Two Ears of Corn

by: Roland Bunch

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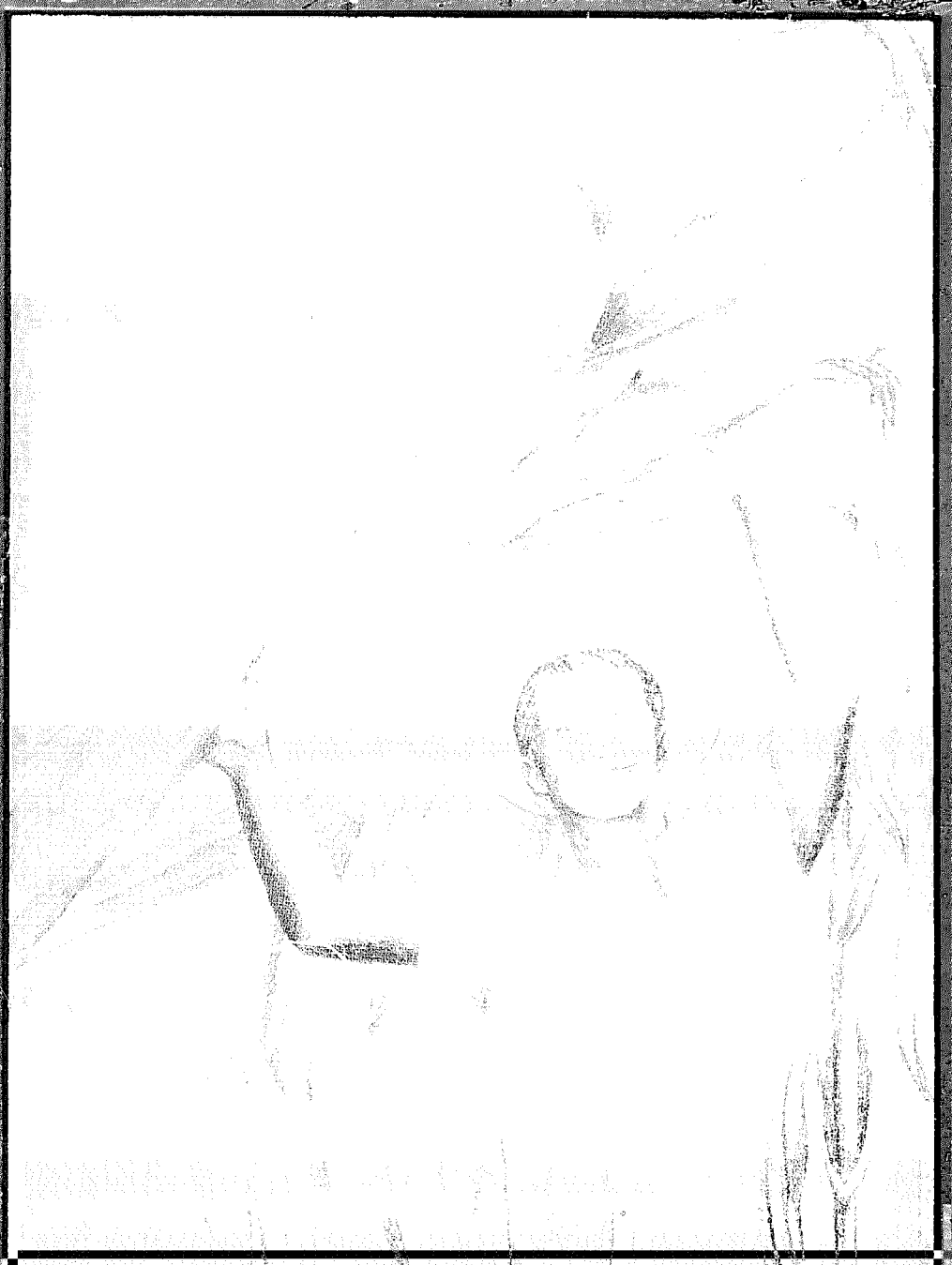
A Guide to People-Centered Agricultural Improvement



By Roland Bunch

Roland Bunch writes from long and varied experience as volunteer, local Program Director, Regional Training Advisor, and as World Neighbors Area Representative for Central America, Mexico and Panama. He has been a careful observer of development programs in many countries, and a keen critic of development efforts, including his own.

The ultimate result of any food production program must necessarily be the harvesting of that extra ear of corn. But that desired result — the growing of more food — is inherently dependent upon how the program is conceived, planned and managed. Roland believes that "program leaders must have a feel for the delicate balances between the value of change and a respect for the society's traditional values; between the demand for excellence and the necessary freedom of local people to make their own decisions. . ."

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Ken Tull, Director of the World Neighbors Department of Development Communications, did the cover design and illustrations. He has worked for many years alongside local leaders, at all levels and on several continents, in the production of simple, practical visual aids, and in the training of program personnel in their effective use.

All of the sketches and drawings are based on real people and actual scenes from programs assisted by World Neighbors in communities around the world. As Ken says, "The people and the places portrayed here are intimate and integral parts of what we have come to know as our "World Neighborhood."

World Neighbors

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80, line 6	roadblocks — suffi-	roadblocks — insuffi-
125, Chart No. 4	No risk - 5; Less labor - 0	No risk - 5; High risk - 0
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237, Diagram No. 6	(Chapter 5) (Chapter 6) (Chapter 9) (Chapter 13)	(Chapter 6) (Chapter 7) (Chapter 10) (Chapter 14)
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Two Ears of Corn

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And he gave it for his opinion... that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together.

Jonathan Swift

We in World Neighbors would differ with Swift's disparagement of politicians. Politicians have, after all, a critical role to play in the effort to solve the world's food problems. They can, among other things, greatly influence whether or not small farmers have the resources and the incentives that farmers need to provide food for the earth's people. Nevertheless, Swift's central message is truer than ever. In a crowded, hungry world, one of the most important and urgent enterprises of humankind, politicians included, must be that of helping villagers make two ears of corn to grow where only one grew before.

Dedicated to the Anacleto Sajbochols, Symphorien Kienous and Salomon Galindos of the world,

villager leaders who have selflessly taken the forefront in the struggle of the world's poor to achieve more fulfilling lives,

and to the Marcos Orozcos, Ayélé Folys, and Janardanan Pillais,

professionals who have labored long and hard to train and support these villager leaders in their noble cause.

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PREFACE

Effective agricultural improvement work grows out of years and years of trying one approach after another, of searching constantly for new, more effective ways of working. Each new approach must not only be tried out, but must be evaluated on the basis of generous amounts of feedback from the field. This feedback deals with the approach's psychological and social as well as agricultural impact. This process is inevitably expensive and time-consuming job, but it is absolutely essential if those of us working in development are ever to meet the challenge of agricultural improvement.

For thirty years, World Neighbors, a small private voluntary agency, has been working in cooperation with a wide variety of local, national, and international organizations to improve the productivity of the small farmer. Through this work, it has not only learned about the approaches used by many other organizations, but has tried out a good many of its own. At the same time, World Neighbors' Area Representatives, working with only ten to fifteen programs each, have been able to monitor very closely the programs' village-level results. This combination of widely varying experience and in-depth feedback has allowed World Neighbors to select and refine a set of techniques that have greatly increased the impact of many of its programs. These techniques are the subject of this book.

Edgar Stoesz once wrote that "a serious gap in the myriads of volumes available is any serious attempt to relate theories to practice and address them to the practitioner in the field. It would seem that practitioners do not write and theoreticians remain in the abstractions of their theories."[1] This book, however, is the attempt of World Neighbors, one small group of practitioners, to tell others what it has learned from its experience in the field. The approaches described have grown out of the day-to-day action of real-life programs; they are based on experience rather than theory.

Failures will be described as well as successes. In World Neighbors we fully recognize that all of us working in agricultural improvement must expose our failures along with our successes. It seems to be characteristic of human nature

that people learn more effectively from mistakes — their own as well as others' — than from success. Revealing our mistakes can be painful, but we must do it so others can avoid repeating them.

The search for ever more effective approaches has by no means come to an end. Thus, the ideas described in this book are in no way presented as the final word in agricultural development. World Neighbors expects — in fact, very much hopes — that new, more effective methods will continue to be discovered. In the meantime, our hope is that these ideas will contribute to the growing dialogue between development agencies and, in turn, to the effectiveness of programs in the field.

SMALL PROGRAMS

World Neighbors' experience is largely limited to small, $5,000 to $40,000-a-year programs. Therefore, the approaches described here will be most suitable to programs of this size, although many of the basic principles should be equally applicable to larger programs.

World Neighbors believes that small programs can play a unique, invaluable role in small farmer agricultural improvement. Small programs can meet the specific needs of specific cultures, markets, and microclimates and can build upon existing local resources, such as traditional knowledge, exceptional leadership, or indigenous forms of organization. They have the flexibility to be creative and to respond to changing needs without bureaucratic delays.

Small programs also tend to be more sensitive to the people they are serving. Program leaders live nearer the villagers, have closer relationships with them, and receive more feedback from them. And small programs can handpick highly motivated personnel who know the people, care about them, and treat them as equals.[2]

For programs working with traditional peoples, these qualities of specificity, flexibility, and sensitivity are essential. Village people are interested in work that responds not to the general needs of the region, but to their own specific needs. Having no experience with large institutions, they tend to

interpret bureaucratic inflexibility as an insult, a sign of indifference, or an ultimate refusal of help. Furthermore, traditional people are accustomed to dealing with others in a framework of personal relationships. They understand and appreciate help offered in a context of friendly reciprocity. On the other hand, impersonal help that goes in only one direction causes suspicion and discomfort. As one long-time worker in India put it, "official routine will not too soon (if ever) take the place of brotherly guidance."[3]

Large programs are, of course, needed. They can and *must* deal with large-scale problems in tax, price, and marketing structures; land tenure; basic agricultural research; the construction of major irrigation and road systems; the provision of credit; and the encouragement of a dispersed, appropriate industrialization.

Nevertheless, the effects of large agricultural programs rarely reach the very poor. Poor people often lack both the self-confidence needed to approach large organizations and the knowledge to know what to ask them once they do. Furthermore, large programs are reluctant to work with farmers who only own a few thousand square meters of land because they are afraid it will lower their cost-benefit ratios. Thus, as John Sommer of the Overseas Development Council writes, without "sensitive intermediaries to help the majority of the population. . .a large proportion of the poor will be left outside the system while the gap will grow between them and those who *can* participate."[4]

Small programs can increase the villagers' desire for change, their knowledge about what changes might be beneficial, and their self-confidence in their ability to make these changes. They can also help villagers develop the leadership skills and organizations needed to multiply the large programs' impact among small farmers. In this way, small programs can create what is, in effect, a human infrastructure capable of bridging the gap between large organizations and the poor.

National and regional programs are increasingly finding that by working in connection with the human infrastructures created by small programs, they can increase their effectiveness. In turn, smaller programs are discovering that

their most important role is not so much that of providing examples of how larger programs should work (the "pilot program" approach has yielded decidedly mixed results), but rather of complementing the larger ones.[5]

AGRICULTURAL IMPROVEMENT AS AN ART

Finally, this book is written in the firm conviction that agricultural improvement among small, traditional farmers is, and always will be, more an art than a science. Though general guidelines for program design can be established, the final outcome of any program will depend much more on good judgment and understanding than on a strict adherence to a set of guidelines. For programs to be truly successful, they will have to be guided by an understanding of the people's needs, motivations, values, and viewpoints, and of the possible consequences of the social processes they are setting in motion. Program leaders will need to have a feel for the delicate balances between the value of change and a respect for the society's traditional values, between the demand for excellence and the necessary freedom of local people to make their own decisions and learn from their own mistakes, and between the need for high motivation and the danger of killing their leaders' enthusiasm with overwork. Above all, the leaders of successful programs must be motivated by a genuine concern for the welfare of others, a basic belief in the villagers' capabilities, and a deep desire to see the people grow in personal fulfillment and self-determination.

In agricultural improvement, as in any art, the principles and guidelines must become almost second nature to the practitioner. But true artistry emerges only when the principles are applied with sensitivity, dedication, and creative insight Without these qualities, even the most ideally designed programs will fall short of their full potential.

SOME NOTES ON TERMINOLOGY

Largely through guilt by association, many of the simpler words denoting what a person does when he helps others learn have gained a bad reputation. Many people have come to dislike the words "teaching," "training," and "extension."

Alternatives exist, such as "communicating ideas," "helping others learn," and "creating an environment in which others can learn," but they are increasingly cumbersome and less well understood. In light of this, I have decided to use the former, more straightforward words, hoping that the larger context of the book will make their meanings clear. Perhaps, if these simpler terms are used in connection with better quality programs, they can become "redeemed by association," and we can reverse the trend toward the use of ever more esoteric euphemisms.

The word "villager," as used here, should be understood to exclude large landowners or other village residents who are more prosperous than the average member of the village. The words "extensionist" and "multiplier" are used interchangeably to refer to people who teach innovations to villager farmers.

In many areas, women work in agriculture as much or more than do men. When they do, some or all of the extensionists, employees, and program leaders should be women. Nevertheless, for the sake of brevity, I have not filled the book with "he or she's" or "she/he's." Instead, I use "he or she" or "men and women" just often enough to remind readers that those people mentioned could be of either sex.

ACKNOWLEDGEMENTS

Many people in World Neighbors have helped tremendously in clarifying the ideas presented here and in providing valuable insights from their own varied experience. Many outside of World Neighbors have also given freely of their time to provide suggestions. They include Sharon Bergstrom, Dodds and Roger Bunch, Stephen Cox, Benjamin Darche, Julian Gonsalves, David Kinley III, Frances Moore Lappe, Ann Mulbry, Edgar Owens, Robert Stickney, Jean Walsh, Robert K. Waugh, David Werner, and Douglas Williams. I sincerely hope that the dialogue begun with these people, so essential in the making of this book, will continue for years to come, helping all of us to improve our work in the world's villages.

September, 1982 Roland Bunch

Agricultural improvement is vitally affected by the motivation, self-confidence, and willingness to work together of millions of individuals.

1 THE CHALLENGE — AND AN EVOLVING RESPONSE

THE CHALLENGE

Even if our only goal in agricultural improvement work were to adequately feed the world's growing population, we would not only have to double, but *triple* world grain production in the next generation.[1] By the end of the century, we will have to be growing not *two,* but *three* ears of corn where one is growing now. Total world production would thus have to grow at a faster rate than that of almost any nation has at any time in history. Yet agricultural improvement is showing itself to be nearly as difficult as it is crucial.

First of all, agricultural productivity depends on a multitude of variables: weather, topography, seed quality, insects, plant diseases, the quantity and seasonal distribution of water, and many properties of the soil, including its texture, nutrient levels, water-holding capacity, and pH. In order for the farmer to optimize those few conditions over which some influence can be exerted, he must have the right tools, animals, fertilizers, pesticides, capital, and labor resources in the right amounts at precisely the right times. The "right" amounts of these inputs can only be determined through time-consuming research and experimentation, and they constantly vary with

changing conditions. Furthermore, only if there exist adequate and accessible markets, transportation, storage, processing facilities, and price incentives does the farmer have any reason to even try to produce a surplus.

The task begins to take on staggering proportions when we realize that all the above conditions must be attained for about two hundred million farmers scattered around the world in some two million villages. By and large, these farmers are illiterate, inaccessible, powerless, unorganized, suspicious of outsiders, unaccustomed to change, unable to take risks, and convinced by lifelong experience that their situation is not likely to improve. They often have very little capital, very little land, and very little experience in handling—or opportunity of obtaining—credit. They speak a bewildering assortment of languages and often live in inadequately understood, ecologically vulnerable environments, such as rainforests, mountains, or semiarid grasslands. And even worse, variations in climate, topography, cultural values, soil types, land tenure, water resources, and traditional cropping patterns can make the technology appropriate to one region or even one side of a valley totally useless to another.

Agricultural improvement is further complicated by its being a supremely human undertaking. It is vitally affected by the motivation, self-confidence, hard work, decision-making ability, and willingness to work together of millions upon millions of individuals. Yet those best educated in agricultural technology often have little respect for their peasant clients and even less desire to brave the uncomfortable conditions and long working hours that successful agricultural work requires.

Lastly, agricultural improvement among small farmers is a relatively recent enterprise in human history. Not until the last twenty-five years has a concerted effort been made to increase Third World agricultural production, and even then, most of the work has been directed toward the larger, more modern landholdings. The resulting lack of experience with small farmers has been compounded by the tragic reluctance of many agencies to publicize their own errors or learn from the successes of others. Facing an extremely complex problem with little experience to guide them, development agencies have not earned themselves a particularly impressive record.

In fact, despite the tremendous worldwide efforts made during the last two decades, the world hunger situation may well be getting worse. Although per capita grain production has inched upward, world food prices have soared and the poor people's incomes have, at best, remained stable. In general, the hungry have grown hungrier, the poor, poorer.[2] Furthermore, past increases in productivity have largely been made in the easiest ways—through cultivating more land, extending irrigation, and introducing fertilizers and insecticides. But increasingly, "all four of the major resources used to produce food—land, water, energy, and fertilizer—are in tight supply; and in a growing number of situations the pressures of growing demand for food are beginning to undermine the ecology of major food producing systems."[3] Future increases in food production will have to be achieved by solving more complex technical, sociological, and political problems. They will also have to pay more heed to ecological limitations and use fewer non-renewable resources.

Agricultural improvement has been called "the most difficult economic task a nation can face."[4] It is difficult, yes, but not impossible.

AN EVOLVING RESPONSE

Gradually, many agricultural programs around the world are trying out and perfecting a number of new, more effective approaches to their work. A few of them have evolved to truly astounding levels of efficiency. Surprisingly enough, out of this tremendous variety of programs working on three different continents, a fairly consistent pattern of evolution in program design is emerging.

Many programs begin with just one or two agronomists who organize an agricultural school and begin giving courses on modern agriculture. Frequently, they also buy or rent a piece of land to try out and demonstrate the innovations they plan to teach. In time, however, the agronomists realize that very few farmers are actually adopting the innovations being taught. They incorporate more practical demonstrations, audiovisual aids, and farmer participation into their lectures. They substitute field days and field demonstrations for classroom sessions. And most importantly, they decide to supplement the regular training with extension work in the villages.

Program leaders, whether agronomists or others, eventually begin to suspect that they have been trying to teach too much. By teaching *everything* about agriculture, they have failed to explain any one practice enough to convince the

farmers of its value or make sure the farmers can apply it successfully. General courses on agriculture, especially the longer residential courses, are abandoned in favor of short courses or one-day sessions that emphasize one, two, or three specific practices. Classes are also scheduled to coincide with the agricultural calendar—each practice being taught just before it is to be used in the fields.

Once farmers begin to try out the new technology and find it successful, more and more farmers start asking for training. Programs often run into difficulty, however, in trying to meet the new demand. In many areas it is difficult to find agronomists who know the indigenous languages and will work in rural areas with sufficient enthusiasm. The transportation of agronomists to villages increasingly distant from the program center becomes expensive. Furthermore, farmers usually prefer to receive classes when agronomists least want to give them—in the evenings and on weekends. Gradually, some of the farmers start showing the new innovations to their friends and relatives. Program leaders find that they can supplement the agronomists' work with classes taught by the program's own star pupils. A multiplier effect is born.

Program leaders soon realize that demonstrations are more convincing and experiments more relevant if they are conducted by farmers in their own fields rather than by agronomists on a program plot. Furthermore, showing their successes to others stimulates the innovators' own sense of dignity, self-confidence, and enthusiasm for further improvement. As a result, the program's experimental farm is phased out. Subsidies and give-aways are also phased out, not only because they are expensive and paternalistic, but because the people's new enthusiasm for innovation has made them unnecessary.

In time, in the best of programs, villager extensionists take charge of the teaching, and the agronomists assume the roles of technical advisors, trouble shooters, or administrators. Ultimately, the better motivated, more capable farmer extensionists work up into the program administration and take over the program entirely.

Along the way, leaders of some programs recognize that

higher incomes do not, by themselves, improve health or living standards. The villagers must learn how they can best use their increased income. Thus, health and hygiene programs may be launched, and potable water and latrine projects begun. Leaders of many programs find that agricultural improvement is being held back by poor transportation, inadequate markets, a lack of small-farmer organization, or any of numerous political bottlenecks. Marketing, road building, group organization, and political consciousness-raising efforts may be established. In many areas, population growth is negating even very high increases in production. Family planning programs must be organized. Gradually, agricultural programs are transformed into integrated development programs.[5]

For programs in the final stages of this evolution, agricultural improvement can be a tremendously efficient and exciting enterprise. Some programs costing $15,000 to $20,000 a year have, in just three to four years, increased by 50 to 200% the agricultural production of from 1,000 to 2,000 farmers (representing 5,000 to 10,000 people).[6] That is, harvests have been doubled for less than $50 per family. And the social, organizational and educational benefits of the program have undoubtedly been even more important than the short-term increases in yields. Such levels of impact probably lie within the realm of possibility in most areas of the Third World.

Of course, most agricultural programs do not follow the above sequence exactly. Many stall out at some intermediate stage. Others skip over stages in between. Still others, somewhat more fortunate, start at some intermediate or later stage.

The process of trial and error that gradually moves programs along this path of increasing efficiency is accelerated by two important catalysts: program flexibility at the local level and candid feedback from the villagers. Organizations with numerous policies and procedures already established in offices outside the country or in national capitals find experimenting with new approaches impossible. In contrast, programs of flexible design with personnel in close communication with the villagers learn of their errors quickly and are free to correct them without delay.

Nevertheless, there is no point in programs' continually starting at the beginning of this evolution, thereby having to learn all these lessons through trial and considerable error. If we are to meet the challenge of agricultural improvement, we must apply quickly and widely the techniques we have already learned and move on to develop even better ones. The longer we take to do so, the longer the poor will continue to suffer.

It is fullness of life which makes one happy, not fullness of purse.

-Rabindranath Tagore

2 THE PROGRAM GOALS

Where a program starts in the evolution toward a more efficient program depends a great deal on the program's goals. If the goals inherent in a program are merely to teach people about agriculture or to convince them to adopt a collection of innovations, the program will needlessly start at an early, relatively inefficient stage of the evolution. In order for programs to achieve the best possible results, we must set our sights on the best possible goals.

AGRICULTURAL PRODUCTIVITY

Increasing agricultural productivity is obviously a major immediate goal of any agricultural program. Most programs, therefore, see their role as that of teaching farmers a set of innovations that will increase the area's productivity. The assumption is that the people will adopt these practices and continue indefinitely to farm at the new, higher level of productivity.

A productive agriculture, however, requires a constantly changing mix of techniques and inputs. Seeds degenerate, insect pests spread and develop resistance, market prices fluctuate, new inputs appear and old ones become expensive, roads and water sources are improved, and laws change. Very few packages of practices will ever succeed in producing a

permanent increase in production. A stagnant agriculture is either a low productivity agriculture or is gradually going to become one. Thus, programs that only teach technological innovations are destined either to become permanent fixtures in the area or to pull out, leaving the people to gradually slide back to their previous levels of production. The former possibility is unacceptable because it creates an undesirable dependency on the program and costs far too much per family benefited. The latter represents a waste of the program's time and efforts.

The goal of an agricultural program should be, on the one hand, to train and motivate the farmers to teach each other the innovations introduced and, on the other, to teach them how to improve on those innovations by themselves. Through a process of small-scale experimentation, farmers can learn to develop and adapt new technologies that will carry their production on to steadily higher levels. And by learning to become high-quality teachers of these new technologies, they can spread them throughout the progam area. Five years after the program has closed, production levels should be higher and improved production more widespread than at the program's end.

In short, the goal should not be to *develop* the people's agriculture, but *to teach them a process by which they can develop their own agriculture.*

BROADER HUMAN GOALS

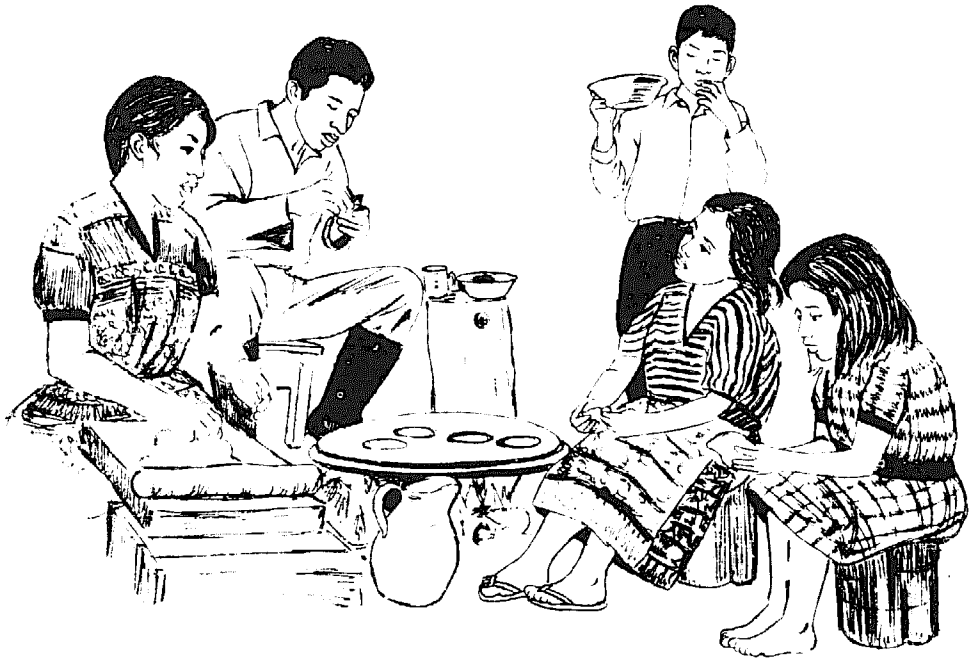
Most small development programs have much broader goals than simply increasing agricultural incomes. They recognize that, as Rabindranath Tagore said, "It is fullness of life which makes one happy, not fullness of purse."[1] These broader goals are variously referred to as improving the quality of life, liberating the human spirit, achieving more fulfilling lives, or developing the total human being. What these terms mean, precisely, is sometimes difficult to define. In fact, *no program should define them without the participation of the villagers.* And the villagers may not worry much about these subtler issues until they have overcome their more immediate problems, such as hunger. Yet if these goals remain

undefined for too long, they may remain unfulfilled as well.

Some of the possible areas of involvement are listed here:

1. Basic necessities

The first of these broader goals are those of the generally accepted basic human necessities. People in most any culture would agree that a certain minimum of food, clothing, and shelter are essential to human welfare. The medical attention, pure water, and hygiene necessary for good health would also be rated as basic needs. And most cultures in today's world would probably include literacy on their list of necessities.



Although increased incomes through agricultural improvement may be necessary for people to be able to feed, clothe, house, and educate themselves adequately, higher incomes do not by themselves guarantee that people will do these things. Programs that are assuming that increased incomes in their areas will automatically produce higher living standards should check periodically to see if this is, in fact, happening.

2. Sociopolitical rights

A second very important group of broader human goals are those embodied in efforts referred to as "awareness-raising," "conscientization," or "empowerment."* In large areas of the Third World, most notably Latin America, the cheap labor of the poor provides a major source of income for the wealthy. Furthermore, wealth in these countries traditionally brings with it tremendous social prerogatives and political power. The elite groups that enjoy these privileges are understandably reluctant to give them up. Yet to maintain these privileges, they must not allow the poor people to attain higher wages, social equality, or political power. In short, they must prevent the development of the poor.

To block the poor people's development, the elite employ a wide variety of techniques. These include social and economic discrimination, control of the educational system and sources of information, regressive tax structures, and control over the land base. Other common techniques include those of directing governmental services to the wealthy (through kinship ties, the law, bribes, or corruption) and restricting or completely eliminating political freedoms and democracy in government. When these techniques prove insufficient, they are customarily reinforced with either the threat or the outright use of violence.

Under such conditions, any program genuinely interested in the basic welfare of the poor will have to deal with the problem of unjust political and social conditions.

3. Brotherhood

A good many programs also hope to encourage among the villagers a sense of social justice, of concern for others, and of honesty and integrity. Other programs wish to promote a spirit of love and service to humanity. And still others are working toward improved social relationships by organizing groups for recreation, discussion, or community betterment. Some of

*Awareness-raising will be used in this book to refer to the process of increasing people's awareness of the nature and causes of their problems and the possibilities and ways in which they can be overcome. Empowerment is work designed to help people gain the power and influence that any citizen would be entitled to in a truly democratic nation.

these programs recognize corruption and a lack of care for others as significant obstacles to development, but most are motivated by the simple conviction that true human fulfillment is achieved only when people live together in an atmosphere of mutual support and brotherhood.

4. Religion

Many programs working in agriculture also hold as a goal the enrichment of people's spiritual lives. Although many Westerners feel somewhat squeamish about the mixing of economic and social goals with ethical and religious ones, most Third World peoples do not share this uneasiness at all. In many cultures people feel very deeply that the material and spiritual sides of life are vitally intertwined, and that man achieves happiness or fulfillment only through a balanced dedication to both. To these people, programs of human betterment devoid of a religious emphasis seem strangely incomplete.

THE IMPORTANCE OF BROADER HUMAN GOALS

Many programs begin working in agriculture because they see agricultural improvement as the foundation upon which

progress toward the other goals must be built. Some of these programs evolve into integrated development programs directly involved in working toward some of these broader goals, while others leave the work in health, brotherhood, and political consciousness to other institutions. A few programs become so involved in building the foundation that they forget about the house.

Other programs have no goals above and beyond that of agricultural improvement. Experience is showing, however, that even these programs had best pay some attention to broader human goals. Agricultural improvement becomes slow, inefficient, and temporary if broader human factors are not taken into account. (see Chapter 16) If agricultural work basically makes people more individualistic, dishonest, and self-seeking (as it sometimes does), the people's ability to work together, which permanent agricultural improvement requires, will be destroyed. If agriculture teaches villagers to feel incapable and to depend on outsiders, the process of agricultural improvement will end the minute the program does. And if people do not become able to defend their land, their water, their markets, and their right to participate in the

making of the laws according to which they must earn a living, they will have neither the land, the water, nor the economic incentives that are indispensable to increasing their agricultural incomes. Above all, we are gradually learning that the very finest development work is done by those people who have a deep sense of social justice and concern for others — a sense that frequently has grown out of a strong spiritual conviction that all God's people are brothers.

On the other hand, agricultural improvement work can encourage villagers to be honest, to work together cooperatively, to serve each other, and to have the self-confidence and optimism necessary to attack their agricultural problems on their own. It can also help them gain the economic base, the organizational ability, and the knowledge of the outside world they will need to defend their agricultural resources and markets. If agricultural improvement is to be efficient and permanent, its methods must strengthen these characteristics in the people. The design of every aspect of the program—from leadership training and administrative style to the choice of the technology to be taught—must take into account the impact it will have on the achievement of these broader human goals.

The driving force behind participation is enthusiasm.

3 PATERNALISM, ENTHUSIASM, AND PARTICIPATION

The principal cash crop along the lower Cauca River was rice, so the program at El Naranjo*, Colombia bought the village a thresher and a huller along with a motor to run them and organized a cooperative to market the rice downriver. It also bought a tractor to help increase rice production and a generator to light the village. The first year, dugout canoes brought tons of rice to the El Naranjo cooperative, which hulled it and sold it at the highest price the farmers had ever received.

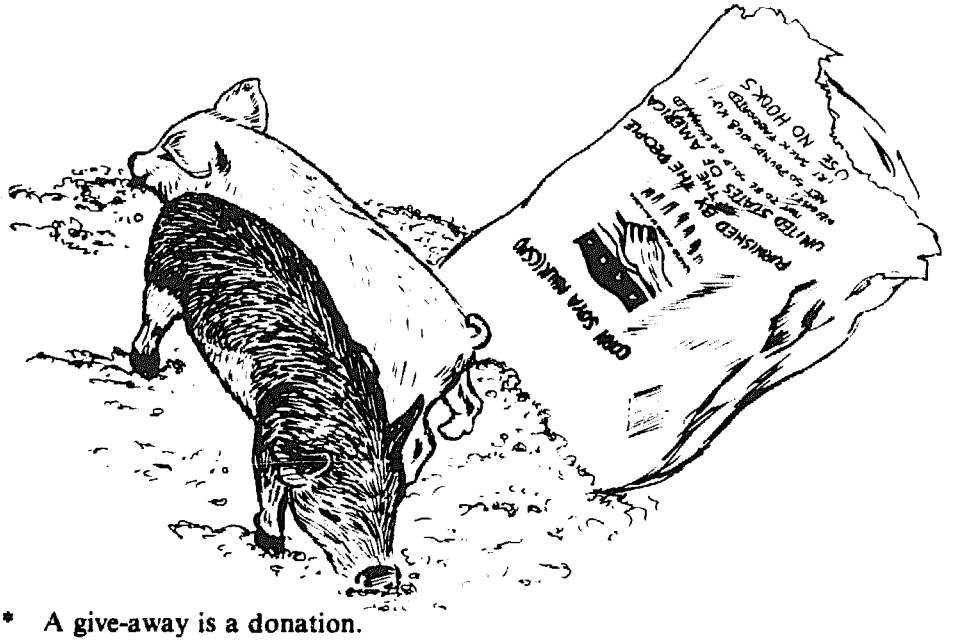
I visited El Naranjo about six years after the program closed down to see how the work had continued. In short, it hadn't. El Naranjo had become a virtual graveyard of rusting equipment and abandoned hopes. The motor had broken down and had never been repaired, so the huller could not be used, either. The thresher had never been used because farmers preferred to thresh their rice in the field. The tractor had broken down, and no one had cleaned up the generator since the year a flood had covered it with mud. The cooperative had disbanded completely; its building, by far the largest in El

* El Naranjo is a fictitious name, but the program's story is a true account of the first program World Neighbors supported in Latin America, beginning nearly twenty years ago.

Naranjo, was full of cobwebs. Yet, as I made my way through the village, a half dozen different people pleaded with me, "But if World Neighbors would just come help us again, we could do so much!"

THE PATERNALISM OF THE GIVE-AWAY**

The outcome at El Naranjo was shocking, but hardly surprising. The rusting hulks of well-intentioned but long-forgotten give-aways are scattered all over the Third World. I have personally seen tractors by the dozens, not to mention ploughs, cultivators, generators, threshers, pumps, scythes, lanterns, and grain mills that were never repaired after the first time they broke down. There are donated granaries that were never used, free high-yield seed that was eaten, give-away breeding animals that were sold or slaughtered for meat, and forest and fruit tree seedlings that died while still sitting in their plastic bags. Tons upon tons of give-away food have either rotted, become infested with insects or rats, or been fed to cattle, pigs, or household pets. Some have even been used to make commercial ice cream or to whitewash houses. Villagers themselves generally recognize the uselessness of giving things away. Folk sayings in dozens of countries admit that people don't take care of things they never had to work for.



** A give-away is a donation.

More and more organizations are also becoming convinced that give-aways are not only ineffective, but, in fact, are detrimental. Why? The reasons are numerous. First of all, when the only progress villagers see is accompanied by give-aways, villagers can easily become convinced that they are incapable of making progress by themselves. Typical is the feeling of the people in El Naranjo that they cannot do anything without more outside "help." This feeling of inadequacy, in turn, creates dependency and subservience, robbing people of their self-respect. Furthermore, when people feel incapable of doing anything for themselves, self-help projects become more difficult than ever.

Another problem arises because charitable agencies naturally try to channel their donations to those most in need. Bitter divisions have thus been created in community after community by the envy and jealousy that erupted when one group or one family received seeds, fertilizers, or food and another did not.

People often become accustomed to give-aways, and even come to expect them. World Neighbors found it nearly impossible to work in northeast Honduras after the Hurricane Fifi relief effort because many villagers refused to work with anyone not dispensing charity. In Togo, half the women in a group attending nutrition classes quit because they felt cheated; they had heard that a similar group ten kilometers away was receiving free milk during its classes.

Give-aways can also blind people to the need of solving their own problems. In the terms of one well-worn metaphor, you can give people so many fish that they lose all interest in learning to fish. Give-aways can also divert people's attention from the underlying demographic, institutional, or political problems that, sooner or later, they must face if permanent progress is to be made.

Give-aways can be as detrimental to programs as to people. First of all, they are monstrously expensive. Supplying a family with half its wheat for thirty years can easily cost fifty times as much as does teaching a family to double its own wheat production. One tractor can easily cost more than it does to give a twelve-month series of weekly agricultural classes to over five hundred farmers. Secondly, give-aways can

hide people's indifference to program efforts. Villagers anticipating an occasional give-away may faithfully attend classes for years without intending to adopt a single innovation. A nonpaternalistic program will know at once if farmers lose interest in what is being taught because attendance drops immediately. Months of useless, expensive training can be avoided.

Lastly, give-aways destroy the possibility of there ever being a multiplier effect. If the people's adoption of some innovation depends on a gift, or people become convinced that it does, local farmers will not try to teach it to their neighbors.

In spite of all these problems, some programs continue to justify give-aways on the grounds that a) they are faster; b) they can "win over" more people; c) the people cannot help themselves; or d) the people are so poor that justice demands they be given a break. Experience shows, however, that good results achieved with simple, inexpensive technologies have very quickly "won over" more people than programs could adequately train. Most of the people judged too poor to help themselves *can* help themselves after all. If agricultural technologies capable of making the people self-sufficient are available, people can either adopt them gradually or be given loans payable after harvest. If no such technologies exist (e.g., among landless villagers), cottage industries or political action may yield results. Lastly, justice demands not that outside agencies give things away, but rather that people be taught to help themselves,. keeping their dignity and self-respect intact, and that these efforts cost as little as possible so that the maximum number of people can be reached with the funds available.

THE PATERNALISM OF DOING THINGS FOR PEOPLE

Two top-notch South American agronomists were asked to help the community of Yanamilla raise its milk production. By culling the herd, improving the irrigation system, and planting new pastures, they showed the people how to raise production from twenty-five to over one hundred liters a day. Six months after they had left Yanamilla, production had

plummeted back down to thirty liters a day.

Once again, although the results were disappointing, they were not surprising. For the paternalism at Yanamilla is a close cousin to that of El Naranjo. It is that of *doing for* people as opposed to *giving to* them. Although this second kind of paternalism is admittedly more subtle than the first, it can do just as much damage. And because of its subtlety, it is even more widespread than the first and less often recognized as being harmful.

Yet this second kind of paternalism suffers from many of the very same problems as does its better known cousin. First of all, *doing things for* people seldom achieves permanence. The rusting hulks of abandoned development efforts *done for* the people, from marketing schemes and agricultural cooperatives to animal raising and reforestation projects, are as common as those of abandoned give-away machinery. Once there are no outsiders to make trips to town, do the accounting, make decisions, pay the bills, keep people working together, or troubleshoot, the work halts as abruptly as it does when the give-aways end.

Secondly, *doing things for* people creates a sense of dependency and inadequacy. The "Please, won't you give us something?" changes to the equally obsequious "Please, won't you do something for us?" but the helplessness and dependency are the same. The people of El Naranjo were as dependent on program personnel to run their cooperative as they were for program funds to buy them a tractor. As a result, neither the tractor nor the cooperative provided them much sense of accomplishment or self-worth.

Most of the other problems with *giving things away* pertain equally to *doing things for* people. People will seldom bother to work at solving their problems if a program is solving those problems for them. Even less will they be inclined to face the deeper demographic, institutional, or political problems that confront them. Doing things for people costs a good deal more than merely supporting the people's own efforts at doing them. Furthermore, programs can, and often do, work on a project for years, spending a considerable sum of money, only to discover afterwards that the people have no interest in carrying on the work themselves. Lastly, if program leaders do

everything, the people lose the opportunity to learn by doing. And what they have never learned, they certainly cannot teach others.

Obviously, though, programs must do *something* for the people. Were the people able and willing to solve all their own problems, they would have done so ages ago. How can we who work in agricultural programs distinguish between those activities we should do, and those we should not? It's very simple: *we should do only those things that the people cannot, or in the beginning will not, do themselves.*

It is, of course, easier to state this rule than to live by it. Finding out what the people can do will require some trial and error, but in the end, knowing what the people can or cannot do is part of the art of agricultural improvement.

It should be emphasized that *anything* we do that the people can do for themselves is paternalistic. Even courses in motivation, sensitization, "animation," or "conscientization," which usually help people avoid paternalism, can be paternalistic in this way. In one program in Africa, women were complaining bitterly about having to carry firewood on their heads for five and six kilometers while the men's ox-carts stood idle. After much discussion, the program leaders decided to investigate why the women were not using the carts, and then they paid a team of professionals to give the villagers a week-long "sensitization" course on how to solve the problem. It never occurred to the leaders that the villagers might have been able to discuss the problem and work out a solution themselves.

If we are to avoid paternalism, either *giving to* people or *doing for* them, our only course of action is to motivate the people to do for themselves. But how? How can these people who so often seem to be conservative, traditionalist, and non-innovative become motivated to carry on their own development process?

Somehow, the people must acquire *enthusiasm.*

ENTHUSIASM—THE DRIVING FORCE BEHIND DEVELOPMENT

"Enthusiasm," as the word is used here, is known by a good

many other names, too: determination, drive, commitment, motivation, inspiration, even love of one's work. It is the desire or willingness to work—to make sacrifices — in order to reach a goal. It is the willingness to step out into the unknown—to experiment, study, make decisions, cooperate with others, and work together toward a common end. Unlike its usual connotation, the word enthusiasm is used here to include even long-term, unemotional forms of commitment.

When enthusiasm is lacking, experimental plots grow up in weeds, no one shows up for meetings, cattle destroy the improved pastures, cooperation between neighbors becomes increasingly difficult, and extensionists seem unable to convince farmers of anything. When enthusiasm is plentiful, farmers walk two full days to attend classes, innovations spread spontaneously from one farmer to another, and many former problems seem to solve themselves. In extreme cases, hundreds of farmers in Guatemala and El Salvador have done thirty to thirty-five days of backbreaking labor to conserve each 0.1-hectare of their soil, while a youth in India spent six months of his own salary on a program building and walked sixteen miles in one day for the program while still recovering from smallpox.[1]

Instilling enthusiasm (as the word is defined above) is the only plausible way of avoiding paternalism. It is, therefore, the basic dynamic of any true self-help program—the driving force that is indispensable to all true human development.

The question, then, is the same one that Jawaharlal Nehru asked years ago: "How to bestow on the villagers that sense of partnership, that sense of purpose, that eagerness to do things?"[2] How can programs be designed so that enthusiasm will grow and flourish? Each one of the following factors can be crucial in stimulating enthusiasm:

1. The program must work toward solving felt needs (i.e., the people must *want* the problem being worked on to be solved).

2. The villagers must believe it possible for them to solve the problem (e.g., the solution must be simple and inexpensive enough to be perceived as within their means).

3. The people must believe that the program personnel a) know enough to competently help the villagers and b) are

working for the people's benefit (rather than to cheat or manipulate them).

4. The people should come to identify with the program's work and its successes by being involved in program planning.

5. They must participate in the program's work, so that when success is achieved, they will feel a sense of accomplishment. The challenge must be simple enough at first that they can meaningfully participate, yet gradually become increasingly complex so they can grow in their ability to deal with problems and can feel an increasing sense of accomplishment.

The people's enthusiasm will be further enhanced by:

1. the freedom to set their own goals when they desire,
2. the freedom to be creative in their work,
3. the opportunity to work together in an atmosphere of mutual support and companionship,
4. the opportunity to continue learning about new subjects of interest, especially solutions to other felt needs, and
5. the recognition, gratitude, and positive feedback of fellow villagers, program leaders, and other program workers.

Success—the Source of Enthusiasm

None of the above conditions will, however, inspire much enthusiasm in the absence of one crucial ingredient: *early recognizable success.* We define a "recognizable success" as *the solution of a felt need with results that are both readily observable and desirable according to the culture's own value system.*

Recognizable success must exist for each of the above conditions to stimulate enthusiasm. For instance, if people work on a problem very long without achieving recognizable success, they will come to doubt that it is possible for them to solve the problem. Villagers skeptical of the program's competence or benevolence will change their minds only when they recognize that the program has achieved successes of benefit to them. Identifying with or participating in efforts that never succeed will produce not enthusiasm, but pessimism, shame, and disappointment. When long-term efforts lead only to failure, companionship and mutual support tend to degenerate into mutual recriminations and bitterness. And

recognition, gratitude, and positive feedback will be forthcoming only when the work is widely perceived as beneficial. In short, *where there are no recognizable successes, there will be no enthusiasm.*

Some programs try to arouse interest and enthusiasm by holding competitions or offering prizes to those farmers who excel. Experience indicates, however, that competitions and prizes seldom produce good long-term results. People in many cultures do not regard individual competition favorably. Secondly, for each person whose enthusiasm is increased because he won, many other people's enthusiasm is *decreased* because they lost. Furthermore, prizes may distract attention from the real benefits that an innovation brings.

More fundamentally, if the technology brings success, the prize is superfluous. If it doesn't, the prize is useless; the practice will be discontinued the moment the prizes are.[3]

INCREASING PARTICIPATION—THE PATH

Constructive Participation

While enthusiasm is the driving force that can move a program away from paternalism, increasing participation is the direction the programs must take. Quite simply, the opposite of *doing for* people is *participation by* the people.

And this participation must occur in both decision making and program execution.

Participation can provide tremendous advantages for a development program. Involvement of local villagers helps ensure that the program will respect local cultural values and will be continually oriented toward the people's felt needs.[4] Obviously, no one can provide more understanding or two-way communication between the program and the villagers than villagers who work in the program. Salaries and transportation for small farmer employees are much less expensive than for professionals. Furthermore, the involvement of villagers helps them to appreciate the difficulty of the program's work and dispels suspicions as to its motives. Thus, villagers participating in a program are more willing to commit themselves and their resources to agricultural improvement.[5]

The most important reason for small farmer participation is that it may be essential to the permanence of a program's work. During five or six years of studying by candlelight, slogging through the mud, and teaching classes late into the night, villager extensionists can become tremendously committed to the success and continuity of their work. This commitment, plus their know-how and teaching ability, will remain in the villages after the program leaves. Furthermore, if small farmers have not been intimately involved in the program, they will probably be neither willing nor able to permanently continue the process of investigating and teaching the changing technology that high-yield agriculture requires.

Small farmer participation provides a whole series of benefits for the farmers, too. Through their own experience (which is their most effective teacher), they learn to plan, to find solutions to their problems, to teach others, and to organize themselves to work together. They learn skills such as how to deal with the give and take within an organization and how to correct each other without hurting feelings—skills that are essential if small farmers are to form and manage their own organizations successfully.

Villagers can, through their participation, gain self-confidence, pride, and the satisfaction of having made

significant achievements. They can also develop the ingenuity and creativity that will enable them to continue improving the life of their communities. These changes—the growth achieved through what we shall call "constructive participation"—are crucial to the fulfillment of the broader human goals, of enabling the people to supply their basic necessities, live in brotherhood, and achieve power. In fact, this growth through constructive participation is the very essence of development itself. Definitions of development abound, but most people would now agree that, among other things, *development is a process whereby people learn to take charge of their own lives and solve their own problems.*[6] Development is occurring where people are gaining the self-confidence, motivation, character traits, and knowledge needed to tackle and solve the problems they have *by actually tackling and solving those problems.*

If this process is, in fact, development, two corollaries immediately follow. First of all, *giving things to* people and *doing things for* people cannot be called development. On the contrary, they are the very *opposite* of development. Secondly, the developmental process, whereby people learn, grow, become organized, and serve each other, is much more important than the greener rice fields and fatter coin purses that result. Although the two must go hand in hand, the "how it is done" matters more than the "what is accomplished." And the "how it is done" must include constructive participation.

Destructive Participation

Participation is not always constructive. In some programs, a single leader emerges and takes control; everyone else learns to be submissive rather than to participate. In other cases, a lack of experience at making decisions as a group causes disagreements. Factions develop and organizations disintegrate. Even well-made decisions can lead to failure, causing disappointment and mutual casting of blame. Many cultures have no acceptable method of correcting the inappropriate or dishonest actions of leaders. When leaders misbehave, people merely sit back and gradually become convinced that organizations are ineffective, or even

dangerous. And very often, too little is known about handling money. Financial losses because of either insufficient planning, poor decisions, graft, or nepotism will also cause division and mutual recriminations.

