1.4
	Malaysia	490,000h	T&V	*	*	*	*	*	*	*	*		*		
	Mexico		PLANAT	*					*						
	Kenya		T&V		*						*				
	Burkina Faso	833m	T&V		*		*					*			1.06
WN	Haiti		P	*			*		*	*					
	Bolivia		P		*			*		*		*			
	Honduras EP	700a	P	*		*		*		*	*		*		
	Togo	25,000e	P	*	*	*	*	*	*	*		*		5.62	
	Ghana	10,000e	P	*		*	*		*	*			*		
	VietNam	1006e	P		*	*		*	*	*	*				
	Honduras CH	900b	P			*	*			*	*		*		
	El Salvador	1,2000e	P		*	*		*	*	*	*		*		
	Nepal TSS	5817	P	*	*	*			*	*					
	Nepal MAH	160,000e	P		*	*	*	*	*		*			9	
	Peru	200d	P				*			*				1.4	

Abbreviations:

ATI-Appropriate Technology International; CGIAR-Consultative Group on International Agricultural Research; FAO-Food and Agricultural Organization of the United Nations; WB-World Bank; WN-World Neighbors; EF-Entrepreneur Focused Approach; FSR-Farming Systems Research and Extension; PPP- Peoples Participation Program; PRA-Participatory Rural Assessment; SEC- Strategic Extension Campaign; T&V- Training and Visit Extension Approach; T&VP- Training and Visit with Participation; T&V/FSR- Training and Visit with Farming Systems Research; T&V modified- T&V modified to include visits at DOA's and houses of field extension agents; P- Participatory; WF- Whole Family; G-General Extension; Microentre.-microentrepreneur development; Planning decisionm- planning and decisionmaking

The exceptional project programs within this study were WN Togo and WN Nepal MAH. An examination of the exceptional characteristics of WN Togo and WN Nepal from Table 10, indicated the following: a participatory extension approach, the formation of select groups, community and village development, leadership development and the participation of farmers as microentrepreneurs.

Characteristics of WN Togo indicated in Table 10 included farmer participation: in farmer groups or organizations, select groups, community and village development, as microentrepreneurs, in leadership, planning and decision making, training and in classes, and in maintaining sustainable benefits.

WN Togo text-characteristic data indicated farmers participation through village associations which were established to provide community leadership, organization and management. Issues addressed included leadership development through self development and awareness training, resource mobilization, needs assessment and self planning. Farmers also were selected and received: training as farmer animators, participatory training, training in monitoring, evaluation and planning techniques. Peasant-farmer trainer animators from two village associations attended a refresher course on: How to prepare and hold a training session and How to conduct animation. During the session the participants prepared a training module on the potential for mobilizing local financial and human resources within a process of self-development; and the benefits of functional literacy.

Farmers also prepared their own program plan.

WN Togo peasant associations participated in several income generating activities, i.e. collective fields, petty trade, cash livestock raising, sale of harvest and food trade.

Characteristics of WN Nepal MAH indicated in Table 10 included: farmer participation in select groups, community and village development, microentrepreneurs development, leadership development, agricultural training, adoption of technology and in maintaining sustainable benefits .

The text-characteristic data for WN Nepal MAH indicated farmer training for farmer-led experimental plots, and farmer collaboration-comprehensive demonstrations. Farmers participated in the testing of new trees on their own land and noting the impact on animal production. Farmers participated in farmer to farmer sharing which enabled people to learn from peers how to manage and use the feeding practice. During field days people from other villages and districts visited the farms of ongoing program participants. Farm tours, field-discussions, and farmer to farmer sharing enabled many people to learn from their peers about everything from transplanting, spacing, manuring, weeding to lopping the fodder and feeding process.

Farmers participated in programs designed to improve animal production and sales. Participants also worked to find solutions to basic needs: health, family planning, and improved drinking water and sanitation.

Research question: Are today's' international agricultural research and extension organizations functioning at a level to assure the small-scale, resource poor farmer a more discernible level of participation and adoption of agricultural technology as we move into the early part of the 21st century?

Ongoing criticisms of international research and extension organizations generally are not centered around the fact that only a small percentage of the small-scale, resource poor farmers are receiving service but rather, the criticisms are aimed toward determining the effectiveness of the agricultural research and extension organizations, i.e. How well are the agricultural research and extension systems serving those who are involved with the extension services? But we need to ask, How well are the small-scale farmers being served? The answer to this question must be based upon past and present documented reports of implemented international agricultural research and extension projects. This study examined the documented reports of 51 implemented research and extension projects, representing more than 1 million small-scale, resource poor farmers and 5 international research and extension organizations within 38 countries. The projects were implemented during nearly a forty year period, 1960 through 1997.

The findings of this study reported in Table 10 suggest that 49 projects indicated farmer participation. Although the majority of projects within this study have indicated farmer participation, it must be noted that farmer participation is not an end unto itself and will not alone increase global food

production.

Seven projects reported data on small-scale, resource poor farmer adoption of technology: each project indicated increases in adoption of technology. Sixteen projects reported sustainable benefits to the farmer-each of these projects indicated an increase, however, three projects suggested a reasonable improvement to the farmer participant.

The findings of this study indicate inadequacies within the documents which suggested that the majority of agricultural research and extension organizations within this study have not provided specific enough data, or documentation was not available to the general public, which would indicate a discernible level of participation and adoption of technology for the small-scale, resource poor farmer as we move into the early part of the 21st century.

The study suggest that the impending need for improved global food production as we move into the 21st century through the more than 1 million small-scale, resource poor farmers may or may not occur. Project reports on the improvement of the small-scale, resource poor farmers have inadequate documentation for progress to be adequately monitored.

## Chapter 5

### Summary and Conclusions

By the year 2024, 83% of the expected global population of 8.5 billion will be living in developing countries. The capacity of available resources and technologies to satisfy the demands of this growing population for food and other agricultural commodities remains uncertain. (The Commission on Environmental Law of the World Conservation Union, 1993)

As we approach the 21st century, a key issue within the field of international agricultural development has been the need to positively impact the global food shortage expected early in the 21st century. In order to do this, many international agricultural organizations have incorporated the participation of the small-scale, resource poor farmer. Seventy-five percent of the world's farmers are small-scale, resource poor farmers (FAO, 1990); however, they have not been the primary focus of agricultural development. This study used methods of multi-document analysis to examine the small-scale, resource poor farmers'

- 1) participation
- 2) adoption of the recommended technology, and
- 3) sustainable benefits

to determine if the farmers could positively impact the food shortage expected in the early part of the 21st century. The study represented the efforts of fifty-one implemented international agricultural development projects, covering close to a forty-year period, from 1960 through 1997. The 51 projects were located in

thirty-eight countries.

#### Document collection

Documents from eleven international agricultural research organizations were collected for the study. The target population included documents from the following non-governmental and governmental organizations: The World Bank (WB), Washington, D. C.; Food and Agricultural Organization of the United Nations (FAO), Washington, D. C. and Rome, Italy; World Neighbors (WN), Oklahoma City, Oklahoma; Appropriate Technology International (ATI), Washington, D. C.; and the following members of the Consultative Group on International Agricultural Research Centers (CGIAR Centers): International Center for Tropical Agriculture (CIAT) Cali, Colombia; International Maize and Wheat Improvement Center (CIMMYT) Mexico City, Mexico; International Potato Center (CIP) Lima, Peru; International Center for Agricultural Research in the Dry Areas (ICARDA) Aleppo, Syrian Arab Republic; International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Andhra Pradesh, India; International Service for National Agricultural Research (ISNAR), The Hague, The Netherlands; and International Rice Research Institute (IRRI), Los Banos, Philippines.

Documents that were selected for the study identified the small-scale resource poor farmer in the body of the text and addressed small-scale, resource poor farmer participation, adoption of the recommended technology, and/or benefits to the

farmer. All documents were published in English.

The following types of documents were collected: case studies, completed and annual project reports, news reports, project audit reports, and a discussion paper. In many instances these documents were difficult to obtain and once obtained 1) often contained nonuniformity in data recording, 2) were not externally reviewed, 3) occasionally were written as claim documents, and 4) contained incomplete data for meta-analysis.

Nonuniformity in data recording. Reports indicated target farming population, number of participants, number of farmers reached, or number of beneficiaries in lieu of reports of farmer participation percentage data. Participation percentages provide an indication of the number of farmers actively involved with the project.

Generally, the project reports indicated number of family participants, but did not also report the total number of small-scale resource poor family participants or the total number of farmer participants within the project area or country.

Documents were not written as research reports. Documents from ATI, WB, and WN were unpublished and were written as internal documents. Two WB documents were Performance Audit Reports prepared by the Operations Evaluation Department. Published documents were collected from FAO and CGIAR. Many of these news reports were written as claim documents providing narrative data without the numerical data to support project results.