Even if these more noticeable problems do not occur, programs may merely fail to produce much recognizable success. As people become convinced that little is going to improve, whatever enthusiasm they had wears off. The best motivated and most talented leaders may go elsewhere. Those who remain do so for the only reasons left—their salaries or graft. Tremendous pressures for deceit and manipulation can be produced by situations in which the continuation of salaries depends upon superiors believing that successes exist where, in fact, they do not.

These kinds of participation teach people that other villagers are not trustworthy, that getting involved in organizations only causes them problems, and that villagers are not capable of solving their own problems. These kinds of participation teach manipulation, deceit, exploitation, individualism, hopelessness, and dishonesty. They are destructive rather than constructive. They do not *produce* development; they *preclude* it.

Participation, then, is not innately good, as is often assumed. It can divide and tear down just as well as unite and build up. Our job is to help keep it as constructive as possible.

How Can We Improve the Quality of Participation?

1) **We must recognize that constructive participation is learned — gradually.** Some development agencies, in trying to avoid the suffocating paternalism and "outside expert knows all" attitudes of the past, have swung to the opposite extreme of providing almost no outside input whatsoever. They merely form a local committee or directive board and start sending it program payments.* Though many of us at first welcomed this style of operation, it unfortunately appears to have produced far more *de*structive than *con*structive participation.

*It is an interesting irony that these programs, which tend to be those that most value the human side of development, have come full circle. They are now operating on the inherent assumption that the only missing factor in village development (outside of forming a committee) is capital.

Why? In most cultures, participation is a *learned* art. Colonizing nations found out the hard way that one does not give birth to a democracy merely by organizing a parliament and pulling away the gunboats. Likewise, we do not produce constructive participation merely by forming a committee. Instantaneous democracies spring forth as rarely among programs as they do among nations.

Many of those who have worked in development at the village level have found that constructive participation requires a surprising number of skills. People must learn how to express themselves in public, analyze and verify information, make decisions, and resolve conflicts. They must also learn how to constructively criticize their companions, acquire and use power, maintain vertical channels of communication, keep accounts and use money wisely, and avoid such common problems as favoritism, nepotism, gossip, manipulation, and autocratic leadership. Constructive participation also requires a certain minimum of mutual trust, honesty, and concern for others. Agricultural programs require, in addition, that people know what increases in agricultural production are possible, how those increases can best be achieved, how to teach each other, and how to administer the necessary supporting services.

We do not expect a first-grader to begin learning arithmetic by tackling differential calculus. By the same token, we should not expect villagers to begin learning participation by running an agricultural development program.

Outsider* personnel, either foreign or national, may therefore be necessary to get the program started. The amount of outsider input, however, will vary from one group to another. Some groups of small farmers that have already learned to handle participation, either through previous work in development programs or by themselves, will need no outsider input at all. Others will need a good deal. In any case, programs should avoid providing any more outsider input than any specific group needs at any given time. And they must, forever and always, work toward the day when the villagers will no longer need any program input whatsoever.

*The word "outsider," as used in this book, includes anyone who is not a small farmer of the same area, tribe, language group and approximate educational level as the people toward whom the program is aimed.

2) **Early recognizable success is a crucial ingredient in making participation constructive.** Success can attract the highly concerned leaders that constructive participation requires. It can strengthen bonds of companionship between the workers and earn them positive feedback from their neighbors and friends. Success eliminates the pressure to deceitfully claim results that were never achieved. And success alone will overcome hopelessness and convince the people that they are capable of solving their own problems.

In the end, success is as crucial to making participation constructive as it was to creating the enthusiasm that motivated the participation in the first place.

3) **There must be conscious and constant efforts to help people learn how to participate constructively.** Both through short courses, when possible, and through constant attention to what the day-to-day experience in the program is teaching those involved, programs must make sure that small farmer participation is as constructive as possible.

How Can We Increase the Amount of Participation?

Despite those few organizations that avoid outside participation altogether, the problem in most programs is still that of too much outsider influence. As David Werner has written about Latin American health programs:

> *From country to country one hears identical motifs, e.g., "Primary decision making by the members of the community," "Response to the felt needs of the community,". . ."Priorities must be determined by the community itself." The idea behind these axioms are of course fundamental. But too often they are foreign to the communities they are aimed at. . . . If there were a little less rhetoric behind these slogans and a little more reality, the state of rural health care in Latin America might be far better off than it is today.*[7]

The problem in small, non-governmental programs has not been so much a lack of desire to increase small farmer participation as it has been a failure to realize how many aspects of program design must go into this participation. The major question is usually not *whether* to increase participation, but *how.*

The following list, by no means definitive, offers a few ideas as to how some programs have succeeded in increasing villager participation. The most important ideas are listed first.

1) **Create enthusiasm.** As noted above, the amount of constructive participation in a program depends on the amount of enthusiasm it can generate. Program salaries can bring about some participation, but they should never overshadow enthusiasm as the principal driving force behind a program.

2) **Start the program small and simple.** Undoubtedly the most common error affecting villager participation is that of organizing programs so large and complex that meaningful participation by the villagers is impossible. Once this error is committed, programs invariably take one of two courses of action. The first is that of outsiders running the program in perpetuity. Local representation may be set up, but the real "power behind the throne" remains in the hands of outsiders. The second alternative is to turn the program over to the villagers before they are at all capable of running it. The result, whether it be a Caribbean canning operation, a rabbit cooperative in Guatemala, or a fishing cooperative in India, is invariably the collapse of the work within a year or, perhaps even worse, the survival of the work through ever-deepening crises until the leaders finally give up in humiliation and exhaustion.

Programs must start absolutely as small and simple as possible while still being capable of producing recognizable successes early on. Expansion should come only as villagers become enthusiastic and capable enough to take over the jobs previously held by outsiders within the program. (See Chapter 6.)

3) **Be careful with the role of outsiders.** Outsiders, both nationals and expatriates, should be chosen for their willingness to live close to the people and their ability to establish friendships of mutual trust and candid two-way communication with the villagers. And they must understand and appreciate the village people's traditional knowledge and cultural strengths.

In their actions and ways of expressing themselves, outsiders must be careful that they leave the villagers room to

discuss, disagree, and be creative. In all too many ostensibly democratic programs, the ranking expatriate or professional is the *de facto* boss. Out of either respect, a belief in certain prerogatives of status, a feeling that foreigners or professionals always know better, or a reluctance to face disagreements in public, the villagers participate only marginally in the making of decisions.

This domination by outsiders can be so overwhelming as to long survive the physical presence of the outsiders. Two full years after one African program had been totally "Africanized," the size of each resident trainee's plot of land, the exact acreage to be planted in each crop, and the specific techniques to be used were all still dictated by rules laid down by whites. Albeit unconsciously, the whites had established a virtual tyranny of rules — of attitudes that "this is how development is done" — that no Africans cared or dared to question.

Outsiders must also remember that the "knight in shining armor" image runs counter to the villagers' feeling that the program is theirs. Most outsiders feel that they are involved in a difficult, uncomfortable, at times downright dangerous job. Often their only recompense is the appreciation they receive for having made these sacrifices. Nevertheless, all of us working in development must remember that our job is not to *become* heroes, but to *make* heroes out of the people with whom we are working. Some gratitude will always be forthcoming, but when things are as they should be, the people will mainly be thanking each other.

4) **Plan for the phase-out of outsiders and of the program itself.** One ever-present goal of all programs should be the eventual takeover by small farmer management. Thus, from the beginning, every activity should be organized in such a way that villagers will learn how to manage it and, if necessary, how to sustain it once the program closes down. We should keep in mind always that the purpose of each activity, apart from its own results, is that the villagers learn to handle it themselves.

The phase-out must be gradual. Villagers can, step by step, move from deciding when and where classes should be held to gathering people for the classes, to presenting the classes, to organizing a series of classes, and eventually to administering

the entire program. As a general rule, no outsider should hold any particular job for more than two to four years.

As small farmers take over the program, some mistakes will be made. However, outsiders must have the humility to recognize that they themselves made an occasional mistake, and that some of the villagers' methods will, in fact, represent improvements on the outsiders' methods. Furthermore, mistakes can be valuable. As long as they are not so frequent or so major that they drastically reduce the program's total enthusiasm or faith in local leadership, they can serve as unforgettable lessons.

5) **Teach farmers to conduct small-scale trials.** Only when small farmers know how to experiment with new technology will they achieve maximum possible independence of outside sources of information and be able to participate in the development of the steadily changing technology required by a productive agriculture. (See Chapter 10.)

6) **Build a leadership pyramid.** The effective participation of an ever-increasing number of villagers in a program can best be achieved by building a leadership pyramid such as that to be described in Chapter 14.

7) **Don't flaunt the moneybags.** Programs that inform the villagers early on that, say, $100,000 are available for the program will confront a good number of problems. Such sums, astronomical by village standards, tend to attract those villagers interested in graft. They can also produce considerable pressures for everyone to receive inflated salaries. Costs are thereby inflated and voluntarism reduced or eliminated. High salaries and the absence of voluntarism complicate employee selection because of the difficulty of distinguishing between those people genuinely concerned about others and those merely concerned about landing a high-paying job. High salaries and low voluntarism reinforce also the feeling that outside money, not the people's own efforts, has made the program successful. Thus, the growth of pride and enthusiasm is stunted. And very likely, when the money is spent, the work will come to a screeching halt.

As villagers work their way up into program management, they obviously must learn about the budget and increasingly decide how it will be used. Nevertheless, their knowledge and

control over the budget, like their participation in general, should not come all at once, but increase gradually over time.

8) **Don't try to meet all of the people's needs.** At the outset, programs normally have to expend a good deal of effort to motivate people to try out recommended innovations. In time, however, well-designed programs will have people from an ever-widening area knocking at their doors. Such programs face two alternatives: to decline, at least temporarily, to meet all the demand or to expand rapidly enough to meet it.

Experience indicates that the first alternative is preferable. Refusing to *do things for* people may, at first, seem hard-hearted, but refusing to *give things away to* people sometimes seems hard-hearted, too.

The benefits of refusing to answer every call for help are illustrated by the experience of a World Neighbors program in Guatemala. Swamped with requests for help, the program decided to work only in those villages from which a group of at least fifteen farmers requested classes. Thus, by the time the program began working in a village, its leaders had convinced a number of farmers that they needed agricultural classes; the farmers had organized themselves into a group; and the group had committed itself to attending weekly classes. In the process, community leaders had become committed to the classes' success. Groups of people had thereby begun to generate, by themselves, the motivation and organization essential to agricultural improvement. Once again, the program had not *done for* them what they could do for themselves.

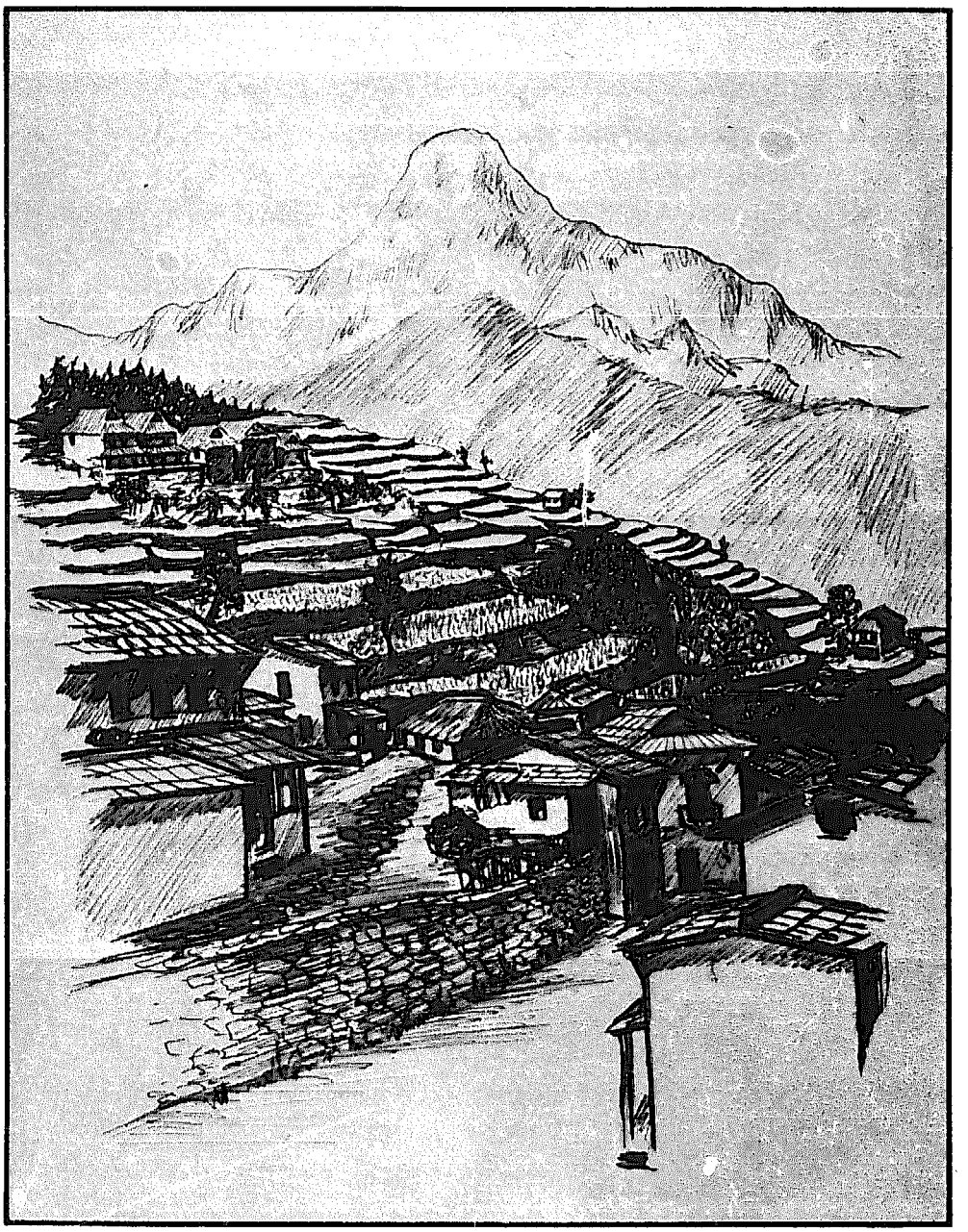
Of course, programs should be careful to avoid letting the people battle unsuccessfully with a problem for so long that they become frustrated, cynical, or resentful (i.e., that lack of success erodes their enthusiasm).

The second alternative, that of expanding the program to meet the growing demand, may force the program to become large and complex all too quickly. Takeover by small farmers will become improbable, if not impossible. And the inefficiency caused by trying to do everything at once, so widely observed among the better-motivated programs, becomes almost inevitable.

9) **Remain constantly aware of the level of villager participation.** We must ask ourselves every few weeks: How many villagers were in the last planning meeting? How much did they say the last time there was a discussion? How many of the last five program decisions were made in ways originally suggested by villagers? How many villagers participated in solving the program's latest emergency situation?

All the above rules of thumb are, of course, easier to formulate than to follow. How small and simple should a program be? How soon should local leaders take over program administration? How soon should village leaders participate in budget planning? No prescriptions can be given. Resolving these questions amid the dust and fury of each unique program is part of the art of agricultural improvement; it will take understanding, sensitivity, good judgement, and generous amounts of feedback from the villages.

In summary, neither giving things to people nor doing things for people will be of much long-term benefit, and both may have serious negative side effects. Development is basically a process whereby people learn to participate constructively in the solving of their own problems. The driving force behind this participation is enthusiasm; the direction in which the people must move is toward gradually increasing participation; and the goal is that the program itself gradually be lost in, and replaced by, a totally participatory movement of the people, by the people, and eminently for the people.



We must work in areas where we have the greatest opportunity of substantially improving the poor people's situation.

4 THE PROGRAM AREA

CHOOSING THE AREA

If small programs are to be of maximum value to the poor and hungry, they must be located where definite *need* intersects with realistic *opportunity for improvement.*

Need

Improving the lot of the very poorest people is a goal of most agricultural programs. These people are, after all, the ones who are hungry and downtrodden, who suffer from malnutrition, illiteracy, ill health, and powerlessness.

For programs with goals of social justice, equality, or empowerment, it is obvious that to achieve these goals, they must work directly with the poorest. These programs do generally recognize that they should work with the poorest, even though many fail to do so in practice. Some programs, however, are interested only in improving the poor people's economic condition. Such programs may harbor some doubts as to whether to work with the more innovative, better-educated medium-size landholders of, say, ten to twenty-five hectares, or to focus on the very poorest farmers — the smallest landholders and the landless.

The argument for working with the medium-size landholders maintains that since world hunger is reaching epi-

demic proportions, the world's food supply must be increased with all due haste. Since medium-size farmers are generally more innovative, more credit-worthy, better educated, and better capitalized, they can increase their production more rapidly. Furthermore, the increases made by each farmer will be made over larger expanses of land. Therefore, the argument goes, if programs work with medium-size farmers, their cost-benefit ratios (i.e., cost per unit of increase in production) will be better and the world's food supply will increase more rapidly.

Nevertheless, the claim that the cost-benefit ratio will be better for those working with medium-size farmers is far from certain. Experience does show that in a very few cases, dramatic, cost-efficient increases in production have been achieved by programs aimed at larger farm units.[1] But experience is also revealing to us a number of previously unsuspected sources of major efficiencies in working with small farmers.

First of all, recent research has made some very promising breakthroughs in multiple cropping and intercropping that may make hand cultivation in the tropics more productive than we had ever dreamed. Secondly, although larger farmers *can* increase their harvests more easily, the real question is, *will* they? Small farmers depend on their harvests for the very food they eat. They, therefore, have more motivation to increase their yields than do larger farmers. They also invest more labor per acre in their land. These labor resources often complement new technology, making it even more productive. Evidence of the small farmers' higher motivation and labor inputs can be seen in the well-established fact that farmers owning two acres or less produce more food per acre than any others.[2] Thirdly, experience indicates that small farmers can be encouraged more often than larger ones to voluntarily teach new innovations to their neighbors, thereby doubling or tripling a program's impact at a minimum of expense.[3]

Nevertheless, the key fallacy in the cost-benefit argument is that the "benefit" may not even be the one we want. The idea that additional food produced by the already well-fed is going to somehow end up on the poorest people's tables is based on a misconception about the causes of hunger. Hunger is not

caused by regional shortages in food supplies or the inability to transport food to where it is needed. Even during the worst of the Sahelian drought, peanuts were being exported from the Sahel to Europe. I have lived and travelled for years among the world's hungriest people, yet I have never had to go without food myself. With only rare, short-term exceptions, food is universally available for those with the money to buy it. Increased food production by the already prosperous will go to industry and to those who can pay the going price for it (and to their cattle, chickens, and household pets), while the unproductive poor will continue to go without.*

Some people argue that the increased production of the medium-size farmers will not so much bring the poor people more food as it will bring the medium-size farmers more prosperity, which will eventually filter down to the masses. But even in theory, the "trickle down" of prosperity is a doubtful proposition in the Third World.[4] Increased wealth among the better-off can even cause wealth to flow *upward*, through such mechanisms as excessive or corrupt usury, the increasing control of undemocratic or corrupt political systems, and the increasing control of scarce land or water resources. In actual fact, prosperity just does not trickle down. While Third World nations have experienced relatively rapid economic growth during the last decade, the poor have, if anything, become poorer. A GNP produced by the prosperous will more than likely be consumed by the prosperous.

Another frequently-used argument for aiming at the medium-scale farmers is that agricultural programs must seek out the farmers who are most innovative, and that these "innovators" are generally medium-size farmers. However, 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.

Even more important, the experience of the Green Revolution and of many good-quality programs indicates that the lack of acceptance of new technology, even among the very poorest, is more often due to the inappropriateness of a

*This, of course, may not be true for some socialist or communist nations where food prices are regulated.

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.

In summary, then, all the arguments for aiming our work at medium-size farmers are based on one of three propositions — either that a) small farmers will resist innovation, b) the wealth created by medium-size farmers will filter down to the poor, or c) the increased production of the prosperous will somehow feed those too poor to buy it. All three propositions are very likely false. *If we are to help the poor, we must help the poor directly.*

Working with the very poorest has advantages of its own. Hand cultivation can generally be less wasteful and more careful of delicate environments than can machine cultivation. Furthermore, extreme inequality can cause tremendous ecological problems. Small farmers may be forced to cultivate steep hillsides year after year while large landowners let flatlands lie unused. Large farmers with a surplus of land can let unprotected hillsides sit idle and erode away, or can "mine" the soil's nutrients by continual careless plantings and then abandon the land when it no longer produces. On the other hand, poor farmers are often tenants or day-laborers who have neither an emotional attachment to nor long-term economic interest in the land they are farming. Tenants, in particular, tend to maximize their short-term profits at the expense of the land's long-term fertility. As a result, tenant farming is probably one of the world's major causes of soil depletion and erosion.

Furthermore, many people are becoming increasingly convinced that dramatic inequalities may actually preclude rapid economic growth because of their negative effects on social and political stability, the work capacity and productivity of laborers, and population growth rates.[5]

It is just as important to work with those of greatest need *within* an area as it is to work in an area of great need. Yet while choosing an area of need is a one-time decision, orienting our work toward the poorest within a chosen area requires a constant effort and will likely affect every aspect of the

program. How to reach the poorest people most effectively will, therefore, be a major theme of this book.

Opportunity for Improvement

We cannot work with all of the poor. Therefore, we must work in those areas where we have the greatest opportunity of substantially and inexpensively improving the poor people's situation.

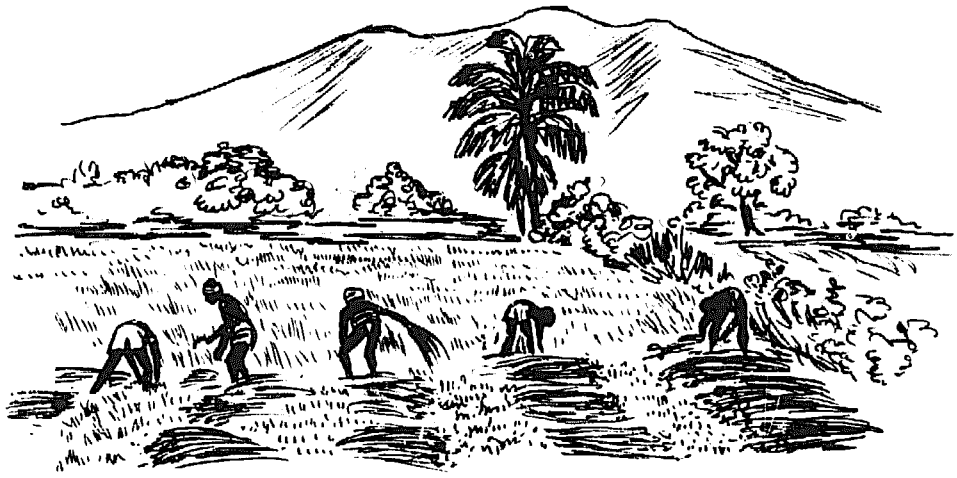
Opportunity is greatest in those areas enjoying certain "pre-conditions of development" which are similar to the essentials and accelerators listed in Arthur T. Mosher's well-known *Getting Agriculture Moving.*[6] For small programs, these essentials and accelerators will differ somewhat from those Mosher describes.

Essentials

1. **A technology** must be available that can respond to the people's felt needs with adequate recognizable successes. This technology can only be considered trustworthy after local villagers have tried it out on their own farms. The sources and criteria for such technologies are discussed in Chapters 8 and 9.
2. **The necessary supplies and equipment** for applying this technology must be obtainable. If they are not available locally, it must be possible for local people to establish, before the program ends, permanent, economically feasible ways of bringing them into the area. Normally, this means that the supplies must be plentiful, inexpensive, and reliably available somewhere within the country.
3. **Local markets** must be able to absorb the expected increases in production at satisfactory, sufficiently stable prices. Although hungry people will themselves consume their first increases in production, later increases will have to be sold. In some cases, the program itself may have to work in some aspect of marketing, such as transportation, storage, processing, or the breaking up of a marketing monopoly. If so, it must make sure that such efforts can succeed at a reasonable cost and in ways the people can carry on after the program ends. (See Chapter 13)
4. The village people must **desire to improve** their

agriculture. Increasingly, the poor throughout the Third World are wanting, if not demanding, economic improvement. As one Latin American president remarked, people who thirty years ago wanted nothing more than a church bell are now clamoring for roads, schools, health centers, and potable water. And certainly the hungry want full stomachs. The oft-mentioned "revolution of rising expectations" has spread to the world's most isolated villages.

Nevertheless, there still are people who do not want change. Sometimes they resist it because they do not know of the possiblities for change that exist. They may, for instance, think that it is only natural for adults to get sick every month or so and for half their children to die before their fifth birthday. They may not know about the advantages of roads, bicycles, or modern medicines. In other cases, they may believe agricultural improvement is either useless or beyond their means because of the inappropriateness of the technology they have seen. In such cases, education as to the feasibility and benefits of controlling disease, eliminating malnutrition, or improving transportation or agriculture may convince them that higher agricultural incomes are worth both the effort and the cultural change that may be required of them.



On the other hand, there are cultures in which the people, well informed of the alternatives, prefer to hold on to their

traditional life-styles. In such cases, we must remember that the desirability of economic development, especially in the Western consumerist sense, is based on a set of values that is neither universally held nor innately superior to many others. For us to entice the people of a different culture into economic "development" may be neither culturally wise nor ethically justifiable.

5. There must be **transportation** for bringing the necessary supplies and equipment into the villages and for getting out the increased production. Without transportation, production beyond subsistence is useless. If the cost of transportation is very high, the farmers' outlays for supplies and marketing will leave them little incentive to increase production. In those cases where a program will need to improve local transport (e.g., building roads or giving loans for launches), the cost of this added effort should enter into the decision about where to work.

Accelerators

1. **The willingness and ability of local people to cooperate and work together** is so important that it could be included among the essentials. Most of us recognize that permanent solutions to most marketing, credit, and political problems require that the people become organized. Nevertheless, even agricultural improvement, if it is to long outlive the program, depends on organization, though perhaps of a very simple kind.

2. Closely allied to the willingness to work together is **the willingness to work voluntarily for the common good.** The Third World is dotted with cooperatives that fell apart, projects that were never terminated, learning and leadership qualities that were never put to use, and organizations that split into factions because no one was willing to put himself out for the common good. Agricultural improvement will have a chance of lasting beyond the life of the program only if farmers are willing to work for the benefit of each other. The willingness to work for the common good, like the willingness to work together, can be greatly enhanced by a good agricultural program, but its existence in the area before the

program starts represents a tremendous advantage.

3. A whole series of **attitudes** will also help accelerate agricultural improvement. Among these would be honesty, reliability, trust in the goodwill of others (especially of those running the program), faith in development and its long-term possibilities, inquisitiveness, a feeling of neither inferiority nor superiority to outsiders, and the willingness to work hard when necessary. These attitudes, important in the general populace, are crucial among the potential leaders.

4. The poorest farmers in the area should have as much **security over their land** as possible. With creativity, even landholdings of half a hectare or less can often produce enough to start a family toward self-sufficiency. But for those who own no land at all, individually or communally, agricultural improvement becomes extremely complex indeed. One must remember that neither share- nor cash-tenants have any incentive to improve their land unless they can obtain reliable long-term leases. Furthermore, any widespread increases in tenants' farm income will eventually be siphoned away from them through higher rents.

Nevertheless, we must work with the very poorest, and often the poorest are those with the least security over their land. Numerous, though difficult, possibilities do exist. The most workable approach will depend on several variables, including the availability and price of land for sale or rent, the nature of rent payments (e.g., cash, harvest), the intensity of land use by the large owners, the nature of the power relationships between renters and owners, and the alternatives for creating employment. Labor intensive practices introduced among neighboring small farmers can provide employment for the landless if we assure that the labor needs come at the right time of year. Land can be bought for the landless, but buying land is an expensive, time-consuming process. Cottage industries can provide employment, but we must not underestimate the difficulties of organizing the landless, finding markets, and teaching the people how to manage a business. Villagers can organize to push for land reform, but history tells us that in too many cases land reform has come only at the terrible expense of considerable bloodshed.

Tremendous difficulties accompany trying to work with

the landless. Nevertheless, in many places we must. In the meantime, these difficulties underscore the critical importance of nationwide land reforms.

5. Another accelerator is **the presence of local institutions or of other good programs,** governmental or private, whose work would complement our own. Government programs, for instance, may be giving land to the landless, offering credit to small farmers, or guaranteeing the prices of certain agricultural products. Indigenous institutions or private development agencies may already have provided opportunities for constructive participation or may have created networks for disseminating information among the villagers. Reasonable proximity to other successful agricultural programs provides opportunities for educational field trips. On the other hand, poor-quality programs may have engendered dependency and paternalism in the people or ruined the credibility of outsiders. Some programs may compete with or duplicate, rather than complement, our own work. And, of course, a competent program already meeting the felt needs of the area could make the presence of our own program superfluous.

Literacy might be listed as another accelerator, but if at least 20% of the adults can read and write, an agricultural program can function quite well. Searching out areas with higher literacy rates will tend to steer our work toward more prosperous farmers.

If the program plans to serve as a pilot project, the program area should be relatively homogeneous with as large a surrounding area as possible.

We can accomplish the most for those who most need it where definite need exists along with these essentials and accelerators.

FINDING OUT ABOUT THE AREA

Development literature is full of cases in which programs either failed or produced untoward results because of a lack of knowledge about the program area. In Afghanistan, a program failed to convince farmers to castrate their bulls even though the farmers knew it would make their animals easier to

handle. The problem was that the castration of younger animals would also inhibit growth of the hump on which the animals' yokes rested. Had program leaders been aware of the problem, they might have saved the project simply by introducing a different yoke.[7] Production of pyrethrum in Kenya actually dropped because of a major effort designed to boost production by organizing village men into marketing co-ops. Project organizers simply had not realized that village women, who grew most of the crop, would cut production once their profits were diverted to the men's cooperatives. And in Bolivia, one program introduced a very productive variety of corn that, being hard to grind, was best suited for making bootleg alcohol — a fact that escaped the attention of the program leaders, but not of the villagers.[8]

Agricultural improvement is an extremely complex undertaking. Hundreds of things can go wrong, and they often do. The only way to avoid many of these problems is to *know the area well* before the program begins and to continue to learn about it during the program's tenure.

The following is a list of the information about an area that a program may need to have before it can work there effectively. It includes more data than any one program would probably need, but could serve as a comprehensive checklist for most programs.

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What to Find Out About the Area

I. HUMAN.

Economic: (a) Income: What are the sources and levels of income (including foods produced for self-consumption)? How many people are in each income and occupational bracket? How much grain does a family consume each year? (b) People: Who are the poorest people? Where do they live? How can they be identified? What are their special characteristics or needs? How do people save, spend, or invest their incomes and why? (c) Miscellaneous: What are the needs, sources, supply and problems of small-farmer credit? At what interest rates is it given and with what guarantees of repayment? Who in the family makes economic decisions? Who makes the decisions about agriculture? What is the division of labor between men, women, and children? What are the economic interests in the villages, including forms of exploitation and possible conflicts? What

are the economic pressures from outside the area? What are the customs regarding inheritance? Are the people hardworking and do they work well in groups? Do they like and respect agricultural work? Do they feel their economic situation is generally getting better or worse? Why?

Social: How are the families structured? What are the marital patterns, kin group patterns, the number of children? What are the mutual obligations and power relationships within the family? What are the tribes, language groups, castes, social classes, organizations, committees for development and factions within the community? Who are the members of these groups and where do they live? What are the barriers, conflicts, or degree of cooperation between them? What is the general level of community spirit and identification? Who are the community leaders and why? What do they do? What are their prerogatives, relative respect within the community, relative influence? What are their sources of influence? What kind of leaders are they? Are they willing to do volunteer work for their communities? What is their history? What kind of personal relationships exist in the area? What kind of people do the villagers like and respect? What are the obligations of a friend? What causes friends to quarrel? How do friends express disapproval or criticism? What is the population and its distribution and why? Are there seasonal migrations? Where, when, and why? Who is involved and why?

Political: (a) The national government: What are the national government's policies and priorities, its agricultural policies, programs, and aims? What is its policy toward private agricultural programs? Who are its local representatives, where do they live, and what are their responsibilities and power bases? What do people think of them? Why? Whom are they working with, and what are they doing? Does the government favor or oppose the development and organization of the poor? What are the political structures, the political factions and parties within the country? What are the probable political developments in the future? (b) Local governments: What are the local political structures and policies, decision-making processes, and political conflicts and loyalties? What is the area's political history? What are the pressures from outside the area, and what has happened when these pressures were opposed? To what extent is there political liberty? What are local attitudes and feelings about authority and government? What do the people know about local or national politics?

Educational: Where are the schools, how many grades do they include, and how large are they? Is there discrimination in the schools? What is the educational level of adults, their rate of literacy

— especially that of the leaders? How do the people feel about education? Do they know about such things as potential yields of crops, potential freedom from disease, the nature of malnutrition, the basics of supply and demand? Do they know enough arithmetic to add, multiply, or divide? Can they or do they keep farm records?

Health: What do people eat? What is their nutritional state? Do they have enough food the year round to avoid hunger? Which people in the community and the family receive the most and the best food? What diseases are prevalent and what are their causes (e.g., sanitation, malnutrition)?

Religious: What are the groups and their beliefs, taboos, values, and superstitions? Who belongs to each group and what are the relationships between them? How does their religion affect their daily lives or their agriculture?

Other development programs: What other programs have been or soon will be working in the area? What have they done? What do they plan to do? What are their philosophies of development? What are the people's attitudes about them and why? What have been these programs' successes or failures and the people's reactions to them? What are these programs' feelings about the arrival of another program and why? What are the possibilities of cooperation?

Values and attitudes: What are the attitudes about innovation and pluralism within the village, about development in general and why? Do villagers desire change? Do they want their children to live differently? Have they followed the advice of previous programs? What are their attitudes toward outsiders, toward experimentation with new ideas? Are they experimenting with new techniques? Which ones? Why? Who is experimenting? What experiments failed? Why? What changes have they made in the last ten years? Why? Have the changes lasted? Why? Have they heard of the program? Do they want it? Why or why not? What do they really think it will do? Who do they think will run it? How do they feel it could be improved? What are their preferences in extension methods, program location, or program leaders? What are their priorities in life? What is the importance of the profit motive? What are their feelings about competition and individualism, about working together, and about their own value as human beings? Do they feel confident in their own abilities? Do they have a sense of cultural identity?

Other cultural traits: What are their most important felt needs? Is there widespread agreement on these? How are differences of opinion or conflicts dealt with? How do they feel about being interviewed? What questions are they not likely to answer honestly or to not want to answer at all? What are their norms of modesty? Is thievery a problem? Is it a problem with certain crops more than

others? What are the general levels of honesty, reliability, and voluntarism?

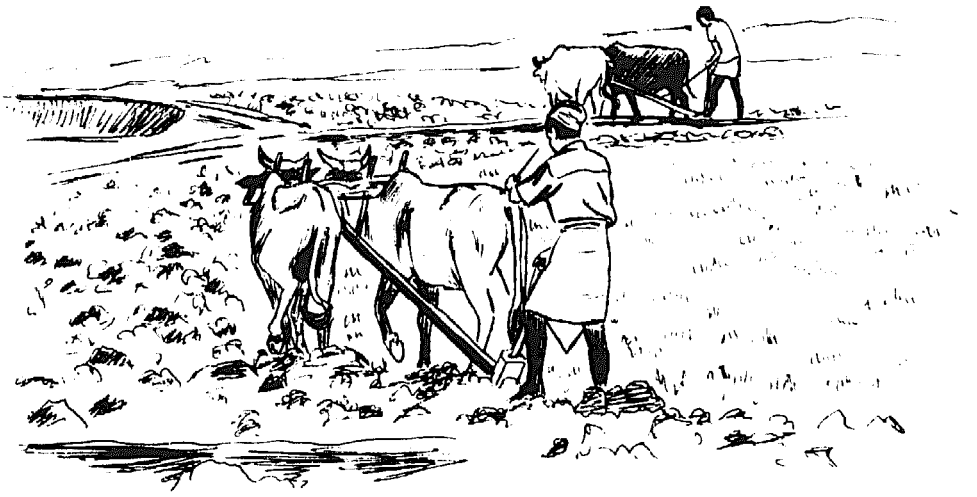
II PHYSICAL:

The Area: What is the area in which the program will work, its size, topography, water resources, animal life, natural cover, and climate? What is the quality of local soils, the care given to them? What do people need from the environment? In what quantities are these things available and will they be in the foreseeable future?

Resources: What are the resource bottlenecks? What resources are cheap or abundant? What are the ecological dangers? Is the area agriculturally homogeneous with large areas of the nation? Is the program area homogeneous within itself?

III AGRICULTURAL:

Farm size: What are the sizes of farms and the number and distribution of the different sizes? Who owns and who works them? What are the tenancy and rental relationships, their conditions and obligations, and the methods of enforcing them? What is the price of land and the nature of the market for land? What are the cropping patterns of each size farm? Are there feasible opportunities for expansion into unfarmed areas?



Crops: What crops are produced? What is their regional distribution? What practices are used in the major crops and why? What varieties are used and why? What pests and diseases exist and

how are they controlled? What is the source of seed and method of seed storage? What is the reliability of seed sources and the quality of seed? Is there irrigation? Where? Are there unused water sources? Why? Is fertilizer used? If so, what kinds? What are the harvests and how do they vary throughout the area? Why? Do the people use a crop rotation? What are their storage methods and problems, and the amount of loss in storage? What qualities, such as taste, texture, large leaves for forage or wrappings, do villagers expect from their traditional crops? Which crops are cash crops? What are the relative actual and potential earnings of the various crops planted and potential new crops?

Animals: What species and breeds of animals are raised? What is their regional distribution? What quantities are owned by the poorest farmers? What housing are they given? What are they fed? What pests, diseases, and poisonous plants exist and how are they or can they be controlled? How fast and how large do the animals grow? Which products are used by the family and which are sold? What quantities of these are produced per animal and per hectare (or other limiting resource)? What are the relative actual and potential earnings of different animals?

Markets: Where are they? How do they operate? When are they open? Who runs them? Are they free or controlled, and by whom? Is there a black market? Are co-ops involved in marketing? What transport is realistically available to small farmers? How passable are the roads or rivers in each season? What processing is done and at what price? Are the people satisfied with the markets? Are local stores well-stocked, and with what? What do the people buy and sell most? What are the marketing bottlenecks or monopolies? Have there been recent changes? Is marketing information available?

Miscellaneous: What are the limiting factors in the local agricultural production system? What do the people see as the major problem and the possible solutions to these problems? What are the labor problems, levels of unemployment, peak labor periods? What tools are used, and what provision is there for local repair? What agricultural inputs are needed? What is their availability, reliability, and quality? Are there possible new sources? What diversity is there in agricultural practices? What are the possibilities for innovations? What is their value according to the criteria in Chapter 8? What information and training resources exist? What are the religious and cultural connotations of the different crops and animals?

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How to Collect the Information

A variety of methods can be used to collect needed information. Rather than relying on any one or two methods, a program should use as many as are feasible, economically and administratively.

Reading and observation. These will probably be the first methods used, especially if the program must choose between a large number of possible locations. Maps, histories, registration and census data, and anthropological ethnographies should be read whenever available. Often local institutions, such as cooperatives, marketing organizations, mills, government organizations, or health posts will have important records or reports.

Observation of the area, often underutilized and underestimated, can provide indispensable knowledge. A World Neighbors — Oxfam program in San José Poaquil, Guatemala, collected most of its baseline data by having local leaders merely walk through their villages to observe how many families had dug soil conservation ditches, pruned their fruit trees, built latrines, or used an improved system of planting beans. Even the less experienced eye can pick up such factors as the kinds of crops and animals raised, methods and intensity of cultivation, tools used, topography, water resources, and transportation and marketing facilities.

Those with more experience can collect a good deal more information. For example, subtle changes in natural vegetation, leaf color, or soil color may signal changes in climate or in the pH, depth, drainage, or nutrient content of the soil. Weed growth in the fields, attempts to control soil erosion, and the amount of fallowing can give clues as to land tenure patterns and labor demand. Diversity of housing or traditional dress will often signal socioeconomic or cultural divisions within the community. And diversity of crops or animals may indicate openness to or previous success with innovation.

Conversation, open-ended interviews and formal surveys. Although program leaders needing information usually think first of formal surveys, these should generally be used as a last resort. Open-ended interviews and casual conversation can

usually provide much more valuable information, cause less suspicion, get more accurate answers, generate less resistance, and cost the program less money. We should, of course, interview women, children, and personnel of other development programs as well as village men.

The major use of formal surveys would be in program evaluation, through the collecting of baseline data and later comparative data. (See Chapter 13.) Other uses can include gathering baseline data for program monitoring and helping villagers become more aware of the area's problems. For instance, after having conducted a major survey for a program in San Francisco Gotera, El Salvador, village leaders used flipcharts and sociodramas to present the results to their neighbors. The presentations not only dispelled suspicions about the survey, but generated a good deal of enthusiasm for improving the conditions the survey had revealed. As in the above case, a number of programs have trained small farmers to largely design and carry out formal surveys.

Meetings. Meetings have advantages over conversations in that they save time and allow people to bounce ideas off each other and discuss disagreements. Nevertheless, in many cultures, people are not accustomed to participating freely in meetings. Even when they are, they often hold back information that reflects negatively on themselves or others. They also tend to withhold opinions that do not agree with those of other villagers, especially when these villagers hold positions of authority or power.

After the program has been established, new and better means can be used to get to know the area:

Constant feedback from the villages. Probably no amount of professional information-gathering in Afghanistan would have ever made the connection between castration and the shape of an ox yoke. Nor is it likely that any multidisciplinary team of development specialists would have predicted that the corn varieties introduced into Bolivia would be used for making bootleg alcohol. Nevertheless, Afghan farmers could easily have told program leaders why they refused to castrate their animals, and Bolivian farmers knew soon after the first harvest of the new corn that a lot of it would be going into whiskey.

We professionals must quit thinking we can constantly second-guess the people. The incredible array of problems that arise in programs of agricultural improvement will not, by and large, be avoided through increasingly sophisticated, complex, and expensive multidisciplinary analyses. Rather, we can most easily and frequently avoid them by maintaining a system of honest and continuing two-way communication between the people and the program. Constant feedback from the villages is an absolute necessity: precious few programs have enough. (See Chapter 5.)

Living among the villagers. Another extremely important way for outsider personnel to learn about the program area is to live among the villagers. The closer program leaders come to living as the villagers do — the more we can leave behind our cities, towns, embassy crowds, and missionary compounds — the better our work will be.[9] It is only when we have spent all day stooped over while transplanting rice in flooded paddies, when we have raced out into the family courtyard to rescue drying millet from a sudden rain, when we have survived for days on nothing but boiled field corn, and when we have fallen in love with the villagers' enchanting children, that we can come to speak with the villagers' vocabulary, understand their priorities, and fathom their feelings and wants. And it is only then that they will truly come to trust us.

Having villagers as program leaders. Of course, program leaders will most intimately know the area when local villagers are the leaders. As village leaders gradually move into decision-making positions, the program will be less and less likely to make errors based on a lack of knowledge about the area.

Only plans that have flexibility leave room for increasing community participation.

5 PLANNING

At times, the staggering urgency and complexity of poor people's problems overwhelm us. We yearn to attack all their problems at once, and at full throttle — to climb on our horses every morning and ride off in all directions. But the villagers will only be able and willing to work on a few problems at a time, and at their own pace. Thus, precisely because the need is so great and the resources so limited, we must decide which problems are of highest priority and attack them with maximum efficiency. To do so, we will have to back up our good intentions with sound program planning.

Flexibility

Good planning for agricultural improvement differs from most management planning in two very important ways. First of all, it must be highly flexible. As Development Alternatives, Inc., concluded after a worldwide study of agricultural programs "Few projects can survive a rigid blueprint.... Most projects scoring high on success experienced at least one major revision after the project determined that the original plan was not working. This flexibility is critical."[1]

The need for flexibility is understandable. The best approach for any particular agricultural program to take depends on a multitude of constantly changing variables, including the availability of appropriate technology, the

incidence of insects or disease, market prices and demand, the availability of inputs, access to means of transportation, the people's attitudes toward the program, and the levels of enthusiasm and technical understanding of program personnel and trainees. Unexpected changes in any of these variables may force the program to make major changes in its approach. Furthermore, even if all these conditions were stable, agricultural development is complex enough that any good program will be constantly discovering new and better approaches to use.

Still, the most important reason for maintaining flexibility in planning is to make room for the second special characteristic of good development planning: villager participation.

Villager participation

In the early stages of a program, the villagers' ability to participate constructively in planning may be limited. They can provide knowledge of local conditions, judge the cultural acceptability of different strategies, and help decide when certain activities should be carried out. But this may be about all they can do. Why? One reason is that villagers will probably have little idea as to how a program is best organized or how to communicate new ideas to others. They may also have little understanding of the basic biological and economic causes of their agricultural programs, and even less of an understanding of the nature, inherent difficulties, or potential results of the possible solutions. Ten years ago, some of the farmers attending an extensionists' classes in Guatemala quit going because he told the group that by improving their soils they could harvest up to 3,000 Kilograms per Hectare. Since none of them had ever seen corn produce more than 1,700 kilos, they thought he was crazy. Today, many of those same farmers harvest over 4,500 kilos per hectare.

As villagers gain experience in the program, however, they become increasingly able to participate in planning. In fact, by the third or fourth year, they should be capable of doing the planning entirely by themselves.

If, however, a program's plans are poured in concrete before the people are able to become involved, no room will be

left for their participation. Either they will do no planning at all, or what planning they do will be mere window-dressing — an arranging of details. Only plans that have substantial flexibility will leave room for increasing villager participation.

The reasons for local participation in planning are numerous. First of all, enthusiasm, the driving force behind development, will be greatly enhanced if the people feel that the program is theirs — that they have meaningfully participated in its planning and formation. Secondly, to the extent that villagers have contributed to program decisions, they will feel committed to making the program a success. After all, no one wants to see his own ideas proved wrong. Thirdly, villager participation will help combat suspicions about the program and help villagers appreciate the complexity of a development program's job. One villager who by chance sat through a planning meeting later told me, "If I had realized how difficult it was for the program to do a good job, I would have supported it more energetically." Fourthly, planning a $20,000-a-year program can bring a tremendous sense of confidence and self-esteem to people who have never handled more than a few dollars. Fifthly, villagers must participate in program planning because they, more than anyone else, know the conditions in their villages and the feelings and desires of those who live there. We must blow the whistle on the myth that "educated" people have all the answers. Any program not using the people's knowledge in its planning is, to some extent, flying blind.

Most importantly, however, we must remember that the primary goal of our programs should not be that of merely increasing production, but rather that of teaching the people to carry on the process of improving their own agriculture. Only by participating in the planning will the people ever learn to carry on that process by themselves.

Yet, in spite of the tremendous importance of villagers' being involved in program planning, they seldom are, even in programs deeply interested in empowerment. All too often either the planning is done in the capital city, the time is too short to call together the villagers, or the program leaders become so excited about some new approach that they assume it will equally excite the villagers. The people's subsequent lack

of enthusiasm or support for irrelevant or ill-planned programs is then attributed to their supposed conservatism, traditionalism, or even obstructionism.

THE STAGES OF PROGRAM PLANNING

The planning process consists of five basic stages:

1. Gathering information
2. Establishing goals and objectives
3. Developing a work plan
4. Preparing the budget
5. Monitoring

In practice, these are not distinct successive stages. Planning inevitably moves in a series of loops and digressions, with two or three stages often proceeding simultaneously. For example, monitoring may suggest a new work plan or the need to gather more information, while budgetary limitations may necessitate a lowering of objectives or the adoption of a less expensive work plan. Nevertheless, the above steps will be discussed in the order listed.