Some documents were written as claim documents. Projects generally did not identify impact upon the small-scale resource poor farmers. This shortcoming was noted by WB Zambia which stated that, " A main omission in the report is an evaluation of the impact of the project on the intended beneficiaries. Who were the beneficiaries: What impact did the project have on their incomes and living condition: Did the project reach the poorer strata of smallholders?" (p. 4).

Numerical data for meta-analysis was incomplete. Documents did not report standard deviations or individual farmer reports or scores (i.e. yield, benefits). These data were necessary for the calculation of effect sizes for meta-analysis.

It is important to note that the data within the documents were adequate enough to draw conclusions concerning the status of the document reports.

#### Narrative and Numerical Analysis

For the purpose of this study both narrative and numerical methods were used to systematically examine the documents. Document text analysis involved the examination of narrative data for themes or patterns of information in each document. Codes were assigned which linked the themes to the research questions. This information was placed on data cards for across-project examination and comparison.

Narrative document examination involved investigation of

background information and text analysis. Meta ethnography and the QSR NUD.ist computer software (Qualitative Solutions and Research Pty Ltd., 1996) were used to systematically provide text-characteristics of each document. Data collected from the QSR NUD.ist computer program provided text-characteristic data and insight into how the small-scale, resource poor farmers have participated within the 51 implemented projects of the study.

Numerical data on farmers' participation percentage, adoption of technology and sustainable benefits were collected from those documents which reported this type of information.

Farmers' participation percentage was collected from those documents that reported the total number of small-scale, resource poor farmers and the number of small-scale, resource poor farmers actively involved in the project or extension method.

Number of farmers reached and the number of project participants was collected from those documents that reported this type of information.

Numerical data were collected from those documents that reported: 1) before and after data on small-scale, resource poor farmers' percentage rate of adoption of technology; and 2) before and after data on the sustainable benefits of the project to the small-scale, resource poor farmers. Numerical data on farmers' adoption of the technology and sustainable benefits were collected to determine the level of 1) farmers' adoption of the recommended technology and 2) effectiveness of the projects to the farmers.

Narrative and numerical data collected from the 51

international agricultural research and extension projects were placed in matrices for across-project comparison. Meta-analysis of the quantitative data was planned, but sufficient specification could not be gained to permit the calculation of effect size.

## Findings of the Study

### Participation of small-scale, resource poor farmers

To determine the small-scale, resource poor farmer's ongoing level of participation, the researcher compiled data from the narrative analysis. Narrative document analysis of the 51 implemented project reports suggested farmer participation: within farmers' groups and organizations, select groups; community, village and/or family; as microentrepreneurs; in leadership development, planning and decisionmaking; general and agricultural training; and classes, and workshops. Of the 51 projects

- \* Fifty percent suggested that farmers participated in select groups.
- \* Forty-seven percent of the projects suggested farmer participation within farmer groups.

Additionally, narrative document analysis identified farmers' participation in capacity building efforts. Capacity building efforts refer to those methods of farmer participation that are directed towards sustaining, equipping, and developing the farmer and farming communities. Document analysis suggested that

- \* Forty-nine percent of the implemented projects indicated farmer participation in agricultural training.
- \* Forty-seven percent of the projects indicated farmer participation in planning and decisionmaking.

- \* At least 30% of the projects suggested farmer participation in  
    general training,  
    leadership development,  
    as microentrepreneurs, and  
    community, village and/or family development

Bunch (1982) and Agenda 21 (Sitarz, 1993) suggest that successful programs emphasize capacity building of the rural poor, i.e. strengthening the sustainability of the farmer and farming community. Characteristics of a successful program for the rural poor include: grassroots farmer participation, community and leadership development, and training. The primary focus must be that of the farmer. As indicated above, many of the projects within this study suggested several of these characteristics.

#### Participation percentage across projects

For the purposes of this study the participation percentage was defined as the number of small-scale, resource poor farmers actively involved in the project divided by the total number of small-scale, resource poor farmers in the project area or within the country. This measure indicated the number of actively participating small-scale, resource poor farmers in relation to the total number of these farmers. Only four of the 51 projects within this study reported this type of numerical data.

The findings of this study suggested that a very small percentage of farmers actually participated in the reported demonstration field days, classes and group activities. For example, of a target population of about six million farmers only

approximately .16% and .30% of the farmers participated in demonstration field days and classes, respectively. The target population consisted of small farmers, sharecroppers, and landless producers. The specific participation of the poorest farmers was not indicated. One project reported that about .49% of the one million beneficiaries (poor rural farm families) had participated in group activities.

Thirty-three projects reported the number of farmers as participants. Approximately one million farmers were reported as participants.

Projects also reported farmer participation in terms of the number of farmers reached and number of project beneficiaries. These types of terms were not defined within the documents and probably do not accurately indicate the number of actively participating small-scale, resource poor farmers. For example, one project indicated that approximately 40,000 smallholders were the beneficiaries. Another project reported the target number of beneficiaries. Neither project identified the number of farmers that were actively involved in the project and project activities; nor did the projects identify what percentage the beneficiaries were of the total small-scale, resource poor farmer population for the country.

Small-scale, resource poor farmer adoption of the recommended technology

This type of data provided an indication of the small-scale, resource poor farmers' level of adoption of the recommended technology. Narrative data from the projects provided insight into each project.

For the purposes of this study, effectiveness of farmers' adoption of technology was determined by subtracting Before Technology data from the After Technology data. A positive increase suggested a level of improvement to the farmer. Seven of the fifty-one projects provided data on farmers' before and after level of adoption of the technology. The findings suggested that of the seven projects, farmer adoption of the technology at a level of 20% or more was indicated in 13 of the 24 recommendations for technology. The data did not indicate whether the technology was available to the poorest farmers. An FAO (1996) report stated that a study on "poverty-oriented" projects worldwide showed that the poorest were excluded from activities and benefits.

Sustainable Benefits to the small-scale, resource poor farmer

For the purposes of this study, sustainable benefits have been defined as those project results which impact the quality of life of the small-scale, resource poor farmers. Sustainable benefits refers to those benefits to the small-scale, resource poor farmer which have continued through project duration and are hypothesized to continue after project closure. Sustainable

benefits should be farmer-sustained benefits and as such should be farmer-maintainable after project closure.

FAO Ghana (1996) pointed out that participation cannot be viewed as the ultimate goal. The project report suggested that participation be viewed as a method of improving the project's ability to identify and produce locally recognizable benefits. These types of locally recognizable benefits may include reduced cost of inputs, improvements in yield, income, education, nutrition, health, and other indicators of improved quality of life.

This study examined the project reports for numerical data on the before and after benefits to the small-scale, resource poor farmer. An indication of the level of overall project benefits to the farmer was determined by dividing After Project data by the Before Project data. Results greater than 1.0 suggest improvement to the farmer. Three projects yielded overall project results greater than 4.0, indicating a level of change which suggested a larger improvement to the farmer. These results reflected sustainable benefits for the duration of the projects.

Sixteen projects measured and reported sustainable benefits in the following terms: increased yield, income, education and visits by the village technicians; decreased animal mortality; increased wool production; livestock production; and improved pest management. Sustainable benefits were most often reported in terms of increased crop yield, savings, income, and monetary benefit.

Projects also reported sustainable benefits in terms of farmer participation. For example one project reported farmer self-sustainability. Farmers remained active in rural development three years after project termination. Farmers continued to save, invest their capital in construction projects and in small businesses. Another project reported the continuance of the non-governmental grassroots participatory extension system comprised of a network of small self-help groups linked through village unions and district federations.

Indicators of participation suggest characteristics of the exceptional program

The indicators of farmer participation which were identified in the document analysis were used in the re-examination of the 51 documents and the selection of the exceptional project/program. The narrative and numerical indicators included: 1) identification of grassroots farmer participation capacity building, 2) identification of small-scale, resource poor farmer participation percentage or number of farmer participants and total number of small-scale, resource poor farmers; 3) project data indicating before and after percentage rate of adoption of the recommended technology, and 4) project data indicating before and after project benefits to the small-scale, resource poor farmer.

1. Grassroots farmer participation. This indicator identifies farmers' participation in groups or within select groups. It also identifies the active participation of farmers in capacity building efforts i.e. as microentrepreneurs, in leadership development, community/village and family development, planning and decisionmaking, and general and agricultural training, etc. These type of efforts help to sustain the farmer and farmers' benefits.

Farmer participation percentage identifies the actual number of small-scale, resource poor farmers that are involved in groups, capacity building efforts, and other project activities. Farmer participation percentage is determined by reporting the number of participating small-scale, resource poor farmers divided by the total number of small-scale, resource poor farmers in the project area (or country). If data are reported in terms of number of families participating, then the total number of families in the project area (or country) should be reported.

3. Increased farmer percentage rate of adoption of the recommended technology. This indicator is determined by subtracting Before Technology data from the After Technology data. A positive increase suggests a level of improvement to the farmer. This indicator presupposes that the projects have relevant technology available to the small-scale, resource poor farmers. If relevant technology is in place and available, then this indicator should actually reflect the small-scale resource poor farmers' level of adoption of the recommended technology. Bunch (1982) suggested that the gap between agricultural research, and the

developing nation's small-scale, resource poor farmer has been increasing due to a decline in the technology generated which can actually be put to practical use by the poor farmer.