Gathering information

This step was discussed in Chapter 4. Nevertheless, we should remember that information gathering is not a one-shot process. A good program continues to gather information about the area it is working in throughout the life of the program.

Establishing goals and objectives

Although agreement is not universal, a consensus is developing as to the specific meanings of the words "goals" and "objectives." The word "goals" refers to the broad, overall aims of a program, the general solutions to the problems addressed. Goals are idealistic, long-range, and sometimes unquantifiable.

Whereas the goals describe the destination — the hoped-for end of the road— objectives point out the milestones along the way. Objectives are specific, short-term results seen as intermediate steps in reaching the goals. They are practical,

concrete, and specific. Objectives must be expressed in clear, precise language, and must state exactly what and how much will be accomplished by what date. And they must be measurable. Whereas a program *goal* might be to raise villager incomes, one of the *objectives* in reaching that goal could be to introduce animal traction to 500 villager farmers so that within three years they are cultivating double the previous land area with the same net income per hectare.

All too often objectives are stated in terms of what the program plans to do (e.g., give twenty-five villagers a two-week course in improved pasture production) or what it hopes the villagers will do (e.g., twenty-five villagers will plant 0.1 Ha. or more of improved pasture). These are preferably referred to not as objectives but as, respectively, "program activities" and "farmer activities." When a program uses these activities as objectives, it is assuming that these activities will lead to benefits for the villagers. But this assumption frequently proves false. Thousands upon thousands of villagers have received classes on pasture improvement without having planted a square meter of new pasture. Even when they do plant better pastures, poor care or inadequate irrigation may cause the new species to die out, while poor pasture management could bloat and kill their animals. Objectives stated in terms of increased production may be misleading because higher costs may negate most of the advantage of the increases in production.

Objectives should be stated in terms of specific benefits to be reaped by the people. For example: by planting improved pastures, 500 farmers will, within two years, increase their milk production per hectare per day by 100% and their net incomes by 70%.

Program workers should, of course, remember that no amount of concrete results will be worth anything if farmers do not themselves become convinced of the innovations' value. Pressuring farmers in order to meet program objectives will never produce long-term results.

The first step in establishing goals and objectives is to choose which of the problems to work on. Then the program can decide on its long-term goals — that is, in what general way it will overcome these problems. And finally, it can formulate its shorter-term objectives.

Which method is used to make these decisions will depend largely on the sophistication of those doing the planning. In young programs among inexperienced villagers, the small farmers' participation may consist of little more than giving their opinions as to which of the problems are most important and judging the cultural acceptability of the potential solution. By the end of the first year, however, they can think back over what has been done, judge its value, and perhaps suggest a few changes. Looking at what has been accomplished and how much more or less might be done the following year can enable them to begin establishing their own annual objectives. By the end of the third or fourth year, local leaders should be able to carry out the entire process of establishing goals and objectives by themselves. This should happen even sooner in areas where villagers already have some experience with development work.

In a World Neighbors - Oxfam program in San José Poaquil, Guatemala, the program personnel, nearly all village men and women, used a simple methodology that could be adapted to many programs. First, they held a brainstorming session in which everyone tossed in all the ideas he or she had as to the area's problems. Brainstorming is merely a technique in which all suggestions or comments are accepted by the group with no criticism, objections, or commentaries. All the

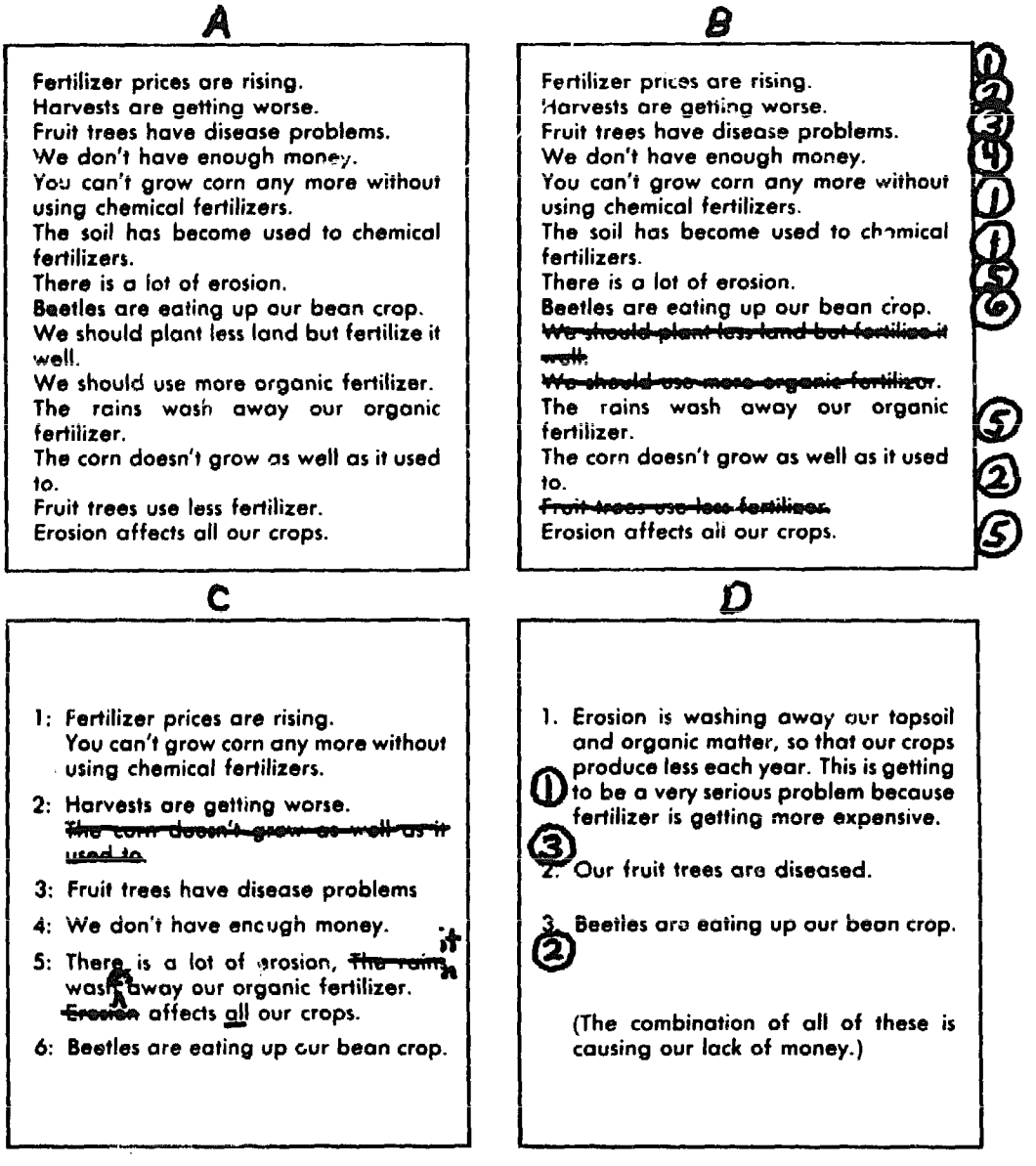


CHART NO. 1. To arrive at the most important problems in the area, villagers first brainstormed a list of problems. (list A) Next, they eliminated the comments that were not truly problems, and then grouped the remaining ideas (those dealing with fertilizer, then with lowered harvests, etc.) (list B) In list C, similar ideas were grouped together, repetitious points eliminated, and causal relationships analyzed. Finally, (list D) the resulting problems were assigned priorities. The same process can be used in establishing program objectives and in general problem solving.

ideas were written, exactly as expressed, on large sheets of newsprint taped to the walls so they could be seen by all and then stored for future reference or transcription. When some one hundred problems had been mentioned and no more were forthcoming, the contributions were analyzed: in simple steps taken one by one and recorded on the newsprint, the program personnel eliminated irrelevant comments, grouped together similar ideas, delineated causal relationships, and finally, assigned priorities to the various problems. In this manner, the program decided on the specific problems with which it would work. Then the program could set its goals.

Each year the process is repeated to set the program's objectives. In another brainstorming session the personnel propose possible solutions to the problems already selected. These are then analyzed and the various innovations rated according to the criteria to be presented in Chapter 8. Once the basic solutions are decided on, the personnel is ready to write its one- and three-year objectives.

After the first time they used this process, the Poaquil personnel suddenly realized that they would be working on solutions *they* had chosen to the problems *they* saw as most critical. Enthusiasm increased so markedly that two leaders who had been planning to leave the program decided to stay on for another couple of years.

Developing a work plan

The program work plan tells specifically what activities must be carried out, when, and by whom. To develop the plan, the program must decide what activities (including administration, monitoring, and long-term planning) need to be performed to reach each one of its objectives. The plan will then include a list of these activities with a time-frame and allocation of responsibility for each one. Finished plans are often written up as GANT charts (see Chart No.2.)

Most of the planning of day-to-day activities is best left for regular planning meetings. Many programs have found that holding weekly or bimonthly planning meetings of all the personnel works very well. These sessions are used to plan the following weeks' activities, but they also provide the personnel a chance to deal with problems (either technological or

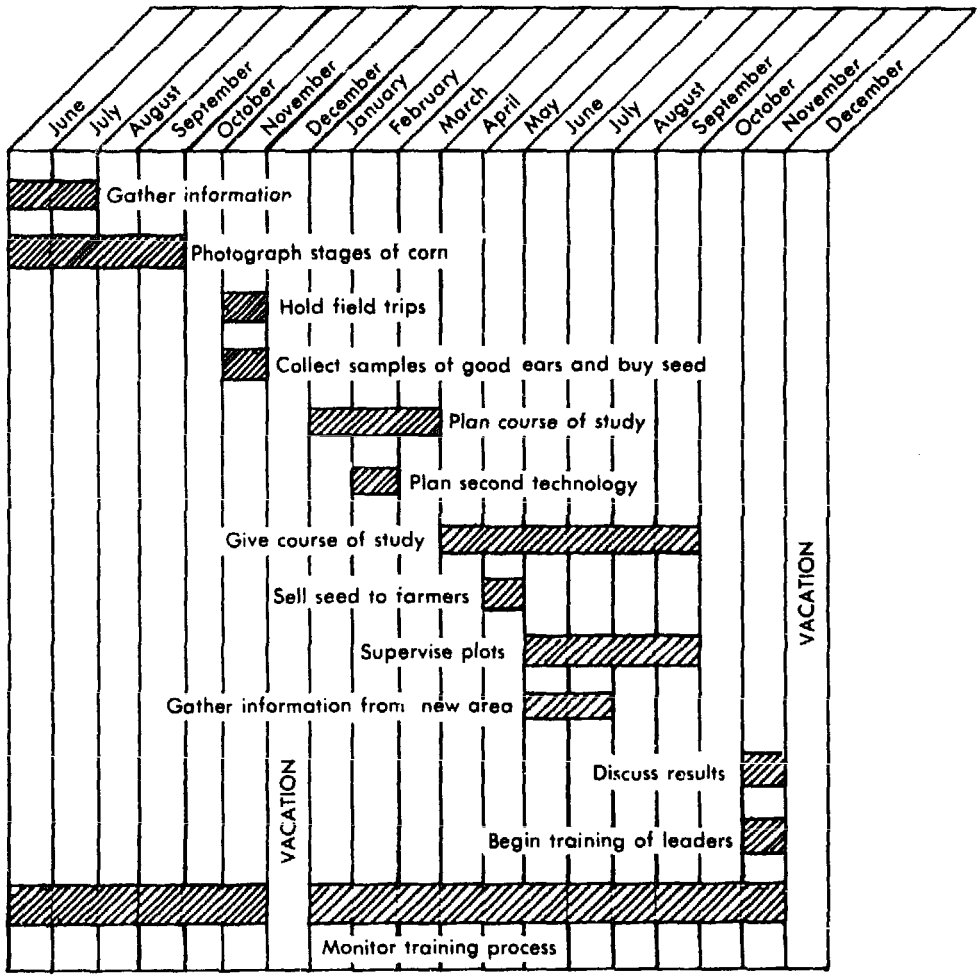


CHART NO. 2. An example of a GANT chart that includes only the teaching functions of a program during one and a half years. (See pp. 165 - 166 for the course schedule from which this GANT chart was made.)

personnal), reflect on and learn from past experience, share success stories, and discuss new ideas. Once again, participation of local leaders in these meetings will probably have to start simply and improve with time.

Any medium- or long-term plan should be considered a guide, a source of general direction for shorter-term planning, but never a rigid framework that cannot be modified when the personnel deem it necessary.

Preparing the budget

Once the program has established its work plan, it can write up a budget. Probably the greatest danger in budgeting is that of succumbing to over-generous offers of funding. Nearly everyone in the field has seen at least one good program destroyed by an overzealous funding agency. Programs should respond to the needs of the villagers, not of the donor agencies.

As a general rule, few programs should ever cost more than $200 per farmer whose productivity is to be permanently improved. I have seen programs that cost from $50 to over $1,000 per farmer reached, and the least expensive ones tend to create more self-sufficiency and more permanent results than the more expensive ones. Maintaining a slim budget is especially important for pilot projects; many of them are so expensive that their replication would be prohibitive.

Salaries will tend to take up the lion's share of a good program budget — from about 40 to 65% of the total, even when salary levels remain modest and half of the program's work is done by volunteers.

Transportation will often take another 35% of the budget, although this will vary widely according to the local situation. To the extent possible, traditional means of transportation should be used. Jeeps or even motorcycles can alienate village leaders from their own people and will make the transition more difficult when outside funding ends. Only those means of transportation for which there are reliable mechanics and readily available spare parts should be considered.

Programs that avoid give-aways and use truly appropriate technology seldom spend much money on agricultural inputs or equipment. Except for revolving loan funds, outlays for inputs and equipment should usually represent less than 10% of the total budget. Efficient programs also tend to spend little on offices or buildings. Almost any program can rent buildings sufficient for its needs, rather than construct or buy them. It can thus avoid both alienation from the people and the potential criticism that it is spending too much on program administration rather than on helping the people. One item often underbudgeted by agricultural programs is that of teaching materials and audiovisual aids.

If a program is producing sufficiently impressive results and is capable of widespread replication, money should be budgeted for informing other programs and institutions of the program's success and the reasons for it.

Above all, budgets should have a built-in flexibility. A program plan is, after all, only as flexible as its budget. Almost all budgets should include a 5 to 10% contingency item. Allowances should be agreed upon as to over- or underspending on individual budget items, and means established to reach agreement on larger changes should they prove necessary.

Monitoring

To avoid confusion, a distinction will be made here between two fundamentally different activities usually included in the term "evaluation." The word "monitoring" will

be used to denote those activities, such as maintaining feedback from the villages and doing simple surveys during the course of the program, that have as a primary aim the improving of the program's own effectiveness. "Evaluation," on the other hand, will refer to those larger studies of program impact and methodology that are done primarily for the benefit of funding agencies or other development programs. For the latter purpose, more energetic, scientifically controlled studies are used. Usually they are conducted when a program is ending, but may also be done once or twice during the course of the program or up to ten years after the program has closed down.

Although monitoring and evaluation may overlap somewhat, they are basically distinct functions with different purposes and procedures. Monitoring will be discussed here, while evaluation will be discussed in Chapter 13.

Constant monitoring of a program's activities and their impact is essential for all agricultural programs. At any moment, an agricultural experiment that runs into trouble, a minor misunderstanding, or a rumor started by middlemen or landowners who see the program as a threat may damage the villagers' confidence in the program. Even when all is going well, the program's past experience can be a rich source of new insights — fertile ground for reflection, learning, and future decision-making. Agricultural improvement is complex enough, the alternative approaches numerous enough, and the potential problems unpredictable enough, that we take it as a rule of thumb that *any program that fails to maintain a continuing flow of feedback from the villagers will fall far short of its potential.*

Most of the monitoring a program does consists of a day-to-day checking up on what is happening in the field. If, for instance, farmers are trying out a new method of fertilizing corn, program personnel should not only visit the plots periodically, but should regularly be asking the farmers a good number of questions: Has the rainfall been good? Has the erosion been kept under control? Is insect or disease damage worse than usual? Is the fertilizer causing the plants to mature earlier than usual, so that birds, insect pests, or even hungry dogs might converge on the fertilized plots? Are market prices

favorable this year? What do the farmers feel about the plots? What do their neighbors feel about it? Are the farmers without plots thinking about trying it out next year? Do they have any suggestions for improving the plots or the program's work in general? Do the other villagers feel the program's work is important? If it is culturally acceptable, the farmers should be asked if people like the extensionists and whether or not the extensionists have kept their promises.

The real challenge is not so much to collect enough information, but rather that it be candid. In many Third World cultures, people avoid ever saying anything unpleasant or critical to anyone else, especially an outsider or a professional. This "conspiracy of courtesy" means that the villagers often know of poor employee performance, serious operational flaws, corruption, or even the imminent demise of a program months or even years before the program's leaders find out. In one case, some 500 members of a 6,000-member cooperative in Latin America were so upset by an administrative decision that they were considering withdrawing from the co-op *en masse*. Two weeks later, when this widely discussed problem was mentioned to the co-op's manager, he was completely taken aback. No one had said a word to him about the problem.

Overcoming the obstacles to getting candid feedback will take a major effort. Program leaders should regularly visit the villages where the program is working. All program personnel must constantly ask questions that may prove embarrassing to themselves, such as why innovations have not been accepted or meetings not attended. They should maintain close communication with other organizations in the area and with friends not connected to the program. But most of all, good feedback will best be achieved when the villagers find out that they can openly criticize the program without giving rise to bad feelings or repercussions, and that their suggestions will be acted upon. Programs that put a high value on the villagers' opinions, take criticism well, and make decisions accordingly, will receive the best feedback from the villagers.

Skillful observation can supplement and verify the feedback a program is receiving. Since agriculture is highly visible, one can often actually see where progress is taking place and where it is not, or which ideas have been accepted

and which have not. Indications of success include: the number of people asking for more training, the degree of enthusiasm with which farmers tell the results of their innovations, the number of days work farmers are willing to put into innovations, the spontaneous spread of innovations from one village to another, the willingness of leaders to experiment with untried innovations, and the incorporation of new practices into traditional life patterns. For example, an Oxfam program in El Salvador felt it had made real progress when some of the farmers put in over twenty days work per 0.1 hectare to adopt new soil conservation practices. Guatemalan program leaders were pleased when the seed of a green manure crop they had introduced appeared in traditional markets, and a Bolivian program financed by the Methodist Church felt a wry sort of satisfaction in the night-time disappearance of tomato plants from its experimental farm.

Among the indicators of problems would be decreasing attendance at agricultural classes, villagers' claiming they cannot adopt new practices because they "don't have enough time," and an abandonment rate* of more than 15 to 20%. Any of these should be seen as a danger signal — a sign that enthusiasm for the program is dropping dangerously low. Too little recognizable success or too many innovations are often the root of the problem.

In addition to the regular villager feedback, programs need an occasional "taking stock," a tallying of results. Many programs do this once a year to check up on the accomplishment of their annual objectives. In this case, the same data can then be used to establish objectives and make plans for the following year.

Occasionally a few broader questions should be asked, such as whether the objectives are truly worthwhile, whether they are leading to the fulfillment of the goals, and what will be the long-term ecological impact of the program. Questions of internal management should be broached: What are the program's resource bottlenecks (e.g., transportation, training of personnel, etc.)? Is the allocation of personnel time the best possible? Is the program's money being spent in the most

*The abandonment rate is the percentage of those having successfully tried out a practice who subsequently abandon it.

efficient way possible? What are the relationships between the personnel? How democratic is the program administration?

Although an occasional outside consultant may be useful, the vast majority of monitoring will necessarily be done by program staff.

The information we gather through monitoring should, whenever possible, be written down for future referral. Much of it can be recorded in simple monthly reports written by each employee. The information thus gleaned from yesterday's efforts must then be used as the basis for today's reflection and learning and for the on-going planning of tomorrow's work.

Small is beautiful. In small programs the people's hoes and shovels are not made to look ridiculous by program tractors and earthmovers.

6 START SLOWLY, START SMALL

A great deal of heartbreak which in the past has too often turned over-optimistic idealists into later cynics, would be avoided if those who wish to help in agricultural development could learn to be content to do good slowly.

Geoffrey Masefield, Oxford University[1]

In any project good ideas often come faster than they can be applied or accepted and the timing of their application is often crucial. . .waiting has perhaps been one of the most significant things we have had to do.

Dr. Michael Church, Makerere Medical School[2]

The journey of a thousand miles must begin with the first step.

Folk saying

THE IMPORTANCE OF STARTING SLOWLY

Obstacles to be Overcome

All the four of us had to do was hire a few workers to pull

up forty gunny sacks of clover slips and transport them to a village at five hours distance. Already having a Volkswagen and firm promises of a large truck and a pick-up from the Ministry of Agriculture, we figured we could finish the job in a day and a half.

We were to have no such luck. We began by shuttling between four different offices in different parts of town to get permission to use the pick-up and get a key that did not work anyway. After hot-wiring the pick-up, we nearly crashed it into an adobe wall before realizing the brakes were bad. Then we discovered that since the Ministry had not paid its bills in two months, neither gas station in town would put gasoline in a Ministry vehicle. We had to borrow a 5-gallon can and drive back and forth for gasoline in the Volkswagen.

During subsequent days, further problems cropped up: a rainstorm washed out a road; we bent a bumper while driving the pick-up through a streambed; one of us had to baby-sit the pick-up the whole day it was being repaired to prevent the mechanic from stripping it of parts; seven of the eleven workers contracted to dig up clover slips did not show up for work; two of us spent a day in bed with diarrhea; for twenty-four hours no gas station in town had gasoline and no one knew when the next gasoline truck would arrive; two of us spent fifteen minutes trapped in a gas station while a rabid dog ran up and down the street and bit two strays; an inexperienced Ministry driver got the truck bogged down in mud holes four times in five kilometers and, in frustration, started drinking heavily while he was driving; local officials fishing for a bribe threatened to hold up our trip for three days; and the villagers finally had to carry the clover by mule the last five kilometers because the road was under repair. In the end, the day-and-a-half job took four days and all of one night.

Operation Clover was plagued with a good deal more than its share of problems, but the rural areas of the Third World are, in general, well-endowed with unexpected obstacles. Among them are mechanical breakdowns, ill health, supply shortages, communications failures, poor transportation facilities, high rates of employee turnover and illness, the sudden destruction of crops by bad weather or pests, faulty understanding across language or cultural barriers,

discrimination, political instability, and corruption and dishonesty among politicians and government officials. If a program is to run well, it must allow extra time to overcome these obstacles. Otherwise the seed arrives late, the extensionists fail to show up for meetings, the test plots are overgrown with weeds, classes are given without sufficient preparation or the needed audiovisual materials, and promises are not fulfilled. The program, quite possibly through no fault of its own, begins to look more slipshod than sure-footed. There are many other reasons that programs should not tackle too much work the first year or two.

The Need to Get to Know the People and the Area

It takes time to come to know an area, to get a good feel for all the cultural, social, economic, and agronomic conditions that affect agricultural improvement.

In the early stages of a program, the personnel must have time to form close relationships with the people, to gain their confidence and trust. Especially those of us from Western cultures must remember that traditional cultures are very personalistic. Personal relationships form an important part of everything that is done. The impersonal, business-type work relationship so common in the West is, in most traditional cultures, no relationship at all. If a program is to gain the necessary trust and confidence, its employees must have time to do such things as walk through the villagers' fields, send them a note of appreciation, enjoy a meal in their homes, or play awhile with their children.

The Need to Learn to Run a Democracy

It also takes time for people to become accustomed to running a program democratically — to learn to both participate and allow others to do so, to formulate and express ideas, to consult with co-workers instead of making spontaneous decisions, and to handle the give-and-take of working as a team. Democracies take more time than dictatorships, but they allow the participation that is the essence of development.

The Need for Close Supervision

During a program's first year or two, time must be allowed for very close supervision of the villagers' experimental plots. In part, this supervision is needed because the villagers have no experience in small-scale experimentation to tell them what to expect from their plots and the importance it may have. They may, therefore, lose interest in the plots and quit taking care of them. Also, since the villagers' understanding of the innovations is minimal in the beginning, program personnel must be on the lookout for any number of weird, totally unexpected mistakes.

Most importantly, though, supervision should be close because the program must achieve the highest possible proportion of successes during its first few years. Villagers basically learn from their experience.[3] And long experience has taught them not to expect anything to go any better in the future than it has in the past. If an experiment fails, they have *learned from their experience* that the innovation is no good. Explaining to them that it could have succeeded, and, in fact, would have had they just watered it again or applied the right fertilizer, may only further convince them of the program's incompetence. To expect that either the technology or the program will function any better in the future is folly. The technology failed, and the program failed. And that is that.

Early in the program it is better to have fifteen closely supervised plots, all successful, than to spread the program's efforts among thirty plots, five of which fail. The failures will probably end all chances of working with the farmers connected with them and will damage the credibility and enthusiasm of the extensionists that supervised them. They will also cast doubts on the program's competence, even among those farmers whose plots were successful. Since almost any agricultural experiment can run into problems within a week or ten days, program personnel should plan to make weekly visits to each plot during the critical months. After a few years, when the program has built up a backlog of successes, it can better afford an occasional failure.

The Need to Keep One's Promises

Programs must also leave time to make sure they can keep their promises to the villagers. In much of the Third World, villagers have been cheated and deceived time after time. The reason may have been a desire to exploit them, indifference toward treating villagers decently because of their supposed inferiority, or just the inability to do what was promised. The consequences, however, are the same: millions of villagers have become skeptical of everything they hear.

Sadly enough, development agencies have continued the pattern by repeatedly making promises and raising expectations that are not met. Promised supplies arrive too late, extensionists fail to attend meetings, services offered are never provided, and projected benefits never materialize. A program that fails to keep its promises damages its credibility and kills villager enthusiasm. It also destroys the credibility and the enthusiasm of its villager leaders. Good leaders may well leave the program. And once credibility among the villagers is lost, it is next to impossible to regain.

A cardinal rule for all programs should be to *promise something only when the program has absolute certainty it can keep its promise.* In an environment in which neither transportation, communication, supplies, nor the promises of other organizations can be relied upon, it is best to promise as little as possible. We who work in development programs must motivate villagers through results, not promises. It also means leaving extra time to deal with emergencies before they keep us from fulfilling our commitments. In most cases, supplies should be on the program's shelves or those of local stores before we promise them to the people, money should be in the bank or fully committed by a reliable funder before we raise hopes about new program efforts, and reliable transportation should be assured before we schedule meetings. Such over-preparation takes time, but it will pay off handsomely.

Overcoming the "Inertia of Disbelief"

Extra time is also needed to overcome the "inertia of disbelief." Complacency, fatalism, and apathy have often been

noticed among traditional societies. After centuries of suffering, during which life in millions of villages has never really improved, and the situation of many groups has actually deteriorated, the people have become demoralized by their own history. Complacency, apathy, and disbelief in future improvements are to be expected. And when no one believes that the future will be any better, no one puts much effort into trying to make it better. Disbelief in a better future becomes a self-fulfilling prophecy.

Early, significant success can break this vicious cycle. Suddenly, villagers are shocked by a competent, reliable program and doubled or tripled harvests into recognizing that new horizons are possible. A new enthusiasm blossoms, a new trust — both in the program's competence and its sincere desire to work for the people's good. A new precedent of excellence is set. Pride in work well done is added to enthusiasm as a major motivation for village leaders. Furthermore, when the villagers come to truly believe in a program, it will be able to attract and train the best and most influential of the villagers. In the end, the example of a well-run, efficient program that keeps its promises is a very important ingredient in raising the people's consciousness.

Evidence of the importance of early success can often be seen in areas where programs have already been operating for at least three or four years. Very frequently the villages that show above-average success in later years are precisely the ones in which the first year of work was most successful.

To ensure early success we need time — time to overcome unexpected obstacles, time to make sure that the technology to be used is as appropriate as possible, and above all, time to choose and develop good leaders. Programs organized too rapidly often try to select a large number of employees sight unseen in a few weeks or months. It is nearly impossible to select high-quality employees this way and attract them into an unproven program, especially if we are to avoid over-professionalizing our program or paying inflated salaries. Leaders are best chosen through a long process of observation — of watching them in action and noting especially their willingness to work hard to help others. Time is needed to support them in their work so they can enjoy it and be

rewarded by success. And it takes time to help them acquire the knowledge and experience they will need. All this is especially important because these are the leaders who will eventually run the program.

The need for time does not, of course, mean that employees should be standing idle, waiting for the next emergency. Time not filled by normal program activities can be dedicated to on-the-job training, the production of audiovisual aids, long-range planning, or visits of extensionists to see the work of other successful programs or of fellow extensionists within the same program.

THE IMPORTANCE OF STARTING SMALL

A program's workload is not all that should be limited during the first year or two; its overall size should be limited, too.

First of all, large programs tend to be inflexible. We have already seen the importance of agricultural programs remaining flexible. Large programs, however, are very difficult to modify. Too many people have become convinced that the present methods are best. Too many people have been trained in, and have become accustomed to, current procedures. Some people's jobs may even depend on maintaining these practices. Too much money has been spent on the present methods for people to easily admit that a better way exists. Changing to new equipment, new inputs, and new training materials can require major additional expenses and too many villagers have come to know the program and will see it as vacillating, unknowledgeable, or incompetent. The villagers may be disgusted by the quantity of money spent on mistakes. In short, large programs run the risk of being poured in concrete before the wrinkles are worked out. They wind up either living with the wrinkles for a long time or spending a lot of extra time and money to smooth out hardened concrete.

On the other hand, small programs can and should be started with the idea that they will evolve as time and experience show them better ways of working. Mistakes, though always painful, become relatively inexpensive lessons for the future. And the program, presented as an experiment

rather than a sure-fire success, will not lose its credibility.

Secondly, small programs allow for and encourage more villager participation. The personal approach of a small program makes villagers feel more welcome to participate, and the small size allows them to understand it better. Villager leaders thus have a better chance of providing worthwhile feedback and participating in the making of decisions. Through this process of *learning* program management *by doing* it, villager leaders grow in sophistication as the program grows in complexity.

Being more flexible, small programs can change in response to villagers' feedback, thereby making villagers feel that their participation is valuable and motivating them to participate more. Furthermore, in small programs the people's efforts are less likely to be lost in the shuffle. The people's hoes and shovels are not made to look ridiculous by program tractors and earthmovers, nor their nickels and dimes by the program's thousands of dollars. Sometimes villagers can even solve problems that would spell doom to a larger program. In South America, a large communal cattle-fattening project was threatened with failure because a bank loan to purchase the cattle had been refused. World Neighbors personnel suggested that if the project were scaled down to half that planned, the villagers could contribute their own animals to be fattened. As a result, the people avoided the red tape and expense of a bank loan, and in four months had earned a 40% return on the value of their own cattle.

Thirdly, large programs necessarily involve large sums of money. Thus they run the constant danger of being powered by the "force of money" rather than the "force of conviction." People may be attracted to the program by the fine equipment, big offices, and new cars. Villagers and employees alike may parrot program policy they do not agree with merely to stay in the good graces of those who control the money; candid feedback is no longer possible. Worst of all, the temptation at all levels of the program is to try to speed things up by using more money. The program may pay for farmer experiments, provide incentives for participation, or pay inflated salaries to attract employees not drawn to the program for better reasons. And, of course, the greater the quantity and availability of

money, the more likely it is to encourage corruption. It is not the agencies' money, but the people's enthusiasm that must be the driving force behind development.

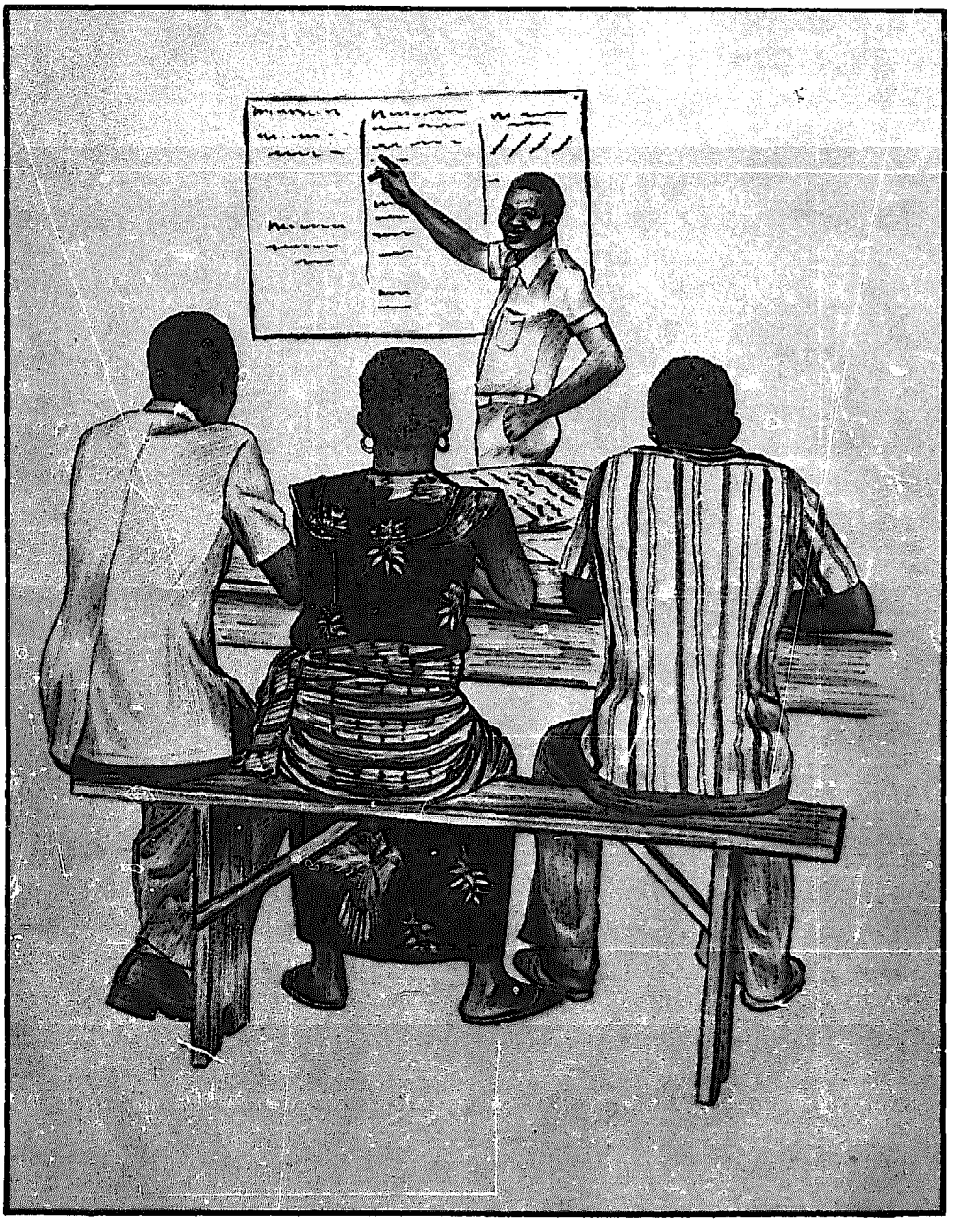
Finally, development has its own pace. Anyone who tries to rush it is in danger of stumbling over it. One must slow down along the way to remove a good many roadblocks — sufficiencies of supplies, villager organizations, leadership abilities, roads and markets, etc. Furthermore, true development — the movement by the people — must grow from the people's convictions and their gradually increasing enthusiasm for change. Large programs are generally unable to slow down and walk at the varied paces of the villages within their scope.

Small programs can also work in small areas. They can thereby minimize transportation and supervision costs. And smaller areas are likely to be culturally, climatically, and agronomically more homogeneous.

HOW SMALL SHOULD THE PROGRAM BE?

The question remains, "How small is small?" This will vary from one situation to another, but World Neighbors' experience indicates that the most successful programs began with a maximum of only one or two professionals (of secondary education or above), two or three villager employees, and a first-year operation budget of between $3,000 and $20,000 (excluding major one-time vehicle or equipment purchases). They were usually aimed at a target population of from 15,000 to 30,000 people.

To many organizations, this size program sounds infinitesimal. But the idea is not to remain small forever. In fact, the ultimate reason for starting small is to build the best possible foundation for future growth. By starting small, programs will more likely stimulate the enthusiasm, credibility, local participation, and increased sophistication that any larger program will need. Perhaps most important in the larger stages of the program will be the central core of leaders that the program was able to bring together, train, and motivate while it was still small. More than anything else, it is this core of leaders that will allow the program to grow while continuing to be a movement of, by, and for the people.



It is better to teach one idea to hundreds of people rather than hundreds of ideas to one person.

7 LIMIT THE TECHNOLOGY*

There are usually only one or two factors which limit the productivity of an agricultural system, and the aim of technology transfer is to identify and provide the limiting element, ingredient, or practice. . .

Edwin B. Oyer
Cornell University[1]

In many cases a small and simple change in farming practice may be most strategic in removing bottlenecks and providing a basis for accelerated development.

W. Y. Yang[2]

Every day we watch the sadly unproductive fields of the poor, knowing that dozens of innovations might improve them: better cultural practices, new crops, "miracle" seeds, fertilizers, insect control methods, hand-powered machines, and on and on. Undoubtedly, many of these innovations could help increase almost any traditional farmer's income. Isn't it, then, our duty to teach these people all we can about modern agriculture? Does not justice demand that we share with them all the technology we know?

*A limited technology is one that changes only a few practices, preferably one or two, in the farming system presently in use. Only in rare instances will it involve a new crop or breed of animal. "Technology" is taken to include on-farm crop storage but not marketing.

The issue is much more complex than just whether or not we should throw out vast quantities of information. It takes us back to our original goals. Is there any point in the farmers knowing about an innovation if they do not put it into practice? Is there any value in their putting it into practice only to abandon it the following year? Are they to be simply passive receivers of information, or are they to *participate* in the process — to help find and adapt technology and teach it to others? And are we reinforcing community solidarity and social justice, or destroying them?

World Neighbors' experience has unquestionably led us to believe that farmers are better served, and the goals of agricultural improvement better fulfilled, if we seriously limit the amount of technology we teach.

WHY SHOULD WE LIMIT THE TECHNOLOGY?

To Start Slowly and Start Small

If programs are to start slowly and start small, they must teach a limited number of innovations. Each additional practice a program promotes means that additional training must be given, additional teaching materials and audiovisual aids bought or produced, and additional test plots organized, each plot with more variables to be tested. If necessary inputs are not available, the program itself must buy and sell them until they are made available locally. Furthermore, experimental plot supervision and backup become more complicated. All these factors increase program complexity.

To Achieve a High Rate of Success

When we work with only one or two practices, we can select those that best combine simplicity and low risk with major increases in yields and earnings. In this way, we have the best chance of achieving a high rate of success. The program gains credibility not only because of its success, but because it wastes little of its own or the peoples' effort on less effective innovations.

To Reach Hundreds of People

There is in our work a very important trade-off: we can aim at either teaching one idea to hundreds of people or hundreds of ideas to one person. Teaching one idea to hundreds of people has turned out to be preferable for a wide variety of considerations, ranging from permanence* of innovation and the development of leadership to community solidarity and social justice. For example, one integrated program in Central America tried to introduce some twenty different practices, including contour ditches, fertilization, latrine construction, and family planning. The extensionists worked hard, and in two years' time about 60% of the families in the program area had adopted one or more of the recommended practices. By the fourth year, however, previous adopters were abandoning the practices faster than the extensionists could convince new people to try them out.

What had happened? First of all, extensionists teaching twenty different practices cannot dedicate enough time or energy to any one practice. Thus the people are often neither sufficiently convinced nor sufficiently well informed about any one practice to do it well. People only half-heartedly dug their contour ditches, leaving them so shallow that the first rains washed them out. They did not understand how to use fertilizer correctly, so much of it was wasted. Because of these failures, people quite naturally abandoned the innovations.

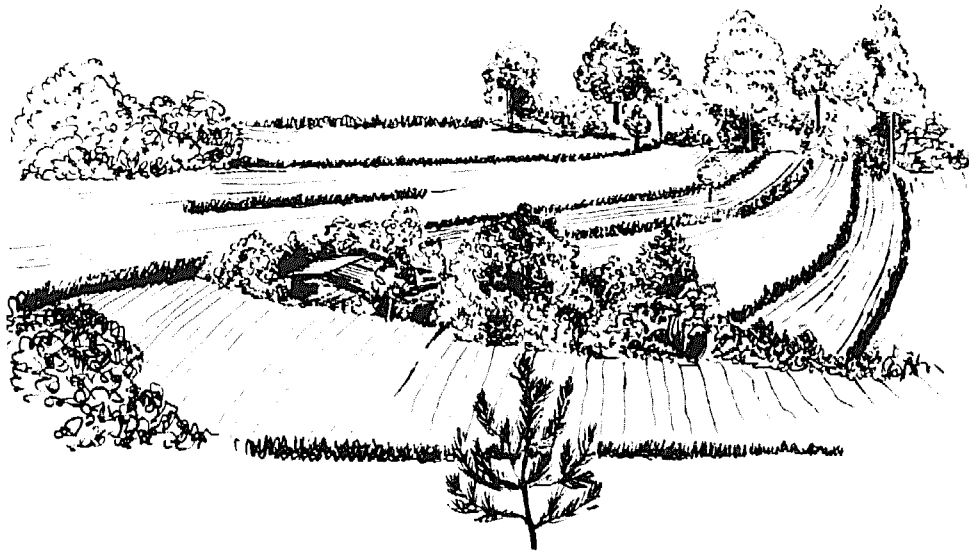
Even more important, no innovation became permanent because those in favor of any particular practice were never numerous enough to resist popular pressure to conform — they never reached the "critical mass."

People ir traditional communities are accustomed to living in an environment of consensus. With regard to most issues of life — customs, values, beliefs, ways of doing things — they enjoy a high degree of consensus.[3] This consensus is comforting, it reduces psychological tension, and it is probably an important factor in the oft-observed sense of dignity and self-worth among traditional villagers. A lack of consensus produces anxiety. It is painful. (Westerners probably best

*"Permanence" of an innovation means that the people will continue to use the innovation until it loses its usefulness or they find a better one to use in its stead.

understand the pain of a lack of consensus when they show up at a party inappropriately dressed.) Needless to say, villagers try to maintain consensus whenever possible.

When the program mentioned above began promoting its twenty practices in a village, six or eight families would try out fertilizer and four or five others would dig some contour ditches and two or three would make a latrine. Even though the program succeeded in convincing, say, 60% of a community to try out one innovation or another, never did more than 20% of the community try out any one specific innovation. 80% of the community, the vast majority, was always unfamiliar with any one particular innovation. As long as 80% of a community is against an innovation, it has little chance of survival. The desire for consensus, the pressure to conform, will more than likely spell its doom. Development literature is full of cases of farmers who made spectacular gains in harvests, yet deserted their improved practices a year or two later because of peer group pressure. Furthermore, teaching a practice that later dies out is worse than doing nothing at all, because future programs will have even more difficulty introducing innovation.



If the program had promoted only one practice, for example, contour ditches, and 60% of each village had tried it out successfully, a new consensus would be formed — that contour ditches are good. Then, in order to bring about

unanimity again, the farmers without contour ditches would gradually adopt them. Consensus would be working *for* the program instead of *against* it.

To Reach the Critical Mass

The percentage of the people in a community that must experience success with an innovation to turn the tide of consensus in favor of an innovation instead of against it is what we will call the "critical mass." If fewer than this number of people in a village adopt a given innovation, it will tend toward extinction. However, when the number of successful adopters reaches the critical mass, the pressures in favor of the practice outweigh those against it. Gradually, the innovation spreads through the community spontaneously until its use is virtually universal.

The experience of several programs in Latin America indicates that the critical mass normally varies between 25% and 45% of a community. In a given culture, it will vary according to the influence of the adopters and the simplicity, advantageousness, and ease of adoption of the innovation. The critical mass will also be somewhat larger in more conservative communities, or ones that are suspicious of outsiders. Nevertheless, it can be surprisingly consistent within a given culture.

For a practice to have a good chance of being permanent, the number of people successfully adopting it in any given community must reach the critical mass. Generally, the only way to achieve this is to promote just one or two practices at a time.

Some projects working with tribal groups or other tightly organized communities may have to convince entire communities all at once to use an innovation. In this case, it may be more important than ever to develop a favorable consensus as rapidly as possible by concentrating the program's efforts on one or two innovations.

Innovations will be permanent only if the necessary inputs continue to be available. In an economy where agricultural supplies are handled by private entrepreneurs, the availability of any given input increases with the demand for it. If a program promotes twenty innovations, none of them is likely

to enjoy enough demand to ensure the availability of the necessary inputs. However, if we teach one idea to hundreds of farmers, we can easily create enough demand for any needed input that store owners will make sure they stock an adequate quantity. Thus the innovation has a better chance of being permanent.

For obvious reasons, teaching one idea to hundreds of farmers is also more conducive to social justice. A program promoting twenty innovations can easily spend a disproportionate amount of its time teaching more and more innovations to a handful of farmers. A limited technology program, however, must move on to new groups of farmers once the most innovative farmers have adopted one or two practices. Therefore, instead of spending most of its time with the more innovative and prosperous farmers, the program is forced to work with those who are less innovative, less able to invest in improvements, and less quick to learn. A limited technology program will reach more people, and will more likely reach the poor.[4]

Promoting only one practice creates less economic disparity between adopters and non-adopters than does promoting five or ten. Apart from being unjust, large disparities in income can cause a number of problems. First of

all, they cause jealousy and resentment, two surprisingly widespread realities of village life. Jealousy and resentment in turn alienate innovators and lessen their influence, thereby decreasing their potential for leadership. Feeling cut off from the community, innovators may even abandon the new technology. Jealousy and resentment sometimes have even more serious consequences. World Neighbors people have known of villagers who set fire to harvests, stole tools, and poisoned the animals and even the family members of those who dared to progress too far too fast.

Large economic disparities between members of an extended family can arouse tensions within the family. To assure their members' survival, many traditional cultures obligate the more prosperous members of a kin group to share their prosperity with the others. Some of the suddenly affluent innovators will resist these obligations, thereby weakening an important coping mechanism of the society.[5] Others will react like the Philippine farmer who in one year multiplied his cash income on a tomato crop fifteenfold by using a disease-resistant variety. Because of pressure from his relatives to share the profits, he abandoned the new variety the following year.[6]

In time, large income differentials can create a village elite that exploits others and develops economic interests that differ from or even conflict with those of the remaining villagers.

In summary, promoting whole shopping lists of technology that may make a few farmers wealthy weakens consensus, aggravates economic inequalities, and arouses jealousy, resentment, and kin group tensions. If we expect villagers to continue to cooperate and work together for their common betterment, we must, instead, work toward reasonable increases in income for the majority of the people.

To Develop Leadership

Limiting the technology with which we work is also important in developing leadership. I once worked in a World Neighbors program giving weekly classes to some thirty-five village leaders. We would demonstrate how to castrate a pig one day, teach them how to fertilize corn the next week, and

demonstrate how to prune fruit trees or select seed potatoes the following week. We were shocked when a village survey at the end of the year indicated that only two of the practices had been adopted, each by only two leaders. We had created apathy instead of enthusiasm. The following year we spent all year teaching only two practices. This time, in spite of the inertia created the first year, eleven of the leaders successfully tried out one innovation, and eighteen tried out the other. Two years later, twelve of these leaders were enthusiastically teaching both practices to groups of villagers. Now, ten years later, the leadership process which that program started has resulted in the training of scores of leaders and the adoption of both practices by over 4,500 farmers.

When a program bombards prospective leaders with a different innovation every week, it gradually teaches them that good agriculture requires a vast score of knowledge they have no hope of ever dominating. They come to feel that they are doomed to being permanently ignorant. They become convinced that villagers who want to improve their agriculture must, forever and always, go to a professional. Seldom do they learn any one innovation well enough to feel confident that they could try it out successfully, and sooner or later the lack of concrete results destroys even their desire to continue learning. On the other hand, if a program concentrates its efforts on a limited technology, villagers can, in one year, study it repeatedly and in depth, try it out, become convinced of its value and of their ability to handle it, and sometimes even work out a few of its flaws themselves. They can gain enough experience and confidence in their own mastery of the innovation to feel capable of teaching their neighbors. Furthermore, the success of their experiments will increase their enthusiasm for continuing innovation. We will be building rather than destroying the knowledge, enthusiasm, and self-confidence our leaders need.

Limiting the technology also obviates the need felt by many programs to require their trainees to have at least a sixth-grade education. Primary school graduates are often looking for opportunities outside the village. Even worse, they were attending school during the years when most village children learned about agriculture from their parents. Thus, many

never learned how to farm, while others consider farming beneath them. Farmers with only two or three years of schooling, and even those who are illiterate or barely literate can easily dominate one or two innovations a year, and these people often become more enthusiastic, harder working village teachers.[7]

To Avoid Excessive Increases in Income

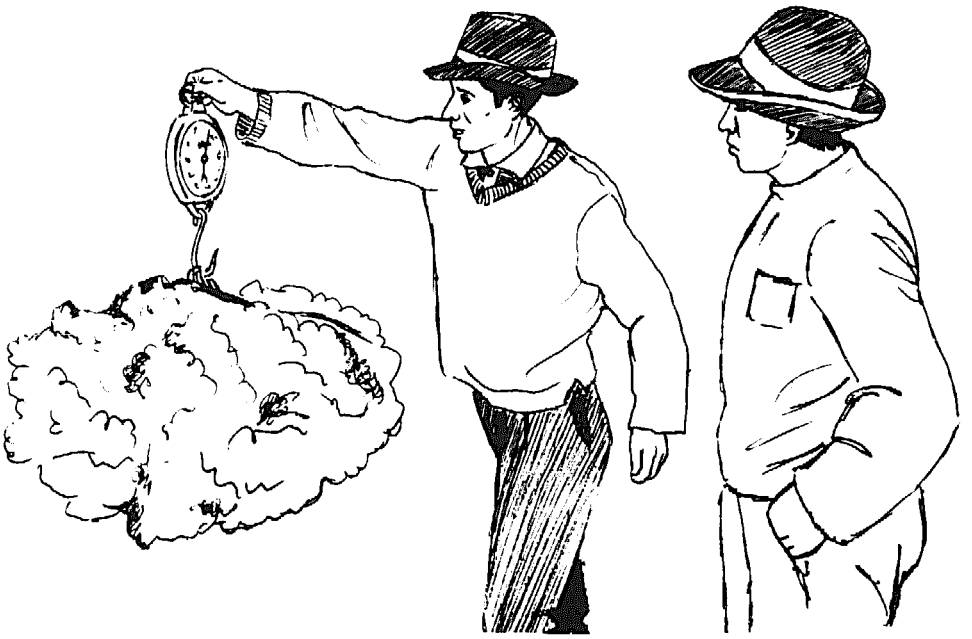
Another reason for limiting program technology is that the very objective of teaching multiple technologies — to achieve maximum increases in yields — is not necessarily desirable. Experience indicates that, surprising as it may seem, a program's first technology should generally *not* increase incomes by more than 150%. The first reason for this was explained above: excessive increases in income cause economic disparities that in turn cause jealousy, resentment, and kin group tensions.

Another reason for avoiding excessive increases in income derives from our being interested not so much in increasing incomes *per se* as in improving the people's long-term welfare. The problem here is that small farmers, like all of us, frequently fail to spend unexpected windfalls of cash in ways that will contribute to their long-term welfare. Caught unprepared, with little idea of how to use the money well and often with the distinct feeling that the money came rather easily, people tend to waste it.

Nevertheless, when incomes rise gradually, people's expectations rise accordingly. They begin looking ahead and planning how they can use future income. Feeling that the money was hard-earned, they naturally want its benefits to be long-lasting. And they have the time, coupled with a gradually increasing store of technical knowledge, to find ways of reinvesting their money so that the benefits *will* be long-lasting.

Still another reason for avoiding sudden large increases in income derives from our basic goal of agricultural improvement. Our central purpose is not that of raising incomes. We are instead striving to enable the poorest people to carry on their own process of rural development. If the program teaches the people how to increase their incomes

more than the 50 to 150% needed to maintain enthusiasm, it is denying local leaders the opportunity to earn the credibility and the approval of their neighbors. All the innovations providing dramatic increases in income are promoted by the program, only smaller, insignificant increases in income will be left for local leaders to teach later on. The villagers therefore lose confidence in their own leaders. The leaders will also lose enthusiasm for their work. If, on the other hand, the program leaves simple innovations capable of substantially raising incomes for local leaders to experiment with and to introduce after the program has ended, the leaders' prestige will be enhanced. Furthermore, the villagers will come to see improvement not as a one-shot occurrence dependent on an outside program, but as an on-going process that *they and their leaders* are capable of carrying on by themselves.



To Avoid Making Needless Efforts

The last reason for starting with a limited technology is that, very simply, this is the way villagers tend to adopt new technology anyway: one or two practices at a time. As John W. Mellor writes:

> Major programs of community development and extension ... have normally included an effort to gain farmer acceptance of a wide range of innovations said to increase production and incomes, and yet the acceptance. . .has generally been rather small. On the other hand we have numbers of examples of individual innovations, including a number of mechanical innovations, improved seed varieties, inorganic fertilizers, and so on, which have in certain specific situations spread very rapidly even without formal programs of farmer education and exhortation.[8]

Programs that teach more than two innovations at a time may well find that villagers are trying only one or two of them and forgetting about the rest.[9]

HOW CAN WE LIMIT THE TECHNOLOGY?

First, we must be totally convinced that we really *want* to stick to a limited technology. It is all too easy to get excited about one innovation after another, gradually turning a single-innovation program into a scattershot one. There is ever and always the temptation to introduce one more innovation that will boost the yields even higher. Agronomists want more impressive looking fields, program administrators more dramatic statistics, and extensionists a more interesting, varied technology to reach. To keep us working on a limited technology, we must keep our sights set on the thousands of farmers we have yet to teach. We must keep in mind our long-term goals — that our purpose is not to be the heroes ourselves but to leave improvements for the villagers to make, thereby letting *them* become the heroes. And we must stand firm.

Of course,farmers who have innovated successfully will begin asking for more technology. Sometimes it may be best not to teach it to them (see p.89-90.) If we do teach more technology, it should probably be used as a reward for those who are teaching others. Hopefully it would require little or no supervision and no inputs that people cannot obtain for themselves.

How much should we limit the technology? Many technicians recognize the value of limiting technology and, as a result, advocate the "package approach." This school of thought suggests that, instead of teaching everything about

modern agriculture, we should study the present farming system and then introduce from three to five innovations as a "package." The reason for working with from three to five practices is that very often, they say, there is such an interdependence among various production factors that no one of them is clearly limiting. That is, if we do not improve at least three or four conditions, we will not achieve a large enough increase in income.

The problem is that programs have begun promoting packages of three to five practices *regardless* of whether all that technology is needed or not. In fact, no one seems to have bothered to define what constitutes "a large enough increase in income." Some authors talk about packages that increase harvests two or three times, while others promote packages that increase them six to eight times.[10]

What is an acceptable increase in income? At what level of increase can we decide that a given number of practices, be it one, two or five, is sufficient?

This question in turn brings up that of our overall goal in agricultural improvement. Our purpose, once again, is not to develop their agriculture for them, but rather to *teach them a*

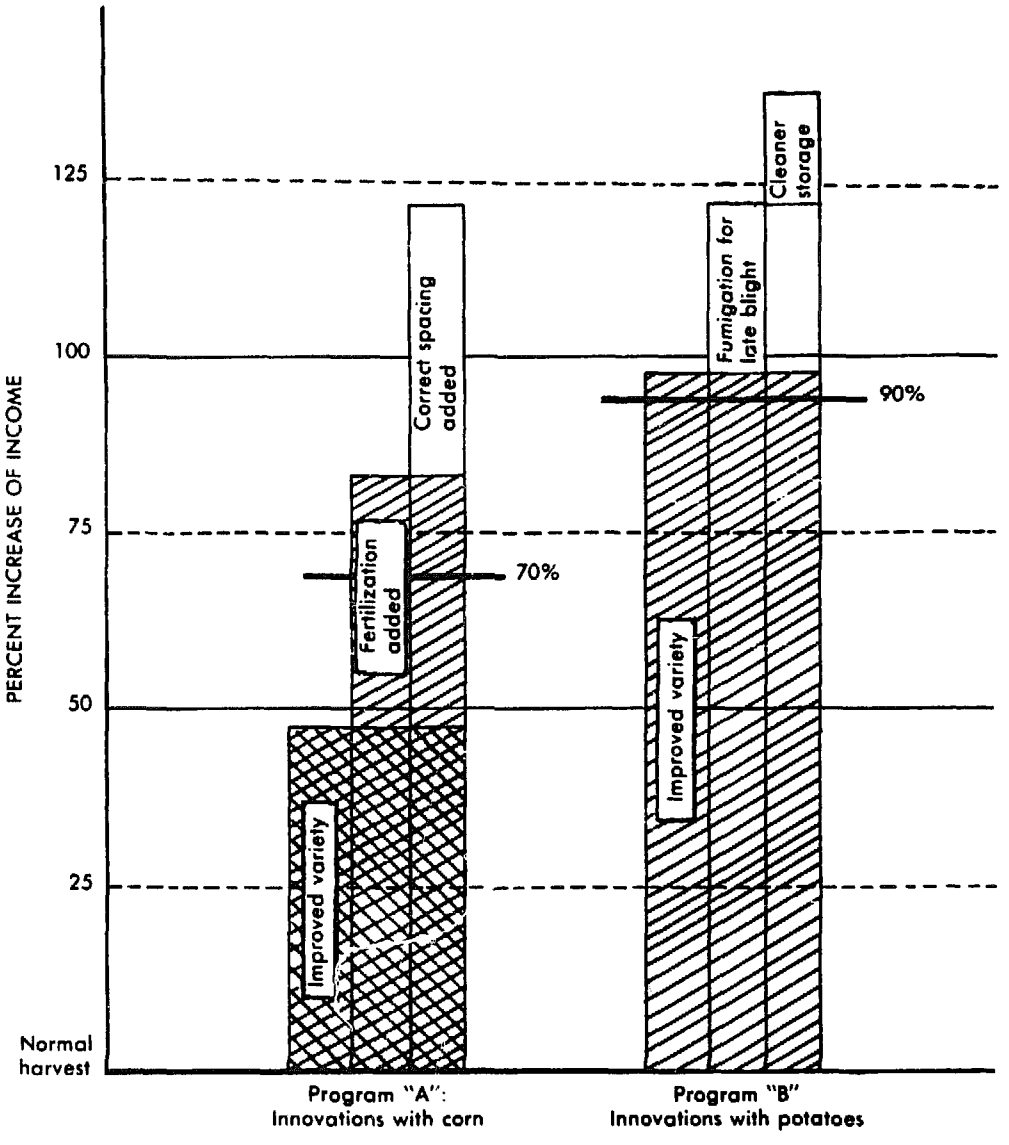


CHART NO. 3. Program "A" is looking for a 70% improvement in its corn production. Two innovations, introducing an improved variety and fertilization will be needed to achieve a 70% increase in income. On the other hand, Program "B" can achieve its desired 90% increase in income with just the introduction of an improved variety of potatoes.

process whereby they can develop it themselves. The purpose of a program's first technology, then, should not be to make a once-and-for-all-time increase in incomes. Rather, it is to create enough interest that people will try it out successfully, become enthusiastic, and get involved in the program — in short, *to get them participating in the process of developing their own agriculture.*

The question of acceptable increases in income then becomes, "What increase in income is required to create the needed interest and enthusiasm among small farmers?" According to Mosher, "different qualified experts have estimated the increased yield* necessary to appeal to farmers in the beginning at different amounts, ranging from 40 to 100 percent."[11]

Farmers need this margin in part because increases in incomes of less than 20 to 40% are difficult to recognize when farmers are using neither control plots nor financial accounts. Farmers also need a good margin because of a number of uncertainties such as weather conditions, prices, and the adaptability of the technology to local farm conditions. To the degree that any of these uncertainties become more acute (e.g., the timing or amount of rainfall fluctuates dramatically from year to year), the margin will increase to 75% and beyond. And it will take a somewhat larger increase to create enthusiasm than it does merely to make the increase recognizable.

Suppose, then, that in a particular situation, a 70% increase in income is considered sufficient to stimulate farmer enthusiasm. Then the question of how much we should limit our technology is rather easy to answer: use the minimum number of innovations needed to achieve a 70% increase in income. (See Chart 3.) If one practice is sufficient — and surprisingly often it is — then working with a package of practices complicates the technology needlessly.

It takes time to find one or two innovations that raise income so significantly, but such a search is well worth the time it takes. In the past, the individual innovations that raised incomes most dramatically were improved seeds and

*Mosher is apparently not referring to "yields," but rather to increases in net income. Added expenditures and a risk factor would have to be subtracted from increased yields to arrive at the figure for increased income.

fertilization with chemicals. Now, scattered, little-known programs are achieving equally impressive results with a wide variety of other innovations. Criteria that can be used in this search for innovations are outlined in Chapter 8, and the methods to be used are given in Chapter 9.

A program should not, of course, limit itself to one innovation for its entire duration. In time, it will build on its one or two initial innovations in an ever-expanding pyramid of technology, to be described in Chapter 9.

An appropriate technology meets a felt need, is simple to teach and understand, and uses resources poor people already have.

8 CHOOSING AN APPROPRIATE TECHNOLOGY: THE CRITERIA

". . . a high proportion of success stories tend to involve innovations which were very similar to practices already followed, which were simple and easy to apply, and which provided unusually high returns."

John W. Mellor[1]

The introduction of innovations into Third World agriculture has met with everything from disaster to exhilarating success. Well-bred animals have often died of disease and malnutrition. Home and school vegetable gardens have yielded disappointing results in many projects in India[2] and nearly everywhere they have been tried in Latin America.[3] Yet poor goatherds in a remote program area in the Bolivian Andes have walked for fourteen hours to buy animal vaccines, and Indian farmers involved in a program in Guatemala are producing, with their own native varieties, up to 3,200 kilos per hectare of dry beans, twice the average yield in the United States.

Some innovations increase the production of thousands of farmers while others fail to be accepted by even a handful. If we

are going to work with only a few innovations, how can we choose the ones that will find the widest acceptance?

World Neighbors' experience indicates that there are a number of widely applicable criteria that can guide us in choosing the appropriate technology for any particular area. In this chapter these criteria will be listed and explained. Chapter 9 will deal with how to put them into practice.

I. IS THE TECHNOLOGY RECOGNIZED BY THE POOREST FARMERS AS BEING SUCCESSFUL?

Does the Technology Meet a Felt Need?

Agricultural programs have too often "scratched where there wasn't any itching." If people are to adopt a program innovation, they must become convinced that it meets an important felt need. If they are to go beyond just adopting it by taking the time necessary to receive extra training and teach the techniques to others, the technology must answer their needs so well that farmers become genuinely enthusiastic about it.

Meeting a felt need is easiest when the people's need is specific, such as that of protecting their chickens from Newcastle's disease or obtaining wheat varieties that are resistant to lodging. In most cases, however, the people merely feel a desire to increase their incomes or food supply, and the program must select a technology from among dozens of alternatives. In such cases, other criteria will be needed.

Is the Technology Financially Advantageous?

Farmers, even subsistence farmers, become interested in an innovation only to the degree that it promises them a substantial and dependable increase in either food supply or income at local prices. In fact, the largest single factor in creating enthusiasm within a program is the increase in individual income achieved by the program's technology.

As mentioned in Chapter 7, a program's first technology should usually raise incomes from 50 to 150%. The only increase that matters to a farmer, of course, is the part of the income or goods which he or she will receive. The portion of

the harvest or income that is paid to the landowner, moneylender, or tax collector will neither provide any incentive for adopting the technology nor create enthusiasm for future innovation.

Does It Bring Recognizable Success Quickly?

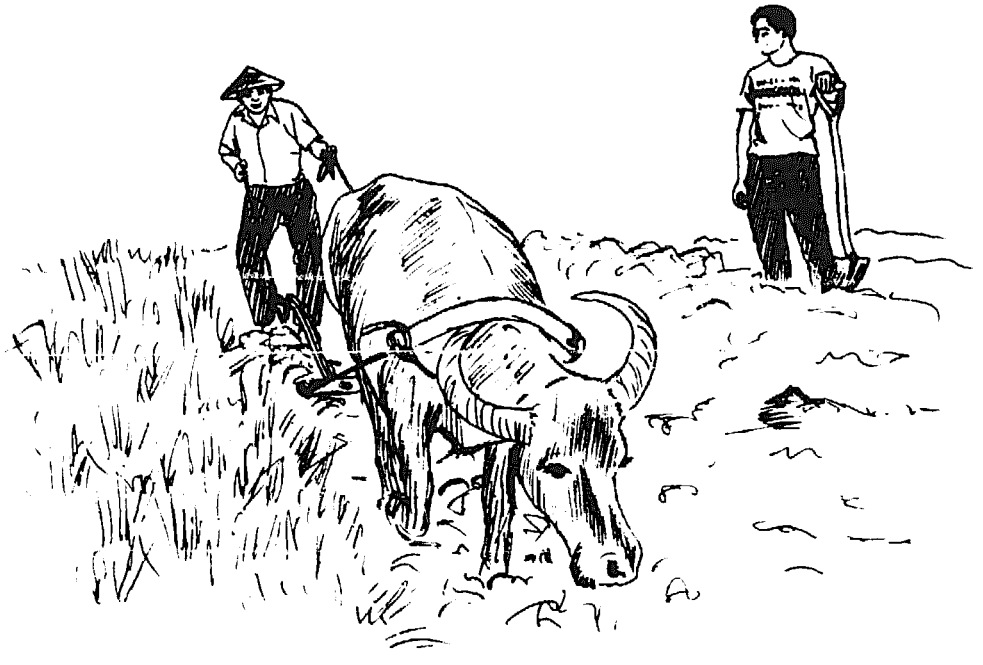
An agricultural promoter working in a Guatemalan town I shall call San Vicente was puzzled by the people's reactions to a couple of innovations. The first one had been his introduction of allspice plants into the community. Although unknown in San Vicente, allspice had proved to be extremely profitable in similar areas of Guatemala. His second project had consisted of introducing a new variety of sweet potato that promised to out-produce those the townspeople already planted as a cash crop.

The sweet potato project was going very well. The plants were healthy, the farmers had weeded and watered them carefully, and every week another farmer or two would approach the promoter to request more seed. The allspice trees had grown equally well and promised much higher profits, but the people of San Vicente seemed to have lost interest in them completely. They had allowed weeds to grow around them and had planted *chayote* and passion fruit vines that were climbing up and cutting off their sunlight. They had even cut down a few for firewood. "Why," the worker asked me, "are these people so enthusiastic about the sweet potatoes, yet so totally uninterested in the allspice?"

The reason lay in the people's never having seen an allspice tree before. They had no idea whether the trees were growing well, or whether and when they would bear. They had no idea how much work it would take to care for them, harvest them, and process the harvest. Nor did they know how much the produce would weigh, how far they would have to carry it on their backs to sell it, or how much they would earn. Even though the worker knew the allspice trees could be successful, the people of San Vicente had no way of recognizing the trees' potential for success until some ten years later when they would have the long-hoped-for earnings in their pockets.

With the sweet potatoes the story was different. Less than a

month after planting time, people had noticed that the new variety's foliage was more luxuriant than that of their own variety. Soon they were digging around the stems of the new variety to see how the roots were growing. When they saw that the roots of the new variety were growing larger than any they had ever seen before, they knew the new variety was a success, and the word spread fast. The people had been able to recognize the success of the sweet potatoes because they were familiar with the rest of the process: once the roots were growing well, a given amount of work would result in a certain size harvest that would command a known price in a familiar, reliable market.



As a rule, recognizable success will come sooner with crops already familiar to the people. For instance, people who have traditionally grown corn will recognize the success of a side dressing of nitrogen when it makes the leaves turn green about two weeks after application. People less familiar with corn may not recognize the success of a side dressing until the ear has filled out several months after fertilization. And for those who have never grown corn, the success of a side dressing will not become apparent until the grain is harvested and sold, and

then only if a control plot was used to isolate the effect of the side dressing itself. In the case of pastures, farmers unfamiliar with a new species will have recognizable success only after the pasture has matured and been grazed and the farmers' animals have grown larger or produced more milk, wool, or offspring.

It is of utmost importance that recognizable success come as quickly as possible. The entire dynamic of a self-help program depends on the enthusiasm it generates, and only recognized successes can help create that enthusiasm. A period of from two or three hours to two months between application of the technology and its recognizable results is very good. A period of two to five months is quite acceptable. But if a program's first technology does not produce a recognizable success within one or two years, the program may run into serious problems. Not only will the program lose momentum, but its credibility may be called into question, and the very success of its technology may be put in jeopardy. Like San Vicente's allspice trees, the new technology may lose the people's interest and fail because of neglect.

Does the Technology Fit Local Farming Patterns?

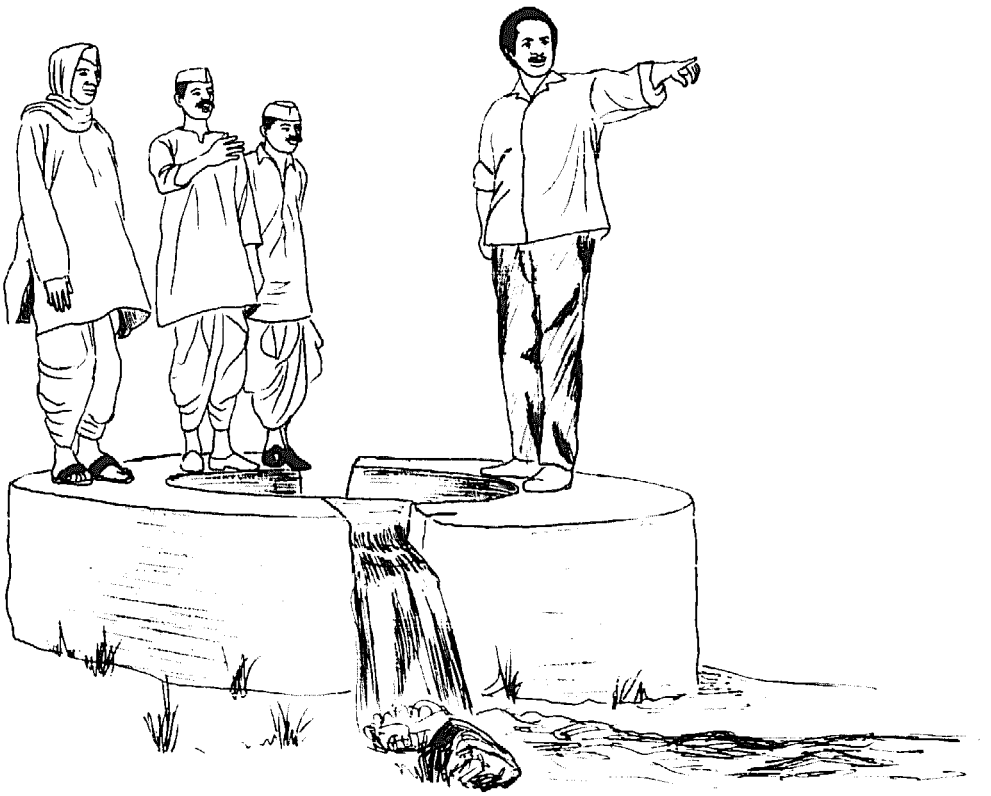
If a farmer's animals need his corn stalks as fodder to survive the dry season, he will be reluctant to use the stalks to make compost. If his pigs serve as a way of marketing corn he cannot store safely, he will resist raising his pigs on commercial feeds. If he is squeezing two consecutive crops into one rainy season, he may refuse to try out more productive strains requiring a longer growing season because the two crops would no longer fit into one season.

Each farmer seeks to raise the income of his or her *total* farm operation, not that of one crop or animal at the expense of another. Therefore, new technologies must fit into local farming patterns as easily and advantageously as possible.

II DOES THE TECHNOLOGY DEAL WITH THOSE FACTORS THAT MOST LIMIT PRODUCTION?

To grow well, nearly every kind of food plant requires a correct balance of more than twenty-five different soil or

environmental conditions. Among the necessary conditions in the soil are adequate depth, oxygen content, texture, structure, moisture content, slope, freedom from certain salts and poisons, and supplies of each of fourteen nutrients. Other factors essential to plant growth are the genetic potential and adaptability of the plant being grown, carbon dioxide in the air, sunlight, temperature, and freedom from insects, diseases, extremes of weather, and wild or domestic animals. A lack of any one of these conditions, whether it be water, soil depth, or even soil molybdenum, is capable of totally destroying a plant's ability to produce, regardless of how plentiful the other conditions are. That is, the one or two conditions that are least adequate in any given locality will determine that area's maximum productivity. Still other factors can limit farmers' productivity even further, including everything from their labor supply and quality of grain storage to a multitude of factors that affect animal growth. The least adequate condition in an area is its "limiting factor."



An innovation must in some way attack the limiting factor or factors in the local farming system if it is to increase the system's productivity. Improving any other factors will increase productivity only minimally, if at all.

III WILL THE TECHNOLOGY BENEFIT THE POOR?

A major international debate has arisen as to whether or not the "miracle wheat" and "miracle rice" varieties have helped the more affluent farmers at the expense of the poorer ones. However that debate is resolved, one of its underlying assumptions can no longer be questioned: the very nature of an innovation determines which economic groups will most benefit from its use. Although some innovations may be close to neutral, the vast majority of them tend to favor one group or the other — either the already wealthy or the truly poor. One of the saddest commentaries on agricultural efforts in the Third World is that almost all the technology promoted there, even by organizations purportedly aiming to benefit the poor, has been biased in favor of the already wealthy.

What characteristics will make a technology most beneficial to the poorest farmers?

Does the Technology Utilize the Resources the Poor People Already Have?

I once watched a veterinarian spend half an hour describing how an incubator for chickens could be constructed using a common light bulb. The only problem was that not one of the farmers listening lived in a community with electric power. Countless classes on composting have been given to farmers who already recycle nearly every scrap of organic waste their farms and families produce. Fish farming and crops requiring irrigation have been recommended to farmers who barely have enough water to drink. Almost universally, technologies designed for large-scale farming are taught to farmers who have less than a hectare of land. And in a world where millions of the poor have been forced to farm hillsides with up to 75% slopes, researchers in Guatemala in 1978 could not find a single precedent to guide them in laying out scientific experimental plots on a hillside.

Technology for small farmers must use the resources they already have. When outside resources are indispensable, they must be easy to obtain on a permanent, reliable basis and they must be inexpensive. We should always keep in mind that outside resources will bias our technology in favor of the affluent, who have better means of transport, more technical knowledge, and more familiarity with the world outside the village.

Obviously, we must make sure that the resources being used are not destroyed. Land, water, forests, genetic variability of crops, and even insect predators must be conserved or renewed, or the gains made will be temporary, indeed.

Is the Technology Relatively Free of Risk?

If a large landowner's crops fail, he merely draws down his bank account or takes out another loan. At worst, he may have to sell some land. When a poor farmer's crops fail, he may go hungry. Poor people simply cannot afford to take the same risks that more prosperous farmers do.

Cash crops are often riskier than food crops because they add the risk of low market prices to that of a poor harvest.

Is the Technology Culturally Acceptable To the Poor?

For reasons as varied as the world's cultures, certain otherwise promising innovations may be unacceptable to the people of a given culture. An appropriate technology obviously must avoid violating local standards of acceptable behavior.

Is It Labor-intensive Rather Than Capital-intensive?

The cheapest labor in any capitalist economy, and especially in Third World villages, is normally that of the poorest people. Thus, whereas capital-intensive technology will favor those with capital, labor-intensive technology will tend to be cheapest for, and thereby favor, the small farmers. Technology designed for the small farmer must be, as Gunnar Myrdal says, "utterly labor intensive."[4]

An expatriate organization working with animal herders in

South America had for years been promoting the planting of certain clover and grass species for pasture improvement — with limited results. The recommendations included the plowing of natural pastures (even though tractors were in short supply), purchase of a variety of seeds (some of which were also periodically unavailable), fertilization with chemicals, inoculation of the seed, and broadcast sowing. Assuming all the inputs were bought at the cheapest prices available, farmers would spend over $200 per hectare, apart from the cost of numerous trips to town.

Looking for a less expensive approach, World Neighbors personnel found a community of small farmers who had discovered that clover slips could be dug out of a pasture and transplanted by hand without plowing. Transplanting produced a pasture of somewhat lower quality than seeding, but it enjoyed a number of advantages: root nodules on the transplants automatically inoculated the new pasture land; native pasture species remaining between the transplants prevented erosion during irrigation; farmers with a community seedbed never had to leave the community to obtain inputs or machinery (unless they chose to use chemical fertilizers); and the transplants matured three months sooner and were hardier than a seeded pasture. But above all, this technology required absolutely no out-of-pocket expenses. The only expense was the people's own labor — a total of 70 days per hectare, which, if valued at $1.50 a day the local wage would be $105 per hectare.

The appropriateness of the technology was evident. This community, with no outside help, had planted more improved pasture in one year than any other community in the province, and its native milk cows were producing four times the province's average.

One kind of capital-intensive technology that has come to be recognized as frequently harmful to small farmers is that of mechanization, especially tractorization. One writer with ample experience in India has even stated that increased tractorization "threatens the very existence of small farmers."[5]

Situations do exist where the labor supply during certain months of the year is the critical factor limiting production. In many parts of Africa, for instance, severe labor shortages

occur during the planting and weeding operations. In such cases, the most appropriate technology may be mechanization. Nevertheless, the following should be kept in mind:

a) The machines should be inexpensive, simple to operate and maintain, free of dependency on outside resources (including fuel and replacement parts), and efficient for use on farms of the size, topography, and soil types of the poorest farmers.

b) Mechanization should *raise* the demand for labor during seasons of underemployment by intensifying land use or allowing additional land to be planted.

c) It should avoid relieving one labor bottleneck only to aggravate another. As an example, mechanization may result in larger plantings, which may worsen the labor shortage at weeding time unless it is accompanied by some technology that simplifies weeding (e.g., denser planting or planting in rows).[6]

Animal traction usually fits these criteria better than tractors, but even animal traction has proved troublesome at times.

Often, because of traditional divisions of labor by sex, the

effect of new technology on workloads of each sex should be taken into account.

Is the Technology Simple To Understand?

Many writers have recognized the importance of technological simplicity. Mosher states that "one of the main tasks in agricultural development is to find ways of farming that farmers of typical ability can use effectively if only they will learn a little more."[7] E.F. Schumacher writes: "New economic activities . . . will be beneficial and viable only if they can be sustained by the already existing educational level of fairly broad groups of people." Edgar Stoesz adds that community development workers should "guard against an innovation which is three or more steps ahead of community comprehension and capacity."[9]

Clearly, not only is small beautiful; simple is also beautiful. The reasons are numerous:

a) Simple technologies use the small farmers' knowledge.

Apart from labor and certain physical resources, small farmers possess great resources of empirical knowledge. They

know their local soils and climate. They know the insects, diseases, and weeds that infest their pastures and fields. And often they know dozens of varieties of traditional crops, along with each crop's climatic adaptability, physical characteristics, growing period, resistance to pests and diseases, storage qualities, desirability in local markets, and even cooking properties and tastiness.

A technology that makes only a few changes in traditional farming systems will use these knowledge resources. A technology that involves new crops or radically different processes is, as Frances Moore Lappe observed, "inherently biased in favor of those who have access to government agricultural extension agents and instruction literature."[10] In actual practice, these people are seldom the poor.

b) Simple technology's use of the small farmers' knowledge also fosters self-confidence and human dignity.

Programs that introduce technology drastically different from the traditional are inherently inferring that what the people know is of inferior value. On the other hand, programs that teach techniques similar to those already in use lend a sense of dignity to the old practices. Furthermore, farmers will feel more self-confident when working with crops and techniques they know.

c) Simple technologies are easier to modify.

All too often a package of practices is introduced to farmers as a single, all-or-nothing unit. Farmers then have little understanding of how the individual practices can be changed, built upon, or incorporated into other farming systems. Furthermore, if the package in any way begins to fail, farmers may discard it just as they adopted it — all at once.

When farmers learn new practices one by one, or at least experience the interplay of the different practices in a simple package, they will later be able to modify the package or incorporate practices from it into new farming systems. Since an improving agriculture is constantly changing, this ability to make modifications can be extremely important. If small farmers are ever to develop their own agriculture, it is absolutely essential.

d) Simple technologies foster a dialogue between teacher and learner.

If the farmers already know many of the crops, animals, or procedures involved in a new technology, the usual "top-down" approach by which the extensionist tells the farmers what to do can be converted into a mutual search for solutions. In this search, the extensionist contributes his or her more technical knowledge, and the farmers contribute their geographically specific experimental knowledge. Such a dialogue provides the villagers with an opportunity to become involved in the learning process and sharpen their critical powers. Farmer participation also contributes to the effectiveness of a new technology because farmers can point out and help correct those aspects of the technology that are poorly adapted to local conditions.

Four characteristics can help in identifying a simple technology:

a) It resembles the technology the people already use.
b) It involves crops or animals the people already know.
c) It is as technically *un*sophisticated as possible.
d) It requires few inputs.

IV. IS THE TECHNOLOGY AIMED AT ADEQUATE MARKETS?

Are Market Prices Both Adequate and Reliable?

Agronomists frequently forget that the profitability of any production beyond that of subsistence will depend entirely on the nature of the local markets, even in a planned economy. Before any technology is considered, market prices and their fluctuations must be checked. Prices at harvest time are, of course, the only ones relevant to small farmers, unless they own safe, inexpensive means of storage and can avoid using production credit payable at harvest.

The degree of competition in uncontrolled markets also affects the market's value to small farmers. If merchants or processors control the prices, any increased income achieved by the farmers will be siphoned away through lower prices. Profitable innovations will only profit those in control of the prices.

Is the Market Available to Small Farmers?

Because of the small farmers' limited means of transportation and the quality and quantity of their produce, they may find entry into many markets impossible. Supermarkets in the cities often provide lucrative markets for specialty crops, but they demand a quality of produce and conditions of delivery and year-round supply that are difficult for the small farmer to fulfill. Large traditional export markets are often controlled by international monopolies, yet efforts to open new channels for export often stumble over the problem of the developed countries' demands for tremendous quantities of produce with rigid quality controls. Unless a program is willing to become involved in the complicated, time-consuming processes of quality control and cooperative marketing, these markets are largely closed to small farmers who are just beginning agricultural improvement.

Does the Market Have Sufficient Depth?*

An agricultural program in an isolated town in northern Guatemala began by promoting egg production. The first year everything went well: leaders from the outlying villages learned to raise the chickens in cages and found that their eggs had a

*The "depth" of a market refers to the amount of supply it can absorb without appreciable decreases in price.

good market in town. The following year the program encouraged the leaders to train their neighbors voluntarily. Many did, and egg production soared. But since the market was small and the eggs difficult to ship elsewhere, the price of eggs plummeted well below their cost of production; everyone involved, including the leaders, lost money.

In effect, the program had taught the villagers that by teaching others they could only harm themselves. It had also destroyed the leaders' credibility among their people. The program's subsequent efforts to stimulate a voluntary multiplier effect in the villages understandably met with little success.

A similarly structured program in central Guatemala began working with beans, a crop that can be transported easily and enjoys a heavy demand throughout the country. Again, the first year went well, except that the leaders found it difficult to get trucks to carry their individual harvests to market. The second year, however, when the leaders had taught their neighbors to grow beans, truckers hurried to please the growing clientele and transport costs were shared among all the producers. Yet the market price of beans remained stable. During the third year the new leaders taught more classes than ever. The gratitude and prestige their successful classes had earned them, as well as the ease in marketing that had resulted, had greatly increased their motivation.

Working with limited markets destroys enthusiasm for sharing knowledge and allows the market to put limits on the program's impact. It also discourages innovation among those farmers who lose money when the prices drop. Perhaps worst of all, it tends to teach people that agricultural advances are short-termed and unpredictable. The people's attitudes about agricultural improvement and even development in general may be permanently colored by these experiences.

Producing for markets with depth will in most cases turn us toward either the major traditional food crops of the nation or well-established export crops. It will also steer us toward those products that are easiest to store and transport, which include basic food grains and roots and major export crops.

V. IS THE TECHNOLOGY SAFE FOR THE AREA'S ECOLOGY?

No program genuinely interested in the long-term well-being of a people will knowingly promote a technology destructive to the environment in which those people must live and grow their food. Yet hundreds of programs have, directly or indirectly, done so. Worldwide problems of erosion, overgrazing, salting, silting, and deforestation are destroying millions of acres of soils every year.[11]

A detailed presentation of the ecological impact of different technologies would take too long, but a few basic guidelines can be given here. In irrigation projects, however small, we should beware of salting, silting, erosion, and changes in ground water levels. Those working in semiarid grazing areas or in rain forests should recognize that they are dealing with particularly delicate environments. Overgrazing of the former or plowing, clearing the land cleanly, or cultivating continuously the latter can be especially dangerous. Deforestation and erosion must be prevented everywhere.[12]

The most controversial environmental issue is that of the use of pesticides. The ideal situation would be never to have to use pesticides at all. Nevertheless, insects, diseases, and weeds each year destroy an estimated 15 to 35% of the world's agricultural production.[13] And malnutrition and hunger, aggravated by these losses, undoubtedly result in far more misery and loss of life than would the ecological consequences of preventing the losses. Thus pesticide use may be necessary in specific, limited situations. But we must avoid using pesticides whenever possible and always think of them as a stopgap measure to be used until safer, more permanent solutions are found. When pesticides *are* used, we should give preference to selective, low-residue chemicals of low toxicity, and farmers should always be warned of their dangers and taught safe ways of handling them.

Alternatives to toxic pesticides are becoming increasingly common. Insect- and disease-resistant varieties, pheromones, desiccants, and other ecologically safe methods of pest control may soon become more widely available, while some backyard remedies like releasing predators and spraying with solutions

of insect carcasses may find use in certain situations.

We must remember, though, that cultural practices like crop rotations and timely planting and cultivation have always been humanity's primary line of defense against pests.[14] By orienting our work toward traditional crops, we can take advantage of centuries of the small farmers' experience in controlling pests naturally.[15]

VI. CAN THE TECHNOLOGY BE COMMUNICATED EFFICIENTLY?

Agricultural programs, like any other enterprise, must be as cost-effective as possible (i.e., we must get as much impact as we can per dollar spent). To achieve optimal efficiency, we should ask:

Does The Technology Require a Minimum of On-site Supervision?

Visits to farmers' fields are expensive. Innovations that require only a few visits for close supervision and trouble-shooting (e.g., during only one part of the crop cycle) will cost less than those requiring more visits. Once again, working with crops and animals with which the people are already familiar is preferable.

Simple innovations also decrease the need for costly supervision. The number of totally unexpected and at times bizarre problems that arise on experimental plots is directly proportional to the amount of difference there is between the new technology and the traditional one.

Is It Simple to Teach?

a) Simple technologies require less time and effort to teach.

As Conrad Arensberg has written, "complex innovations require much more time and instruction than simple ones and their complexity provides more chances for failure."[16] In addition to taking less time, simple technologies involve a minimum of locally unavailable inputs. Thus the program avoids getting involved in transporting, selling, or assuring the supply and quality of new inputs. And there is less likelihood

that farmers will have to abandon innovations because of shortages, late arrival, or increased prices of inputs after the program closes down — a frequent occurrence well illustrated by the Barpali Village Service vegetable project in India.[17]

b) Simple technologies are learned sooner and spread faster.

Simple technologies encourage a strong multiplier effect because villager leaders master simple technologies more quickly and have fewer problems teaching and demonstrating them to others. Furthermore, their students find these technologies easier to learn and retain. If these technologies, including all their directions, dosages, and precautions, cannot be retained by the illiterate, they may be useless, even dangerous, for most of the small farmers.

Simple technologies generally cost less for the small farmer to put into practice. Therefore, villager leaders will more easily be able to convince their students to try out the innovations.

c) Simple technologies have a longer-lasting impact.

Since simpler technologies result in fewer failures and allow for modification without being discarded as a whole, they are likely to last as long as they continue to be advantageous to the people.

Does It Arouse Enthusiasm Among the Farmers?

Technologies that fail to arouse the people's enthusiasm will spread only as far as the paid extensionists personally take them, whereas those that do create enthusiasm will "spread with phenomenal rapidity from one individual to another with very little outside stimulus."[18] In terms of program efficiency, the former situation is untenable. If a technology does not spread beyond the range of contact of the program's paid personnel, whether they are agronomists or not, the program *must* find a more appropriate technology. We simply do not have the financial resources to use paid personnel alone to spread new technologies around the world.

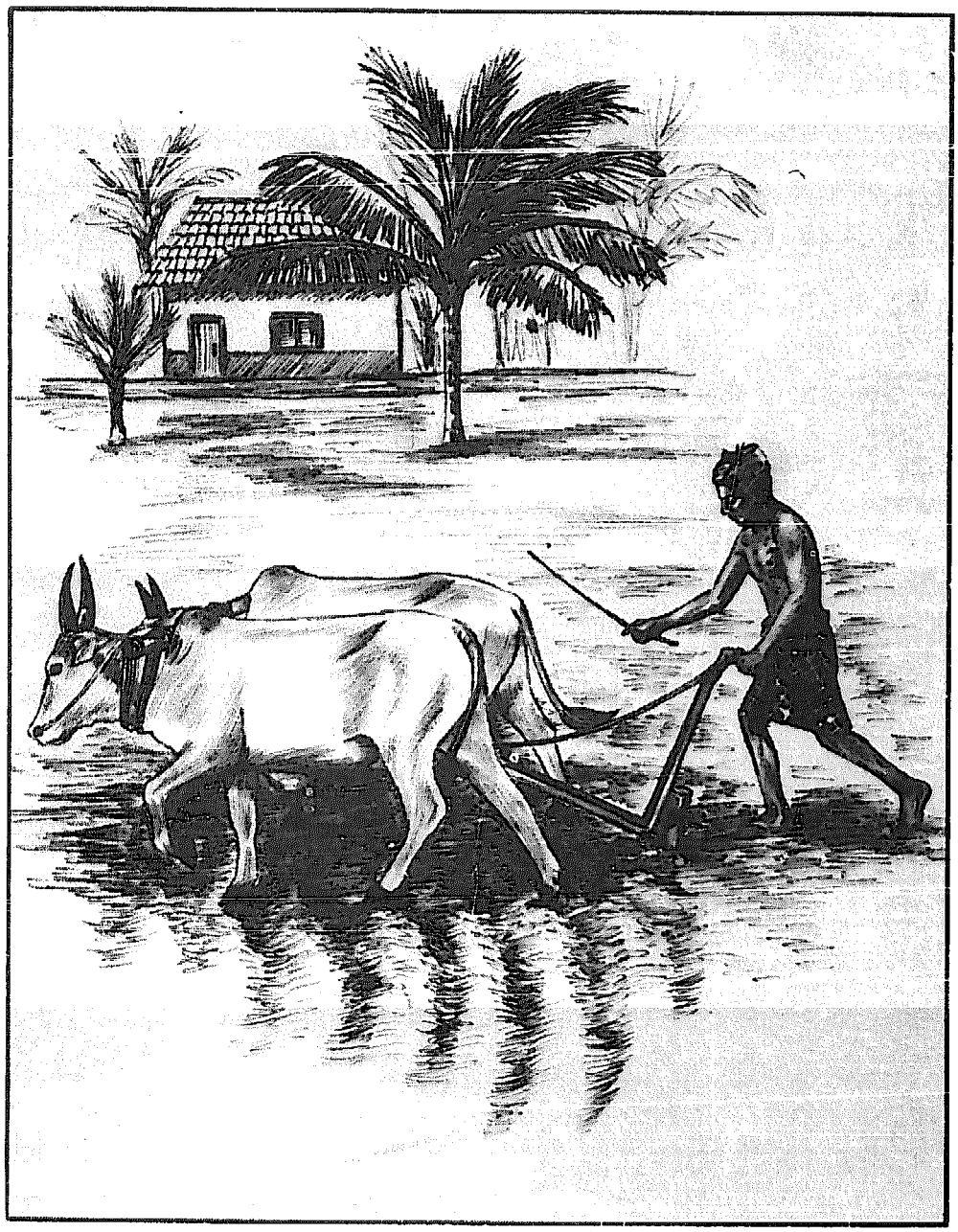
As Charles Erasmus has observed:

> . . .the kinds of innovation which would seem to be most inexpensive are those which require the least man-hours for strictly promotional purposes. Such innovations include those from which

benefits are easily verifiable through casual observation [are 'recognizable successes']. which are accepted and diffused on an individual basis, which meet a strong need already felt by the people (of particular appeal to the profit motive), and those which are in sequence with local development (not too complex).[19]

7. IS THE TECHNOLOGY WIDELY APPLICABLE?

A technology appropriate for 5,000 farmers would obviously permit a program to have more impact than would a technology appropriate for only 50 or 500. Although variations in topography, microclimates or cultural groups may restrict the area of a program's work, a well-chosen technology can often surmount these barriers.



Whereas the technology of the experiment stations has been over-rated, that of local farmers has generally been under-rated.

9 CHOOSING AN APPROPRIATE TECHNOLOGY: THE PROCESS

Often the first reaction to the list of criteria for an appropriate technology is, "That's all fine, but it may be downright impossible to find technology that will fit all those criteria."

Although no one can know for sure what the potential for increased yields and incomes is in the Third World, we have good reason to believe that a tremendous potential exists. One indication is the wide variation in current levels of production in different countries. Average rice harvests in India and the Philippines are one-third to one-sixth of those in Japan and Taiwan.[1] Thus, if the poorest producers of India and the Philippines (who produce much less than their national averages) were to match the average yields of Japan, they would have to increase their yields by ten to twelve times.

Furthermore, a large number of simple, inexpensive innovations look very promising.[2] Among these are simple soil conservation measures, the use of native green cover crops, the use of blue-green algae in irrigated rice, planting in rows rather than broadcasting, intercropping and multiple-cropping,

bringing back native herbs and food plants in danger of dying out (such as winged bean, amaranth, changkok, tarwi, etc.), organic insect and pest control, better water use and drainage, tree culture and the intercropping of trees with other crops, the storage and processing of grains and vegetables, pasture improvement, animal vaccinations, and countless simple cultural improvements in traditional crops. We have hardly begun to investigate most of these possibilities, much less to pass them on to small farmers.

With so many possibilities, how do we choose the best innovation to use at the beginning of a program? How do we find an innovation that meets the criteria in Chapter 8? The process can be broken up into four steps:

1. Establish the general priorities of the area.
2. Look for and list the potential innovations.
3. Choose three to six innovations according to the criteria from Chapter 8.
4. Test the innovations.

ESTABLISH THE GENERAL PRIORITIES OF THE AREA

The general priorities should be determined on the basis of the answers to the following questions: What do people want the program to do? What technologies have they already tried out on their own? What are the limiting factors in the area's farming systems? Which resources are most plentiful? Which are cheapest? What are the seasonal labor shortages or surpluses?

This establishing of priorities must be based on an intimate knowledge of local farming systems and carried out with a maximum of villager participation.

LOOK FOR AND LIST THE POTENTIAL INNOVATIONS

Ideas for potential technologies can be supplied by experiment stations, local farmers, other programs in ecologically similar areas, program people, or local agronomists.

Experiment Stations

Experiment stations are the traditional source of technology and have achieved many successes, especially in the area of agricultural chemicals. Nevertheless, in the past, their technology has not been looked at critically enough. Most of it is not at all what the small farmer needs.

First of all, experiment stations rarely bother to find out what small farmers actually need or want. Far short of establishing a running dialogue with the villagers as to their needs and preferences, they seldom broach the question. Scientists often disregard cultural values and know almost nothing about the small farmer's overall farming system or marketing constraints. They also have little appreciation for what villagers look for in their traditional plants. In Guatemala, for example, corn provides cornstalks for fencing, husks for wrapping hot food, and leaves for fodder, in addition to providing grain, which must satisfy local taste preferences and have the right texture for making tortillas. No matter how much grain it produces, a corn plant that fails to fill these needs is unacceptable to rural farmers.