4. Sustainable benefits to the small-scale, resource poor farmer. This indicator suggest that during the duration of the project an improved quality of life for the farmer has emerged, which may be measured by the projects' extensionist/researchers and farmers in terms of improved production, conservation, economic opportunity, training, education, etc., i.e. the sustainable benefits. For the purposes of this study sustainable benefits have been defined as those project results that have impacted and improved the quality of life of the small-scale, resource poor farmers through the duration of the project and have been hypothesized to continue to do so after project closure. Sustainable benefits must be farmer-maintained. FAO Ghana (1996) pointed out that participation cannot be viewed as the ultimate goal. The project report suggested that participation be viewed as a method of improving the projects' ability to identify and produce locally recognizable benefits. These types of locally recognizable benefits may include reduced cost of inputs, improvements in yield, income, education, nutrition, health, and other indicators of improved quality of life. An estimate of effect size can be calculated from Before and After Project data reported for each farmer. This type of information would indicate the degree of meaningfulness of the data.

The narrative and numerical findings of this study indicated

that two of the 51 projects suggested exceptional characteristics. Both projects utilized participatory extension and/or extensionist approaches which emphasized the formation of select groups, community and village development, leadership development farmer participation as microentrepreneurs. The sustainable benefits to the farmers were reported in terms of increased incomes and sale of animals. Both projects yielded large numerical results suggesting a reasonable amount of change and improvement to the farmer.

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#### Inadequacies within the data

Projects generally did not identify impact upon the small-scale resource poor farmers. WB Zambia stated that "A main omission in the report is an evaluation of the impact of the project on the intended beneficiaries. Who were the beneficiaries: What impact did the project have on their incomes and living condition: Did the project reach the poorer strata of smallholders?" (p. 4).

WB Kenya noted that, "the report does not make any effort to assess the project effects/impact, regarding the benefits/disbenefits, intended or otherwise for both the intended beneficiaries as well as other groups. This is important because the project represents a first attempt of the Bank to target the poor farmers" (p. 30).

The overall findings of this study indicated inadequacies within the document data which suggested that the majority of agricultural research and extension organizations within this

study have not provided specific enough data and/or documentation was not available to the general public. Key data items were frequently not reported: for example, indication of small-scale, resource poor farmers' participation; participation percentages; farmers' percentage rate of adoption of the recommended technology; and sustainable benefits to the farmers. Of the 51 implemented projects within this study:

- \* 49 projects reported small-scale, resource poor farmer participation
- \* 6 projects reported small-scale, resource poor farmer participation percentages
- \* 7 projects reported rate of adoption of the recommended technology
- \* 16 projects reported data which dealt with the sustainable benefits to the small-scale, resource poor farmers

The implemented project reports included in this study provided inadequate documentation to forecast the small-scale, resource poor farmers' impact on the expected global food shortage in the early part of the 21st century.

## Conclusion and Recommendations

The International Agricultural Developing Agencies and Organizations are to be commended for their persistence in efforts to help the small-scale, resource poor farmers improve their agricultural production and welfare. However there remains a grave need for international agricultural research and extension organizations to work toward focusing on the small-scale, resource poor farmers within the project reports.

Based upon the findings of this research study the researcher recommends the following:

1. That the lack of information in project reports needs to be addressed. It may be that the agencies working in international agricultural development failed to focus on the small-scale, resource poor farmer, have failed to document their results or that the documentation is not available to the public. However, for the organizations that desire to a) improve the sustainable development of the small-scale, resource poor farmer and b) work toward meeting the need for increased global food production, these issues of implementing the exceptional program for the small-scale, resource poor; and assuring small-scale, resource poor farmers' participation, adoption of the relevant technology, and sustainable benefits must be addressed.

Implement the exceptional program. Ideally, a farmer-focused extension and/or extensionist program, that is, one that emphasizes through a participatory approach: a) farmer-relevant needs and benefits; and 2) equipping and strengthening the

farmers' ability to improve and sustain their own agricultural production and welfare.

Identify and report small-scale, resource poor farmers' participation and participation percentages. Project reports need to indicate farmers' participation. For example, the project reports should define a) how the farmers are involved or participating in project, as well as indicate b) the number of small-scale, resource poor farmers actively involved in each of the projects' capacity building efforts (i.e. training, planning and decisionmaking, family development, etc.) and activities (i.e. meetings, field trips). The total number of small-scale, resource poor farmers in the project area and/or within the country should be indicated.

Identify and report before and after data on adoption of technology. This measure presupposes that a) the small-scale, resource poor farmers have been identified, and b) relevant technology is available to the small-scale, resource poor farmers). Projects should specifically identify the poorest farmers and their respective adoption of the recommended technology.

Identify and report before and after data on sustainable benefits to the farmers. Projects should identify project results that have impacted and improved the quality of life of both farmer and community during the duration of the project. Sustainable benefits should be farmer-maintainable. Examples of sustainable benefits may include: improved water source; yield; education;

nutrition; livestock production; entrepreneurship; income; market accessibility; and continuance of farmers' participation in issues of self-sustainability, i.e. grassroots extension and development, etc.

2. That the indicators of small-scale resource poor farmer participation identified within this study be used within future document reports. This type of data would help to maintain focus on the small-scale, resource poor farmer. These indicators would also be beneficial in the effort to identify and select foundational characteristics of the exceptional program.

3. That narrative and numerical indicators be used to identify projects which have been helpful to the small-scale, resource poor farmer.

4. That individual farmer reports or standard deviations should be reported. These data are necessary for calculations of effect size for meta-analysis. This type of data (i.e. yield, livestock production, income, livestock sales, etc.) would provide information on the degree of meaningfulness for each project result.

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\* Indicates documents used in the study.

Appendix A

Definitions

For the purposes of this study the following definitions have been used.

1. Adoption is the percentage of farmers using a technology (Swanson, 1989).
2. Beneficiary is an individual or community who is the recipient of services from agricultural research and extension.
3. Document text analysis is the methodology used to systematically investigate literature or contents of documents.
4. Extensionists or extension agents are those individuals who communicate and interact with farmers and the rural community in an effort to: encourage them to help themselves, gather information and determine possible solutions, teach an agricultural-related message, disseminate messages, provide training, and act as an liaison between the research station or government and the farmer and the rural community.
5. Indigenous people are those characteristically involved with subsistence-oriented agricultural production, that have a close attachment to ancestral territories and natural resources within their area; and have traditional knowledge which influences how they interact with the land, environment, beliefs, survival and development (Davis and Ebbe, 1995).
6. International agricultural extension is a non-formal,

primarily agricultural education service for rural people. Characteristic services of agricultural extension generally include: communication of agricultural research findings and recommendations; dissemination of useful information through organized action; identification of client need and possible solutions, and teaching people to help themselves, i.e. how to improve their quality of life, income, farming practices, etc.

7. Light and Pillemer method of exploratory literature review. Methods of investigating the findings of multiple studies through both narrative and numerical data analysis.
8. Participation is the active involvement of farmers and rural communities within the specific project being examined (Swanson, 1989). Document text analysis and text-characteristic analysis were used to identify indicators of participation within the documents that reported this type of data. (Refer to pages 42,47,and 48).
9. Small-scale subsistence farmer or small-scale, resource poor farmer are those farmers with limited resources; that have difficulty obtaining sufficient inputs to allow them to adequately use the available technology (Shanner, Philipp and Schmehl, 1982); and/or have less than one hectare of land for agricultural production (FAO, 1990).
10. Sustainable benefits are those project outcomes which are expected to have a long term benefit on the quality of life of the small-scale, resource poor farmers.

11. Sustainable development has been defined as the development which encourages an improved quality of life, production and economic opportunity, conservation of natural resources, in which the farmer or rural community has the training and knowledge to maintain the results. A sustainable development implies the active participation of the farmer and/or indigenous community.
12. Meta ethnography is a qualitative method used to analyze narrative information. Meta ethnography is characterized by the utilization of detailed text, matrices, and tables to synthesize qualitative data.
13. QSR NUD.ist computer software is a qualitative method used to systematically examine multiple documents. The QSR NUD.ist program generated text-characteristics which provided narrative information about each project.

Appendix B

Diffusion and Adoption

Diffusion of new ideas and practices is, "a special type of communication, which involves the process by which innovations (a new idea or practice) spread from their originating source through various communication channels, to the members of the social system, i.e. a family, community, board, farmer group, etc." (Blackburn, 1984).

Roger and Shoemaker (1971) working within rural sociology emphasized a cross-cultural approach to diffusion. They defined diffusion as the process by which innovations (new messages, ideas or practices) spread to members of a social system (i.e. village, neighborhood, township).