Research stations almost universally use yield or income per hectare as the criterion of success. In different areas, however, the limiting resource may be investment capital, labor needs per hectare, or the labor required at planting or weeding time. The proper criterion in each of these cases would be yield or income per unit of the limiting resource. Income per hectare may be totally irrelevant. For example, ICTA found that in Zacapa, Guatemala, labor availability during the planting season was the limiting factor in small farmer bean production. In this case, income per man-day of labor at planting time is the only relevant criterion of success.

Experiment station work is based on the assumption that experiments on one piece of land in one climate and with one soil type will provide relevant data for a whole section of a nation, and that experiments on soils that for years have been cropped, cultivated, fertilized, and chemically treated in non-traditional ways will provide data useful for traditional farms.

Lastly, experiment stations are generally oriented toward the plantation crops, export crops, cash crops, and crops or

animals that are the highest priorities of national governments and foreign professional journals rather than of the local villagers. And they tend to work with high-yield, high-risk, capital- and fertilizer-intensive technology on flat and often irrigated land. Their technology is often the exact opposite of what the small farmer needs.[3]

Fortunately there is a growing movement toward "farm systems research," in which the experiments are carried out on small farmers' land by the farmers themselves, and their subsequent adoption of the technology is the criterion of success. Those experiment stations using this approach will probably produce technology that is more appropriate for small farmers than have the traditional experiment stations.

Local Farmers

Whereas the technology of the experiment stations has been overrated, that of local farmers has been underrated. Good local farmers often produce two to three times what neighboring farmers do. Furthermore, through a natural selection process, they have chosen their methods according to the criteria for appropriate technology. By teaching these farmers' methods to others, we can achieve significant increases in production. Though many technicians doubt the value of this methodology, it was the one used in both Japan and Taiwan in the early years of their tremendous agricultural take-offs, and it was also used extensively in Western Europe and the United States.[4]

Other Agricultural Programs

Development agencies must put aside their occasional sense of professional pride and competition in order to learn about and use each other's technology. Often, a nearby agricultural program with several years' experience will have done a good job of testing and selecting an appropriate technology. At the very least, it will have gained valuable experience as to why some apparently worthwhile innovations do *not* work.

Program People or Local Agronomists

People in our own programs may also have good ideas. We should, however, maintain a healthy skepticism about our own ideas and those of our own staff or institution.

CHOOSE THREE TO SIX INNOVATIONS ACCORDING TO THE CRITERIA

Each of the potential innovations should be rated according to the criteria for an appropriate technology. Again, the experience of World Neighbors and other organizations such as OXFAM of England has provided some idea as to how well the different kinds of innovations fit these criteria. Only a few general comments about some of the possible innovations and their often overlooked problems are presented here.

New Varieties of Traditional Crops

Of all the possibilities for agricultural improvement, introducing a new variety of a traditional crop is probably the simplest. It is particularly simple if the cultural practices, growth period, and taste of the new variety are identical to those of the old one. It is usually a one-time change. It costs little, fits into present farming practices, requires little supervision or training, and can be easily understood. It should come as no surprise, then, that the introduction of new varieties, among them "miracle" rice and wheat, have, along with fertilization, been the most widely adopted innovations in the Third World.[5]

One problem of new varieties is that they may lack resistance to local pests or diseases. Problems with insect and animal pests are usually aggravated when the planting or harvest dates of the new varieties differ from those of neighboring fields. Other problems of new varieties can include reduced adaptability, high agricultural input requirements, poor taste, poor storage quality and the failure of the nonedible parts of the plant to meet people's needs. In the long run, if the new variety is highly successful, the main problem can be a reduction in the crop's genetic variability. Farmers should be warned always to keep some of their

traditional seed and to continue to look for additional improved varieties.

Hybrids are often of less value for small farmers than are other introduced varieties. Hybrids are sometimes more vulnerable to disease than other varieties. Often they are less adaptable; a change of 150 feet in elevation can drastically lower their productivity. Worst of all, farmers using hybrids must buy new seed for every planting. Many seed suppliers in developing nations, especially governmental ones, produce poor-quality seed and cannot be relied upon to continue producing an adequate supply year after year.

Fertilization

Fertilization with chemical fertilizers is another practice that is among the easiest to introduce and most widely accepted by small farmers. It requires few adjustments in farming patterns, is easily learned, takes little supervision, has wide application, and gives rapid, significant results. It can also help build up the soil's organic matter content by making

crop residues more abundant, and it complements very well most other improved practices. On the other hand, it is expensive, creates dependency on outsiders, increases weeding problems, may become uneconomic in a few years because of rising energy prices, and may have a negative impact on soil ecology.

Organic fertilizers benefit the soil in many ways. Nevertheless, as long as organic fertilizers, including homemade compost, remain several times more expensive per pound of nutrients than chemical fertilizers, the dilemma over whether to use chemical fertilizer will continue to be a difficult one.

One generally overlooked possibility for increasing soil fertility is that of planting native legumes as green manure crops to be incorporated into the soil. They can be grown during fallow periods or intercropped with traditional crops. Drought-resistant varieties may be planted just before the rains end so they can grow during the dry season.

Pest and Disease Control

If pests or diseases are causing major losses among traditional crops, pest or disease control can be a simple innovation with immediate, visible results. When biological controls are possible, inexpensive, and reliably effective, they can be an extremely good opening technology for a program. Pest control with toxic chemicals should be used only with extreme caution. (See Chapter 8.)

Mechanization

Mechanization can, in some cases, solve a seasonal labor shortage problem, but the issue is much more complicated than it seems. (See Chapter 8.) Mechanization can increase production per acre or unit of labor, increase the area planted, reduce time for operations so additional plantings can be made, and provide more exactness in operations. On the other hand, it is expensive; can put people out of work; requires maintenance, parts, fuel, and knowledge not locally available; can be used only on flat land of certain soil types with

	Rotation of grazing	Cattle dips	Hay making	[illegible]rans[illegible] clover pasture	Arti[illegible] insemination	Se[illegible] clover pasture	[illegible]ject (milkbarn)	Cur[illegible] mastitis	
Felt Need?	1	3	4	1	2	1	2	5	Very strong-5; None-0
Financial advantage?	3	3	4	4	2	4	5	2	150%-5; Less than 25%-0
Rapid Success?	1	4	2	3	2	2	1	4	0 to 1 week-5; over 2 years-0
Fit Local Pattern?	0	4	2	4	4	3	0	5	Yes-5; No-0
Utilize People's Resources?	5	1	3	4	0	1	0	0	Entirely-5; Only land-0
Low Risk?	5	3	2	5	1	3	2	5	No risk-5; Less labor-0
Labor intensive?	3	4	5	5	3	3	4	3	More labor-5; Less labor-0
Simple?	3	3	2	4	1	1	0	5	Very easy-5; Complicated-0
Markets adequate, available?	4	4	4	4	4	4	2	3	Very good-5; Inadequate-0
Market depth?	4	4	4	4	4	4	4	4	High-5; Low-0
Ecological impact?	5	3	3	5	3	3	3	3	Positive-5; Destructive-0
Communicated Efficiently	1	3	1	4	1	1	0	4	Efficiently-5; Expensively-0
Widely Applicable?	5	5	5	4	4	4	2	4	Any area within 5000 ft. elevation-5 Only in 1-2 Villages-0
	40	44 3	41 1	51	31	34	25	47 2	

CHART NO. 4. The relative appropriateness of different innovations can be found in this manner. Differences of less than five to ten points are insignificant, but over ten points they are valuable indicators. Occasionally one factor (no increase in income or severe conflict with local patterns) will eliminate a technology even if it would otherwise have a high score. The score of each technology will, of course, vary from one culture to another and even from one village to another. Villagers can and should participate in these evaluations.

accessibility to roads; and may produce a negative impact on social and family relations.

Both tractor and animal mechanization are complicated, difficult technologies to teach and supervise.

Introducing a Nontraditional Crop

A monoculture can cause poor diets, a poor seasonal distribution of income, economic dependency on middlemen, heightened pest control problems, and soil depletion. Where farmers practice a monoculture, crop diversification is somewhat justifiable; where they do not, it is much more difficult to justify.

Introducing an entirely new crop is much more complicated than improving a traditional crop. With a new cash crop, farmers must usually learn everything from where to buy and how to recognize good seed to where to market the crop and at what price. If it is a food crop, they may also have to learn how to store and process it. The introduction of a new crop should not normally be attempted if a 50 to 100% increase in income can be made with an existing crop.

Most cultures will resist diversifying into a new crop until they can satisfy all their subsistence needs with the land and resources they already have. This is true for many reasons: traditional farmers do not trust or understand markets enough to depend on them for their food; the color, texture, cooking qualities, or taste of the food in the markets may fail to meet their needs; producing their own food protects them against scarcity in the market or variations in price; the traditional food plant may provide many more family needs than just food (e.g., fuel, fodder); farmers derive satisfaction from growing the food for their own families; not growing a traditional crop may disrupt traditional religious rites, work patterns, family ties, or divisions of labor. Thus, before farmers will diversify, they generally must learn how to grow all they need of their traditional crops with less land and fewer labor resources than they already have.

If diversification is into a food crop already eaten but not grown in the area, problems of texture, color, and cooking qualities may arise. Also, farmers are usually reluctant to

invest money in a crop from which they receive no cash income in return. If the diversification is into a cash crop, we must ensure that markets are adequate and that we are not adversely affecting the people's food supply.

Introducing a new food crop with an unfamiliar taste is extremely difficult. In addition to all the difficulties inherent in introducing a new crop, there are all the problems of what to do with the harvest. People do not know how to store, process, or cook the food. Some of them will not like its taste, yet what they do not consume will have no market. Such a project rarely succeeds. One, a soybean project in Zaire, wound up building its own soybean marketing system.[6] Such a solution is tremendously expensive and inefficient and ordinarily has little hope of permanence. Many of the miracle crops (e.g., winged beans, tarwi, amaranth) fall in the new-crop-unfamiliar-taste category when they are introduced into new areas.

Vegetable gardens are a kind of crop introduction that enjoys wide popularity yet has a record of nearly universal failure.[7] Seldom do the gardens last more than one or two years beyond the end of a program. A vegetable garden involves the introduction of not just one but as many as ten new crops, many of unfamiliar taste, with all their particular cultural practices and problems with insects, disease, storage, and cooking. The necessary supplies are usually in such small demand that they are not locally available, and seed, if available, has frequently been gathering dust on store shelves so long it will no longer germinate. Often women, who tend the gardens, have heavier workloads than men. Lastly, vegetable gardens normally grow only during the rainy season, when villagers often have plenty of free herbs that grow wild in their fields, and are more nutritious than most introduced vegetables. Often, these overlooked native vegetables are precisely the crops we should be promoting.

If, in spite of all the problems, home vegetable gardens are still considered a nutritional necessity, it might be wise to introduce one or two of the most important species rather than the customary eight or ten.

Sometimes, one or two vegetables can be good cash crops, but they usually demand rather exacting care.

Irrigation

Irrigation projects are usually complicated and difficult. First of all, the farmers must be well organized and able to work together exceptionally well. Any of the problems of distribution of the water, charging for its use, or maintenance of the irrigation system can cause serious divisions within a community. Furthermore, if benefits from the project are to be shared equally, land must be communally farmed or be flat, consistently suitable for irrigation, and well distributed among the community's members. To further complicate matters, irrigation can seldom be tried out on a small scale, and new, more intensive crops must usually be introduced to make the irrigation system pay.

Multiple Cropping

Multiple cropping has recently inspired a ground swell of enthusiasm among researchers. Among the advantages cited are the intensified demand for labor, the use of local resources, the large increases of income with small capital outlays, and better insect, weed, and disease control. The difficulties will depend entirely on how well the particular cropping system fits the criteria of an appropriate technology: the simplicity of the technology, the similarity of the system to traditional practices, its flexibility in fitting into farming systems, etc. Simple innovations in multiple cropping have real potential, but many of the multiple cropping innovations presently being investigated are far from simple.

Trees

Trees provide numerous advantages. They can produce food in the off-season, grow in combination with plants of different heights to maximize land use, make use of marginal soils, use nutrients too deep in the soil for other plants, protect the soil from erosion, and resist most pests. They also provide economic stability in drought-prone areas. Yet trees have one fatal flaw: the recognizable results do not usually appear for at least three or four years. Trees are rarely a good technology to

start with, but they can be a very valuable introduction the third or fourth year of a program.

Small Animals

Traditional, free run poultry raising requires little capital, produces medium-term results, and is already familiar to most villagers. However, putting the birds in cages or pens elevates poultry raising to a very complex level of technology that requires expensive feeds and medicines and sophisticated management. In most cases this technology has no permanence.

Where poultry run free, the limiting factor is usually disease. Vaccinating these birds can, with very little effort, understanding, or investment, double the income or food they provide. The major disadvantage of this technology as a starter is that poultry is a sideline for most farmers and therefore may not arouse much enthusiasm.

Rabbits are almost always a new animal for villagers. Furthermore, there is seldom a market for the meat or furs; they have a very high disease rate; and they are so attractive that children become attached to them and refuse to let them be butchered. Although they are a good idea nutritionally, they are rarely a permanent innovation.

Fish raising has also received a lot of attention. It requires little capital, and fish have few diseases. But they can only be grown well in warm climates on relatively flat land with ample water and heavy clay soils. Furthermore, although they are an excellent source of food, production per pond is usually much less than is expected, and fish rarely bring much income.

Bees often provide a good income and can be raised using very simple technology, but they are seldom more than a program sideline because most people are unwilling to handle them. Care must be taken to ensure that an adequate year-round supply of nectar is available, and that insecticides are not used nearby.

Pigs, like other nonruminants, produce at best only one pound of food for every three or four pounds they consume. As long as a family has only a few, the pigs can live on scraps. If, however, the animals must be fed human food or commercial feeds, the meat produced will frequently be too expensive to be consumed by small farmers.

Grazing Animals

Grazing animals are often promoted because they complement crop production. They consume by-products of cropping operations, and they provide power, transportation, and manure for fertilizer. In addition, they produce meat, milk, skins, and wool; they serve as a form of savings; and they can make use of marginal lands for grazing. Nevertheless, grazing animals present a number of serious problems. If people traditionally have grazing animals, they often have strongly held customs and values that prevent change, including communal ownership of grazing lands. For people who do not already have such animals, animal raising is a complex technology with major initial investments, high risk, and no trialability (i.e., one cannot try it out with a $10 investment).

Although the first impulse is to improve the stock, the limiting factor with grazing animals is not usually genetics, but parasites, infectious diseases, or food supply. Thus parasite control, vaccination, or pasture improvement is usually the indicated technology. Vaccination and parasite control can be very good beginning technologies where there is a felt need and the technology is kept simple.

Two innovations that have tremendously high failure rates in Third World villages are artificial insemination and silage production. Artificial insemination is based on the usually incorrect thesis that genetics is the limiting factor. Furthermore, it is an extremely complex technology that is entirely dependent on a constant supply of semen and commercial coolants that are difficult to obtain, and on transportation to deliver the semen while the animals are still in heat. Silage making is such a complicated technology that the silage frequently spoils even when prepared by professional agronomists. If dry season food supply is the limiting factor among animals, hay making is simpler than silage making. The propagation of year-round drought-resistant native grasses, legumes, or forage trees is even simpler, and in certain cases can be a very good beginning technology.

About twenty-five percent of all the Third World's food is lost in storage, and much of the quality of the remaining food is lost as well. Especially in hot, moist climates, and in places where prices fluctuate greatly, tremendous potential lies in improved storage. Often the problem lies not so much in the traditional containers as in their hygiene and maintenance or the adequate drying of the grain before storage. The most promising possibility is that of making minor improvements in traditional storage systems, such as drying the grain properly or applying a fumigant or some kind of organic insect control (e.g., coconut oil or ground chile peppers). These can be simple, inexpensive innovations with wide application. Processing, especially simple milling, oil extraction, and drying or preserving of fruits and vegetables also have genuine possibilities. Communal storage projects have not had much success or permanence because of the complexity of the technology and problems of communal organization and financial controls.

Soil Conservation

Where soil depletion and erosion are serious problems, soil conservation can be an extremely important, simple, labor-intensive technology that complements many other technologies. However, the results of soil conservation often take years to be appreciated. Thus soil conservation should usually be associated with another simple technology that produces quickly recognizable results. Any conservation work requiring contour lines should be laid out with "A-frame" levels rather than surveyors' levels.

Land distribution

At times land settlement or the purchase of large landholdings for distribution is our only hope of helping the landless (although cottage industries are sometimes a preferable alternative). Both are among the most difficult, least cost-effective kinds of projects possible. In fact, neither is a *substitute* for agricultural improvement; rather they are an *addition to* it. For if new owners do not learn to use their land well, they will probably abandon it or sell it back to the large landowners.

TEST THE INNOVATIONS

Once the possibilities have been narrowed to three to six innovations, they must be tested under local conditions. This can be done either on farmers' plots, a program plot, or a combination of both.

By far the best, least expensive, and least time-consuming method is to let small farmers test the technology themselves. A new seed or new technique can be shown to several farmers who can test it (with program supervision when necessary) and then report back the results. The advantages of this method are that a closer dialogue is established between the farmers and the program; farmers learn about the innovations being tested; they understand better where new technology comes from; the villagers participate more; the test takes into account the farmers' ideas, values, and understanding, as well as their farming system; and tests can be made at a variety of elevations

and in a variety of soils and climatic zones. Furthermore, when an experiment is successful, it can double as a demonstration of the best kind — one done by a local villager. Nevertheless, farmers' plots can be used only when the program has developed a close relationship with a lot of farmers and has taught them how to do experiments and keep farm records. In the meantime, a program plot will have to suffice.

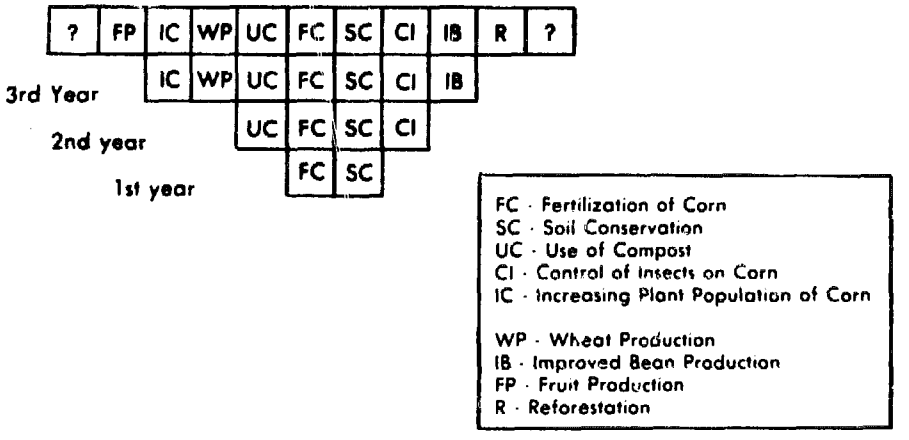
A constant danger of program-run experimental plots is that they will take up program leaders' time that could be better used in extension work. Such plots should be as small as possible (seldom more than 1/4 hectare needed, with individual experiments of 10 x 10m), and should use a minimum of employee time. Strict accounts must be kept of each experiment. One experimental farm in Central America spent more than $10,000 over three years on experiments with pig raising before someone discovered that it was *losing* a minimum of $20 per animal.

Lastly, experimental plots should duplicate as closely as possible the conditions on the poorest villagers' farms. Managers of a large experimental-demonstration farm in Micronesia found that local soils were extremely acid, so they trucked in crushed coral from a nearby reef and ploughed it into the soil. As a result, hectares of tomatoes, squash, and fruit trees flourished beautifully. Nevertheless, when I asked how many of the program's hundreds of graduates had put into practice what they had learned, program leaders could think of only two. The students' soils were, after all, too acid to produce the same results. Other program plots have irrigation when nearby farmers depend on the rains, use tractors while the farmers use hoes, are situated on rich bottomlands while all the poorer villagers farm eroded hillsides, and market the crops in pickups while the farmers use horses, donkeys, or their own backs.

If the testing is done on a program plot, villager leaders must be kept informed of the progress of the experiments. The willingness of villagers to adopt the technology the following year is the best test of a technology's appropriateness.

THE TECHNOLOGY PYRAMID

The idea is not, of course, to teach only one innovation



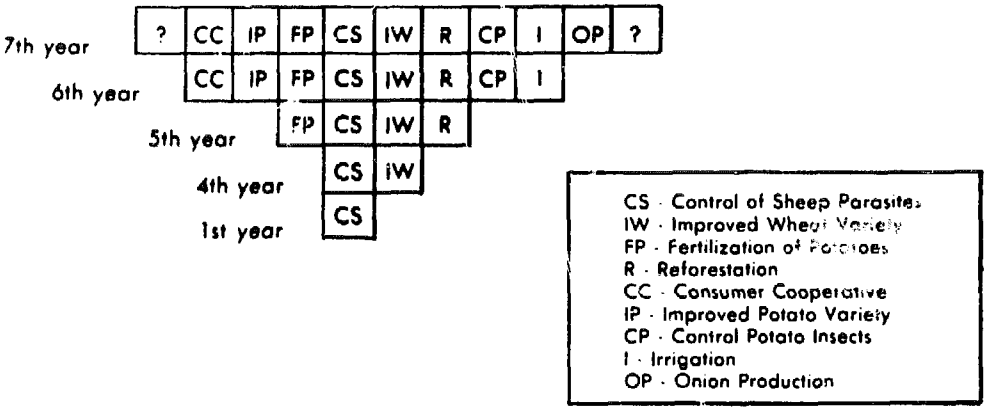


DIAGRAM NO.1. Examples of Technology Pyramids from two different programs. The first program began with two innovations. The fertilization produced immediate recognizable successes that helped soil conservation (contour ditches and grass barriers) become a mainstay of the region. The third year brought the first fairly complicated innovations with the introduction of wheat as a new crop to be planted in rotation with bush beans and corn. The question marks signal technologies that varied from one village to another because local extensionists had tried out and were now teaching technologies of their own.

In the Bolivian program, farmers had more traditional crops, so simple innovations involving a variety of crops could be used before it was necessary to move on to more difficult innovations. In this case, the control of sheep parasites was practiced for three years before the improved wheat variety was introduced because research was needed to decide which innovation to introduce next and because intense suspicion of outsiders made a slow start necessary.

during the entire life of a program. As farmers experience success with one innovation, they gain trust in the program and in the process of change itself. They also gain sophistication, self-confidence, and enthusiasm for trying out more innovations. Because they have learned how and why one should try out new technology, they will be more likely to take good care of future experiments. Furthermore, their incomes will have increased, so they will be able to take larger risks and invest more in the next innovation. In short, they are more motivated and better equipped to learn another stage of technology. Each step forward, successfully taken, makes more steps possible.

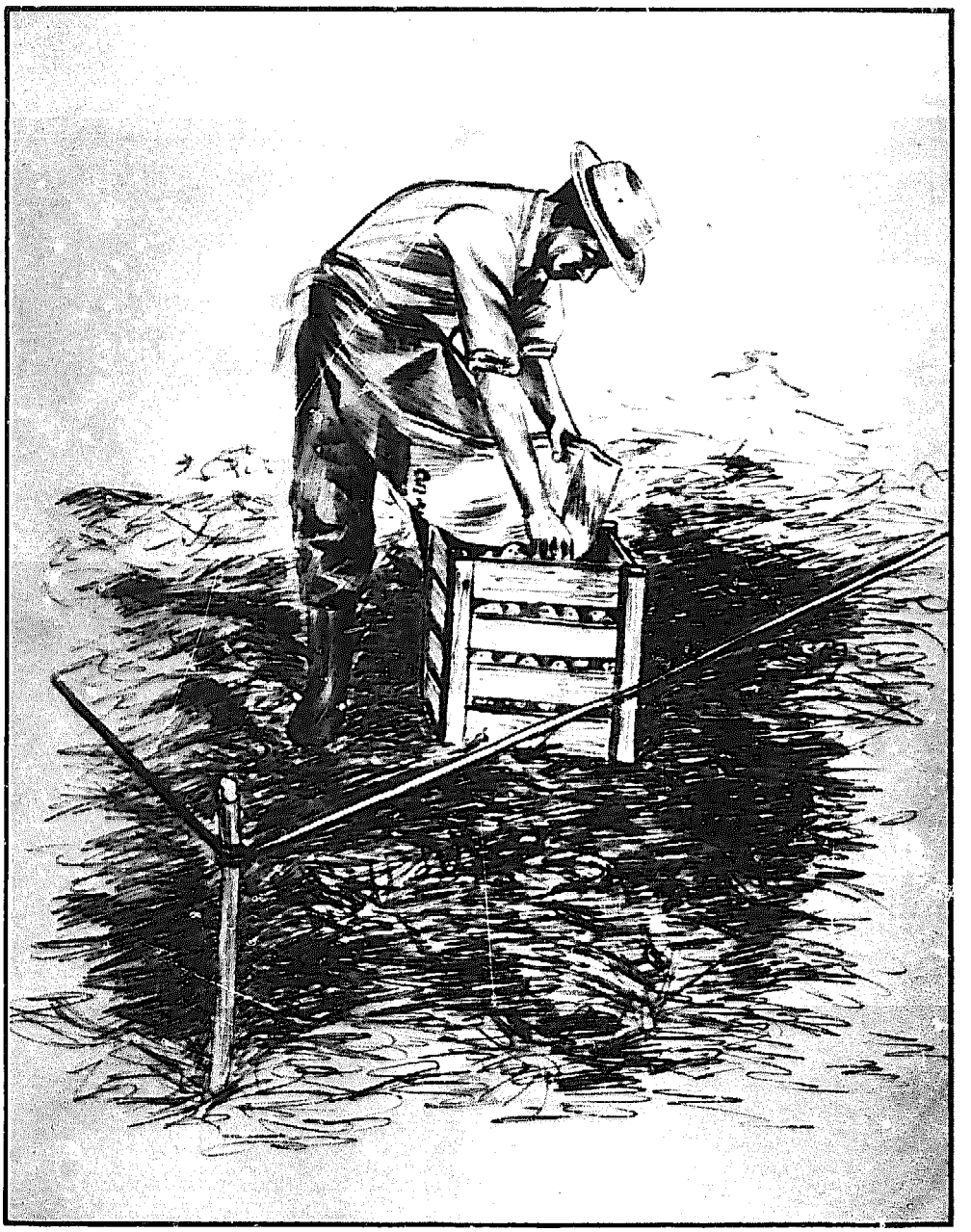
The added income, enthusiasm, and sophistication gained in adopting the first innovation will be needed in tackling a second. If the first innovation was truly the most appropriate possible, successive innovations will tend to be more expensive, more difficult to learn, or more complicated to put into practice. Furthermore, as long as they apply to the same crops or animals, they will probably bring diminishing increases in income. Nevertheless, each innovation successfully adopted makes the villagers more able to learn and adopt more difficult innovations.

Thus. each year or two, new innovations are taught to the farmers who have already mastered the previous ones. Gradually, an inverted pyramid of technology is built. (See Diagram No. 1.) Each year those farmers who are just beginning to innovate learn the first innovation while those who have already learned the first innovation progress up the pyramid one step each year. Subsequent steps of the pyramid can also have increased numbers of innovations. While it is best for beginning farmers to learn only one innovation well, those farther up the pyramid will probably be sufficiently sophisticated, motivated, and well financed to experiment with two or three innovations a year.

As a program introduces each stage of technology, it should be testing a new technology for subsequent years. New innovations will, of course, continue to be chosen according to the same criteria used the first year.

When is it time to introduce the second stage of technology? Here, again, enters the artistry of agricultural

improvement. Certainly it should not be introduced until after the first innovation has been adopted by a large number of farmers. Some of these farmers should already be teaching it to others, and the adopters of the innovation should have reached the critical mass in some communities. At the same time, the new technology must be introduced before too many of the original innovators begin to lose their enthusiasm or feel that the first advance they made was just a one-time lucky break. With new innovations coming along periodically, they will see the first innovation not as a one-shot affair, but as the cutting edge of a new and exciting adventure toward higher yields and an increasingly satisfying way of life.



No technology should be taught unless the students are experimenting with it on their own land.

10 SMALL-SCALE EXPERIMENTATION

The fundamental problem confronting agriculture is not so much the adoption and spread of any particular set of physical inputs or of economic arrangements or of organizational patterns or of research institutions. Rather it is to build into the whole agricultural process . . . an attitude of experiment, trial and error, continued innovation, and adaptation of new ideas.

> Report of a Conference on Productivity and Innovation in Agriculture in the Underdeveloped Countries. Massachusetts, Institute of Technology[1]

Once the technology has been chosen, the job of introducing it to the people begins. From the start, we must remind ourselves that our job is not just to teach people technology, even less to be "salesmen" of technology. Much more important than selling any particular technology is teaching the people a method of village research with which they can continue to try out new innovations year after year. Once again, *we are not here to develop their agriculture, but to teach them a way in which they can develop their own agriculture.*

In this role we should never try to convince a farmer to change over entirely to some new practice (except in the rare, usually avoidable cases in which the nature of the technology

requires it). Instead, all we need to do is to convince the farmer or group of farmers to try out an innovation on a small piece of land, usually 1/20 hectare or less, or on two or three animals, and to keep a simple accounting of the results.

The temptation always exists to try to introduce an innovation on as many acres of land as possible. It makes our program statistics look better. But we should not be any more interested in one person's innovating on a hundred hectares than we are in one person's learning a hundred ideas. Objectives and results expressed in areas of land rather than in numbers of farmers once again exert pressure on a program to work with the larger, more prosperous farmers.

There are many reasons why we should promote small-scale experimentation rather than large-scale adoption.

WHY TEACH SMALL-SCALE EXPERIMENTATION?

Teaching small-scale experimentation provides advantages for everyone involved: the small farmer, the villager extensionist, and the program.

Advantages for the Small Farmer

The first advantage for the small farmer is that it reduces his or her risk; it protects him or her against major economic failure. Innovations can fail for many reasons. They may not have been tested sufficiently by the program. Those that have been well tested can fail because of differences in weather, topography, microclimate, or soils between the time and place the innovation was tested and the time and place it was put into practice. An innovation can also fail because of the specific situation of the individual farmer, such as his or her seasonal labor availability, the possibilities and cost of transportation to market, his storage capability, or the presence of disease organisms or stray neighborhood animals. Furthermore, farmers may not have accurately understood or remembered the extensionist's recommendations or may make any of dozens of possible mistakes in applying them.

Any of these errors, whether caused by the program, the extensionist, the farmer, or nature, can result in the farmer's losing not only a crop or some animals, but all the capital

invested in them besides. When a subsistence farmer loses a year's harvest, it is a deep personal tragedy. It can mean that his family will go hungry for weeks or even months. It can also mean he will have to borrow money or food that will take years to repay, often at usurious rates of interest.

On the other hand, if the farmer starts by trying the innovation on a limited quantity of land or with two or three small animals, he can make sure he knows how to do it and what the probable results will be before he risks an entire year's income. If there is a loss, it may hurt, but it will not affect his well-being for months and years to come.

A second advantage of small-scale experimentation is that a farmer can learn much more in this way than by experimenting with his entire crop. If a farmer makes a change in his entire crop or all of his animals, he can try out only one change or one combination of changes each year. If, however, he devotes just 1/20 Ha. to small-scale experimentation, he can do as many as ten different 5x10 mt. experiments each year. I have seen a single small farmer experiment with three different vegetables, five varieties of pasture grass, three or four soil conservation methods, and various plant populations for his corn all at the same time.

Thirdly, a farmer who makes a change in an entire crop or with all of his animals has no way of comparing the results of the new production system with those of his previous one. If the harvest or the animals improve, the farmer may never be sure whether the improvement is due to the innovation itself or to fortuitous circumstances, such as good weather or less disease. On the other hand, even a very good innovation can fail when conditions turn bad. If, however, a farmer tries out the innovation on a small scale, he has a natural control plot: the rest of his farm.

Advantages for the Extensionist

With so much at stake, small farmers are much more likely to try innovating if they can do so on a small scale. Thus the extensionist can get a much larger number of people to try out innovations. The extensionist's job is less frustrating and difficult, and his rewards are greater.

Secondly, small-scale experimentation helps the extensionist preserve his credibility and prestige. In order to convince a farmer to adopt an innovation wholesale, an extensionist must usually assure him that the innovation involves very little risk. In practice, the extensionist usually promotes it as being a sure success. On the other hand, if all he needs to do is convince the farmer to try it out on a small plot, he can present the innovation as an idea worth trying. After all, it presumably has already been tried out successfully by the program, by other small farmers, and by the extensionist himself. The extensionist can even afford to admit, as he should, that there is a chance the experiment could fail. After all, most farmers will understand that the possibility of learning about an innovation that can improve all their harvests of a given crop for years to come is well worth the risk of losing just once the harvest on a 5x10 mt. plot. Thus farmers try out the innovation because past experience has proven it an "idea worth trying," not because it is a guaranteed success.

When a farmer loses his entire crop or his animals die, he has failed in his responsibility to his wife, his children, and

often the entire extended family. He has failed in what is often the one thing he prides himself in doing well. He may have to watch while his family members reduce the quantity or nutritional value of the food they eat, perhaps endangering their health. And he loses prestige. Such a failure usually causes intense feelings of hurt and frustration, which in turn create a deep emotional need to blame someone for the failure. Any extensionist even partially responsible for such a failure should not be surprised if his reputation is attacked with vengeance. Those he caused to fail may become enemies overnight. In the case of a villager extensionist, these new enemies may well have been his best friends, his relatives, and those with whom he had the most influence. Furthermore, if the extensionist promoted the guilty innovation as a sure success, the villagers' own experience has proven to them that he is either ignorant or untruthful.

The extensionist has lost his credibility, his prestige, and his friendships. Even though the fault may lie with the program rather than himself, he has lost much of his value as a leader.

On the other hand, an extensionist who promoted an unsuccessful innovation as an idea worth trying out on a small scale, and who had warned farmers it might fail, has not ruined his credibility. Nor has he caused major economic failure, hunger, or suffering; presumably, people have risked what they could afford to risk. Furthermore, a crop failure on a 5x10 mt. plot, although unfortunate, will cause no major hard feelings. Thus the extensionist has likely retained all of his credibility and a good part of his prestige.

Small-scale experimentation also protects the extensionist from being blamed for a crop failure caused by unfortunate circumstances, such as bad weather or insects. Since the rest of the crop will have suffered equally, farmers will realize that the innovation itself was not responsible for the loss.

Advantages for the Program

A program whose extensionists have been protected against a loss of credibility, prestige, and friendships is, of course, immensely benefited itself, as is a program whose technology is reaching a wider audience because farmers risk

less in trying it out. Furthermore, since farmers are prevented from losing an entire crop or herd of animals, the program avoids being responsible for villagers suffering major losses. The program thus avoids seriously damaging both the people's good feelings toward the program and their enthusiasm for agricultural improvement.

But still further advantages accrue to the program. First of all, it is able to reach the poorest farmers because small-scale experimentation makes it possible for them to begin innovating with a very small initial investment. Nor need they feel ashamed for starting on a very small plot.

Secondly, should a loan service be provided by the program, it will be greatly simplified. By using small-scale experimentation, most farmers will be able to try out

technology without a loan. For those who do need a loan, a maximum of $30 should be enough for any small-scale experiment with a truly appropriate technology. Frequently, $5 to $10 will suffice. Not only is the program thereby able to assist more farmers with a smaller outlay of money, but smaller loans tend to be easier to collect. We also avoid the danger of inadvertently getting small farmers into debt over their heads.

Thirdly, as farmers do more and more experiments, the program will get more and more feedback about its technology. Increasingly, it can learn from the villagers about new solutions to its technological problems and new ways of adapting its technology to different farm conditions and to the particular needs of the small farmer. In South America, a program promoting the transplanting of clover for pastures learned from the villagers' experiments that the clover would grow better if it was pastured down to a height of twenty centimeters just before transplanting. Program leaders also learned that if they planted clumps of three to four stems rather than single-stemmed plants, the clover would be ready to pasture a month or two sooner. In a World Neighbors program in Guatemala, villagers using improved techniques for growing black beans discovered a native variety capable of producing up to 3,200 kilograms per hectare. After this variety proved itself superior to scores of varieties imported from the seed bank in Colombia, the national basic grains program began recommending it as the best variety for the western highlands of Guatemala. The improvement of technology by villager farmers not only increases a program's effectiveness, but increases the farmers' sense of self-esteem as they realize they have turned the tables and are now teaching technology to the program.

Even more important, however, for villagers, extensionists, and programs alike, is that the villagers are learning an attitude of experimentation, a method of scientific inquiry. They are learning a way of mathematically evaluating innovations so they can make increasingly precise farm management decisions in the future. The program is thus achieving what is at once the most difficult, least often accomplished, and most important goal of agricultural

improvement work: *to teach people to carry on, by themselves, the never-ending process of developing their own agriculture.*

And this is happening. In some program areas, whole villages or clusters of villages are taking off on their own, developing technology far beyond what the program taught them. In San Martin Jilotepeque, Guatemala, wild rabbits were wiping out program-introduced soybeans. One day a local farmer smelled a horrible odor as he was walking by a drug store. It was iodine. He bought a pound, mixed it with water, and spread the solution around the borders of his soybean field. The rabbit problem was eliminated. Some of his neighbors discovered that burning sulfur at the edges of their fields provided the same happy results. Another farmer found that he could intercrop peanuts among his beans. The beans matured before the peanuts needed the space, increasing his per hectare harvest by 50% over that of separate plantings. Still another villager found that he could construct simple trellises over his coffee trees and grow passion fruit on them. The passion fruit not only shaded his coffee but also more than doubled the net income from his coffee field. Meanwhile, other villagers near San Martin are experimenting with cauliflower, cabbages, native herbs, and native root crops. Successful innovation creates enthusiasm, and the increasing enthusiasm pushes people to innovate more and more. The process gathers a momentum of its own.

HOW TO TEACH SMALL-SCALE EXPERIMENTATION

In the beginning, villagers only need to learn to:

1) measure off several plots of land or separate out two or three animals,
2) plan experiments so that only one production factor varies between each two plots or groups of animals,
3) weigh or measure the results, and
4) write down and add up all the expenses and income of both the experimental crops or animals and the controls.

Farmers of nearly any educational level can learn to do this. Even illiterate farmers have been taught to read and write numbers and then use mimeographed sheets with drawings that depict the various cultural practices and inputs. In time, as

they become willing to learn and able to understand more, they can keep more exact accounts and use more complex, scientific experimental designs.

Small-scale experimentation should be an integral part of the program's training process. No technology should be taught or classes given unless the students are experimenting with the technology on their own farms. Once again, our goal is not merely to impart knowledge, but to help villagers learn how to improve their own agriculture. The first step in that process is for them to learn about an innovation and try it out through small-scale experimentation.

It is preferable to think of a course of study not as a series of classes but as a series of planned experiences.

11 TEACHING THE TECHNOLOGY

THE COURSE OF STUDY

From earlier chapters, we can gather that a good course of study would deal with only one or two simple innovations that satisfy a felt need. It would be planned and executed with a maximum of flexibility and villager participation, and would use small-scale experimentation as an integral component of the learning process.

All villager training should be accompanied by extension work. In fact, the extension work should not be seen as just "follow-up" after the classes, but rather as the principal training activity, with the courses merely serving to back it up. Furthermore, those teaching the courses should also do extension work to prevent their becoming isolated from the needs and problems in the farmers' fields. If a program is doing no extension work, however, its personnel would do well to visit the villages to make sure the recommended innovations are being adopted.

Planning a Course of Study

All too often we underestimate the time needed to plan a good course of study. Even one that deals with only a couple of simple themes can take days to plan properly. In addition to

the time required for the preparation of audiovisual materials and hand-out sheets, we will need a lot of time to get information from the villagers and to ensure that they participate in the planning of the course.

Once the technology has been chosen, the first step in developing a course of study is that of villager interviews. Program personnel should interview at least fifteen to twenty of the area's farmers, including some who have adopted the innovations concerned, others who tried them out and abandoned them, and still others who never tried them out at all. These farmers should be asked what they think about each innovation, why they did or did not try it out, what rumors they have heard about it, and what its advantages and disadvantages are. Those who have adopted it should be asked specifically what steps they use to implement the innovation, what they have learned about it, what problems they have had, and how they have overcome the problems. Careful note should be made of all responses, not just for the concrete data they may contain, but for the phrasing and terminology as well. During one interview, a Peruvian farmer remarked, "When I feed clover to my cattle, they produce so much milk it drips all night." Such simple, homespun phrases add humor to classes and help villagers identify with the new technology.

Interviewing village farmers may sound like a tedious

waste of time, but nearly everyone who tries it is surprised at the quantity and quality of the information collected. In the Bolivian jungle, recent settlers using slash-and-burn techniques were losing half their rice crop each year to an insect pest. Program agronomists were recommending that farmers control it with various insecticides, all of which were expensive, highly toxic and only occasionally available. During farmer interviews, however, program leaders met a villager whose rice was completely undamaged. For three straight years, this farmer had kept his fields free of the insect by a) clearing the jungle in such a way that the wind could circulate well, b) burning the host weeds thoroughly, and c) planting on a certain date. None of the program agronomists had ever suspected that the insect could be controlled so well at virtually no expense.

The course of study should begin by arousing interest and motivating the farmers to try out an innovation. Then it should make sure they know enough to experiment *successfully*. Finally, it should encourage them to teach others and show them how to do it. (See Chart No. 5.) The course should answer their doubts about the innovation, yet inform them of its disadvantages as well as its advantages. The classes should be timed and inputs made available in accordance with the agricultural calendar so that recommended innovations can be put into practice within a month after they have been learned. There is, after all, little point in teaching people three weeks after they have planted their millet that they should have planted it a different way.

CHART NO. 5

The Learning Process

TEACHER'S ACTION	tells the "why" of the innovation	teaches the "how"	encourages people to try it out	evaluates and encourages practice	trains and encourages people to teach others
HOPED FOR LEARNER'S RESPONSE	learns why, becomes interested	learns how	tries it out	evaluates; if innovation is successful, adopts it	teaches others

In each detail, a course of study should begin with what the people already know — their experiences, concerns, knowledge, and beliefs — and move in a simple, gradual, understandable progression to what they need to know in order to innovate successfully. A program trying to convince farmers to turn under their crop residues instead of burning them will normally be wasting its time if it tells the farmers that cornstalks contain 0.8% nitrogen and 0.3% phosphorus. Nevertheless, farmers who already fertilize with cow manure will understand perfectly when told that cornstalks nourish the soil nearly as well as manure does.

After several years, villager leaders should learn not only to plan and teach classes, but to plan whole courses of study. To do this, they must first learn to do villager interviews. Next they must learn to use the ideas from the interviews as well as any they might have of their own to brainstorm lists of advantages, disadvantages, and methods of applying the technology. Then they must learn to actually write up the courses.

Short courses or long-term in-residence courses?

Increasingly, program workers are realizing that short courses are better than long-term in-residence courses, and that whenever possible, one-day classes each week or two are even better.[1] Where transportation difficulties make weekly classes impossible, the program can hold classes for two days every two to four weeks.

The advantages of shorter, more frequent courses are numerous. First of all, one- or two-day courses spread out over the agricultural cycle allow for continuous trouble-shooting and back-stopping. As an integral part of the classes, villagers can report back on how experiments are going in the field, what problems they have had, and what potential solutions they have discovered. The villagers' experience in the field keeps the classes focused in on the everyday practical needs of the farmers and allows them to particpate more in the classroom dialogue.

When a program spreads its classes out over a year, it can schedule them so that innovations are taught a week or two before they need to be applied.

The frequent trips of the villager leaders to the program center allow the program to have plentiful communication with its leaders, maintain high levels of interest, and get continuous feedback. They allow the leaders to make marketing and credit arrangements in town and buy needed supplies. And they make it easier for the program to involve villagers in program planning and execution.

A series of one-day classes extended over a year is less expensive than an in-residence course because the program need not worry about lodging and meals. The program also saves money because it does not need to buy and manage land or animals for villager experimentation; the villagers can experiment on their own farms. The lack of need for dormitories allows courses to be located near the people rather than at the program center.

Lastly, long-term in-residence courses have difficulty attracting the villages' active farmers, their leaders, or the extremely poor. Very few active farmers or village leaders are able to leave their fields or communities for a month at a time. The poorest farmers will never be able to do without a month's income. As a result, some programs that use long-term in-residence courses have had to resort to the paternalistic practice of paying farmers to attend the courses. Other programs have resigned themselves to training youth not yet old enough to be farming on their own. Often these youth have nowhere to try out what they learn. They have little influence upon others because they have little farming experience and because in many cultures are not considered full-fledged adults. Too often they return to their villages overflowing with new ideas and enthusiasm for change only to find that, because of their age, no one will listen to them. Add to the resultant feeling of frustration a long period of absence from the community and new job possibilities that their intensive training has opened up to them, and many of the students may gravitate toward the cities rather than return to rural farms.

This is not to say that longer-term courses should never be used. Occasionally a three- to four-day course in a village has proven valuable for spurring on a specific village. During slack periods in the agricultural year, one- or two-week courses on special topics can be organized for villager leaders and

program employees. Even so, courses of a month or longer are generally not advisable.

The Written Agreement

Once the demand for a program's classes is strong enough, the program may find it worthwhile to write up an agreement for the students beginning each course. The program can promise, for instance, to provide weekly classes on proven technology and make monthly visits to the students' fields. The students, in turn, can promise to attend classes regularly, study hand-out sheets between classes, try out each of the innovations taught in the classes, and even, in special cases, teach them to two or three others. Such an agreement should never be pressed on anyone, but it can let each participant know from the start what is expected of him or her and what he or she can expect of others.

The impact of any course of study on the village should be monitored constantly. A good many errors can be detected and corrected in time if program leaders are receiving plenty of good, candid feedback.

Each One Teach Fifteen

The purpose of any leader is to strengthen, help, inform, and sometimes even form, groups. In agricultural programs the leaders are the link — the two-way transmitters of ideas, plans, and information — between the village groups and the program. Leaders are crucial. Nevertheless, the central purpose of all leaders is to increase the well-being of the groups of farmers out in the villages.

Whenever anything is being taught, it should be taught to a group. After all, we can teach a group of fifteen people nearly as easily as we can teach one person, yet the impact is fifteen times greater. Whether the program should train already existing groups (e.g., governmental, tribal, religious, or cooperative groups) or organize groups of its own depends on the local situation. Such a decision should not be made, as it often is, by outside policy makers or by a development agency's headquarters.

Groups of from twelve to twenty people are most

manageable. It is better to teach a small, enthusiastic group than to dilute it with the unenthusiastic, thus creating a large, apathetic one.

Who Should Be Taught

After the first year or two, most programs will be running several levels of training classes at once. A majority of these classes will be for "village groups" — groups of farmers from one or two villages meeting in a home , a communal building, or under a tree, in one of the villages. A second and possibly third level of classes will be for more advanced groups of villager leaders, two or three leaders from each village, who will meet in some central location, such as the program's offices. A village group includes almost anyone from the village who wishes to attend. Those in the villager leader classes, however, are carefully selected leaders who will later be prime candidates for program extensionist and, eventually, program leadership. The selection of these leaders will be discussed in Chapter 12 their training in Chapter 13

Although anyone should be accepted in the village groups, it is preferable to work with adults. As mentioned, youth often have no land or animals with which to experiment, and have little influence upon the community. Teaching adults will avoid the conflicts between age groups that can arise when youth receive the training but older men and women still retain the power. Furthermore, once the adults are convinced, they tend to work harder at the innovations and maintain them longer because they are accustomed to hard work and have experienced first-hand the suffering caused by poor agricultural production.

A few program leaders insist that it is impossible to get older men and women to innovate or change their attitudes. They claim that since youth are more malleable and learn more quickly, the only way to succeed is to aim their training at the youth. But more often than not, the problem is less one of conservatism among the adults than it is inappropriateness of the program. Furthermore, if the adults have refused to learn new ways, some serious questions should be raised about whether or not it is right to try to change the basic attitudes of

the youth. Apart from the alienation this approach can cause between age groups within the culture, there is the very difficult ethical question of the right of one culture to push its values onto another.