Rogers and Shoemaker (1971) characterized the traditional social system by: lack of favorable orientation to change; a less developed or "simpler" technology; a relatively low level of literacy, education, and understanding of the scientific method, a social enforcement of the status quo in the social system, facilitated by affective personal relationships, such as friendliness and hospitality which are highly valued as ends in themselves; little communication by member of the social system with outsiders. Lack of transportation facilities and communication with the larger society reinforces the tendency of individuals in a traditional system to remain relatively isolated; lack of ability to empathize or to see oneself in other's roles, particularly the roles of outsiders to the system."

The modern social system was characterized by: "a well developed technology with a complex division of labor; a high

value on education and science; rational and businesslike social relationships rather than emotional and affective; cosmopolite perspectives, in that members of the system often interact with outsiders; facilitating the entrance of new ideas into the social system; empathic ability on the part of the system; members, who are able to see themselves in roles quite different from their own." Through these types of explanations, it has been suggested that the small-scale subsistence farmer exist within the traditional social system. Other farmers, may be identified among the modern social system.

Rogers and Shoemaker (1971) suggested that, "early knowers of an innovation when compared to later knowers, are characterized by more education, higher social status, greater exposure to interpersonal channels of communication, greater change agent contact, greater social participation, and more cosmopolitaness". The reasons innovators require shorter periods of time to adopt included: "1) they use more technically accurate sources and channels about innovations, such as direct contact with scientists, and 2) because they place higher credibility in these sources than the average individual. Innovators may also possess a type of mental ability that better enables them to deal with abstractions. An innovator must be able to conceptualize relatively abstract information about innovations and apply this new information to his own situation. Later adopters can observe the results of innovations by earlier adopters and may not require this type of mental ability."

Bunch (1985) suggested that the sum of these type of characteristics and categorizing, as stated by Rogers and Shoemaker (1971) have led to the argument for directing agricultural research, development and benefits towards the medium-scale farmers. The argument suggest that agricultural programs must seek out the farmers who are most innovative, and that these "innovators" are generally the medium-sized farmers. However, Bunch reported that studies of the comparative innovativeness of small and medium-size farmers are inconclusive; their contradictory results may reflect more the nature of the technology studied than the nature of the farmers. Bunch (1985) suggested that the lack of acceptance of new technology, even among the very poorest, is more often due to the inappropriateness of a program's technology or approach than to any inherent resistance to innovation among the people. Programs that teach genuinely appropriate technologies in an appropriate manner seldom have difficulty finding innovators."

Appendix C

Characteristics of the Successful Program

Successful project programs implement activities and programs which are designed to improve sustainability and increase farmer capacity building. The listed characteristics emphasize strengthening the sustainability of the farmer institutions (groups), serve to develop the farmer and community, and sustain the program benefits (Bunch, 1982, p. 56-192).

Within the project develop and implement institutional build up-strategies which will involve the establishment of human resources as organizations and institutions (i.e. farmer groups) from grassroot farmer participation.

Meet the immediate needs for basic necessities, for example the immediate need for food, pure water, medical attention, and clothing.

Identify needs and assess priorities through continual unconstrained dialogues, meetings. Remain flexible. Maintain farmers' interest and enthusiasm.

Utilize a bottom upward analysis, in the examination of conditions emphasizing their resources, aspirations, priorities, problems, learn their traditional knowledge, develop cultural sensitivity. Realize and focus on the farmers' priorities.

Develop together the goals, objectives, and work plan. Together give specifics of the broad overall aims of the program, the general solutions to the problem, constraints; the specific accomplishments; and activities that must be carried out, when and by whom, respectively.

Increase participation from grassroots. Form farmer/community group(s). This will help to ensure that the program will respect local cultural values and will be continually oriented toward the people's felt needs.

Assess cost in staff time and administrative capacity. Access choices of who should do what, when and how. Encourage cost sharing.

Determine availability of resources, preferably from on-farm resources, or are easily obtainable by the farmer.

Maintenance of availability of resources.

Determine credit availability.

Develop and maintain farmer participation- involving farmer/community development, empowerment, knowledge, skills, training (decision making, technology development, management, extension); to help strengthen the ability of the farmer/community to develop and sustain.

Define the political feasibility- ways for farmers, and poor people to gain control over assets when they increase in value. Political feasibility assess the power and interest of groups of the elites of ensure that the programs/benefits actually reach the farmer.

Utilize decision-making workshops, meetings, focus groups  
Monitoring- maintaining feedback from the farmers, community  
Evaluations- maintain participatory evaluation of program (farmer/community involvement).

Teaching the technology- utilizing a hands-on approach/ and training on-farm groups, demonstrations, and short courses. Technology development through the grassroots organization and/or with the agricultural researcher/ facilitator. This increases relevance and adoption of the technology.

Technology must fit local farming patterns, be free of risks, culturally acceptable, labor intensive, and safe for the environment.

Technology must be financially advantageous. The first technology should usually raise incomes from 50 to 150%.

Teach farmers to experiment with the technology.

Adoption of the technology must bring about a recognizable success, quickly. A period of two to five months is acceptable for programs' first technology.

Train farmer group to teach others farmers.

Increase marketability- the local or regional markets must be able to absorb the eventual increases.

A primary program goal is a totally participatory movement of farmers. Plan for the phase-out of outsiders and of the program itself and the eventual takeover by the small farmer group.

The initiative starts with outsiders; but the aim is to transfer more and more power and control to the farmers, to improve their livelihood, improve the agricultural production; teach the farmers to develop experimentation skills, and to teach other farmers so that the adoption or adaptation of the technology and its benefits will sustain.

Appendix D  
Characteristics of the Documents

This section identifies the following characteristics of the documents: organization, source of data, project name, location, project duration, objectives, approach, target population, number participants, number of farmer participants, and the environment (agricultural and socio-agricultural aspects).

Characteristics of the Documents

ORGANIZATION: APPROPRIATE TECHNOLOGY INTERNATIONAL/USAID  
 Source of data: ATI 1995-1996 Annual Report

Project Name and Location: Bolivia Alpaca Fiber Processors Project  
 Duration: ATI Bolivia  
 1994-Present  
 Objective: To increase income and establish markets for the alpaca subsector  
 Approach: Entrepreneur Focused Approach  
 Target Population: Aymara Indian Herders  
 No.Participants: 12,000 families  
 Environment: High altitude, scarce water, freezing temperature

Project Name and Location: Mozambique Oil seed Processors Project  
 Duration: ATI Mozambique  
 1994-Present  
 Objectives: Increase income for smallholder farmers and oil press owners in 4 districts; To provide consumers with low-cost cooking oil.  
 Approach: Entrepreneur Focused Approach  
 Target Population: Smallholder farmers and oil press owners, press sales agents, repair artisans, coop field officers  
 Number Participants: \*  
 Environment: No data

Project Name: Tanzania Oilseed Processors Project  
and Location: ATI Tanzania  
Duration: 1988-Present  
Objectives: To increase rural incomes through local processing of oilseeds; to produce low-cost cooking oil and affordable animal feed; increase sale of ram presses.  
Approach: Entrepreneur Focused Approach  
Target Population: Small-scale farmers and entrepreneurs  
Number Participants: \*  
Environment: No data

Project Name Zimbabwe Oilseed Processors Project  
and Location: ATI Zimbabwe  
Duration: 1989-Present  
Objectives: To increase rural incomes, employment by helping small-scale oilseed growers and other microentrepreneurs through local processing of crops; to increase consumer access to low-cost edible oil, provide feed.  
Approach: Entrepreneur Focused Approach  
Target Population: Small-scale oilseed growers, microentrepreneurs  
Number Participants: \*  
Environment: No data

Project Name Uganda Oilseed Processors Project  
and Location: ATI Uganda  
Duration: 1993-Present  
Objective: To increase rural incomes through local processing of oilseeds  
Approach: Entrepreneur Focused Approach  
Target Population: Small-scale farmers and entrepreneurs  
Number Participants: \*  
Environment: No data

Project Name Zambia Oilseed Processors Project  
(AFRICARE)  
and Location: ATI Zambia  
Duration: 1992-Present  
Objectives: To increase rural incomes through processing of oilseeds by small-scale farmers and entrepreneurs; to produce low cost cooking oil for consumers and affordable animal feed  
Approach: Entrepreneur Focused Approach

Target Population:	Small-scale farmers and entrepreneurs
Number Participants:	*
Environment:	No data
Project Name and Location:	Nepal Non-Timber Forest Products ATI Nepal
Duration:	1995-Present
Objectives:	Conservation of natural plant resources To establish markets for wild-collected plants. To develop local capacity to harvest, process, market, develop sustainable enterprise; Develop local capacity to conduct biological research and monitor impacts. implement educational program on importance, conservation, uniqueness of biodiversity in Humla (Community based, managed, and owned enterprise).
Approach:	Entrepreneur Focused Approach
Target Population:	Subsistence farmers, herders
Number Participants:	573
Environment:	Biologically rich habitats, remote wilderness
Project Name and Location:	Resource Poor Farmers: Rhizobium Inoculant Users in India, Sri Lanka, and the Philippines ATI India, Sri Lanka, and the Philippines
Duration:	1996-Present
Goal:	To enable small-scale legume farmers to reduce fertilizer cost and increase yields through use of rhizobium inoculant
Approach:	Entrepreneur Focused Approach
Target Population:	small-scale legume farmers
Number Participants:	1004
Environment:	No data

\*ATI (1991) indicated that the total number of small-scale farmer participants was approximately 60,000.

ORGANIZATION: CONSULTATIVE GROUP ON INTERNATIONAL  
AGRICULTURAL RESEARCH  
Source: Annual Reports, News Reports, Case studies

Name and Location: International Center for Tropical  
Agriculture (CIAT)  
News Report (1997)  
CIAT Brazil  
Duration: No data  
Emphasis: The report emphasized a method developed  
by CIAT in Columbia and has been applied  
successfully in more than six other Latin  
American countries.  
The method involved a community diagnosis  
of production problems, coordinated by the  
local agricultural research committees,  
with assistance from scientists and  
extension workers. The method also  
involved farmer participation in planning,  
implementing and evaluation of field  
experiments.  
Approach: Participatory  
Target Population: Poor Cassava farmers of Northern Brazil  
Number Farmers  
Participation: More than 2500 farmers from 75 communities  
participated in the initial diagnosis.  
Environment: An important cassava producing region,  
with unpredictable rainfall, damaging  
pest.

Name and Location: International Center for Tropical  
Agriculture (CIAT)  
News Report (1995)  
CIAT Rwanda  
Duration: Five year experiment  
Emphasis: Combining the different expertise of  
farmers, and integrating farmers onto on-  
station research with breeders early in  
the breeding process to assist  
in early selection of potential varieties.  
Approach: Participatory Breeding  
Target Population: Women farmers  
Number Farmer  
Participation: No data  
Environment: The research station utilized the expert  
knowledge of women farmers. The presence  
at the research station of women farmers  
in the role of evaluators was

revolutionary. In a society where women's power derives from their husbands and where farmers are often illiterate, to treat women farmers as experts required a sea of change in thinking and behavior from all involved. (p.3)

Name and Location: International Center for Tropical Agriculture  
News Report (1995)  
CIAT Columbia

Duration: No data

Strategy: To implement participatory research methods for adaptive technology testing which encourage and equip farmers to manage and conduct research.

Approach: Participatory

Target Population: Farmers, local communities, public sector agricultural research and extension agencies, nongovernmental organizations, and farmer cooperatives.

Number Farmer Participation: No data

Environment: No data

Name and Location: International Maize and Wheat Improvement Center  
(CIMMYT)  
Annual Report (1995-96)  
CIMMYT Mexico

Duration: No data

Emphasis: The development of a strategy involving farmer to farmer dissemination of improved practices.

Approach: Farmer to farmer dissemination using designated contact farmers. (p.13)

Target Population: Contact farmers and CIMMYT personnel

Number Farmer Participants: No data

Environment: No data

Name and Location: International Maize and Wheat Improvement Center  
Annual Report (1995-96)  
CIMMYT El Salvador

Duration: 1960-present

Objectives: No data

Approach: No data

Target Population	Farmers in Guaymango area
Number Farmers	
Participated:	No data
Environment:	Scientist worked to identify benefits to the farmers. The recommended package combined soil conservation components and productivity enhancing components. Additionally, the farmers desire for a high yielding variety of maize with enough stover to feed their animals and apply the additional residue to the field was met within the recommended package. (p.12)
Name and Location:	International Maize and Wheat Improvement Center Annual Report (1995-96) CIMMYT Bangladesh
Duration:	No data
Objectives:	To train the whole family in improved wheat production techniques: teaching farmers how to handle and store wheat seed after harvest in several wheat producing districts of Bangladesh. (p.35)
Approach:	To benefit rural women marginal farmers. Whole Family Training Project, a pilot project funded by the Australian Agency for International Development
Target Population:	Marginal and small landholding families (husband, wife plus two other family members)
Number Farmer Participants:	2,370 people belong to 508 mostly marginal and small landholding families attended the training sessions with nearly 100% attendance. (p.35)
Environment:	Although largely unrecognized, women's contribution to agricultural production at both the household and national level is significant in the developing world. However, for the most part women farmers have little access to the training and information that are so basic for improving crop production. Furthermore, in countries where, for cultural reasons, women do not speak to men outside their families, reaching them through mostly male extension workers is virtually impossible. The Whole Family Training Project arose from the perceived

need to address these issues and give women access to wheat production technologies. (p.35)

Name and Location: International Potato Center (CIP)  
News Report (1994)  
CIP Peru

Duration: No data

Emphasis: To develop a cheap, safe and effective integrated pest management strategy that centered on the use of a locally available parasitic fungus to control weevil larvae damage to the potato crop.

Approach: Pilot project. No data

Target Population: 3,500 poor families in 117 Peruvian Andean communities

Number Farmers Participated: 100 participating villagers had reduced losses of their crop. Total number of participating farmers was not provided.

Environment: In 1980s damage was so severe that farmers began abandoning fields and those who remained were applying ever larger amounts of expensive chemical pesticides.

Name and Location: International Center for Agricultural Research in the Dry Areas (ICARDA)  
News Report (1995)  
ICARDA Ethiopia

Duration: No data

Emphasis: Research team actively carrying out research for Ethiopia's millions of small, resource poor farmers.

Approach: No data

Target Population: Researchers

Number Farmer Participants: No data

Environment: Addressing needs of Ethiopian agriculture to resist crop failure and strengthen food security.

Name and Location: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)  
Report (1996)  
ICRISAT India

Duration: No data

Emphasis: Methods that bring farmers and scientist closer together in an effort to encourage

adoption of the message.  
 Approach: Participatory rural appraisal methods involving interview techniques to understand farmers preferences.  
 Target Population: Farmers in drought prone areas  
 Number Farmers  
 Participation: No data  
 Environment: No data

Name and  
 Location: International Rice Research Institute (IRRI)  
 News Report (1996)  
 IRRI Laos  
 Duration: No data  
 Approach: No data  
 Emphasis: Farmers collaborating with Lao-IRRI Project to establish practices that will improve soil fertility and reduce weed pressure.  
 Target Population: Collaborating farmers  
 Number Farmers  
 Participation: No data  
 Environment: No data

Name and  
 Location: International Rice Research Institute  
 News Report (1996)  
 IRRI Vietnam  
 Duration: No data  
 Emphasis: Farmer training to learn pesticide delay technique  
 Approach: Participatory  
 Target Population: Farmers (wife and husband) who have been using early-season insecticide spray. Advanced farmers who have been working with the University and demonstrate the strategy.  
 Number Farmer  
 Participants: No data  
 Environment: No data  
 Name and  
 Location: International Service for National Agricultural Research (ISNAR)  
 Discussion Paper (1991)  
 ISNAR Guatemala  
 Duration: 1985-1989  
 Emphasis: Dealt with methods used to promote widespread dissemination of technology to

resource-poor farmers in Guatemala.  
 Approach: The approach supported the technical training of both agricultural extension agents and researchers in the Farming Systems Research approach.

Target Population: Extension agents, researchers, and resource poor farmers

Number Farmer Participants: Approximately 80,000 resource poor farmers in marginal and diverse highland areas

Environment: Previously, the national research institute had not placed much emphasis on building strong links with extension. It was believed that new technology, verified on farm with farmers, would diffuse spontaneously, without a formal transfer effort. However, this approach was only partially successful, the impact being greatest among commercially oriented small-scale farmers in the more favorable lowland environments. A new approach was needed to reach resource-poor farmers in the more marginal and diverse highland areas. More systematic and participatory links with extension had to be developed.  
 (p.1)

ORGANIZATION: FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS (FAO)

Source: FAO Case Studies and News Reports

Project Name and Location: No data  
 FAO Case Study (FAO, 1990)  
 FAO Indonesia

Duration: 1980-1986

Objective: To assist small-scale farmers, tenants, and sharecroppers through agricultural extension, training, and research and field action. (p.110)

Approach: Participatory

Target Population: Resource poor farming population

Number Farmers Participating: No data on total

Environment: The case deals with small-scale resource-poor populations. Although the regular agricultural extension service had been strengthened, most of the resource poor farming

population was not getting the necessary technical advice and guidance, and therefore remained isolated, poor and with low productivity and income. (p.81)

Project Name and Location: No data  
FAO Case study (FAO, 1990)  
FAO Rwanda

Duration: 1984-1988

Objectives: To increase the quantity and quality of agricultural production by improving production techniques in (a) soil conservation, (b) soil fertility improvement, (c) mixed farming systems, and (d) farmers' group organization.

Approach: Participatory

Target Population: A population of 180,200 small-scale resource-poor farmers.