To the degree that women are making the decisions about agriculture or are doing the work, agricultural training should be directed toward and eventually run by women.

Writing and Reproducing the Course of Study

A course of study that has been used successfully for several years and has wide application may well be worth writing down and reproducing. Three different levels of materials may be useful:

(a) *A theoretical background for villager teachers,* arranged by subject like a school textbook. It should be written simply and include only those points needed to understand the why and how of the recommended innovations and to answer the questions commonly asked in classes.

(b) *A set of plans* for the extensionist *describing each individual class,* arranged in the order in which the classes are to be taught. Each class description would include an outline for the class, instructions for making and using audiovisual aids, advice on teaching techniques, and a checklist of the materials needed to teach the class.

(c) *Hand-out sheets* for the students. These sheets should be very simply written and heavily illustrated.

HOW TO TEACH CLASSES

Use Dialogue

Villager participation is as important in the learning process as it is in choosing the technology or eventually running the program. Lecturing should, whenever possible, be substituted by discussion, debate, group analysis, questions and answers, and group sharing of experiences. Discussion should emphasize not only the subject matter included in the course of study, but also the very nature and content of the course of study itself. A certain minimum of theoretical

material that may evoke little discussion must usually be introduced, but it should be interspersed with material that will allow for plenty of villager participation.

Dialogue is important because it recognizes the people's intelligence and the value of their culture, their knowledge, and their experience. It also allows a very beneficial synthesis to occur between the empirical knowledge of the farmer and the theoretical, scientific knowledge of the technician. Through this process, both parties learn, to the benefit of both. Even more important, dialogue is one more way in which villagers can participate in their own development process.

In many traditional cultures, people may hesitate at first to participate in classes. In some cases they are shy; in others they fear being laughed at; and in still others, especially when foreigners or professionals are present, they may feel ignorant and inferior or may have been trained to remain silent. This reluctance to participate can be overcome in a number of ways. First of all, the atmosphere must be as conducive as possible to participation. Teachers must treat the villagers as equals. They must be humble, avoiding any hint of a superior "father knows best" attitude. In addition, they must learn how the villagers live, how they farm, and how they prefer to be treated. In time, the teachers should visit the farmers' lands, get to know their families, and become their friends.

Concrete steps to increase participation can also be taken. If chairs or benches are used in the classroom, they should be arranged in a circle rather than in rows. Classes should be liberally sprinkled with questions that the farmers find easy to answer correctly. In groups of twelve or more, participation can be increased by breaking up into discussion groups of from three to five people each. Afterwards, a representative of each group can present its findings to the larger group. Sometimes, particularly with new groups, special ice-breaking games can encourage the participation of the people who are shy.

Very important in maintaining participation is the frequent use of genuine praise and approval. We must give recognition to the villagers for their intelligence and the importance of their traditional knowledge, skills, and beneficial folkways. Such approval is much more than just a stimulus to participation; it is an important part of the people's

empowerment. Poor people, especially minority groups, have for so long been treated as if they were ignorant and useless that many have come to believe they are. When people become convinced that they are incapable, they *become* incapable. As E.F. Schumacher wrote, "A man is destroyed by the inner conviction of uselessness."[2] On the other hand, when we show villagers genuine respect, we give them self-confidence, and with it the psychological capability to function competently.

By the same token, we should be extremely sparing in our criticism. People in many traditional cultures have difficulty dealing with criticism.[3] Furthermore, actions that seem totally unjustified and reprehensible in an outsider's cultural or economic context can be totally rational and natural in a villager's. All too often we think something a villager did was strange, only to realize weeks later that given his situation and values, it was perfectly logical, even praiseworthy. The appropriate reaction of outsiders to "strange" actions by villagers would more often be to reflect on why they were done than to criticize them.

Teach the Way Villagers Talk

Our most effective teaching is that which most nearly approximates the way villagers communicate with each other. First of all, we should use their native language, and, within that language, the vocabulary the villagers use. "City language," especially technical language and that of the universities, can be as unintelligible to villagers as a foreign one. Villagers tend to speak graphically, expressively, often humorously, and to heavily illustrate their conversation with examples from their own experience. We would do well to follow their example.

Villagers, especially illiterate ones, tend to repeat important points several times during a conversation. This repetition takes the place of writing things down; it helps them remember. Again, this is a good custom to imitate.[4] One way of presenting the same material over and over without boring the audience is to use a variety of audiovisual aids. To teach a method of planting potatoes, a results demonstration can show its advantages, a flipchart and then a series of slides can

show how the operation is done, and a practice session in the field can provide experience at doing it. After the use of each audiovisual, the main points should be summarized and hand-out sheets distributed.

We sometimes become bored by all the repetition, feeling it is unnecessary. But these people's lives and well-being may depend on their accurate recall of what they have been taught. Most of us would starve if we had to earn a living by recalling exactly what we heard in our elementary school classes. Once again, if we are maintaining accurate feedback, we will know when the villagers have learned the material well enough.

Be Practical

People everywhere learn better from their experience than they do from books and chalkboards. This is even truer among villagers, to whom books are often strange and foreign. Their "school" has always been their own experience. This fact is not likely to change. Thus, it is usually preferable to *think of a course of study not as a series of classes but as a series of planned experiences.*

We should do as little teaching as possible using written

materials in a classroom. Demonstrations, field days, and concrete experience should be used at least half the time. Villagers should see and feel the inputs (when this is not dangerous), work with the tools or machines, and practice in class everything that they will later need to do in their fields. Theory, especially in the beginning, should be kept to a minimum. We should include only the theory that is locally applicable and absolutely necessary for farmers to understand the why and how of each innovation. After all the effort made to limit the technology, it would be sad to burden the course with a lot of unnecessary theoretical material.

More than just technical information can be communicated through people's practical experience. We must take advantage of examples of villagers who are well-motivated, extensionists who have adopted innovations, and program leaders who walk miles through the mud to help others. Well-taught classes with ample use of audiovisuals will provide a good example for students soon to become teachers. Most important, villagers will be convinced to continue innovating by the concrete results in their own fields. In the end, the villagers' own farms, hundreds of them, are our most effective classroom, and their successful experiments our most effective visual aids.

Use Audiovisual Aids*

Roughly, a person remembers 10% of what he has heard, 50% of what he has seen, and 90% of what he has heard, seen, and done.[5] This means that if all we do is talk, we are wasting 90% of our time. World Neighbors personnel frequently remind people: "What I *heard,* I forgot. What I *saw,* I remember. But what I *did,* I can do!" Audiovisual aids have proven themselves effective to entertain, to stimulate people's interest, and to make ideas more concrete. They help explain, illustrate, and communicate information and ideas. They are particularly useful for preparing people to learn and for reviewing material already taught. Virtually no class should ever be given without the use of visual aids.

Audiovisual aids are not, however, a substitute for competent, well-informed, and enthusiastic teachers. They are marvelous tools, but, like a shovel, they can do nothing if a person does not know how to handle them.

When we think of audiovisual aids, we should not think only of movies and filmstrips. Audiovisual aids also include demonstrations, sociodramas, puppets, flipcharts, flannelgraphs, and any other object or action that illustrates the point at hand. Probably the most effective motivation visual I ever saw was one used by a villager extensionist to promote a new bean variety. He had a single dried and varnished bean plant taken from his own field with over eighty pods and five to six beans in each pod.

The same criteria can be used for judging the appropriateness of an audiovisual aid as for that of an agricultural technology: it should be simple, effective, inexpensive, easy to operate, and, most important, easy for villagers to continue making after the program is terminated. Chart No. 6 can be used in selecting the audiovisual aids most appropriate for any given situation. In addition to those listed, we should also consider the area's traditional media — puppets, songs, games, drama, dance, town criers, etc. Nor should we use only one audiovisual aid at a time. The most

*For a discussion of audiovisual aids and their use, see *World Neighbors in Action* Vol. 4, Nos 1E and 4E on "Nonprojected Aids" and "Projected Aids." These newsletters can be ordered from World Neighbors.

CHART NO. 6. Selecting the Tool You Need

VISUAL AID	ADVANTAGES	DISADVANTAGES
Chalkboard Audience size: 5-30 people	Inexpensive, can be homemade, easily maintained, minimum preparation. Enables audience participation. Easy to continue using after program ends.	Limited to the user's artistic ability.
Flannelboard Audience size: 8-25 people	Inexpensive, easily made with rough cloth or a blanket, glue, sand, and paper. Difficult drawing could be drawn by an artist and duplicated. Ideal for showing sequence of events and reviewing lesson, as figures can be brought back on the board. Often humorous.	Requires considerable advanced preparation. Cannot be used out of doors if there is any wind. Some artistic ability is required if making homemade figures. Easy to get figures out of sequence.
Flip charts Audience size: 8-30 people	Inexpensive, can be homemade. Good way to give information in sequence because they are bound, illustrations stay in sequence and help the extensionist remember the order of ideas in his class.	Deteriorate with constant use. Some artistic ability required if making homemade flip charts.
Flash cards Audience size: 5-15 people	Inexpensive, can be homemade, very easy to transport. Good way to give information in sequence to small groups.	Deteriorate with constant use. Some artistic ability required if making homemade flash cards. Easy to get out of sequence. Limited to small groups.

Demonstration Audience size: 1-30 people	Excellent way to use materials in a real situation. Uses local materials. Easy to understand by people not accustomed to looking at illustrations. Good way to get audience participation. Is impressive, convincing to the skeptical. Replication after program ends is easy.	Takes a lot of planning and preparation, and perhaps transportation of students to demonstration site. Most demonstrations can only be done during the daylight hours.
Sociodrama Audience size: 15-40 people	No transport problem. Is graphic. Shows motion and therefore can explain step-by-step sequences. Draws audience's attention. No equipment needed. High audience participation. Often humorous. Replication after program ends is easy.	Requires good advanced preparation. Some people cannot do sociodramas.
Slides Audience size: 10-30 people	Dramatic, less expensive than cinema film, excellent way to bring distant things to audience and to show time sequence. Battery-operated projectors available. Local slides easily made.	Easy to damage, easy to get out of sequence and project upside down or sideways. Requires projection equipment, electricity or batteries and a camera to make slides. Used only at night or in a darkened projection area.
Filmstrips Audience size: 10-30 people	Dramatic, less expensive than cinema film and slides. Once inserted correctly in projector, impossible to get out of sequence. Can show photos of the real thing and shows sequence in time. Battery-operated projectors available. Relatively easy to transport.	Requires projection equipment, can be damaged, requires either electricity or batteries. (Sometimes batteries are expensive.) Limited appropriate filmstrips available. Used only at night or in a darkened projection area.

Film **Audience size: 25-100 people**	**Dramatic and gets the audience's attention. Shows motion and therefore helps explain step-by-step and time sequence very well.**	**Requires expensive equipment, electricity. Difficult to transport and operate. Very easily damaged. Attracts too many people. Beware of people going for entertainment only. No possibility of replication after program ends. Limited appropriate movies available. Allows no dialogue. Used only at night or in darkened area.**
Radio **Audience size: 1,000's**	**Covers large area and many people. Good for testimonials.**	**Too expensive, creates dependency on outsiders. Only good for simple message. No personal contact. No discussion. No participation. Use after program ends very difficult.**

effective teachers will, for example, use a flipchart, a chalkboard, and a walk through a successful field all in the same class.

The content of audiovisual aids should also be appropriate to the local setting. Those used repeatedly should be field-tested with villagers who will provide candid feedback about the aid.

Use Field Trips and Field Demonstrations

Field trips during which village farmers see the successes of other village farmers should be used frequently in every program. They are especially effective in stimulating the interest of farmers new to the program in either the program itself or some innovation. On a field trip, such farmers can learn, through their *own concrete experience*, that a) the

program is competent; b) the program is genuinely helping villagers make changes they want to make; c) the farmers who have adopted the innovations are happy with them; and d) the participants can adopt the innovations, too, because the farmers who already adopted them are no different from the participants themselves.

Field trips can also serve as a reward to the farmers doing the demonstrations. The privilege of showing their successful crops or animals to others should definitely be shared.

Specific, limited objectives should be established for each field trip. For example, a field trip might be organized to motivate twenty-five farmers to try out planting peanuts in rows. The farmers doing the demonstrations should know beforehand the objective of the trip.

Groups of twenty or thirty are the best size for a field trip. If the group is any larger, some people will have trouble hearing, participating, and staying with the group during walks between fields. Those unable to hear well will tend to begin chatting about other things.

All those who go on a field trip should have a genuine interest in the subject of the trip; no one should see it as just a chance to go sightseeing. If the participants are from villages new to the program, it is usually best to require them to pay all or part of their travel costs. If the field trip is for farmers who are already active in the program, it may be best to select three or four leaders from each village, giving highest priority to those who have helped others the most. When the purpose of a field trip is to show the program's work to people from other programs, the best people to invite are those with field-level experience who are truly multipliers.

Field trips should be held in areas that are as near the participating farmers' homes and as similar to their own areas as possible. Each field trip should include visits to experiments of at least three or four different farmers. If the recommended innovation is visible from a distance, it can be worthwhile to travel a route from which everyone can see that dozens or even hundreds of farmers have adopted the practice.

During the field trip, we must remember that an enthusiastic farmer is our best advertisement. The demonstrating farmers should do most of the talking, fielding

questions, and relating their own history and experiences. Often they can say, more directly and convincingly than program people ever could, that other villagers will be losing out if they do not try the new technology.

Visitors should see not only the innovation, but its recognizable results as well. Farmers should not just be shown a good pasture; they should milk the cows. They should not just see a new tool or potato crop, but actually use the tool to dig up a row of potatoes. Demonstrators should also show what concrete improvements in their daily lives (e.g., new tools or improvements in their homes) have been made possible by the innovations.

After the field trip, we should get feedback about it from the participants. This can normally be done informally during the participants' trip back home. If we are not already working with the participants of a field trip in their village, we must begin to do so within a few weeks after the trip. This is extremely important. Motivating people to experiment with an innovation without subsequently ensuring the success of their experiments too often leads to failure, and causing a failure is worse than doing nothing at all. If we are not planning to work in a village, we should not take its people on a field trip.

AN EXAMPLE

To give a clearer idea of how to organize a course of study, the following plan is presented. Its objective is to introduce a new variety and planting system for corn in a highland area of Guatemala.

First Year: June-September

-Visit the area, gathering pertinent information (see Chapter 4), especially the traditional way of planting corn and farmers' experiences with attempted innovations.

-Photograph all stages of corn being grown according to the new recommendations in other areas.

November

-Organize field trips for the area's leaders to be held just before the harvest of the improved corn.

-Collect samples of good-quality ears to be used in future classes.

-Arrange to buy seed of the new variety immediately after the harvest and store it properly.

Second Year; January-March

-Plan the course of study, perhaps nine classes including 1) Why change to a new variety?: 2) Why change the planting system?: 3) The nature of the new variety, especially those characteristics that will affect cultural practices; 4) The new planting system (demonstrations and practice); 5) Review; 6) Planting of corn in selected students' plots with the participation of the students: 7) & 8) Supervision, backstopping, and feedback; 9) Harvest.

-Begin planning the second technology to be taught to these leaders.

April-June

-Hold classes scheduled so that each innovation is taught one or two weeks before it must be put into practice.

-Sell seed to the farmers a month before planting time.

June-September

-Continue classes.

-Supervise plots.

-If the program plans to expand its work into new areas the following year, begin the process all over again in those areas.

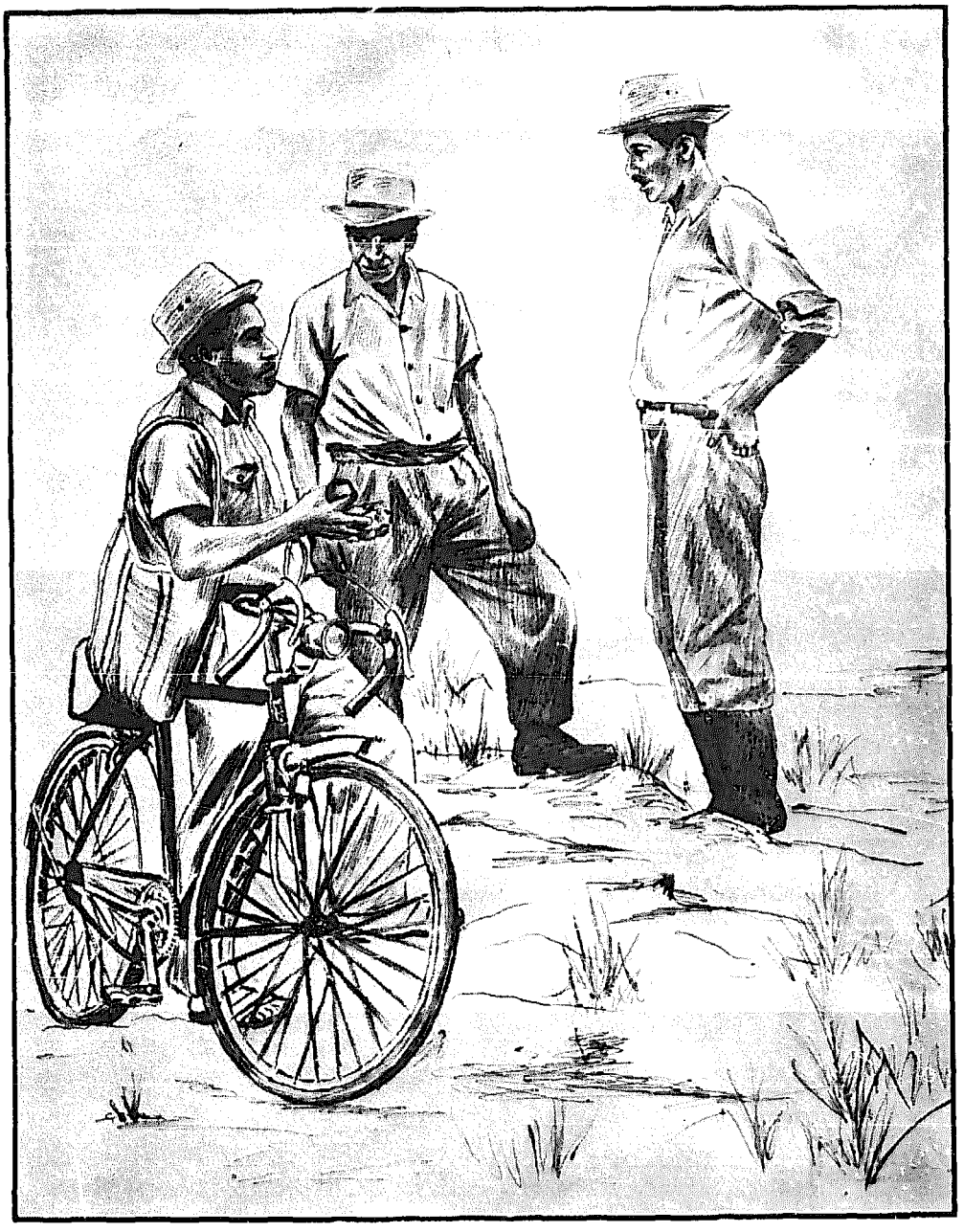
December

-Discuss the results, going over income and expenses, asking for suggestions on improvements in both the technology and how it is taught.

-If the leaders are willing to teach others and the program is going to continue to expand, begin training them so they can start training others in April.

Third Year: December

-Return to the villages to get feedback. Did the leaders use the new seed and planting system in their corn fields? Did their neighbors: Why or why not?



The foremost criterion of a good villager leader is that he has already proven himself willing to work voluntarily for the good of the community.

12 EMPLOYEES

The selection and training of the worker, therefore, is or should be always regarded as a matter of major importance. . . . many agencies are realizing that the worker is even more important than the program; that it is his attitude to the people and his skill in working with them that mainly make for success or failure.

T.R. Batten[1]

People are what make agricultural programs work. The best program design in the world will not make a program successful if the personnel are not both capable and willing to make it succeed. The employees' competence and motivation are often the limiting factors in a program's effectiveness, with a lack of motivation disturbingly often being the key problem.

Extreme care must be used in selecting and training extensionists. The eventual leaders of a program will, after all, probably come from among its first groups of villager extensionists. Furthermore, it is the extensionists who do the program's work; it is they who give the villagers their impression of the program. An extensionist in one Central American program repeatedly promised his students a visit from the program director. Later, if he found the director was booked up, he would save face by telling the villagers the director had gone back on his word. Before the program

leaders ever found out what was happening, the extensionist's students had lost all faith in the program staff. In many other cases, whole villages have come to feel a program was indifferent to them because an extensionist failed to show up for meetings. Other villagers felt a whole program lacked respect for them because one extensionist became angry with them. If extensionists are poorly motivated, uninterested, or incompetent, villagers will come to see the program in the same light. And the program leaders will often have no idea why the program is failing.

HOW TO SELECT EXTENSIONISTS

Should We Use Villager Leaders or Professionals?

Local villager leaders have a number of advantages over outsiders as extensionists. First of all, they understand the people with whom they are working. Being of the same culture, the extensionists have a "feel" for the villagers, an intimate understanding of their feelings and the reasons behind their actions. The extensionists know the area's unique character, its people, its groups, its history, and its problems. They speak the villagers' language and use their vocabulary. Having been poor themselves, they understand the villagers' economic problems and priorities. And a local extensionist knows intuitively how to motivate other villagers to innovate because he or she can remember what arguments convinced him or her not too long before. In the end, the best way to understand a villager is to *be* a villager.[2]

Villager leaders already have established friendships and contacts with groups and organizations within the villages. In one program, for instance, villager catechism teachers had an immediate "in" when they became extensionists: the catechism groups allowed them to add fifteen minutes of agricultural training to their religion classes. Villagers tend to trust extensionists who are of their own race, culture, tribe, or language group, more than outsiders, who may be different. Villager extensionists also have the advantage of being able to show their students that they, the extensionists, have already done what they are urging their students to do. Even in the rare

case that an outsider plants a field to serve as an example, villagers may say, as they do of experimental stations, "We could do that, too, if we had the money he has." But villager extensionists can say to their students, "You can do this because I did it, too."

Villagers often work harder at exension work than do outsiders. They are accustomed to doing manual labor and walking long distances through wind, rain, and mud — important for working in the isolated areas where the need is greatest. They identify more closely with the villagers' hardships than outsiders because the villagers are their own friends and neighbors. Since a villager extensionist lives in the village, he or she is close at hand when late blight attacks the villagers' potatoes or a lamb gets sick. And he or she will live on there, providing a permanent source of knowledge and a strong voice in favor of continuing improvement long after the program has ended.

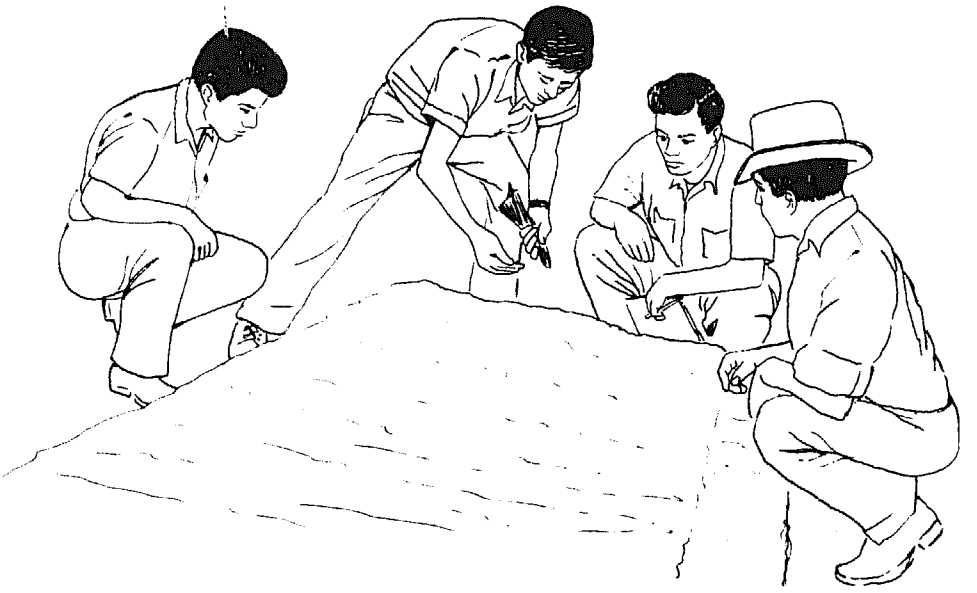
When villager extensionists are the authors of success, the area's villagers can rightfully feel that the success belongs to them. The villagers gain pride in themselves. And the successful extensionist provides a role model for village children and an example of what villager adults can aspire to become.

Another advantage of villager extensionists is that, rightly or wrongly, hiring a villager costs from one-half to one-fifth

what it does to hire an outsider. Not only is the outsider's expected salary-plus-*per-diem* several times what a villager requires, but he often expects to travel in a jeep.

And lastly, employing villagers is in keeping with the primary goal of our work — to teach villagers *how to solve their own problems* through the process of *learning by doing*. If villagers are to *learn* to solve their own problems, they, not outsiders, must be the ones who *do* solve them.

Of course, villager extensionists have their disadvantages. If they work in villages near their own, they can shirk their duties fairly easily. They may help their friends and relatives to the exclusion of other villagers, or they may get so involved with village or tribal duties that little time remains for program work. Lastly, there is truth in the old adage that no one is a prophet in his own village. People are often reluctant to learn new ways from their own neighbors. Nevertheless, programs can overcome this problem by making sure the extensionist's crops or animals do well, giving him diplomas for studies, and having professionals visit his fields and praise his work.



Lastly, villager extensionists will need more training and may learn more slowly than some outsiders, but working with a limited technology minimizes this problem.

Even less effective in extension work than other outsiders

are those who are available for just a few months or a year or two. In addition to having the usual problems outsiders have with language and communication, they add those of lack of program continuity and a long period of gaining the villagers' trust after each personnel change. Short-term outsiders, like long-term ones, may have useful roles in a program, but villagers should take over their jobs as soon as possible.

None of this is meant to signify that professionals will have nothing to do. The demand for agronomists capable of motivating dozens of villagers to multiply their impact will never be satisfied. As agencies come to understand the tremendous potential for improved rural livelihood offered by this multiplication of efforts, they will likely destine more funds to agricultural improvement. Furthermore, where farmers are innovating rapidly, the demand for agronomists is usually higher and the agronomists' work is more varied and challenging than in a static, traditional area. And when our work is multiplied to reach thousands of farmers, it is immensely more rewarding.

Criteria for Selecting Village Leaders

A program should, above all, choose leaders who can and will multiply their knowledge among other villagers. After all, good villager leader-multipliers can spread the innovations we teach to many times more people than we can teach ourselves.

The best indication we can have that a person will be a good multiplier is that he or she has been helping others voluntarily in the past. He or she may have taught classes, helped build a road, or spent extra time cleaning the village house of worship. Often this person is the one to whom villagers go informally when they need help. In whatever way it is evidenced, *the first and foremost criterion of a good villager leader is that he has already proven himself willing to work voluntarily for the good of the community.* Institutions as diverse as UNESCO, the American Friends Service Committee, and World Neighbors, working in programs in Bolivia, Burma, Guatemala, Peru, Puerto Rico, and Togo, have used this characteristic as their primary criterion for choosing leaders, and have found it a good one.[3] Motivation, not skill or

knowledge, is the key. Why? First of all, it is much easier to teach a well-motivated person the knowledge he needs than it is to change a knowledgeable person's motivation and attitudes. As T.R. Batten, longtime leader in community development work, writes:

> Few trainers who have had both kinds of persons to deal with will be in any doubt. . . . Teaching keen and interested learners is child's play compared with the difficulties encountered in attempting to change a person's attitude to his job or to the people with whom he will work.[4]

Agricultural extension work is often hard, uncomfortable work that requires long, irregular hours, and is nearly impossible to supervise. Program workers have to be enthusiastic, well-motivated self-movers. Usually the best proof of the person's willingness to work hard under difficult conditions is that he has voluntarily worked under those conditions to help people in the past.

Many programs and studies have shown that educational level does not correlate with success in extension work.[5] In fact, as already mentioned, too much formal education can actually be undesirable.[6] The only useful educational requirement is that the leader know how to read and write, even if haltingly.

The second criterion is that the leader have *empathy for the people,* that he identify with and care about them. A villager leader should be as much like the rest of the farmers, especially the poorer ones, as possible. He should *not,* by and large, be wealthier, own more land, or belong to a different social class or tribe than the majority of the area's poorest farmers. And he should know how to swing a hoe. This similarity to the poorest villagers helps prevent the leader from feeling superior to the poor or becoming disrespectful of their knowledge and customs. On the contrary, it often gives him a strong desire to work for the people's good. The only danger here, rare but serious, is that an occasional extensionist is so aware of the suffering of his people that he becomes paternalistic, constantly wanting to give them things or do things for them that they can do for themselves.

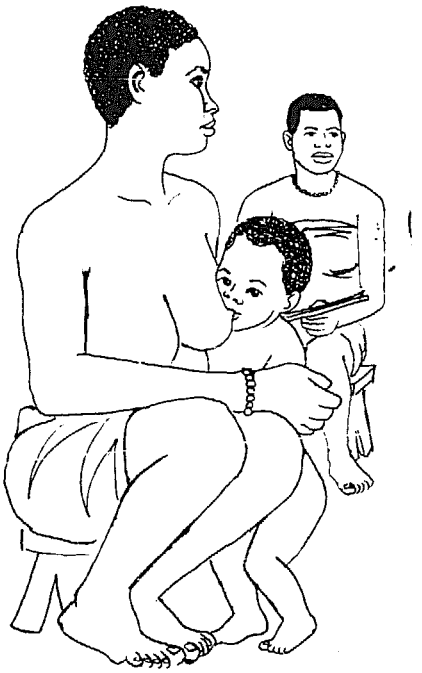
Before a leader can teach an innovation to others, he must

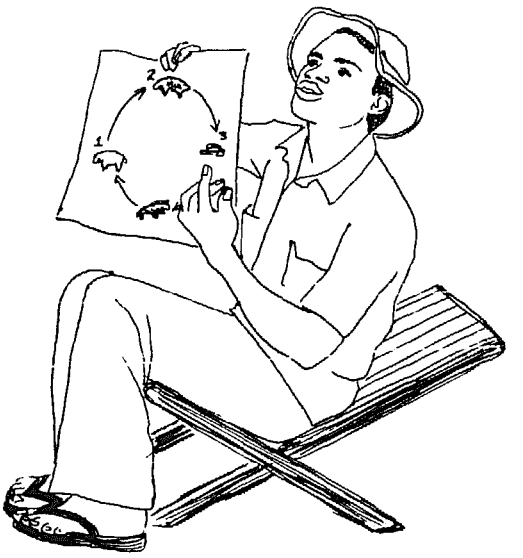
have put it into practice successfully himself. In short, he must have practiced what he is going to preach. In a reasonably successful program this stricture should never present a problem. By the time a practice has proven itself enough for extensionists to be needed, a good number of villagers will have tried it out. Likewise, good programs promoting appropriate technology rarely have a need to search for innovators; plenty of people will be innovating. Besides, a conscious search for innovators often attracts people who are at the fringes of their culture or who are economically better off than their neighbors.

Some programs would insist that a prospective leader already be influential. This is nice, but not necessary. Even in Africa, where social positions within the tribe tend to be relatively fixed, well-chosen extensionists of little influence acquired all they needed by the time they were able to teach others.

How to Select Villager Leaders

A question troubling many programs is how to find good leaders. Good leadership is not so often *found* as it is *allowed and encouraged to develop*. Nevertheless, how do we start the process?





During the first contacts in an area, the program begins asking about the villagers' needs and looking for ways to improve traditional agriculture. Hopefully, villagers become involved in analyzing their own situation and looking for solutions.

The leadership development process begins in earnest, however, when the program has found and tested a successful appropriate technology. When it has, some villagers, perhaps with program encouragement, will begin learning about it and experimenting with it. If the program exercises the care it should in making sure these first experiments produce recognizable success, word of the success will spread. Scores of new farmers will want to try out the new technology.

At this point, two very important things are happening. First of all, large numbers of villagers are beginning to want to try out the technology. Thus, a demand for extension work now exists. The program must expand its training work in the villages. At the same time, many villagers are experiencing success with the new technology. This success increases their self-confidence, their faith in the program and its technology, and their enthusiasm for innovation. This experience is not only a very valuable part of their leadership development; it is a necessary one, since no villager leader should ever teach an innovation he has not put into practice himself. A few of those who tried out the technology will begin showing it to their friends and neighbors. Those who do are the prime candidates for training as villager leaders and volunteer extensionists. Thus, just when the need for extension work presents itself, so do the human resources to fill that need: villagers who know the new technology and are demonstrating the required motivation.

It is usually advisable to select two or occasionally three leaders from each village rather than just one so they can work together, support each other, and have more influence within the village.

Some programs insist that villagers choose their own leaders right from the start. In some cultures, especially in Africa, this may be necessary. Nevertheless, in the beginning, before villagers have seen how a program works, they often do not know what qualities are most needed in a good agricultural

leader. They are likely to choose the tribal headman, the richest villager, the politically most influential, the leader of the kin group that controls the most votes, the youth with the most formal education, or just the youth with the most free time. In these circumstances, program leaders would best consult with the villagers about different candidates and select the leaders themselves. In a year or two, however, after some discussion as to the qualities most needed, the villagers should be naming their own leaders.

How to Select Extensionists

Once a program has volunteer extensionists, selecting salaried employees is no problem. They would simply be those who have done the largest amount and best quality of volunteer work.

Certainly, before we select anyone, villager or outsider, as an employee, we should find out how well he worked in his previous jobs. Far more important than any letters of reference is feedback from the villagers he was helping about his competence and motivation. Do not expect to improve very easily the bad work habits learned in a previous program.

Good extensionists must be democratic in their approach and allow maximum participation from their students. They must also make sure they do everything they promise to do. Many villager leaders lack these attributes in the beginning. Nevertheless, the example of a well-planned, thorough, democratically run program should help them learn to do thorough, well-planned participatory work themselves. Programs can help their employees work better by teaching them how to plan ahead and how to use pocket-size appointment books.

Should We Use Volunteer or Salaried Extensionists?

When a program has active volunteers, the question arises as to how many of them to put on salary and when. A salaried employee can dedicate more time to the program (volunteers seldom work more than one or two evenings a week), can participate more in the decision-making, and can be

coordinated more easily. On the other hand, a volunteer often has more credibility because villagers know he is teaching something he believes in, and not just something he is paid to teach. A volunteer's experiments carry more weight because his students know he is as poor as they are. A volunteer, of course, costs less, and, ironic as it may seem, paying him a salary more often weakens his drive and sense of mission than strengthens it. Certainly, no agency should ever hire anyone thinking that his motivation and drive will increase. As Mr. Batten writes, "No agency can 'buy' more than routine work. It cannot, for instance, buy enthusiasm and sacrifice."[7]

Generally, the decision as to whether to put volunteers on salary can be made on the basis of the need to maintain a ratio of approximately one half-time paid extensionist for each three or four volunteers. Hiring more extensionists than this incurs needless expense and downplays the community's contribution to the effort. Hiring fewer extensionists makes smooth administration and adequate backup of the volunteers nearly impossible.

WORKING WITH VILLAGER EXTENSIONISTS

Should We Hire Them Full-time or Part-time

It is generally better to employ two villagers half-time than one full-time. Half-time employment allows twice as many villagers to have the experience of working in the program and of participating in decision-making. The extensionists in the program can represent more of the villages in the program area. Extensionists who work half-time still have the time to tend their crops and animals, thereby keeping up their own experience at farming and at trying out innovations. By farming half-time, extensionists also avoid becoming too economically dependent on the program.

Furthermore, extensionists who continue to be part-time farmers maintain their identity as small farmers, continue to be members in full standing of their communities, and have less tendency to feel superior to other villagers.

What Should Villager Extensionists Be Told When Hired?

Normally, villagers we hire will not have worked in any other institution. Therefore, they often do not have a clear idea of what is expected of them. We may assume they know more than they do. It is therefore valuable, to the extent culturally possible, to spell out from the start specifically what is expected of them and what they can expect from the program. First of all, they should know that they were not chosen for the job because of some favor done or some special relationship they have with the program. They were chosen because of their proven willingness to help others. They should be forewarned that working in a program can be difficult. They will have disappointments, work long hours, and, almost inevitably, be criticized by other villagers. At the same time, if the extensionists work hard, they will learn a good deal and will probably gain the respect of their communities, along with a tremendous sense of personal accomplishment.

They should be informed of their responsibilities, including experimenting with innovations, promising to do only what they can be sure of doing, and providing a good example for their neighbors. It may also be valuable to discuss how they

will find time for their own agricultural work. They may have to plant less land in order to have time for their program work. In such cases, part of their salaries may have to be spent on food to replace the loss of harvest. They should also understand that because the program will only last for a given period of time, they should avoid becoming dependent on a salary. At the same time, they can expect from the program competent support in their work, continued training, and the right to participate in program decision-making.

Personnel Meetings

Personnel planning meetings, as mentioned in Chapter 5, provide the principal opportunity to practice democracy within the program. In these meetings, workers can tell each other of their successes and failures, discuss new ideas, and learn the give-and-take of a team effort by airing grievances and deciding who will handle undesirable chores.

Programs are generally strongest if we take the time to let everyone voice his opinion on each issue and discuss it until everyone basically agrees. This kind of decision-making by consensus takes longer than decision-making by majority vote, but it gives decisions an added strength because everyone agrees on them. It avoids the jostling for votes and the occasional pushiness of majority decisions. There will be times when we will have to settle for a strict majority vote, but in a small program, consensus can be reached surprisingly often.

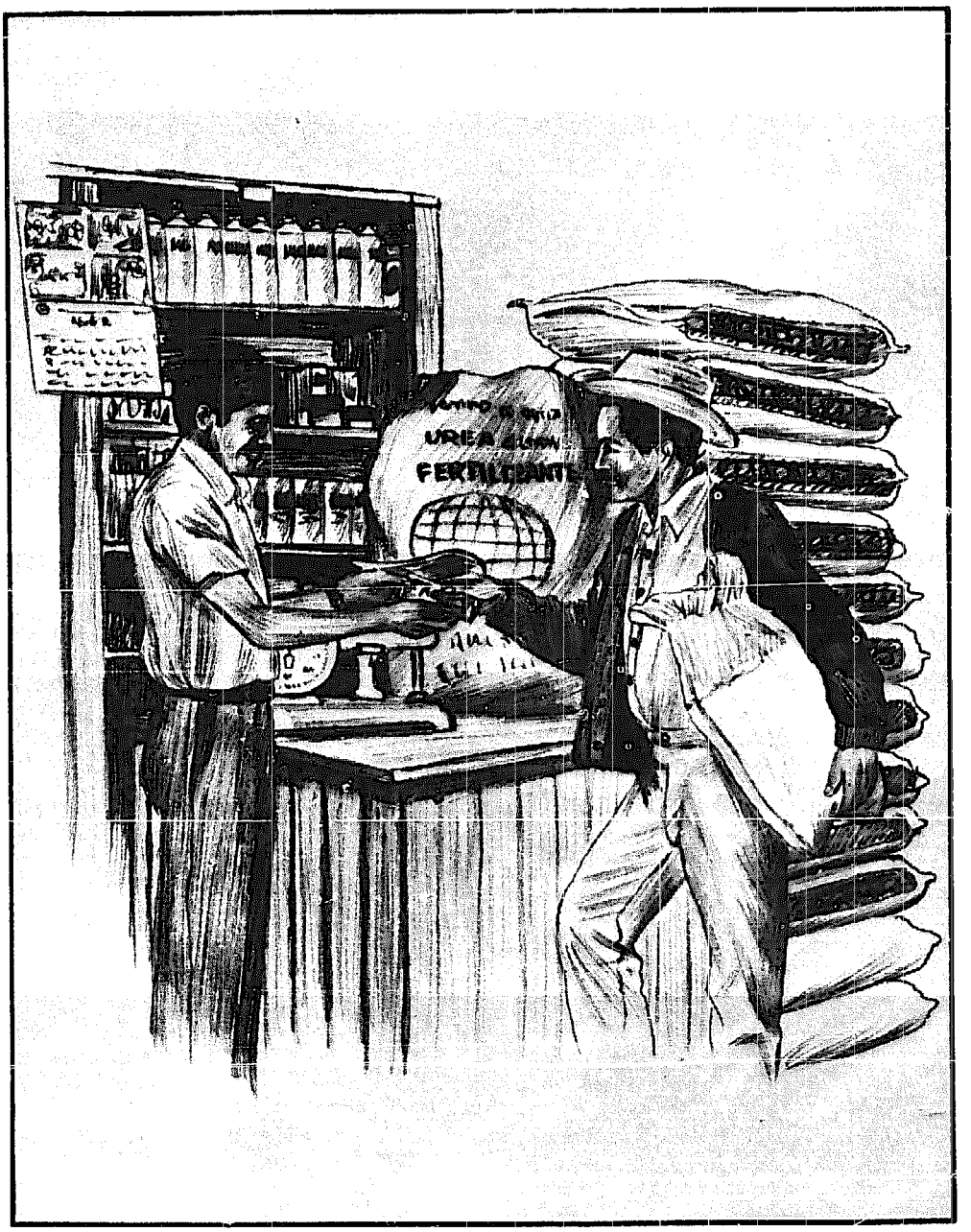
Working with Employees

Especially in the beginning, extensionists must have the full support of program administrators. Inputs and loans must be provided on time, needed transportation and information made available, equipment kept in good repair, and salaries paid on time. The least we can do for well-motivated leaders is to allow them to be effective. We should also take time to visit classes they are teaching, see fields where their students are innovating, and give them the praise and encouragement they deserve.

Program accounting must be kept tight and up to date. If

extensionists are handling funds, we should make spending policies and restrictions very clear and do accounting for those funds at regular, frequent intervals.

Some extensionists may be tempted to spend most of their time in the office. Although time is needed for planning classes, preparing audiovisual materials, and writing reports, extensionists should spend most of their time in the villages.



The program is not there to supply a service, but rather to help the villagers learn how to supply it for themselves.

13 SUPPORTING SERVICES, EVALUATION, AND PHASE-OUT

A lack of either credit, agricultural supplies, or marketing services can limit agricultural production just as easily as any of the factors in Chapter 8. Nevertheless, these limiting factors are considered here separately because, at least initially, programs, rather than villagers, must usually overcome them. Programs become involved because these problems must normally be solved early, if they are to be solved at all, and the solutions require organizational skills, capital, business management abilities, and perhaps even political clout that villagers probably do not yet have. Nevertheless, if any local institution is capable of supplying a needed service without overloading its administrative capacity, the program should encourage the institution to do so.

Credit

We should not offer credit unless we are sure it is needed. People using traditional farming systems normally do not need it, nor will they be able to repay it. Therefore, if the program's first technology incurs little or no expense, as is to be hoped, no credit will be needed.

Where credit appears to be necessary, we should find out: What alternative credit sources, native or institutional, are available? What is the history of institutional loan giving? Do villagers tend to feel they need not repay institutional loans? What are the approximate nonrepayment rates? At what rates of interest do local moneylenders loan money? Are these rates exorbitant when nonrepayment rates are taken into account? For what purposes do the moneylenders loan money? How do they encourage repayment? Does the farmers' indebtedness force them to plant their land in certain ways, to sell their crops before they are harvested, or to sell them immediately after harvest when market prices are lowest? Are villagers able to save money from one crop cycle to the next? Do they use some traditional method of saving money, such as buying animals? How efficient is this method of saving?

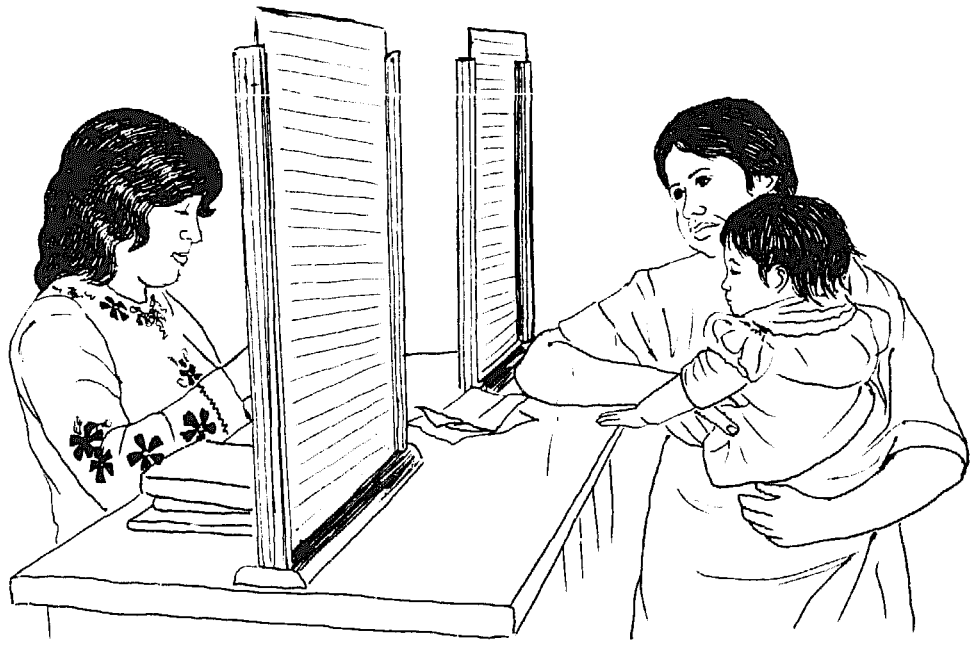
If villagers have come to feel that they need not repay institutional loans, it may be impossible to give credit. Otherwise, if loan programs are well managed, repayment rates can be very high among even the poorest villagers.[1] Repayment will be highest when:

a) the technology people already use yields a good income,
b) the technology the program is introducing effectively increases incomes further,
c) the new technology is dependable and understandable,
d) the prices of the necessary inputs are low,
e) local markets are dependable and pay good prices, and
f) loans are small.

One cause of nonrepayment may be that loans are used for personal needs rather than for agricultural investment. Nevertheless, trying to find out or control how a small farmer uses a cash loan is nearly impossible.[2] We can prevent the nonagricultural use of loans to some extent by timing the delivery and repayment of loans according to the agricultural cycle. Giving loans in kind can also help, but such a loan program is difficult to administer and even more difficult to turn over to local people. Even then, loans in kind are not totally foolproof; people can sell the goods.

Loan administration. Loan programs should start small in

order for us to try out administrative procedures and check repayment rates and ways of encouraging repayment. In most cases, we should only give loans to farmers who are trying out program innovations. Since these innovations will be tried out in experimental plots of 1/20 hectare or less, or with a few animals, first-year loans need not cover any more than the cash outlay required by such an experiment. Loans can thus usually be limited to $20 to $30 per farmer during the first year or two. In fact, programs aimed at poor farmers should seldom give a loan larger than $50 per farmer. Having a loan limit helps focus the program's benefits on the truly poor. Program extensionists or credit committees can verify which villagers have attended classes and tried out the new technology, thereby qualifying for loans. It takes more time to organize credit committees, but they allow more participation and may be necessary in cultures where extensionists would be put under too much pressure to favor relatives or friends.



Loans should be given with a minimum of paperwork — a simple, legal contract, receipts for use when a loan is given and payments are made, and a book where the movement of each loan is recorded. Eligible farmers should be notified well in advance that loans are available. Loans should be given within

two weeks after they are requested, should *never* be delayed beyond when they are needed, and should normally come due soon after harvest or whenever prices for the crop or animal involved are expected to reach a reasonable level in local markets.

We should always charge interest on loans, with the minimum rate being enough to cover inflation plus administrative expenses. Giving interest-free loans subsidizes program innovations and makes turnover of the credit service to a more permanent organization nearly impossible.[3]

Where nearby institutions are also offering loans at reasonable terms, we should coordinate our credit programs by instituting similar credit policies, charging similar interest rates, and exchanging lists of delinquent debtors.