Number Farmer Participants: No data on total

Environment: Marginal or difficult agricultural areas with a high prevalence of small-scale farmers. The study areas were hilly, with elevations from 1,600 to 2,500 meters and slopes of 40 to 45% over half of the terrain. The national extension system was promoting team work among technicians and administrators. Extension agents were to work with farmers in "cells" which could be about 1,000 farmers in a commune.

  

Project Name and Location: The Agrotechnical Extension Service in the Municipality of Shanghai  
FAO Case Study (FAO, 1990)  
FAO China

Duration: 1979-1987

Emphasis: General improvement of the farm family and a need for increasing farm production and family income.

Approach: General Extension

Target Population: The general farming population, 4.3 million farmers, practically all of which were small-scale farmers.

Number Farmers Participation: No data on total

Environment: The agrotechnological extension service in the study area was part of the Ministry of Agriculture. The technical information came from specialized technical stations.

Project Name and Location: No data  
FAO Case study (FAO, 1990)  
FAO Cyprus

Duration: 1978-1987

Main feature: To improve the productivity and efficiency of the entire farming operation, including home economics.

Approach: General Extension

Target Population: A farming population of 48,046 most of which were small-scale farmers.

Number Farmer Participants: No data on total

Environment: The agricultural extension case in Cyprus covered the entire country.

Project Name and Location: FAO Peoples Participation Programme  
FAO People's Participation Programme  
News Report (1990)  
PPP Sierra Leone

Duration: No data. Report of a terminated project.

Emphasis: The report examines the projects' self sustainability. Three years after project has terminated small farmers groups remained actively involved in rural development.

Approach: FAO People's Participation Programme

Target Population: Small farmers

Number Farmer Participants: No data

Environment: No data

Project Name and Location: Mahasahana  
FAO Case Study (1996)  
FAO Sri Lanka (MAH)

Duration: No data. A report of a terminated project.

Emphasis: A non-governmental grass roots participatory extension system comprised of a network of small self-help groups linked through village unions and district federations. Created since 1985

by a joint project of FAO and Sri Lanka's Ministry of Agricultural Development and Research.

Approach: Participatory  
Target Population: Small farmers with household incomes below the national poverty line.

Number Farmer  
Participants: More than 2000 farmers, organized in 225 groups and linked through 23 village unions and two district federations.

Environment: Previously, a World Bank funded project, which ended in 1985.

Project Name  
and Location: FAO Peoples Participation Programme  
FAO People's Participation Programme  
News Report (1990)  
PPP Kenya

Duration: No data  
Emphasis: Report identified the benefits of participation in the PPP project. Kenya PPP project benefits included increases in savings, maize output, and an increase in the number of children attending classes at school.

Approach: FAO People Participation Programme  
Target Population: No data  
Number Farmer  
Participants: No data  
Environment: No data

Project Name  
and Location: Sri Lanka Padipanchawa Village Board  
FAO People's Participation Programme  
(1996)  
PPP Sri Lanka

Duration: 1989-present  
Emphasis: The report details the level of functioning of the small farmer inter-group association village board which included to: elect leaders and group representatives and to provide services to the group. The services included helping to provide assistance in the following areas: solving problems, opening individual bank savings accounts, identifying specific group needs, setting up meeting with extension support, and in providing links with other village boards.

Approach: FAO Peoples Participation Program  
Target Population: Two villages  
Number Farmer  
Participants: 44 individuals within the participating

Environment:	groups No data
Project Name and Location:	FAO Strategic Extension Campaign Case Study SEC Bangladesh
Duration:	Two months in 1984
Objectives:	To increase rat control practice among the small-scale wheat farmers
Approach:	FAO Strategic Extension Campaign
Target Population:	Small-scale wheat farmers
Number Farmer	
Participation:	No data
Environment:	This campaign effort came after it was decided that the previous campaign effort had no impact on small farmers with less than 2 acres. The 1984 campaign gave special emphasis to reaching small farmers. The characteristic multi-media strategy included: leaflets, pictorial booklets, slides, instructional poster, radio spots, group discussions, portable flip charts. and training strategies to the extensionist, and other extension service personnel, and training for participating contact farmers.
Project Name and Location:	FAO People's Participation Programme FAO Case Study (1996) PPP Zambia
Duration:	No data
Emphasis:	The report emphasized the functions of the Small Farmer Inter-group Associations PPP group.
Approach:	FAO Peoples Participation Programme
Target Population:	Small Farmers
Number Farmer	
Participation:	116 persons
Environment:	The report dealt with the background, organization and function of the PPP project in Zambia.

ORGANIZATION: THE WORLD BANK  
Source: Project Completion Reports and Project Performance Audit Reports

Project Name and Location: National Agricultural Extension and Research Project  
Project Completion Report (1993)  
WB Zimbabwe

Duration: 1983-1991

Objectives: To improve agricultural productivity in the communal areas; and to raise the income levels of the communal area farmers. They were to be achieved by supporting an adaptive research program targeted to communal areas and introducing new technologies through strengthened extension services.  
The project took the form of a national program with activities through the country. It had two broad components: strengthening the extension program and strengthening the research program. (p.2)

Approach: Modified form of T&V, Farming systems research, and the use of radio, video, and media.

Target Population: The communal area farmers and those resettled by Government. Extension service personnel.  
At independence, Zimbabwe inherited a dualistic farming system with commercial (usually white) farmers occupying most of the fertile, highly productive land while the majority of small farmers (mostly black) were restricted to communal areas (CA) where land was poor and yields were low. The productivity of the CAF (communal area farmers) was low, as they lacked credit facilities, inputs, marketing services, adaptive research and adequate extension advice. (p.1)

Number Farmer  
Participants: No data  
Environment: The Government of Zimbabwe (GOZ) at independence was concerned about the income disparities between the commercial farmers and the smallholders (oriented toward subsistence production) in the CAs and the potential for social and political instability if these imbalances were not addressed. Therefore, GOZ initiated programs to improve the access of CAF's to agricultural services as well as to resettle 162,000 CA households. (p.iii)

Project Name  
and Location: Eastern Province Agricultural Development Project  
Project Completion Report (1990)  
WB Zambia

Duration: 1982-1988

Objectives: The primary objective of the project was to increase production of the major crops in the Eastern Province.  
This was to be achieved through improving research, extension, credit, and input supply services. The project also sought to: improve groundnut and cotton processing and storage; strengthen institutional capability of the Eastern Cooperative Union and Zambia Agricultural Development Bank through technical assistance; (p.ii)

Approach: T&V, Farming systems research, radio, drama

Target population: Small farmers in Eastern Province and the

Number Farmer: No data

Participants:

Environment: Shortages of qualified staff and inadequate decentralization of authority from the headquarters were two drawbacks mentioned which provided data on the setting. (p.ii)

Project Name  
and Location: Agricultural Research and Extension Project  
Project Completion Report (1993)  
Republic of Yemen  
WB Yemen

Duration: 1985-1992

Objectives: The project aimed at strengthening the agricultural research and extension activities in the Peoples Republic of Yemen, through reorganization of the research and extension operations in the main agro-ecological regions; To complement these actions, the project aimed at: (i)streamlining "outreach" through developing of research/extension coordinators and involving field extension agents in the implementation of field trials and demonstration plots; and (ii) strengthening the Agricultural Communications Unit. (p.iii)

Approach: Modified T&V extension approach whereby programmed visits were carried out from the DOAs and from the houses of the Field Extension Agents. (p. 4)

Target Population: Farmers and extension personnel

Number Farmer Participants:

Environment: Agriculture is the single most important sector in the Republic of Yemen. About 200,000 people, 41% of the labor force in the South work in agriculture. However due to substantial migration to Saudi Arabia and the Gulf States in the 1970/80s (until the Gulf Crisis), the agricultural population is aging and is predominantly women. (p. 1)

Rainfall is erratic and is generally less than 200 mm per annum, therefore cropping depends mostly on irrigation.

Project Name  
and Location: Erzurum Rural Development Project  
Project Completion Report (1992)  
WB Turkey

Duration: 1982-1989

Objectives: This project was formulated with the main objectives of raising income and employment levels in Erzurum through agro-related activities and the quality of life through improved rural infrastructure.

Approach: T&V

Target Population: 353,000 farmer-beneficiaries and extension service personnel

Number Farmer  
Participants: Report indicated an estimate of 353,000 people benefited from the project (this total may also include extension personnel).

Environment: The Government was concerned about the potential for social and political instability which could arise if the disparities were not addressed. It therefore moved to tackle the particular development needs of the poorest regions, particularly in the fields of agriculture. Government decided that from the perspective of rural development, Erzurum Province in Eastern Anatolia, where the majority of the population was extremely poor, needed the most urgent attention.  
(p.iii)

Project Name  
and Location: Kano State Agricultural Development  
Project (KNADP)  
Project Completion Report (1992)  
WB Nigeria

Duration: 1981-1989

Objectives: KNADP had two primary objectives: (a) to increase food production and incomes of some 430,000 farm families; and (b) to alleviate the state's shortage of trained and experienced personnel for agricultural development.  
(p.iii)

Approach: T&V

Target Population: Farm families and extension service personnel

<p>Number Farmer Participants: Environment:</p>	<p>Estimated at 760,000 farmers This Agricultural Development Project, as well as others, had to operate in a difficult environment brought upon by unstable economic and political conditions. The period between 1982 and 1986 witnessed three changes in the political regime, and the end of the oil boom.</p>
<p>Project Name and Location:</p>	<p>FES-KARIA TISSA Agriculture Project Project Completion Report (1992) WB Morocco</p>
<p>Duration:</p>	<p>1979-1990</p>
<p>Objectives:</p>	<p>The primary objective of the project was to improve the living standards of some 34,000 farm families who cultivated 256,000 ha or 96% of the arable land in the project area. This was to be achieved principally through increasing agricultural production and farm incomes. Improved living standards would furthermore be pursued by complementing increased farm incomes by a series of infrastructural investments. In order to attain its objectives the project would consist of three main components: an agricultural development component which included the reorganization and strengthening of the extension services, through the provision of housing, equipment, farm management training, incremental short-term credit and improvements in the supply of farm inputs. Secondly, soil and water conservation measures on a trial basis and thirdly, an infrastructural development component including the school classrooms and some health facilities. (p.iii)</p>
<p>Approach:</p>	<p>T&amp;V. The farmers participation approach was used for the conservation component.</p>
<p>Target population:</p>	<p>34,000 farm families who cultivated 256 ha or 96% of the arable land in the project area and the extension service (p.2)</p>

Number Farmer  
Participants: No data  
Environment: The latter part of the implementation period of the project coincided with a singularly difficult period for Morocco's economy during which the financial and budgetary situation deteriorated increasingly.

The project implementation period furthermore witnessed some of the worst possible climatic conditions. This obviously affected the agricultural component. The actual results achieved are all the more remarkable as they were accomplished under these adverse climatic conditions. (p.iii)

Project Name  
and Location: Malaysia National Extension Project  
Project Performance Audit Report (1988)  
WB Malaysia

Duration: 1977-1985

Objectives: To increase agricultural production, and raise the income and standard of living of about one million rural families throughout Malaysia. These represent more than 80% of the rural families served by the Department of Agriculture (DOA) extension service and comprise the majority of the poorest group in the agricultural sector. They are the padi farmers, coconut farmers, and mixed crop farmers who rely on rainfed agriculture and cultivate about 1.5 million acres in Peninsular Malaysia and 1.0 million acres in Sabah and Sarawak. (p.iii)

To introduce and accept the T&V methodology. (p.iii)

Approach: T&V approach with a modification of the number of visits to 4-5 weeks by extension contacts instead of bi-weekly visits.

Target Population: About 1 million rural families throughout Malaysia which comprise the majority of the poorest group in the agricultural sector. The extension service was also a target population.

Number Farmer  
Participants: No data  
Environment: Prior to the project, extension services were constrained by inadequate staff numbers at operational level. The project was in line with the Government's objective to follow-up on the preceding Agricultural Research and Extension Project and to make better use of recommendations produced by research stations through improved extension activities aimed at smallholders.

Project Name  
and Location: Rainfed Agricultural Development Project  
Project Performance Audit Report (1990)  
WB Mexico

Duration: 1981-1987

Objective: PLANAT can be seen as an extension of Plan Puebla, or as a simplification of PIDER narrowing it to its agricultural components. Its main aim was to increase farm and ranch production in nine high-potential rain-fed districts, mainly through improved extension, applied research and irrigation. Producers were encouraged to organize into groups, which had a say in productivity-related rural public works financed by the project: principally roads and storehouses; and in the projects's investments in afforestation and in soil and water conservation. Credit under the control of PLANAT was added to the design to encourage adoption of the projects technical packages. (p.v)

Approach: PLANAT  
PLANAT was meant to evolve into a national program for all 124 rainfed districts (DT's) as soon as requisite technical staff could be trained. The project, therefore, financed training and administrative support at the national level. (p.v)

Target Population: Rainfed farmers (126,699 beneficiaries) and the extension service

Number Farmer  
Participants: No data  
Environment: In 1979 Mexico discovered that its oil reserves were larger than hitherto realized; it seemed to be rich.

Government wished to do more to help the rain-fed districts that had been largely ignored and to replace growing food imports.

The project financed training and administrative support at the national level. (p.v)

PLANAT's national-level records, including those of the M&E unit were wiped out by the earthquake of September 1985. A survey of 824 sample beneficiaries indicated that the beneficiaries were surprisingly satisfied with public services, such as extension, input supplies and credit. (p.vii)

Project Name  
and Location:

Second Integrated Agricultural Development  
Project

Project Completion Report (1990)

WB Kenya

Duration:

1980-1986

Objectives:

The project was to be the second phase of a new long-term program for the development of smallholder agriculture, and promoted the "wholefarm" approach to farmer services. The project components consisted of: strengthening cooperatives and agricultural services provision of storage and transportation facilities for marketing of farm produce; provision of agricultural inputs to farmers; improvement of rural roads and domestic water supply facilities; rehabilitation of five small-scale irrigation schemes; and soil conservation works. (p.v)

Revisions of the Project included the disaggregation of the project into separate projects with national, rather than area specific coverage. The major component parts were: agricultural extension, livestock, and credit. (p.8)

Approach:

T&V extension pilot

Target Population:

Approximately 40,000 smallholders were expected to benefit directly from the project. The extension service was also a target population.

Number Farmer Participants: Environment:	No data In the period 1963-73, Kenya's agricultural sector grew by an average 4.6% annually. Most of this growth was attributable to large scale farming together with smallholders growing export cash crops in the high potential agricultural areas. Early in the 1970's Government became increasingly concerned with the needs of less privileged smallholders, who had, until then been largely excluded from the development process. The Project-the Second Integrated Agricultural Development Project (IADP II) was the second phase of Bank assistance to the Program and was the eighteenth agricultural project in Kenya supported by the Bank. (p.1)
Project Name and Location:	Niena Dionkele Rice Development Project (Burkina Faso) Project Completion Report (1989)WB Burkina Faso
Duration:	1980-1987
Objectives:	The two main objectives were to test methods of bottomland (bas-fonds) development and to resolve problems of the rice subsector. (p.iii)
Approach:	Pilot project
Target Population:	The rice subsector and the extension service
Number Farmer Participants: Environment:	833 farmers In 1981 rainfall was only 79% of the average for the period May-September. Unfortunately the dike and peripheral drainage canal prevented the water from reaching the perimeter. In 1982, 1985, and 1986, abundant rains caused flooding that depending on the year was either early, long or late. In 1986 a particularly catastrophic flood made it necessary to try to install valves to evacuate excess water.

ORGANIZATION:	WORLD NEIGHBORS, INC.
Source of data:	World Neighbors 1994-1995 Annual Reports Neighbors Magazine 1997**
Project Name and Location:	Ivwa Pilot Project** WN Haiti
Duration:	1994-present
Emphasis:	Identification of family needs, small farmer group formation, organizational training themes
Approach:	Participatory
Target Population:	Women, family
Number Farmer	
Participants:	No data
Environment:	No data
Project Name and Location:	Toracani Integrated Development** WN Bolivia
Duration:	Reported as a new program; No data
Emphasis:	Food Security, agricultural training, health, child spacing, literacy, clean water, nutrition, income and generation
Approach:	Participatory
Target population:	women, family, subsistence farmers
Number Farmer	
Participants:	No data
Environment:	Remote area, Need for food security
Project Name and Location:	El PARAISO Integrated Agricultural Program WN Honduras EP
Duration:	No data. Project was in its' Phase out period.
Objective:	To improve agriculture, community organization, health, nutrition, and literacy
Approach:	Participatory
Target Population:	Farmers, community
Number Farmer	
Participants:	No data
Environment:	Food shortages, persistent hunger periods, low levels of maternal and infant health

Project Name  
and Location: Promoting Rural Community Self-Development  
Program  
PADCOR-BASSAR

WN Togo  
Duration: 1983-Present  
Emphasis: To strengthen the autonomy of 2 village  
associations and to help establish it by  
addressing village communities  
weaknesses in leadership, resource  
mobilization, needs assessment and self-  
planning through: mobilizing local  
resources, widening village leadership  
in managing the various community self-  
promotion activities, managing a  
sustainable community self-development  
process, and developing intervillage  
collaboration.

Approach: Participatory  
Target Population: Members of two village associations

Number Farmer  
Participants: No data  
Environment: No data

Project Name  
and Location: Program for Strengthening Community  
Organization and Management Capacity  
(POSCOM)  
WN Ghana

Duration: 1994-present  
Objective: To help develop representative  
organizations at the village level and  
raise awareness on the potential for  
community self-development.  
To help build important capacities that  
will empower villages to mediate and  
manage the development process based on  
their own priorities and to sustain their  
efforts.