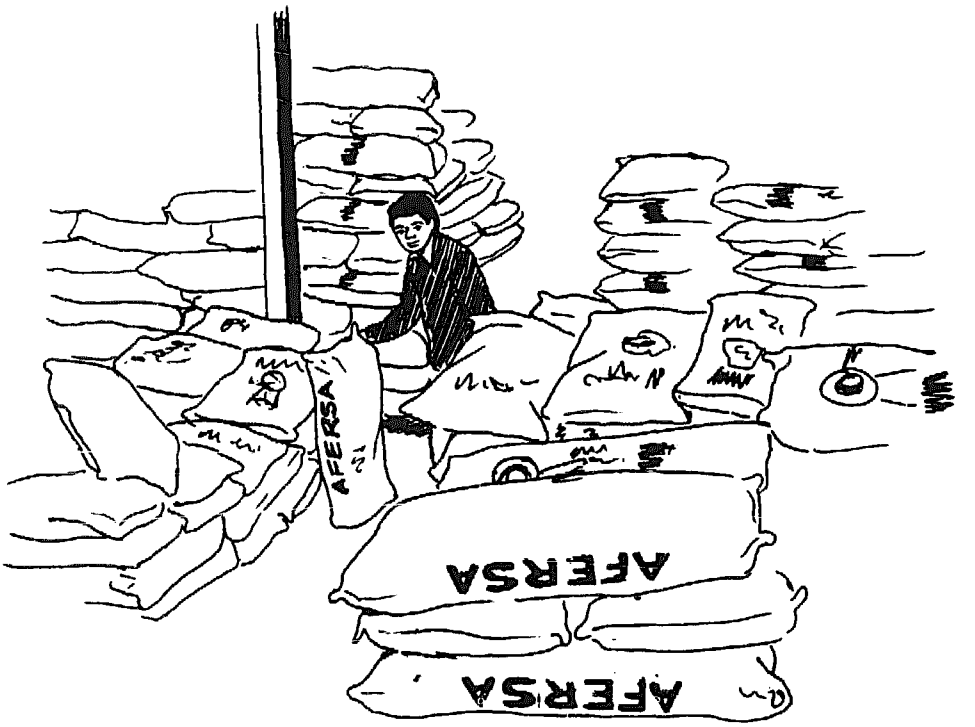
Loan repayment. In collecting debts, an ounce of prevention is worth a pound of cure. Most programs that have a problem with delinquent debts have been somewhat negligent one way or another.

The first step in achieving a high repayment rate is to make very clear at the time the loan is given when it must be paid, what the penalty is for late payment, and how and under what conditions the loan can be extended, if at all. Even before the program gives any loans, it should set aside time for home visits to delinquent debtors. As soon as a loan is overdue, a notice should be sent to the debtor, and additional notices should be sent out at one- to two-month intervals. Such measures should be taken from the very start, not instituted after a problem already exists, because delinquent debtors, if numerous, can become a strong influence in the villages against repayment.

These methods should suffice to collect small loans. If they do not, the program should investigate other culturally acceptable ways of collecting loans. Often local credit committees can take the responsibility for collecting loans. A program can try various forms of village or tribal group liability or guarantees of tools, animals, or land. It can hire loan collectors, paying them a percentage of what they collect. Nevertheless, most such methods have their drawbacks. Group liability can cause bitter divisions within a community, and guarantees can be sold. Cosigners seldom pay, but when

they do, they often end up resenting the program.

Collecting delinquent loans is always a difficult, enthusiasm-killing task; no one program worker should ever have to dedicate too much time to collecting loans.



Phase-out. No credit service should be started unless there exists some feasible way of phasing it out. If the program's technology provides large enough increases in income, credit may only be needed to prime the pump, and can simply be terminated after several years. In this case, the program should encourage villagers to save their increased income, perhaps through some traditional means, such as buying animals. If credit is going to be a long-term need, the program can either turn the service over to a local institution capable of handling it or, if none exists, organize one. Savings clubs, such as those organized by Oxfam in Africa, might be a simpler alternative than full-blown credit cooperatives.[4] All permanent credit

institutions should build up local resources by encouraging farmers to save.

Agricultural Supplies

A program should become involved in selling an agricultural input only when program innovations or present levels of production require the input and local suppliers either cannot or will not make a dependable supply available at a reasonable price. Even then, the program should make plans from the outset as to how it can turn the service over to local people.

Where marketing is competitive, the best way to provide agricultural supplies is to inform local store owners that the program expects the demand for certain inputs to increase dramatically and will sell them only when they are not available elsewhere at a reasonable commercial price. As the demand for each input increases, store owners will stock it and the program can phase out its sales.

Establishing a program store to be turned over to individual villagers or a cooperative is the most complicated, least desirable alternative of all. If established, the store should remain simple, handling a very limited line of supplies until the accounting and controls are thoroughly understood by all concerned.

All inputs sold by the program must be of dependable quality and proven effectiveness in the field. Adequate quantities of them must be available *when* they are needed, and they must be packaged in amounts that small farmers can easily afford and transport. We can never assume that packages contain what they say they do, even when produced by subsidiaries of multinational corporations. Fertilizers, feeds, and even medicines produced by such companies have been found to contain less than the quantities of active ingredients or nutrients described on the label. Supplies should be sold at a reasonable price, covering the wholesale cost plus transportation and overhead. Subsidized prices merely make transferal of this service to private salesmen or a local institution more difficult, and may accustom farmers to using inputs that, when bought at reasonable commercial prices, no longer pay.

Marketing

The need for marketing work is difficult to gauge accurately. Traditional merchants are often more efficient and have smaller profit margins than it may seem at first glance. All too often, a cooperative organizes a marketing scheme to prevent the middlemen from earning "exorbitant profits," only to find that it cannot provide the same services at the same markup. In analyzing the efficiency of a marketing system, we must take into account the merchants' transportation costs, capital investment, storage costs, risk, and spoilage.

In many cases, we can avoid work in marketing by choosing agricultural technologies which deal with crops or animals that already have an adequate marketing system or that are consumed locally.

Sometimes, rather than setting up an entire marketing system, we can use a simpler approach. A program in East Africa increased farmers' incomes by teaching them about correct weights and measures and making standard weights available for purchase.[5] Others have opened up non-competitive marketing systems to new merchants or villager organizations by building roads or providing loans for boats or trucks. In other cases, programs have had to set up competing marketing systems, or threaten to, in order to make the existing ones more competitive. Whatever a program does in marketing, it should be prepared for a strong, even violent reaction from the already-established merchants.

In many cases, the problem will have been solved by the time the program ends, and no further effort will be needed. If continuing work will be required, some method of local takeover should be planned before the service is begun.

EVALUATION

The monitoring of a program for its own internal use was dealt with in Chapter 4. Here we will deal with evaluations — those studies done primarily for groups or individuals outside the program, including program funders, development agencies, and other agricultural programs.

If a funding agency requests the evaluation in order to decide about future funding, it will in all likelihood establish the evaluation's objectives itself. If the evaluation's purpose is to provide information for other development agencies, we should answer several basic questions before we start. First of all, what do we consider "success?" If we define success as having reached our specific program objectives, will other agencies agree that those objectives are important? Will they accept our methods of measuring that success? Even more important, who is interested in our results? Anyone? Even well-executed evaluations are too often filed away and forgotten, without having had any impact on future programs.

Perhaps as valuable as any general program evaluations are those studies that compare the relative impact of two or three strategies within a program. Descriptions of observed side effects of different strategies and reasons for their success or failure are also valuable.

If a large, general evaluation of a program is to be done, the purpose of the evaluation, criteria for success, indicators of these criteria, kind of information needed to measure these indicators, and ways of gathering that information must all be established before the program begins to have an impact. A baseline survey must be done to establish the pre-program levels of the indicators. At least as valuable as an evaluation done at the end of a program is one done five to seven years later to check the permanence and spread of the program's impact.

Large-scale evaluations can be complicated. Basic errors that will cause others to disregard the study can easily be made by the uninitiated. Thus, most large evaluations should be done with the help of an outside professional. If well chosen, an outsider can add fresh insights to the evaluation, help the program avoid basic errors, lend objectivity to the evaluation, and add credibility to the report. He or she may also know what information would most interest and benefit other programs, and how the report can best be written.

On the other hand, an outsider generally has little sense of the history of the program, the cultural obstacles it has overcome, or the changes it has brought about. He or she will have little idea of which evaluation methodology would be both culturally acceptable and capable of getting accurate responses from the people. Outsider evaluations cost more than villager-run evaluations, and they are often threatening to program leaders. They also deny program leaders the opportunity to learn about how programs are evaluated. Finally, there is something basically paternalistic in assuming that villagers capable of learning to manage a program are incapable of learning to evaluate it well.

A consensus seems to be developing that better than either the outsider evaluation or the exclusively program-run self-evaluation is the so-called "aided self-evaluation." This approach, whereby the outsider acts as an adviser but villager leaders actually carry out the evaluation, combines the best of both worlds. It adds the outsider's technical expertise to the villagers' basic "feel" for their culture and unsurpassed knowledge of the program.

Before any outsider is hired, the program should find out

what previous experience he or she has had in agricultural work and should see copies of his or her previous evaluations.

THE NEED FOR A PHASE-OUT DATE

No agricultural program can expect to receive outside funding and support forever. Spending money year after year in the same area to do what the people should be learning to do for themselves is a poor use of scarce resources. It is also paternalistic. Sooner or later, the local people must be prepared to carry on and multiply the program's efforts by themselves, and the sooner the better.

A definite phase-out date for the program should be planned and kept in mind from the very beginning. Such a date is advantageous to a program for several reasons. First of all, it engenders among program workers and villagers a spirit of "let's get things done while we still have the time!" It creates a dynamic of urgency. The villagers come to feel that this opportunity is going to knock but once, and they had better take advantage of it. As a result, the program spends a minimum of time on motivation.

Secondly, having a preset termination date helps the staff keep in mind that outside support will eventually terminate. Planning is done with the question always in mind: "What will happen when the program ends?" This is as it should be. The program is forced to respond to the people's felt needs; if it doesn't, who will bother to carry on when the program ends? The program is forced to remain simple; if it doesn't, who will be *capable* of carrying on? And the program achieves more villager participation because the cutoff date puts pressure on the program to get people involved and put pressure on the people to learn how to carry on when the outsiders have left.

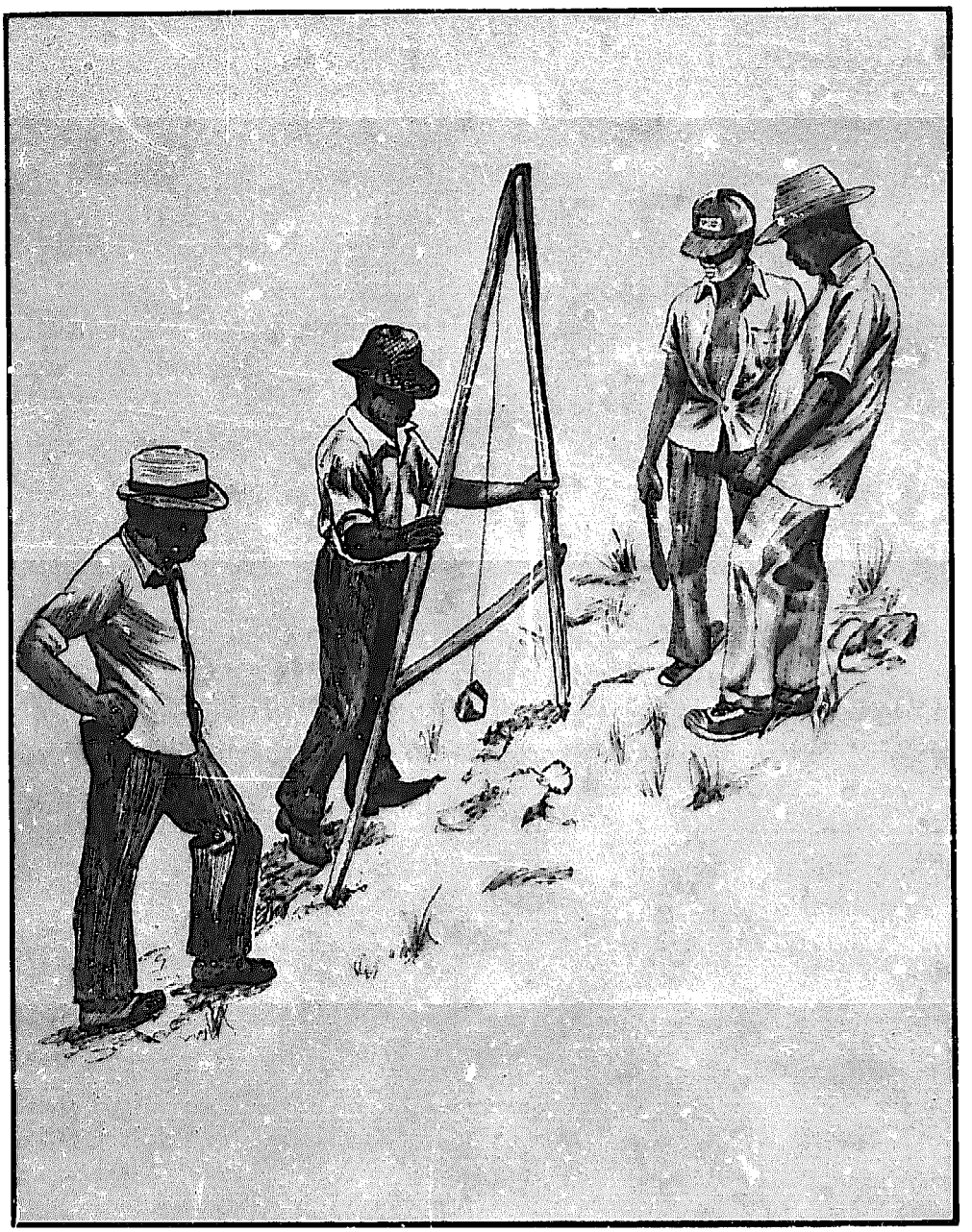
Thirdly, dependence on the program is greatly reduced because the people are forced to realize that *the program is not there to provide a service, but rather to help them learn how to provide that service for themselves.* They must go to the program not just to receive a service, but to learn how to perpetuate it and, hopefully, improve it.

A cutoff date also has a positive effect on the relationship between extensionists and their villager students. If

extensionists feel they are permanent teachers on a permanent salary teaching permanent students, they tend to begin feeling superior to their own neighbors. On the other hand, if they fully understand that they are temporary teachers on a temporary salary teaching students who may themselves become teachers, the relationships tend to remain ones of equality and interdependence.

Lastly, a cutoff date is, very simply, the program's way of saying to the people that it has confidence in them. A permanent program has inherent in it the assumption that the people will never be able to carry on the work themselves. In contrast, a program with a cutoff date recognizes that the people are competent and will, in time, be totally capable of doing everything the program is doing. Villagers very quickly perceive this difference in attitude.

As time goes on, a program may find that the cutoff date needs to be changed. Like all other plans, this too, must remain flexible. A program should never close down prematurely just because a date was set six years before. On the other hand, flexibility should not become an excuse for continuing on forever.



The impact of a program multiplies as the learners become teachers.

14 MULTIPLYING OUR EFFORTS

Very simply, we have done nothing if nothing lasts. If five years after the program has terminated, nothing is left of our efforts, we have, in fact, done harm. For it will be even more difficult for villagers to become enthusiastic about innovation in the future if their first efforts at innovation have come to naught.

The chances of our work's being permanent should be very good if we have worked with a few appropriate, easily understood innovations that truly answer a felt need, if they have brought success according to the people's own values, if we have emphasized those few innovations long enough that the critical mass has been reached in many of the area's communities, and if we have allowed villagers to increase their constructive participation in the program until they have taken it over and learned to run it well.

Nevertheless, we cannot settle for just permanence. We must have as our goal the multiplication of our efforts — the spread of improved agriculture across a larger and larger area for years after all the outside support has ended. The problems of insufficient food, poor health, and poverty among the world's villagers are of vast proportions. We cannot depend on salaried workers alone; development agencies could never

begin to pay for all the work that is needed. The only way those of us dedicated to solving these problems have a chance of reaching the world's two billion villager farmers is to train hundreds of thousands of villager leaders to take the forefront in the battle.

Villager leaders *should* take the forefront in this battle. Their involvement is proof that village people can solve their own problems. It strengthens other villagers' sense of dignity. And it confirms our trust and confidence in their abilities and their potential.

How do we train and motivate villager leaders to carry on the work of agricultural improvement and, more generally, village development?

HOW DO WE PROMOTE MULTIPLICATION BY VILLAGERS?

Attributes of a Good Extensionist Multiplier

First we must ask, "What does a villager need in order to be a good leader and multiplier?" World Neighbors considers the following attributes to be necessary:

1) **Motivation to help others.** Although this motivation is the main characteristic looked for in selecting an extensionist, the training process must constantly reinforce it.

2) **Enthusiasm.** Just as enthusiasm is the driving force behind development, it is also the driving force behind an extensionist multiplier. Furthermore, only an extensionist who has enthusiasm can inspire enthusiasm in others.

3) **Technical knowledge.** An extensionist multiplier must know thoroughly the specific appropriate innovations capable of meeting the felt needs of his or her area. He or she must also be able to judge the appropriateness of potential innovations and know how to try them out.

4) **Conviction.** The extensionist multiplier must, through personal experiences of success with the technology, become totally convinced that the technology he or she is teaching is valuable.

5) **Prestige.** Only if villagers respect the extensionist and his or her knowledge will they come to the extensionist to learn.

6) **Teaching abilty.** Knowing something is not the same as being able to teach it. A good extensionist must know how to teach.

Although the training efforts of many programs are aimed almost exclusively at strengthening the trainee's *technical knowledge*, it is obvious that an extensionist must possess all six characteristics to be effective. The question, then, is, "How do we create, stimulate, or reinforce these characteristics in a villager leader?"

Any program that started its work carefully will have a tremendous head start in ensuring that its leaders will have these characteristics. The leader's experience with a limited technology that successfully met felt needs has given him a beginning of *technical knowledge* and the *conviction* of that technology's value. Its quick success has given him *enthusiasm*. The teaching style used with the village group in which he first studied provided him an example of good *teaching techniques*, and he was later selected as a leader predominantly because of his proven *motivation to help others*.

Nevertheless, the training process must continually strengthen each of these attributes. To do so, World Neighbors recommends a three-step training process.

The Three-Step Training Process

1. Practical and Theoretical Training. This training is the in-class and out-of-class training described in Chapter 11. Although in many programs this is the only training given, an adequate training process for multiplication includes two additional steps.

The practical and theoretical training normally consists of several kinds of training efforts. First of all, it includes the weekly or bimonthly classes for selected villager leaders already mentioned. These classes will probably include both potential and already active volunteer extensionists, and may also include salaried extensionists, if convenient. The classes will deal with progressively higher levels of technology on the technology pyramid as the need arises for these leaders to know higher levels.

The second kind of practical and theoretical training is seminars of about one or two weeks for program personnel and volunteers, usually held in the agricultural off-season. These seminars are generally used to deal with one concrete, practical subject, such as the why and how of some agricultural technology, the techniques for using a visual aid, or the methods of planning a course of study.

A third kind of practical and theoretical training consists of reflecting on past experience — why the work has or has not been successful, why the people have or have not liked it, and why the methods have or have not stimulated enthusiasm and constructive participation. Personal experience is always the best teacher, but to profit most from that experience, one must reflect back over it and look for lessons and new ideas. Even superior to just "learning by doing" is learning by doing and then reflecting on the doing.[1] This training is most easily done about once each month during personnel meetings. It may involve only the salaried employees, or may also include volunteer extensionists.

All the above training should include ideas designed to *motivate* leaders *to help others.* This motivation can be based on ideas of moral or religious duty, villager dignity, or group solidarity. The trainees should reflect on the advantages of living in a community where *everyone's* agriculture is improving — where everyone can afford to contribute toward community projects, where everyone feels the need for an agricultural supply store or a road to market his increased produce, and where no one has been left so far behind that he or she becomes jealous and resentful of the leaders' progress.

During all this training, we should remember that people teach as they were taught. These classes should provide an example of the very best in teaching techniques so that the extensionists are learning good pedagogy along with the subject matter.

The practical and theoretical classes, then, can strengthen the extensionists' *motivation to help others,* their *technical knowledge,* and, by providing a good example, their *teaching ability* — only three of the six characteristics needed. (See Diagram No. 2.)

2. **Small-scale Experimentation.** Small-scale

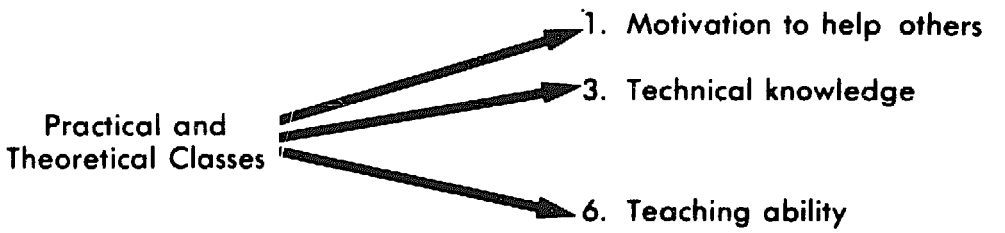


DIAGRAM NO.2. The practical and theoretical training, in many programs the only training process used, strengthens only three of the six necessary attributes of a good extensionist multiplier.

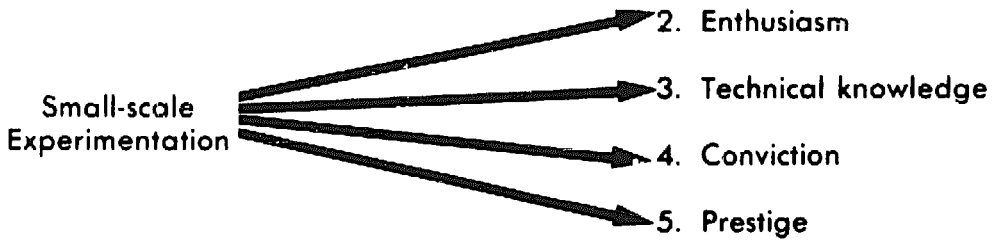


DIAGRAM NO.3. Small-scale experimentation strengthens four of the six necessary attributes.

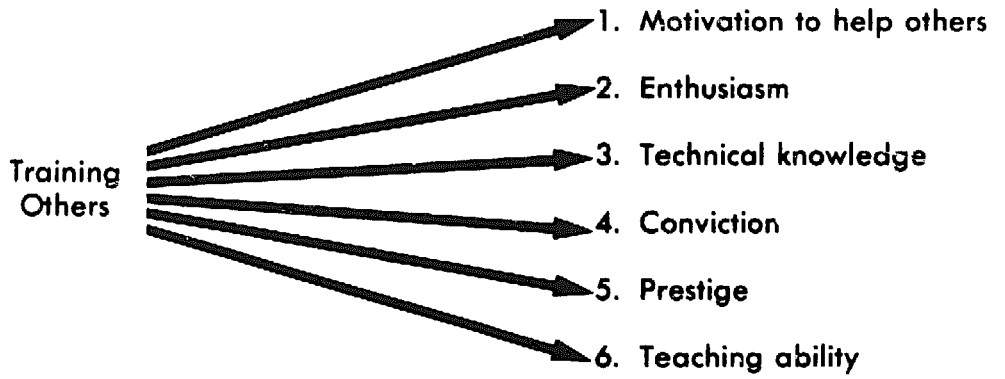


DIAGRAM NO.4. The experience of training others should be an integral part of the training process. It strengthens all six of the necessary attributes of a good extensionist.

experimentation is the second step in the multiplier training process. Every extensionist multiplier must experiment with the technology he is learning. It is of utmost importance that these early experiments be successful.

Experimenting with these innovations gives the extensionists added *technical knowledge*. The experiments' success increases the extensionists' *enthusiasm* for change and their *conviction* that the technology is worthwhile. And their ability to produce better crops or animals than other farmers will increase their *prestige*. Increased production also permits volunteer extensionists to dedicate more time to the welfare of others.

3. **Training Others.** The third step of the training process consists of the extensionists' actually going out and training others. With close program support and supervision, the extensionists begin giving classes to village groups in their own or nearby villages.

As the extensionist multipliers begin teaching, the program must help them do the best job possible. The extensionists' weekly or bimonthly classes should begin to deal with at least three aspects of each class the extensionists will be teaching:

a. The theoretical background of the innovation to be taught. Obviously, the extensionists must be able to answer most of the questions they will be asked while giving their classes. If a course of study on the innovation being taught has been written up as described on page , the pages of theoretical background material can serve as the basis for this part of the training.

b. Guided experience in teaching. Often beginning extensionists can best learn to teach by first watching a good teacher present a class as it should be taught, and then giving the same class themselves. After each extensionist gives the class, his classmates can provide feedback and suggestions, to the extent culturally acceptable.

c. The making and use of audiovisual aids. Extensionists should learn to make and use audiovisuals, especially flannelgraphs, flipcharts, sociodramas, and any others that can be reproduced in the village at little or no cost. As they learn to teach each of the classes dealing with the innovation, they should make the audiovisuals needed

for that class. At first, they should probably use visuals like flipcharts that have a set sequence, thereby helping the extensionists remember the message.

As the extensionist trainee succeeds in increasing the harvests of other farmers' experimental plots, these farmers' gratitude will strengthen the trainee's *motivation to help others* (through positive reinforcement, the most powerful modifier of behavior known to psychology). Praise of the trainee's success from program leaders can add to this positive reinforcement. His *enthusiasm* for change and for his work will increase as he watches his neighbors' and friends' productivity improve.

Teachers often observe that one who teaches learns more than do his students. In one World Neighbors program, the extensionists have taken to saying, "You don't *really* know anything until you've taught it yourself." Thus, as an extensionist teaches innovations, he broadens his own *technical knowledge*. The trainee's *conviction* about the value of the technology is increased considerably as he watches a

dozen or so of his students also achieve success with their experiments. His *prestige* grows not only because of his role as teacher, but also because he has improved the well-being of the community. And his *teaching ability* is improved through the time-tested process of learning by doing.

This third step of the training process, is, then, the most important. If managed well, it strengthens every one of the six characteristics needed by a good extensionist multiplier. (See Diagram No. 4.)

All extensionists should be trained in groups, not as individuals. The members of a group can learn from each other and support each other. By training groups, we teach more people with the same time and effort, and the program avoids dependency on any particular individual. Counterparts and other people trained one at a time often become overly individualistic, have no companionship or friendly rivalry to keep them going, and sometimes, because of all their special training, begin to feel superior to their co-workers. Experience with the counterpart system has generally been disappointing.

Sending trainees to foreign countries, especially the United States or Europe, has also nearly always had negative results for small, rural-based programs.

Finally, we must remember that the most powerful educational tool we have is our own example.

THE LEADERSHIP PYRAMID

Ideally, as its impact grows, a program gradually forms a pyramid of leadership. From the moment a program begins teaching an innovation, it has two "levels"* to its pyramid: those teaching the innovation, whether professional or villager, and those learning it. Those who are teaching should be experimenting with a second level of technology while they are teaching the first.

Each year, the program reaches more and more village groups, from which leaders are selected and trained as volunteer extensionists. The original teachers then teach the second level of technology to the volunteer extensionists and

*The terms "pyramid" and "levels," as used here, in no way imply a vertical hierarchy or chain of command. Rather they are used to illustrate amounts of experience in the program and flows of information about innovations.

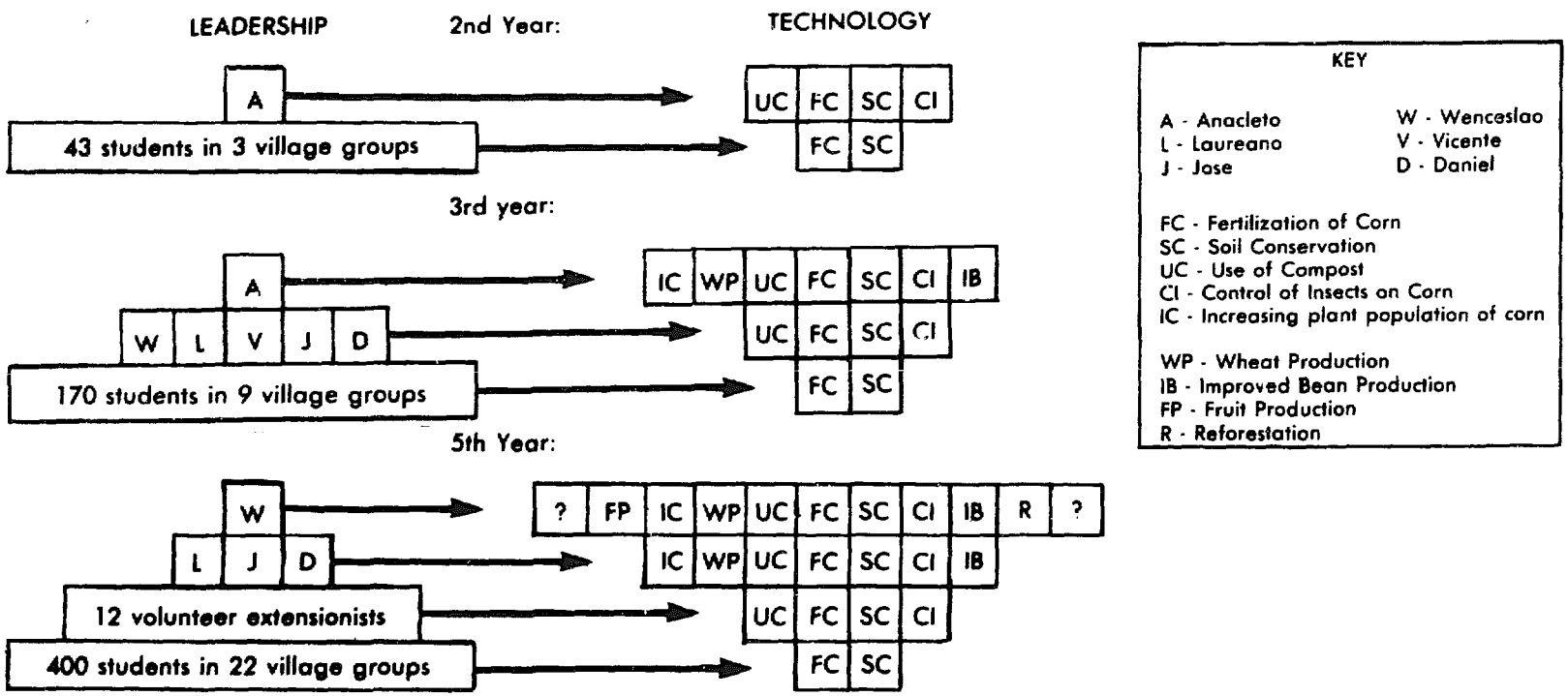


DIAGRAM NO.5. The second year of this program, Anacleto was teaching the fertilization of corn (FC) and soil conservation (SC) to forty-three students while he himself learned about composting (UC) and the control of corn insects (CI). The third year, a group of five volunteer extensionists emerged. They taught about 90 village students the first level of technology while Anacleto taught them the second. By the fifth year of the program, Anacleto had moved to another post, and Wenceslao became the full-time director of agricultural work. Laureano, Jose, and Daniel had become half-time salaried extensionists, and 12 villagers were working as volunteers. What the diagram does not show are the many villagers among the second year's 43 students and the third year's 170 who continued to learn new technology in the technology pyramid without moving up the leadership pyramid.

begin to investigate a third. The leadership pyramid now has three levels: the older teachers, presumably on salary; the volunteer extensionists; and the village groups. As newer leaders are trained, they will form more levels on the pyramid. Each year, those at the peak of the pyramid must find new technology so that in successive years that technology can work its way down the pyramid, from teacher to salaried extensionists to volunteer extensionists to village groups. In this way, we continually develop new innovations and move down the pyramid so everyone can learn new technology whenever he is ready for it.

Of course, the leadership and technology pyramids will function somewhat differently in each program. The time needed to find new innovations will vary from year to year and from program to program, as will the number of leaders willing to work voluntarily and the number who drop out. Furthermore, many farmers will be moving up the technology pyramid without moving up the leadership pyramid.

Nevertheless, programs would do well to maintain a more or less pyramidal structure of both their technology and their leadership. If the programs did not start out with this kind of structure, they can and should work toward it. The leadership pyramid assures the program that, when one leader leaves, another is ready to take his place. Meanwhile, the technology pyramid assures leaders of new innovations to learn, thereby helping to maintain their excitement, enthusiasm, and desire to continue learning. It also reinforces their growing conviction that development can truly be an unending process.

Problems appear when either of the pyramids becomes too badly misshapen. If the leadership pyramid expands too much at any one point, those just above the bulge will be unable to support and supervise all those below them. If the pyramid becomes too thin in its upper reaches, the program may fall victim to another common problem: the one-leader program syndrome. A one-leader program is one that is dependent on a single individual whose enthusiasm, organizational ability, and charisma make it move, but who does not develop other leaders. Thus the program fails to multiply itself. If and when the leader leaves, the program falls apart.

The technology pyramid should not stray too far from the

correct shape, either. A large bulge in an early year of the program has much the same effect as would the program's having failed to limit its technology the first year. The bulge causes a diffusion of the program's efforts and produces a lack of consensus among the leaders as well as the villagers. Furthermore, any great quantity of technology introduced in one year is probably inadequately tested. And the dialogue and sharing of interests among the extensionists break down because each one is working with different innovations. A scarcity of good innovations at the top of the pyramid will fail to make adequate use of the program's leadership resources and will cause leaders to lose interest in their work. A scarcity of technology also lessens the overall enthusiasm for change, the desire to attend classes, and the general dynamic of urgency within the program.

So we gradually create two ever-expanding pyramids, each one complementing the other. The goal, of course, is that the pyramid of villager leadership become able to take over the entire program and, by itself, maintain the growth of the pyramid of technology.

THE PHASE-OUT OF SUPERVISION AND TRAINING

As the leadership pyramid becomes increasingly self-confident and capable of developing new technology, program-funded backstopping, supervision, and training can gradually be phased out.

As the amount of supervision is reduced, the percentage of the villager leaders' experiments that fail will probably increase. More and more problems previously solved by outsiders will be left for villager leaders to solve. This is desirable. In the beginning, the preoccupation with making absolutely sure that every experiment succeed is necessary to build enthusiasm and make participation constructive. But in the real world, one does not always succeed. Gradually, as leaders become more self-confident and capable, the amount of supervision should decrease, and they should learn, through their own experience, that experiments do fail and programs do have problems. If they first encounter failure the moment the program ends, they may give up. On the other hand, if they

have gradually learned to solve larger and larger problems and no longer become discouraged when experiments fail, they will be ready, when the program leaves, to confront the real world with all its problems and failures. To shield them from problems they are capable of confronting is to be paternalistic and, in the end, to leave them unprepared to continue by themselves.

The rate at which supervision and support are withdrawn is crucial. If they are withdrawn too quickly, villagers may become discouraged and lose their enthusiasm. If they are withdrawn too slowly, the program will drag on year after year while the leaders feel increasingly unchallenged and spoon-fed. Once again, agricultural improvement is more an art than a science.

During a program's last year or two, program outsiders should gradually phase themselves out of the training function. Villagers will increasingly develop their own innovations. At the same time, the program should put its villager leaders in contact with permanent sources of technology in the area: experiment stations, commercial agents, other innovative villagers, professional employees of local institutions, and sympathetic agronomists. By experimenting with both their own innovations and those from outside sources, the villagers will be able to find out which innovations can further improve their agriculture.

As they test more and more technology, the villager leaders should learn to share their new-found information with each other. Increasingly, villager extensionists should use the training classes they attend to show and report to each other the results of their own experiments.

In time, they should gradually organize themselves to co-ordinate their experimentation. For instance, one group of farmers could experiment with five new peanut varieties while another group takes charge of comparing various plant populations for millet. Using a standard mimeographed "experiment report sheet," these groups of farmers can then report their findings to the larger group. By thus organizing what is in effect their own experiment station, stretched out across the program area, the villagers can develop large

amounts of homegrown technology. By systematically reporting it to each other, they can spread this technology across the entire program area.

Class time will increasingly be taken up by the villagers' organizing and reporting on experiments and by occasional nonprogram professionals invited by the villagers. Program outsiders can thereby gradually phase themselves out of all teaching. When the program ends, the shift to locally taught and organized classes will already have been made. Gradually, the dialogue once carried on between the program and the villagers has become a dialogue among the villagers.

Even if experiment stations do begin to develop technology appropriate to small farmers, we can hardly expect them to develop the technology needed for the uniquely different farming systems developed by farmers in a truly successful program. Therefore, a relatively self-contained system of developing and disseminating new technology such as that described above becomes essential as program area farmers develop their own unique, more highly productive farming systems. The organizational framework in which this system of technological development and dissemination continues to operate may be a formal institution. It can also just be several groups of farmers who have come to know each other, recognize the importance of what they are doing, and therefore continue to do it together.

Programs have often attempted to establish local sources of funding in order to continue paying the salaries of program staff permanently. These efforts have rarely been successful. For sufficient funds to be raised, the most competent leaders in the program become so involved in generating income that little time is left for the work in the villages. The few expenses for paper and a mimeograph machine incurred by the mimeographing of report sheets can usually be paid by charging for copies of the experiment reports.

Toward the end of the program, the villager leaders should also learn about ideas such as the technology and leadership pyramids, the importance of limiting technology, and any others that have contributed to the program's success, so they can continue to generate success themselves.

INTERPROGRAM MULTIPLIER EFFECT

Multiplying our successful efforts *between* programs is as important as multiplying them *within* a program. If every new agency that begins work in a country must reinvent the wheel, we will all accomplish very little. Even more deplorable is the tendency of some agencies to try to compete with everyone else, usually by providing more paternalistic "services," in order to attract more members to "their" organizations. Many villagers notice rather quickly the hypocrisy of a development agency that exhorts them to cooperate with each other while the agency fails to cooperate with other agencies. Development agencies *must* learn from each other's experience and coordinate their efforts.

The difficulty of developing a dialogue and coordinating efforts with other programs is often underestimated, with the result that few programs allow enough time for such cooperation. Among the obstacles to be overcome are suspicion of each other's motives, differences in political philosophies or objectives, a sense of competition among agencies, personality clashes or pride among program leaders, and a lack of program flexibility caused by either program bureaucracy or top-down decision-making from agency headquarters. A further problem is caused by the previously mentioned "conspiracy of courtesy." During all the years I worked with a certain health program in Latin America, everyone told me it was nearly perfect. I never heard a whisper about its shortcomings. Later, when I changed jobs, I began hearing many such whisperings. Villagers tend to tell the people in a program all the good things about itself while telling people in other programs all the bad. The unfortunate consequence of this "conspiracy of courtesy" is that the leaders of each program gradually come to believe that theirs is the best program and all the others are incompetent, if not slightly suspect. Programs mistakenly come to believe they have little to learn from each other.

To some extent, programs can learn from each other through published articles and seminars. Nevertheless, experience tells us that program leaders, like villagers, learn more through their own experience than by talk or the written

word. The most effective way to begin a dialogue between two programs is to have leaders and extensionists of each program visit the other's result demonstrations or field trips. Such visits help program personnel understand more quickly and concretely what it is they can learn from and offer to each other.

The relationship between two programs is greatly strengthened when they begin to show a willingness to help and collaborate with each other. The relationship is further enhanced by each program's maintaining flexibility in its program design in order to coordinate efforts and make modifications when other programs' methods prove superior.

No relationship between two programs should be formed too hastily; building good relationships takes a steady effort over a period of months and even years.

"We should start with simple forms of organization and let people gradually work up to the more complicated ones."

15 BUILDING INSTITUTIONS

How many times have we heard. . .that the president went off with the cooperative's money? How many cases do we know of backlogged bookkeeping? Where the accounts don't balance?. . .Very often we are asking people with few resources to invest, to capitalize, and leave their savings with a cooperative. So one day the farmer comes around and asks, "How is my account?"

"Well, it's not up to date because the accountant hasn't been in."

WHAT!? What are we trying to pull on these people?

David Fledderjohn
Agricultural Cooperative
Development International[1]

Into (the Third World village) environment the introduction of a sophisticated structure without any radical modification was bound to run into difficulties. It is not co-operation itself which is at fault but the stringent organizational procedures used which make it impossible for the traditional forms of organization to be 'upgraded' to new levels where they can be of greater value to their members and can respond to the felt needs of the people concerned.

Christopher Howse
Oxfam, United Kingdom[2]

THE IMPORTANCE OF INSTITUTIONS

In the last few years, much has been written in favor of "institutionalization" — the formation of village institutions. There are many reasons why establishing village-level institutions is, in fact, of utmost importance.

First of all, many agricultural problems can only be solved by organizations. Examples of services that usually require an organization are the giving of credit, the formation of villager capital through savings, the control of overgrazing, the coordination of large-scale irrigation projects, the eradication of certain insects and rodents, the control of erosion, the investigation and dissemination of agricultural innovations, the transport and sale of agricultural supplies, and the lobbying of government for favorable laws and needed services. Villager organizations can also serve as intermediaries between large institutions and the villagers. They can distribute large bank loans among hundreds of small farmers. They can help villagers sell directly to wholesale buyers or retailers. And they can provide the channel for a two-way dialogue between an extension service and thousands of villagers. Some of these functions are at times performed by government agencies or private entrepreneurs, but in most cases, these services will exist only if villagers become organized to provide the services for themselves. As they do, they are once again learning to solve their own problems.

Secondly, organizations can give our work permanence. Although the kind of organization can be simple, people do need to be organized if they are to continue developing new technology and spreading it among the villages. In the long run, agricultural improvement depends as much on people's working together as it does on their acquiring know-how.

Thirdly, if villagers are ever to compete in the outside world, they must become organized. At present, the contest between the rich and the poor is extremely uneven; the rich are not only wealthier, they are better organized. Village-level institutions can provide experience in the skills villagers must learn to organize themselves.

THE FLESH AND BLOOD OF AN INSTITUTION

The problem is that too many institutions formed in the villages are little more than skeletons. A membership list is drawn up, officials are elected, a site is found for holding meetings, and a set of by-laws is established. A large group of people may even gather when an important official arrives for a visit. But, in fact, the organization is just a skeleton. Meetings, if held at all, are poorly attended. Financial support, voluntary work, and constructive participation by the members are largely nonexistent. The services provided, if any, are maintained by a few salaried employees with only haphazard accounting controls. In numerous cases, the institutions are on the verge of bankruptcy.

We have, in our work, assumed that people of different religious, cultural, socioeconomic, and racial groups would willingly lay aside their differences in order to work together. We have assumed that villagers were cooperative- and collective-minded when they were competitive-minded. We have assumed that they would be able to understand how to run complex institutions transplanted from Western culture.

And we have assumed that we could hand a copy of a cooperative's statutes to a group of people who have lived their entire lives in authoritarian societies and that instantaneous democracies would grow and flourish. In short, we have been so busy piecing together the frameworks of institutions that we have forgotten that these skeletons, by themselves, are lifeless.

An institution that is truly alive consists not only of an organizational framework, but of a certain feeling among the people — a sense of belonging, of identity with the organization. The members must either trust each other and be worthy of that trust or know how to prevent each other from running off with all the money or all the benefits and services. Each time a chore needs to be done, there must be a waving of hands instead of a shaking of heads. People must know how to make group decisions, give and receive constructive criticism, handle money, and run a business competently. To have a really strong organization, people must care enough about each other to work hard for each other's welfare.

It is these characteristics, these more intangible feelings,

skills, attitudes, and even moral attributes, that constitute the flesh and blood of an institution. These are the characteristics that will convert it from a lifeless skeleton into a functioning, moving organism that provides needed services and experience in constructive participation. In the end, engendering in the people these attitudes, feelings, and skills can be more important than establishing any particular institution. An institution only needs to stumble and fall once to be ended for good. On the other hand, a *cooperative attitude* can form the basis of village institutions as often as and whenever they are needed.

We must stop rushing to build skeletons, and take the time and effort to breathe life into them. The first step is to choose the kind of institution that is *capable* of coming alive.

APPROPRIATE TECHNOLOGY FOR INSTITUTION BUILDING

Using an appropriate technology in institution building is just as important as it is in agriculture. Surprisingly, the criteria for an appropriate technology in institution building are nearly the same as in agriculture.

Does It Meet a Felt Need?

The need for an institution should not arise from within the development agency, but from among the people. The proposed institution should provide the simplest solution to a felt need of the people, and the need should be felt strongly enough that the people make most of the effort to organize the institution.

If there is no definite felt need, no institution should be formed. Nor should we form an institution if another one can fill the need. As Edgar Stoesz observes, "Communities cannot afford the luxury of structures which do not serve a practical purpose."[3]

Unneeded organizations will last about as long as the villagers feel they must keep the organizations going to satisfy a development agency or receive whatever subsidies may be forthcoming. Then the organizations will die. As a result, the program's credibility will be damaged and the villagers will

have one more reason, based on their own experience, for *not* working together.

On the other hand, if people definitely need an institution, that very need will push them to overcome their differences and learn to work together.

Does It Address a Limiting Factor in the Agricultural Situation?

If the people are going to go to all the work of establishing and maintaining an institution, it must address a major limiting factor in the local agricultural situation. Care should be taken to choose the factor that will be most limiting three to five years in the future when the institution will be strong enough to solve major problems.

Is It Financially Feasible?

If at all possible, we should establish institutions that do not need to handle money. Such institutions are, after all, the simplest. If an institution must handle money, we must make certain that it will be financially solvent, even in a changing environment and with the quality of management villagers can provide. One common failure is to underestimate the efficiency of competing businesses. Another is to forget that competing financial interests may try, either from inside or outside of the institution, to destroy it or gain power over it.

Can It Bring a Recognizable Success In a Short Time?

People feel prouder of belonging to an organization and will usually work harder for it if it achieves recognizable success early on. Institutions should therefore have relatively simple, easily attained objectives, and everyone should be informed of the successes achieved.

Does It Fit into Local Social Patterns?

Institutions, like customs, are indigenous to specific cultures. Those transplanted from one culture to another often have difficulty in taking root.

Nearly all traditional cultures have cooperating societies of one kind of another.[4] Rather than bring in foreign institutions, we should first find out what kind of cooperating societies already exist and how they function. Then we should use them, whenever it is possible without overloading their administrative capacity. We can thus avoid all the work of establishing an organization and finding or developing organizational ability. Future competition between the new organization and the older ones will also be avoided.

If we do help form new institutions, they should be as similar to indigenous institutions as possible.[5] The savings cooperatives, or "susu," in Liberia provide a worthwhile example. Wanting to save pocket money instead of spending it carelessly, the people merely made a simple modification in a traditional rice-saving custom. Shares of from $0.05 to 0.50 are saved in the cooperative each week. After a few months small loans may be given, and at the end of the year, the members redistribute the savings among themselves.[6]

If an institution must handle money, we should find out what traditional safeguards are used by local groups or communities to prevent the loss of communal funds. Such safeguards will undoubtedly work better than Western-style vigilance committees.

Is the Institution Simple to Understand and Run?

If an institution is too complicated for villager leaders to run, it will fall apart soon after the outsiders leave. In fact, it should be simple enough that a broad spectrum of the villagers can run it, not just a few star leaders. In the long run, an institution will represent only those capable of managing it. If only two or three people can understand the accounting, effective participation is limited to those few people. And only their goodwill will keep the organization from being run not only *by* them, but *for* them.

Institutions need not be permanent. Short-term needs can be met by short-term institutions. A World Neighbors program in Guatemala introduced wheat-growing into a highland area. Five years later, after the program had terminated, some 800 farmers were planting wheat. Suddenly, just two months before harvest time, some of the villagers discovered that the only thresher in the area was no longer working. By then experienced in organizing themselves, the villagers called an emergency meeting of wheat growers. Within two weeks they had 600 signatures on a petition asking for a thresher and had collected the money needed to send representatives to several other highland townships to look for threshers. Within two months, three threshers were working in the area. The wheat growers' "association" had accomplished its purpose and had disbanded three months after it was born.