Approach: Participatory  
Target Population: Four villages in the Kassena Nankani  
District

Number Farmer  
Participants: 10,000 people  
Environment: Food insecurity, malnutrition,  
environmental degradation, poor levels of  
community and reproductive health

Project Name  
and Location: Sung Chang Commune Agriculture and  
Forestry Project  
Yen Minh District Rural Development  
Program  
WN VietNam

Duration: 1996-present; Pilot project

Objective: To promote food security and improved  
living conditions.  
To diversify and raise productivity of  
farming systems.  
To help build the capacity of farmers to  
solve agricultural production and  
community resource management problems  
To develop effective methods of farmer-  
based extension and extension  
communication in the mountainous areas of  
Northern Vietnam Beneficiaries

Approach: Participatory, Farmer based extension

Target Population: Hmong speakers in the Sung Chang Commune,  
households

Number Farmer  
Participants: 1006

Environment: Resource poor conditions, rocky mountain  
areas, food shortages

Project Name  
and Location: CHOLUTCA Integrated Agricultural  
Development Program  
WN Honduras CH

Duration: 1987-Present; Phase out period

Objective: To improve agriculture, environment,  
cooperative organization, and health

Approach: Participatory

Target Population: 25 villages

Number Farmer  
Participants: 900 family members

Environment: Degraded arid environment

Project Name  
and Location: ASAPROSAR Sustainable Agriculture  
Component  
WN El Salvador

Duration: 1993-Present

Objectives: To integrate sustainable agriculture/food  
security into a solid health program.  
To make farmers, their families and  
community aware through training, of the  
good use and care of natural resources.  
To carry out agricultural practices of

soil conservation/fertility without affecting the productive nature of the soil.  
To promote the rational use of chemical products, firewood, and compliance with the forestry laws.  
Promote integrated pest control of crops.  
Promote use of agroforestry techniques by farmers. Seek alternatives for acquiring land for farmer participants.  
Participatory  
Communities, marginalized populations

Approach:  
Target Population:  
Number Farmer  
Participants:  
Environment:

1,200 people in 27 villages  
No data

Project Name  
and Location:  
Duration:  
Objective:

Integrated Rural Development of Tamakoshi Sewa Samiti (TSS).  
WN Nepal TSS  
1985-Present  
To strengthen the capacity of marginalized communities and groups.  
To meet their basic needs through participatory and sustainable development interventions.  
Participatory: community participation  
Focus communities

Approach:  
Target Population:  
Number Farmer  
Participants:  
Environment:

5815 people  
TSS is a non-profit organization registered in 1983 in Ramechhap by residents of Manthali Village. The report defined the area as one of the poorest and most inaccessible mountain districts of eastern Nepal.

Project Name  
and Location:  
Duration:  
Problem:  
Objective:

Baudha-Bahunipatai Family Welfare Project  
Nepal, Majhigaon village  
WN Nepal MAH  
1975-1990  
Peoples' need for animal fodder, fuel, timber, insufficient manure  
To introduce integrated development in the region. To address need for fast growing fodder tree.  
To develop local, community based organizations.  
To strengthen local capacity for program

	management and phase-out of outside support.
Approach:	Participatory
Target Population:	The Majhi people- subsistence farmers, porters, among the poorest classes in Nepal
Number Farmer Participants:	160,000 people
Environment:	Marginal farm land, steeply terraced, rain-fed mostly reclaimed forest. People had a constant need for animal fodder, fuel, and timber.
Project Name and Location:	Los Pilares Marketing and Training Program WN Peru
Duration:	1978- Present
Objective:	To provide training in management, design, marketing of products. To increase income.
Approach:	
Target Population:	Women from the slums of Lima
Number Participants:	200 women and family members
Environment:	No data

Appendix E  
Comments from the Projects

Comments from Project Reports:

The researcher compiled a summary of projects' comments that suggested concerns which could account for low rates of adoption of the extension message. Several of the comments are listed below.

ISNAR: Stated that the dissemination of new technology proved  
Guatemala to be a slow process in the subsistence-oriented agricultural systems due to: The resource poor farmers who first tested the new technology required more than one crop cycle to be convinced of its advantages. Risk aversion was still a major factor determining the pace of adoption. When farmers wanted to adopt, there was usually not enough seed to satisfy demand, therefore farmers had to make effort to obtain seed and multiply it on their own initiative. Technologies such as fertilizers and pesticides required training in their use, the associated program could not adequately meet the training needs (p.9).

WB Burkina Faso The intervention of the Prefect was needed to control the farmers who had plots allocated to them, seeded them, and then abandoned them. In certain apparently infrequent cases, the idea of occupying lands was to prevent them from being settled by their immediate neighbors. A more frequent problem was that of farmers volunteering to participate in the project only in order to qualify for World Food Program rations. Once sowing was finished the beneficiaries disappeared, never to be seen again. . . .these desertions eventually, almost completely ceased. (p.12)

WB Kenya Noted that the report does not make any effort to assess the project effects/impact, regarding the benefits/disbenefits, intended or otherwise for both the intended beneficiaries as well as other groups. (p.30)  
This is important because the project represents a first attempt of the Bank to target the poor farmers (p.30)

- WB Malaysia: Before the adoption of the T&V system the report Malaysia stated that there were inadequate staff engaged in extension at the farm level (p.19).
- WB Morocco: The main risks which could affect successful project implementation included: adverse climatic conditions; inadequate Government funding for project activities as a result of an increasing tightness of the public finance situation (p.6).
- WB Nigeria: More emphasis should have been given at the beginning of the project to the development of appropriate technological messages for the dominant mixed crops cultivation systems; prior testing under smallholder conditions and full appreciation of farmer financial circumstances should have been important prerequisites (p.10).
- WB Turkey: Local cultures and preferences (religious beliefs, diet biases, etc.) should be taken into account. For example the introduction of a new variety of wheat by the project failed because it was unsuitable to the local taste and the artificial insemination of sheep was abandoned when it met stiff cultural opposition.
- The beneficiaries and key people in the project area such as the Imam (Religious Head) and the Muhtar (Village Head) should be consulted so that they and the people over whom they have influence can identify themselves better with the project (p.13).
- WB Zambia: The extension workers were selecting the contact farmers with little consideration to representing the farming community. For instance, although women are active in farming, their representation as contact farmers was negligible (p. 4).
- Only half of the sampled non-contact farmers reported to know about contact farmers and less than 20% claimed to have received advice from the contact farmers (p. 4).
- A main omission in the report is an evaluation of the impact of the project on the intended beneficiaries Who were the beneficiaries? What impact did the project have on their incomes and living conditions? Did the project reach the poorer strata of smallholders? These are questions that merit attention in the report. (p. 23)

WB  
Zimbabwe

Technical recommendations particularly for hybrid maize, cotton, and sunflower (all crops of major importance in the large-scale commercial sector), began to be made on a widespread scale to communal area farmers (particularly those in more fertile zones). However, it soon became clear that extension recommendations were often irrelevant to the large mass of communal area farmers. Thus, the Department of Research and Specialist Services decided to carry out more diagnostic surveys before agreeing to new extension sub-project activities, and to evolve a better mechanism to improve research-extension linkages. (p. 6)

The more sensitive extension supervisors and field workers did adapt messages especially with regard to fertilizer recommendations, but many did not. (p.8)

There are hardly any extension messages of direct relevance to the poorest 30% of all farmers, especially to single-headed households with limited labor and no access to draught power. (p. 8)

WN  
Honduras:

The degraded, arid environment of the area diluted many of the technological and training efforts, proving the importance of supporting the agricultural and forestry variety of plants grown locally or adaptable to the ecological conditions; crucial problems were the lack of water and agricultural materials as well as other basic services for the population, and inadequate roads for the commercialization of products (p. 3).

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- 1998 Ph.D. Virginia Polytechnic Institute and State University.  
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SPECIAL TRAINING

- 1997 Multi-document analysis: narrative and numerical;  
Meta-ethnography and QSR NUD.ist Qualitative computer program; Data collection; Synthesis; and Program design.
- 1982 Agricultural extensionist: Peace Corps  
Liason between farmers, trainees, and the USAID
- 1980 Agronomic and nutritional evaluation of grain sorghum for human consumption. Field and laboratory and consumer analysis. Thesis.

EXPERIENCE

- 1996-98 Research assistant in Educational Research  
Virginia Polytechnic Institute and State University, Blacksburg, Virginia
- 1993-97 Director and Instructor: The Adult Education Program,  
Christiansburg, Virginia.  
Individualized GED preparation Group instruction.
- 1987 Instructor: Adult Continuing Education Center: Virginia Beach,  
Virginia Ford Motor Company.  
GED preparation  
Special needs
- 1985 Environmental Specialist: Florida Department of Environmental  
Regulation, Jacksonville, Florida  
Certified emissions inspector  
Documentation and reports
- 1985 Department of Professional Regulation: Board of Medical  
Examiners, Tallahassee, Florida  
Certification of respiratory therapist and respiratory technicians
- 1977 Soil Conservation Service. Stuart Florida  
Trainee