COOPERATIVES

To what extent do cooperatives, the most widely promoted institution in the Third World, measure up to these criteria? Unfortunately, they generally do not. Cooperatives are a European institution designed to meet European needs. Third World villagers often feel little need for them. Worst of all, cooperatives are tremendously complicated structures that are difficult to understand and even more difficult to run.

It took us decades to realize that even though the tractor is indispensable to Western agriculture, it is an inappropriate, even harmful technology for most of the world's small farmers. Cooperatives, for most of the same reasons, are usually just as

inappropriate. Yet these "tractors of institution building" are being promoted throughout the Third World.

Like tractors, cooperatives do occasionally have their place and do occasionally produce dramatic successes. World Neighbors works with them in a few programs, and will continue to do so, Cooperatives are ideal for handling complicated, large-scale problems — for providing credit and savings services and doing large-scale purchasing, processing, selling, and transporting. They are frequently more democratic than traditional organizations, and they enjoy a homogeneity, both within and among nations, that has permitted the formation of national and international federations. Furthermore, they often have official governmental support. Nevertheless, some of these advantages have their negative sides as well. To the extent that village cooperatives depend on national or international support, they lose their local autonomy and sense of accomplishment.[7] In the more repressive countries where governmental support is most important, the cooperative movement is often controlled to some degree by the government.

The primary problem with cooperatives is their complexity. As Sudhir Sen writes:

> *Of all institutions genuine cooperatives are the most difficult to build and to operate, especially because they postulate a relatively high degree of development and of social justice, in terms of education, health, jobs and income.*[8]

Many problems result from this complexity. First of all, villagers do not understand cooperatives. A cooperative for the production and marketing of honey was established in Latin America by an expatriate agency. After several successful years, the agency succeeded in opening a very lucrative market for the cooperative's honey in Europe. The money earned from the year's first sales market was more than the members had ever seen in their lives, and the long-term economic possibilities were astounding. Nevertheless, the members knew nothing about the cooperative's finances. Fearing their money might otherwise be lost, they dissolved

the cooperative in order to divide the money up among themselves.

One often hears that cooperative leaders lack business experience and talent. This is, of course, just another way of saying that cooperatives are too complicated.

Where the poor do not understand cooperatives, the wealthy and the well-educated often take control of them. Wealthy members of credit cooperatives have loaned to themselves the poorer members' badly needed money, merchants have made sure that marketing co-ops never succeeded in competing with them, and wealthy farmers have taken advantage of subsidies channeled through cooperatives to benefit the poor. Poor people's cooperatives may thus end up helping those whose economic interests *oppose* those of the poor.

Another problem stemming from the difficulty of understanding cooperatives is that those few villagers who do understand cooperatives remain on the directive boards year after year. This long-term holding of offices has frequently given rise to fraud and favoritism.

As a result of these problems, villager cooperatives have made a rather poor showing. Fifty years after cooperativism was founded in India, the Rural Credit Survey Committee of India concluded that "Cooperation has failed."[9] Sir Malcolm Darling, a veteran of the cooperative movement in India, wrote in 1957, "The path of cooperation is strewn with wreckage."[10] The report of a seminar on cooperatives in 1971 states that "Many cooperatives have been founded, but few have survived."[11] A proponent of cooperatives in Latin America admits, "I believe that in Latin America the number of unsuccessful cooperatives is equal to the number of successful ones. This hurts."[12] Another author, describing experience on three continents, writes, "There were some outstanding successes and some tragic failures ¿of which the¡ latter unfortunately far outweighed the former."[13]

HOW SHOULD WE APPROACH INSTITUTION BUILDING?

Just as with agricultural innovations, our role is not to

"sell" organizations, but to inform people about their advantages and disadvantages. Campaign slogans like "give the cooperative ten dollars and it will loan you fifty" attract people who are looking for an easy dollar, who want to receive services without working to provide them. Rosy advertising also creates unrealistic expectations. When the going gets tough, as it inevitably will, the people may feel they were deceived. Their resolve to keep struggling will be minimal. A better approach is to admit that a cooperative is like agricultural improvement: one has to put a lot of work into it, but with considerable care and after some time, one could receive a good harvest.

Programs should begin by working with simpler institutions, thereby letting people work up to more complicated ones, so villagers can learn gradually the skills needed to organize and manage the more complicated institutions. Cooperatives should be used only in the later stages of institution building. They are "the arch and the coping-stone, not the foundation, of rural development."[14]

Probably the simplest and, not coincidentally, the most widespread of all traditional institutions, is the work group, variously known as the *dokpwe* (West Africa), the *mit'a* (the Andean countries), the *kuchubal* (Guatemala), and the *kombit* (Haiti). A group of farmers works together, one day on one of the farmers' fields and the next day on another's. Sometimes they work to the accompaniment of music. In this way, the farmers work more happily, enjoy each other's companionship, and often accomplish more than they would alone. Through such a simple institution, villagers can learn to work together, get to know each other, share tools, do slow-moving large-scale jobs without becoming discouraged by the apparent lack of progress, and learn from each other about agricultural innovations.

Starting with a simple institution like the work group, people can learn to work together in progressively more complicated institutions, such as community action groups, clubs, and associations. The possibilities are as numerous as the needs.

Programs must give the more complicated institutions plenty of time to get on their feet. It takes time to develop

management and accounting skills, and even more time to spread these skills among the organization's members. We should recognize that if we organize a cooperative, we are committing ourselves to continue working with it for at least three or four years. Furthermore, before any cooperative is organized, villagers should spend six months to a year thinking about it and studying what a cooperative is and does. Rarely should an agricultural program ever establish more than one cooperative. We should also avoid overloading successful institutions. The typical fate of the more successful villager-run organizations is that so many development agencies want to work with these organizations that the organizations run into difficulty from being overloaded with projects and services.

Some kinds of cooperatives are more complicated, and therefore less appropriate, than others. Credit and savings cooperatives are probably the least complicated. Production cooperatives are among the most difficult and least often fill a felt need. They have therefore earned what is probably the

poorest track record of all the cooperatives in the non-communist countries.[15]

We should no more subsidize institutions than we do individuals. India's large-scale experiment with official subsidization of cooperatives has largely failed.[16] Subsidization destroys the people's initiative and their pride in the cooperative and allows them to avoid facing the fact that it is a serious business venture. Large donations and subsidies may attract dishonest members and promote corruption. If people have not really worked at or invested in a cooperative, they will have little stake in it. The minute serious problems arise, they may just let the organization fall apart.

Training for cooperative members presently dwells almost entirely on the organization's administrative structure and the rights and duties of its members. These are necessary subjects, but are not the usual source of problems within cooperatives. More relevant training would deal with how to understand and do accounting, how to avoid corruption and theft, and how to administer the businesses in which cooperatives are involved. Especially needed are courses on simplified accounting methods that can be learned by large numbers of cooperative members.

Lastly, even in institution building, we need to get constant feedback from the villagers, non-members as well as members.

"A revolution of improving situations leads to a revolution of rising expectations. People begin wanting to solve some of their non-agricultural problems as well."

16 INTEGRATED PROGRAMS

THE IMPORTANCE OF INTEGRATING AGRICULTURAL PROGRAMS

Villagers see life as an indivisible whole. They intuitively know that development is more than just productive rice paddies; they know it is social and political as well as economic, female as well as male, educational and vocational as well as agricultural. They see no reason for the artificial barriers set up in academia to separate life into categories. They see no sense in those strange distinctions that cause Westerners to assume that a new variety of potatoes has more to do with a farmer's agricultural income than whether he can prevent his water supply from being stolen by a local landowner or whether he is cured of the malaria that has been sapping his strength for months.

When villagers' agricultural successes have convinced them that they are capable of solving their own problems, they begin wanting to solve their nonagricultural problems. And they want to solve first the problems they feel are most urgent, regardless of whether Westerners would classify them as economic, educational, industrial, social, or political. An agency that truly wants to help the people must be willing to respond to these needs.

When a program changes its priorities in response to the people's changing needs, the people learn *through their own experience* that the program is truly interested in them. This makes them feel their participation in the program is worthwhile and thereby encourages more participation. On the other hand, people may perceive a program that refuses to meet their nonagricultural needs as unresponsive and uncaring.

Programs should also be integrated because the benefit of an agricultural program may be small, indeed, if we are only willing to work in agriculture. Increased agricultural production may only lead to more extravagant social ceremonies, higher rent payments to landowners, or lower market prices. Increased incomes can, and sometimes do, lead to nothing more than increased consumption of alcohol. Or they may change the basic nutritional problem from that of not being able to afford better food to that of having the money but not knowing what food to buy, without having improved the people's nutritional state at all.

How Other Efforts Support Agricultural Improvement

Programs should also be integrated because agricultural work is often more efficient and successful when accompanied by other development efforts. For instance, if diseases are reducing people's stamina or forcing them to spend weeks in bed, farmers will hardly be able to tend their fields well. If villagers learn to read and write, they can learn agriculture faster and can write down and retain what they have learned. Few things are more discouraging than a villager's having learned the name of a veterinary medicine only to lose several animals a week or two later because he or she forgot it.

Empowerment work can also be crucial to agricultural progress. If farmers cannot protect their land and water resources from being bought or stolen by large landowners, they will have no land or water with which to farm. If laws unfavorable to the small farmer, such as regressive market taxes, are not changed, farmers may have no incentive to increase production. Marketing quotas or monopolies may also rob them of their incentive to produce.

Lastly, if population growth continues to forge ahead at 2.5 or 3% a year, raising per capita food production will become even more difficult. Furthermore, the longer the population continues to grow, the harder it will be for agricultural production to keep pace.

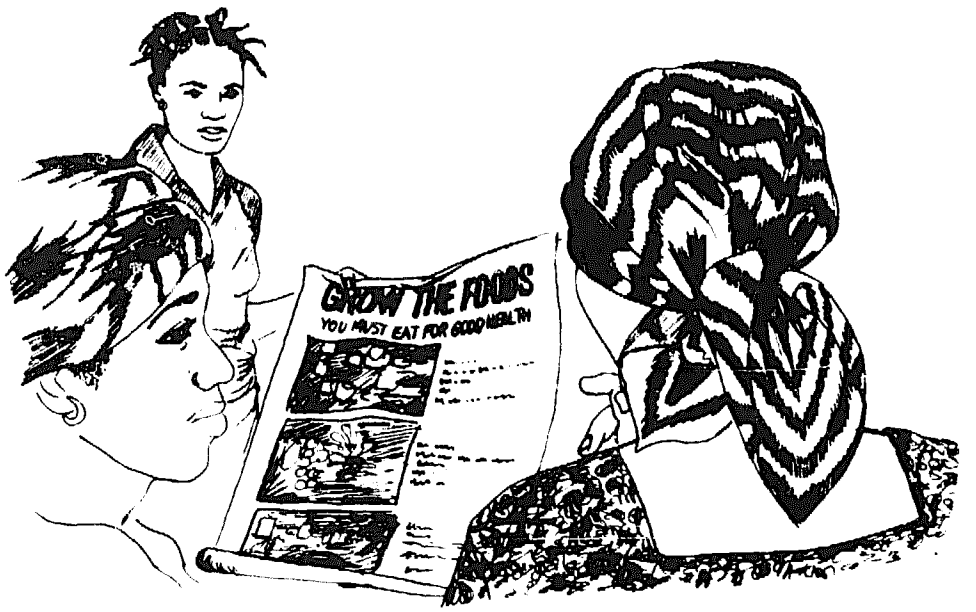
How Agricultural Improvement Supports Other Efforts

Just as health, literacy, and empowerment work make our agricultural efforts more efficient, so agricultural work makes work in these other areas easier.

First of all, in a very basic sense, agricultural improvement changes people. Its rapid, recognizable successes achieved by the villagers themselves tend to change self-doubts into self-confidence and discouragement into hope. Agricultural improvement also strengthens the forces that favor change in the community. Those who were most willing to venture out and innovate have gained prestige and become influential community leaders. The success of the new ways means fewer and fewer people will argue that the old ways were the best ways. These changes make it easier to promote *any* innovation in the future.

Preventive health and nutrition work, because of their slower, less easily recognized results, can especially profit from

being accompanied by agricultural work. Agriculture's quick successes can convince villagers that the program is both interested in their welfare and capable of improving it. Agricultural improvement also gives people the income they need to improve their health. Nutrition classes usually make parents more aware that inadequate food is the cause of their children's ill health. In the absence of increased incomes, such classes may only make parents feel guilty and inadequate. On the other hand, if health classes are accompanied by improved agriculture, families can buy better food and have the additional resources needed to build latrines, boil their water, and improve their homes. Agricultural work may also improve diets more directly by supplying needed fruits, vegetables, milk, or meat.



Good agricultural work also empowers the poor. It strengthens three of the most important sources of power: wealth, knowledge, and organization. Increased incomes can free poor people from various forms of control exercised by landowners, labor contractors, and moneylenders. Agricultural improvement brings the poor knowledge of the outside world and of how different political, economic, and marketing systems work. It also teaches them organizational

skills that are as necessary for political organizations as they are for a credit cooperative: how to work together, keep accounts, deal with dishonest or autocratic leaders, and make decisions democratically. Perhaps most important, agricultural improvement can teach the poor the one key characteristic that holds a political group together when it is under pressure: the willingness of each person to put himself out for the good of the group. Such groups will successfully withstand pressure from the opposition only if each member is willing to defend the group to the point of refusing bribes and facing physical threats, even when the member may gain nothing from the group's current activities.

As agriculture improves their situation, the villagers begin expecting things to continue to improve. A revolution of improving situations leads to a revolution of rising expectations. Yet new factors begin to limit the villagers' well-being. In many areas of the Third World the new bottlenecks are no longer agricultural or technological, but rather sociopolitical. Markets are controlled by two or three wealthy merchants, schoolteachers discriminate against minority groups by purposely keeping their children ignorant, corrupt officials steal money destined for improving roads and markets, laws favor city-dwellers by holding down food prices, and research and extension services are designed to benefit only the wealthy. The villagers' awareness is raised not by an outsider's lectures or an alien political philosophy, but *by their own experience.* Of course, where no such constraints exist, this awareness-raising process will not, and need not, occur.

Since agriculture is an early felt need with a long-term solution dependent on increasing sophistication and knowledge, it is a particularly effective activity for motivating the illiterate to become literate and for preventing the literate from lapsing back into illiteracy.

Finally, recent research suggests that when rural people's incomes rise, population growth rates decline.[1]

For all of these reasons, integrated development has become a major tenet not only of World Neighbors, but of many other organizations as well. On few other issues is there such unanimity. The conclusions of a seminar of development agencies working in Central America state that "because needs

are usually interrelated, efforts to fulfill the needs must be integrated. Problems in public health, employment, marketing, or food production all interact; and an attempt to solve one problem will affect the others."[2] The report on a similar conference of development agencies in East Africa agrees: "It is important to avoid training people in, say, just agricultural skills, without also teaching them how to improve their minds, their homes, their health, their villages and beyond."[3] Two anthropologists, after a major study of technical assistance efforts, write that "because customs tend to be interrelated, change can be introduced most efficiently if it is presented in an integrated, overall approach."[4] And J. Benton Rhoades, former Executive Secretary of Agricultural Missions, states that "Agricultural Missions has become increasingly convinced that the best use of church resources in rural missions is to invest. . .in the preparing of local leaders (men, women, and youth) for integrated rural development."[5]

HOW AN INTEGRATED PROGRAM CAN BE ORGANIZED

Start Small

Probably the single most important recommendation in organizing an integrated development program is to start working in only one or two areas of development. Integrated development programs should start small for the same reasons agricultural programs should: to remain flexible, to encourage and allow villager participation, and to allow the villagers' pace rather than the program's money to set the pace of the program.

New efforts can gradually be added as the people feel the need for them and become capable of carrying most of the burden.

The decision on which new areas of work an agricultural program will expand into should generally be based on the people's felt needs and the complexity and expense of the interventions that would successfully overcome the limiting factors. Curative or preventive health will often be the second effort because it is a widely felt need, it compliments

agricultural work so well, interventions can be simpler, and better health is an excellent long-term use for increased incomes. Furthermore, if women are not involved in agriculture, the program can thereby expand its work to include the entire family.

Learn the Lessons of Our Agricultural Work

Certain lessons from our agricultural experience can and should be applied to our other work. Although many agricultural techniques have no application in health, empowerment, or population work, experience is showing that many of the basic principles of agricultural work do apply. The principles of starting small, working on the limiting factors, meeting felt needs, using simple, immediately successful appropriate technologies, and training local people to multiply and take over the program derive not so much from the nature of agriculture as from the nature of villagers and of development in general. Thus their value extends far beyond the confines of agriculture.

In nutrition work, for instance, experience shows that we can improve our impact considerably if we concentrate our efforts on the limiting factors in the local diet. Many programs expect the people to learn what each of the three food groups does in the body, which foods belong in each group, and how to put together a balanced meal by combining foods from each group. Such a process takes the villagers through a series of abstractions so complicated that after two or three months of weekly classes many villagers still cannot list five balanced meals. A much simpler process is to find out what the limiting factor is in the people's present diet and then choose the most appropriate way of supplying the limiting nutrient. Many of the criteria of appropriateness are the same as those we use in agriculture: is the food inexpensive, locally available, culturally acceptable and simple to prepare?

One nutrition program in Central America found, for instance, that a lack of calories was the major nutritional problem because people were not eating enough fats and oils. Program personnel discovered that an edible squash seed the people usually threw away was rich in oil. By using this seed,

the people could remedy the most important deficiency in their diet at no expense. Other programs have discovered that proteins at weaning time or vitamin A deficiencies during certain months of the year were the limiting factors in people's diets, and they found simple, inexpensive ways of filling these needs.

Even where several foods are needed to improve the diet, the solutions can be simple. A World Neighbors program in Guatemala built its entire nutrition course around three simple sentences: "The traditional diet of corn tortillas and beans is good if we eat enough beans. It is even better if we eat some green leafy herbs each day. It is excellent if we regularly add some food that comes from an animal." Since the course was extremely simple to understand, it produced results with half the effort expended by a nearby World Neighbors program that was teaching the three food groups. Since it had less theoretical material, fully half of the three-sentence nutrition course could be dedicated to practical cooking classes using simple, inexpensive recipes. Furthermore, the people felt the courses were supportive rather than critical of their traditional diet.

Early recognizable success has been found to be as important in creating enthusiasm for preventive health programs as for agricultural programs. The rehydration formula,* a simple, inexpensive innovation capable of bringing seriously dehydrated children "back to life" in a few minutes, has brought a few preventive health programs back to life, too.

Thus, in health work we can apply the limiting factors principle, learning by doing, the use of simple, inexpensive technologies that bring immediate, recognizable success, and the training of villagers to multiply the program's impact.

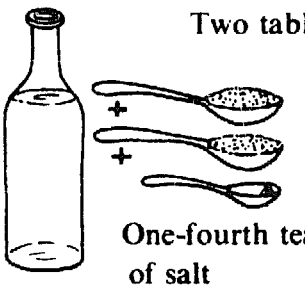
Institution building is more successful when felt needs are met with simple, appropriate technology. Empowerment work would undoubtedly be strengthened if programs achieved early recognizable successes by finding simple ways of meeting small-scale felt needs (e.g., a schoolteacher who only teaches classes two days a week or a merchant who uses false weights). Even in post-disaster housing, a World Neighbors program found that if it wanted hundreds of families to build earthquake-resistant homes, it could teach only a very few simple, inexpensive improvements in housing.

Oral Rehydration Solution

Formula A

One liter of boiled water

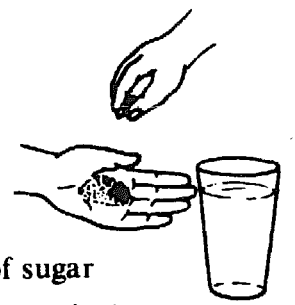
Two tablespoons of sugar



One-fourth teaspoon of salt

Formula B

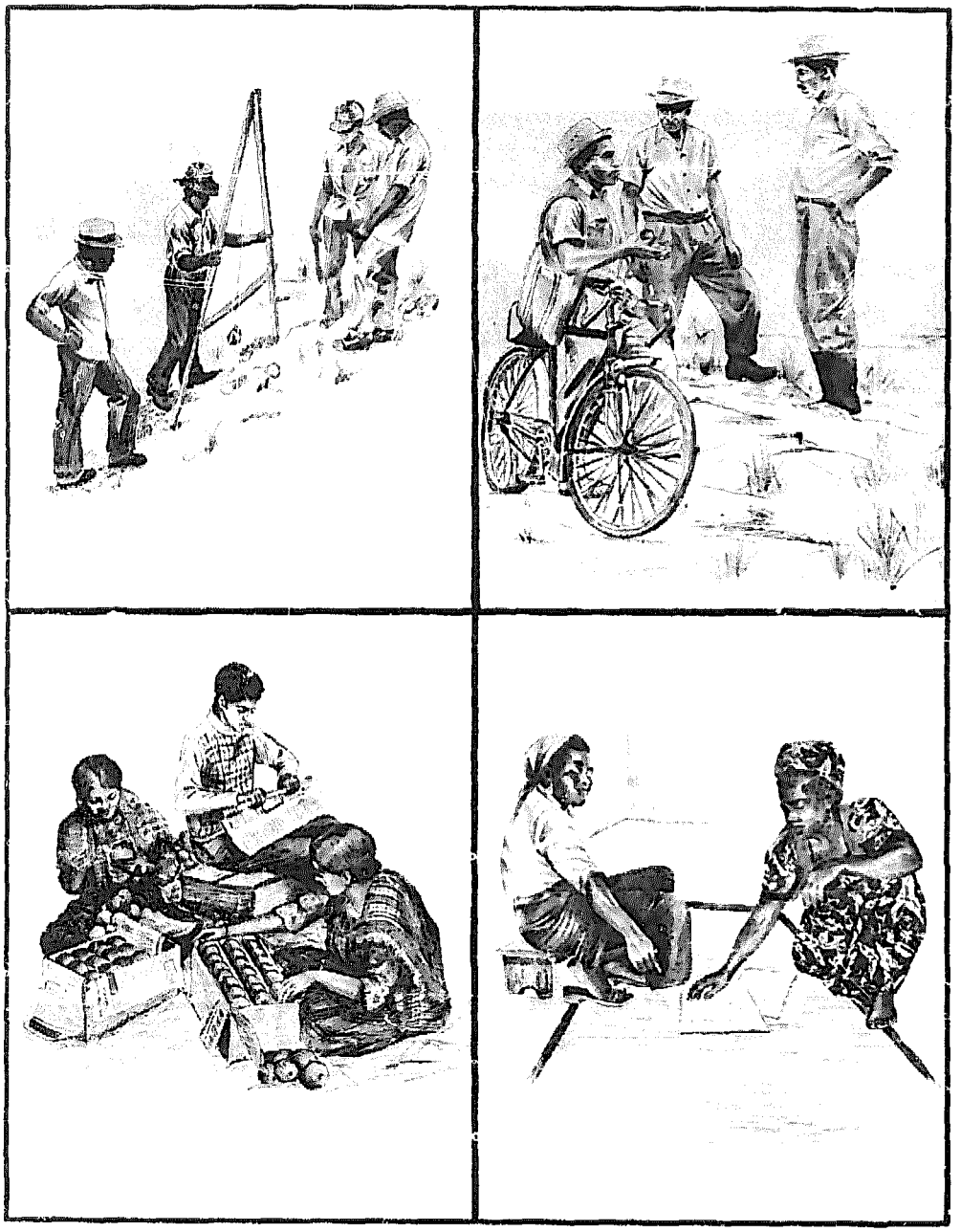
A 3-finger pinch of salt



A scoop of sugar

One glass of boiled water

TWO EARS OF CORN



"Enabling two billion villagers to grow two ears of corn where one grew before is difficult; but it is not impossible."

17 OVERALL PROGRAM DYNAMICS

PROGRAM PHASES

Chart No. 7 gives a general idea of the four phases through which most agricultural programs evolve. Each program will progress through these stages differently. Some programs, because of previous work nearby, know of an appropriate technology from the start, thereby eliminating the need for experimentation. Such programs may finish stage one in just three to four months. Other programs may spend three years finding a truly appropriate technology.

According to the chart, an agricultural program's total duration would be five to twelve years. Nevertheless, since few programs need the maximum time for every stage, most programs should probably last for five to eight years.

INTERRELATEDNESS OF PROGRAM CHARACTERISTICS

Diagram No. 6 shows a few of the more important ways in which the five major principles of good agricultural work can help us achieve our basic goals. The goals in the diagram are assumed to be goals of any agricultural program: 1) that

CHART NO. 7

STAGE	TIME REQUIRED	PRINCIPAL ACTIVITIES
Finding the Technology	3 months to 3 years	Choose and get to know the area Establish and plan the program Find and choose an appropriate technology
Training in the first Technology	1 to 2 years	The first technology is taught The first village groups are organized Villager leaders teach their first classes A second technology is tested Simple institutions are begun, if needed
Expansion	3 to 5 years	Multiplier effect Institutional (started above) Health and other areas of work may start More complex institutions begun, if needed
Phase-out		Making sure villagers are capable of taking over everything Close-out outside funding for agricultural work Health and other work may continue

villagers develop the ability to solve their own problems; 2) that they learn about and adopt improved technology; and 3) that the program achieve the first two goals with maximum efficiency. The arrows indicate the ways in which each principle works to help the program reach its goals.

Not only are these principles of good agricultural work important in reaching our goals; they are vitally related to each other. (See Diagram No. 7) It is almost impossible to follow

PROGRAM STAGES

PERSONNEL	BUDGET
Very few, probably 1-2 professionals and 1-2 villagers	Low budget
Increasing numbers of villagers become extensionists	Expanding budget
All agricultural extension work is done by villagers. Professional phasing out, moving into nutrition, etc.	Largest budget
Villagers take over the administration of the agricultural work	Decreasing budget for agriculture as villagers take over the services and the training function

one or two of the principles without the others.

One fact worth noting about the chart is that the use of a limited technology, probably the principle least often applied in agricultural programs, is the one that is most crucial in helping us to put into practice the remaining principles.

When all five principles work together, the resulting programs can achieve such levels of success that it often surprises the program leaders themselves.

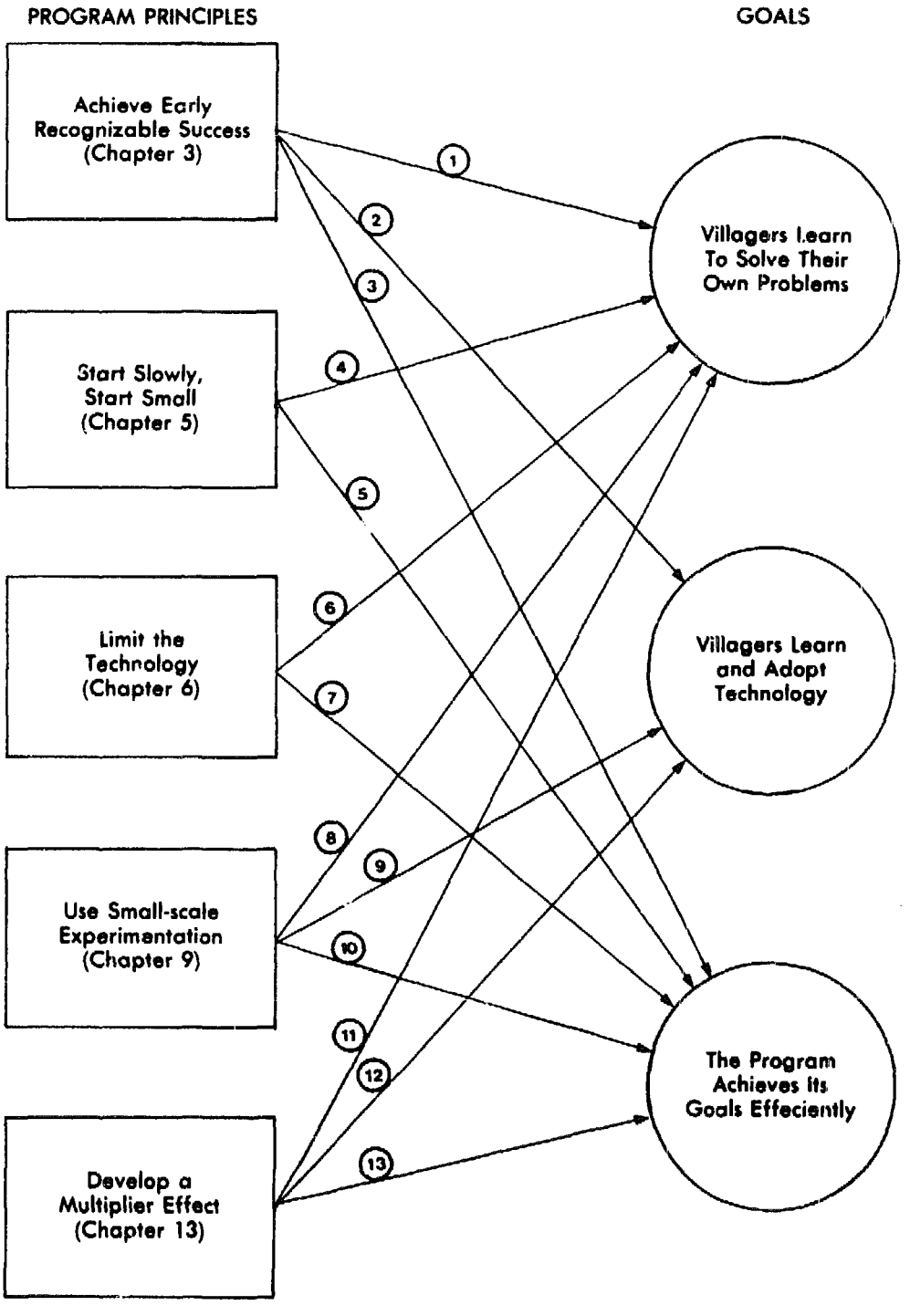


DIAGRAM NO. 6. Good program principles enable the program to achieve its goals.

DIAGRAM No. 6:

1. Early recognizable success will give the villagers enthusiasm, self-confidence, and the feeling that they are capable of solving their own problems. Their enthusiasm will motivate them to put more effort into learning to solve their own problems.

2. Success will give villagers the desire to learn more agricultural technology.

3. A program that has generated plenty of enthusiasm is more efficient because it spends little time motivating farmers. The people's enthusiasm also motivates them to apply their knowledge more widely and put it into practice sooner.

4. Villagers have a much better chance to participate constructively in program decisions and implementation if the program starts small and simple. The villagers thus learn more about how to work together and organize to solve problems.

5. Programs that start small are often more efficient because they can eliminate errors and find more efficient operating methods before they spend too much money on mistakes. Program personnel have more time to think of how things can be improved and to reflect on past experience instead of spending all their time running the program.

6. Villagers master a limited technology faster and have more confidence in their ability to learn things well. They can also learn to teach a limited technology better. The technology, the self-confidence, and the communication skills the villagers learn will all help them in facing future problems.

7. When we work with one or two innovations rather than twenty, one or two inputs will be sufficient for all of our work. At the same time, less technological backstopping is needed. The supervision of experiments is simplified, and villagers can do much of the supervision because they have learned the innovations quickly. Also, fewer lessons need to be planned and fewer audiovisual aids made.

8. When villagers experiment, they learn how technology is developed. Thus they are learning a solution to many of their problems. They are also learning the scientific approach to problem solving, which can have wide-ranging applications.

9. Obviously, while the people experiment, they learn about the innovations that work in their area, as well as some that don't.

10. The program is more efficient because it does not need to run an experimental farm, with all the time and expertise this requires.

11. As villagers become extensionist multipliers, they learn many skills in agriculture, communication, and organization that will help them solve other problems.

12. One never *really* knows anything until he or she has taught it to others. The villager leaders learn even more technology as they prepare for and give their classes.

13. A program nearly doubles its impact per dollar spent if half the program's classes are taught by volunteers.

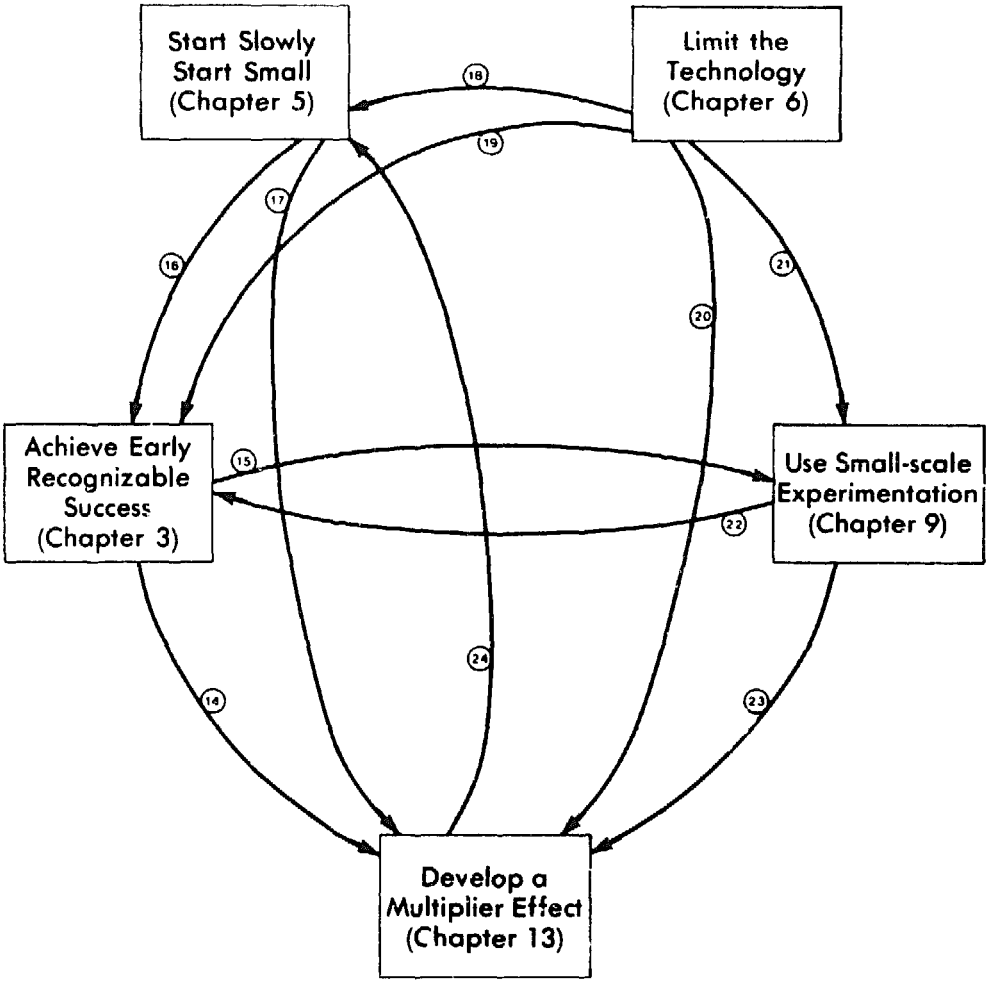


DIAGRAM NO. 7. Program principles are interrelated and interacting.

DIAGRAM No. 7

14. The enthusiasm that results from early success is the driving force that keeps extensionst multipliers on the move.

15. The success of the first experiments creates enthusiasm for continued experimentation.

16. When programs start slowly, they have time for careful, intensive supervision to assure the highest possible rate of success.

17. When programs start small, they also have a better chance to choose and train their leaders well and can provide them better support and supervision. Leaders are also more able to participate in program planning and implementation.

18. The only way to truly start a program small is to start with a limited technology.

19. It is virtually impossible to get scores of farmers to experiment with a complicated or multifaceted technology and assure a high rate of success. The needs for wide-ranging technological backstopping and for many potentially vital inputs are two of the possible sources of problems.

20. When we work with a limited technology, villager leaders become confident of their ability to apply and teach it well. Self-confidence and personal success with an innovation are, of course, prerequisites to a villager's becoming a good multiplier.

21. The experimental design and mathematics necessary to experiment with even five innovations as separate variables are tremendously complicated. On the other hand, trying out a package of practices as a unit violates the principle of changing one variable at a time, and it tends to make the villager feel dependent on the program to develop new sets of complementary innovations.

22. The technology that results from small-scale experimentation brings more success because it is usually more appropriate to the villagers' conditions and capabilities.

23. Villager leaders acquire technical knowledge as they experiment. They are later protected against the loss of credibility and friendships while teaching the technology because their students are risking very little in their experiments.

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In one World Neighbors program in Peru, the conventional wisdom five years ago was that the villagers were so conservative that it would always take at least a full year of motivational efforts to convince a community to begin innovating. For years the program had expanded at the rate of about two new villages a year. In 1980, however, after having adopted a single, appropriate innovation and having trained a growing group of villager extensionists, the program initiated work in more than thirty new villages in one year. In many cases, the villagers came to the program to request classes without a single prior visit from program personnel.

Agricultural improvement is indeed difficult. But experiences like this one in Peru are teaching us that it is not impossible.

John F. Kennedy once said, "We have the means and we have the manpower to eliminate hunger from the face of the earth."[1]

Having already the means and the manpower, we are now learning the method.

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4. John G. Sommer, *U.S. Voluntary Aid to the Third World: What is its Future?* Development Paper 20 (Washington, D.C.: Overseas Development Council, December 1975), p. 12.
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1. George H. Axinn, "Tagore for Today," *Focus*, no. 2 (1976), p. 29.

CHAPTER 3: PATERNALISM, ENTHUSIASM, AND PARTICIPATION

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2. T.R. Batten, *Training for Community Development, A Critical Study of Method* (London: Oxford University Press, 1962), p. 4.
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5. Morss, *et al.*, *op. cit.*, pp. 140, 317.
6. See the United Nations definition of development quoted in *New Internationalist*, no. 61, March 1978, p. 13; and the conclusions reached in Robert E. Hunter, "What is Development?" (Washington, D.C.: Overseas Development Council, April 1971). Further views about the nature of development are given in Irving G. Tragen, *et al.*, "The Contribution of Cooperatives to Institutional Development." A seminar at National 4-H Club Center sponsored by the Advisory Committee on Overseas Cooperative Development, 1971 Mimeographed. pp. 4-5; David E. Lilienthal, "The Road to Change," in Raymond E. Borton, ed., *Selected Readings To Accompany Getting Agriculture Moving*, Volume I (New York: The Agricultural Development Council, Inc., 1966) p. 525; and Lappé, *et al.*, *op. cit.*, p. 369.
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3. Some objective evidence of this oft-observed phenomenon can be found in Morss, *et al.*, *op. cit.*, p. 314.
4. See, for instance, Mahbub ul Haq, "Employment in the 1970's, A New Perspective." Agricultural Development Council Reprint (New York: Agricultural Development Council, October 1972), p. 3.
5. See Gunnar Myrdal, *The Challenge of World Poverty, A World Anti-Poverty Program in Outline* (New York: Random House, Inc., c. 1970), pp. 49-55, for a good discussion of inequality's effects on development.

6. Arthur T. Mosher *Getting Agriculture Moving, Essentials for Development and Modernization* (London: Frederick A. Praeger, Publishers, 1966).
7. George M. Foster, *Traditional Cultures, and the Impact of Technological Change* (New York: Harper and Row, Publishers, c. 1962), pp. 82-3.
8. Conrad M. Arensberg and Arthur H. Niehoff, *Technical Cooperation and Cultural Reality* (Washington, D.C.: Agency for International Development, 1963), p. 3.
9. Interesting comments in support of this idea have been made by people with a wide spectrum of different backgrounds. See, for instance, Michael Trew, "The Small Farmer, A Neglected Resource," *Focus*, no. 2 (1978) p. 17; Arthur T. Mosher, *Creating a Progressive Rural Structure, To Serve a Modern Agriculture* (New York: Agricultural Development Council, Inc. 1969), p. 51; and Hatch *op. cit.*, p. 19.

CHAPTER 5: PLANNING

1. Morss, *et al.*, *op. cit.*, p. 329. Support for flexible planning is also given in Lele, *op. cit.*, pp. 189, 191; and José Paulo Ribeiro and Clifton R. Wharton, Jr., "Case Study: The ACAR Program in Minas Gerais, Brazil," in Clifton R. Wharton, Jr., ed., *Subsistence Agriculture and Economic Development* (Chicago: Aldine Publishing Company, 1969), p. 437.

CHAPTER 6: START SLOWLY, START SMALL

1. Geoffrey Masefield, in Stamp, ed., *op. cit.*, p. vi.
2. E.R. Watts, ed., *New Hope for Rural Africa*, The Proceedings of a Conference held at the Social Centre, Kikuyu, Kenya, in September 1967 (Nairobi: East African Publishing House, 1969), p. 71.
3. See, for example, George Foster's passing comment in Foster, *op. cit.*, p. 139.

CHAPTER 7: LIMIT THE TECHNOLOGY

1. Edwin B. Oyer, "Transferring Technologies for Food Production, What Strategies Are Appropriate?" Paper on World Food Issues, No. 10 (Ithaca, New York: Cornell University), p. 2.
2. W.Y. Yang, "Farm Planning and Agricultural Development," in Borton, ed., *op. cit.*, Vol. 2, p. 645.
3. See also Foster, *op. cit.*, p. 39.
4. The Food and Agriculture Organization quote in Owens and Shaw, *op. cit.*, p. 100, is both interesting and instructive.
5. See Arensberg, *op. cit.*, p. 28.
6. Richard R. Harwood, *Small Farm Development, Understanding and Improving Farming Systems in the Humid Tropics* (Boulder, Colorado: Westview Press, 1979), p. 39.

7. See, for instance, T.R. Batten, *Communities and Their Development, An Introductory Study with Special Reference to the Tropics* (London: Oxford University Press, c. 1957). p. 196; and Nancy Heisey, "Integrating Education and Development," Development Monograph Series, Mennonite Central Committee, pp. 12-13.
8. John W. Mellor, "The Subsistence Farmer in Traditional Economies," in Wharton, ed., *Subsistence Agriculture and Economic Development*, p. 221.
9. This was, for example, the experience of the Institute of Agricultural Science and Technology (ICTA) and the Basic Village Education Project with different cultural groups in Guatemala. See *Instituto de Ciencia y Tecnología Agrícolas, Informe de la Gerencia* (Guatemala: Ministry of Agriculture, Government of Guatemala. 1976), p. 87; and Thomas A. Rich, *et al.*, "The Basic Village Education Project Impact in the *Occidente* Region of Guatemala, A General Summary," (Human Resources Institute, College of Social and Behavioral Sciences, University of South Florida, 1978), pp. 4-5.
10. See, for instance, Mosher, *Getting Agriculture Moving*, pp. 77-78.
11. *Ibid.*, p. 78.

CHAPTER 8: CHOOSING AN APPROPRIATE TECHNOLOGY: THE CRITERIA

1. Mellor, *op. cit.*, p. 221.
2. Hatch, *op. cit.*, p. 31.
3. Charles J. Erasmus, "An Anthropologist Looks at Technical Assistance." Mimeographed reprint of article by same name in *The Scientific Monthly*, 78, (1954), p. 4.
4. Myrdal, *op. cit.*, p. 97.
5. Sudhir Sen, *Reaping the Green Revolution, Food and Jobs for All* (Maryknoll, New York: Orbis Books, c. 1975). p. 244.
6. A very good discussion of the issue of mechanization can be found in Lele, *op. cit.*, pp. 33-38.
7. Mosher, *Getting Agriculture Moving*, p. 10.
8. E.F. Schumacher, *Small is Beautiful, Economics as if People Mattered* (New York: Harper & Row, Publishers, c. 1973), p. 169.
9. Stoesz, *op. cit.*, p. 49. See also Rogers with Shoemaker, *op. cit.*, pp. 22-23.
10. Lappé, *et al.*, *op. cit.*, p. 122.
11. Erik P. Eckholm, *Losing Ground, Environmental Stress and World Food Prospects* (New York: W.W. Norton & Company, Inc., c. 1976).
12. *Ibid.*
13. Sen, *Reaping the Green Revolution*, p. 108.
14. See B.W. Hodder, *Economic Development in the Tropics* (London: Methuen & Company, Ltd., c. 1968) pp. 129-130.
15. Subsistence food crops receive only a small portion of the pesticides used in the Third World. See Lappé, *et al.*, *op. cit.*, p. 50.
16. Arensberg and Niehoff, *op. cit.*, p. 58.
17. Thomas M. Fraser, Jr., "Introduction of Vegetable Growing," in

Raymond E. Borton, ed., *Case Studies to Accompany Getting Agriculture Moving* (New York: Agricultural Development Council, Inc., 1967), p. 23.

18. Erasmus, *op. cit.*, p. 2.
19. *Ibid.* p. 12.

CHAPTER 9: CHOOSING AN APPROPRIATE TECHNOLOGY: THE PROCESS

1. Owens and Shaw, *op. cit.*, p. 58.
2. "Changes in Agriculture in 26 Developing Nations, 1948 to 1963," *Foreign Agricultural Economic Report No. 27*, Economic Research Service, U.S. Department of Agriculture, p. 25.
3. See, for instance, Erven J. Long, "Institutional Factors Limiting Progress in the Less Developed Countries," in Albert H. Moseman, ed., *Agricultural Sciences for the Developing Nations* (Washington, D.C.: American Association for the Advancement of Science, c. 1964), pp. 12-13; *Smaller Farmlands Can Yield More, Raising Agricultural Productivity by Technological Change*, World Food Problems, No. 8 (Rome: Food and Agriculture Organization of the United Nations, 1969), pp. 47-48; Philip H. Coombs with Manzoor Ahmed, *Attacking Rural Poverty, How Nonformal Education Can Help* (Baltimore: The Johns Hopkins University Press, c. 1974), pp. 123-124; and Harwood, *op. cit.*, pp. 32-33.
4. C.W. Chang, "Agricultural Research," in Borton, ed., *Selected Readings to Accompany Getting Agriculture Moving*, pp. 210-211; and "Changes in Agriculture in 26 Developing Nations, 1948 to 1963," *Foreign Agricultural Economic Report No. 27*, p. 50.
5. J.B. Peterson and R.D. Frazier, "Plant Agriculture in the Emerging Nations," in Moseman, ed., *op. cit.*, p. 41.
6. Germain Vanneste, "Introducing a New Crop in Zaire," in Stamp, ed., *op. cit.*, pp. 80-83.
7. Hatch, *op. cit.*, p. 31; and Erasmus, *op. cit.*, p. 4.

CHAPTER 10: SMALL-SCALE EXPERIMENTATION

1. Hapgood, ed., *op. cit.*, p. 16.

CHAPTER 11: TEACHING THE TECHNOLOGY

1. See, for instance, Lele, *op. cit.*, p. 169; Batten, *Training For Community Development*, pp. 61, 71-73; and Coombs with Ahmed, *op. cit.*, p. 39.
2. Schumacher, *op. cit.*, p. 192.
3. Roland Bunch and Roger Bunch, *The Highland Maya, Patterns of Life and Clothing in Indian Guatemala* (Visalia, Calif.: Indigenous Publications, c. 1977), pp. 9-10.
4. See Max L. Lowdermilk, "Problems, Principles, and Possible Methods for Communication with Illiterates Around the World," Department of

Rural Education, Division of Extension Education, Cornell University, Spring 1964. Mimeographed.
5. D.J. Bradfield, *Guide to Extension Training* (Rome: Food and Agriculture Organization of the United Nations, 1966), p. 72.

CHAPTER 12: EMPLOYEES

1. Batten, *Communities and Their Development*, p. 188.
2. This has been very widely observed and confirmed experimentally. See, for instance, Rogers with Shoemaker, *op. cit.*, pp. 14-16; Owens and Shaw, *op. cit.*, p. 128; William Fuller, "From Village School to Agricultural College in Iran," p. 52, and Basil G. Moussouros, "Agricultural Education in Greece," pp. 68-70, both in Badeau and Stevens, eds., *op. cit.*; and Shumacher, *op. cit.*, p. 192.
3. Batten, *Training For Community Development*, pp. 23-24.
4. *Ibid.*, pp. 24-25.
5. Mention of some of these studies is made in Prodipto Roy, *et al.*, *Two Blades of Grass, A Summary of Two Studies on Agricultural Innovation in India* (Hyderabad: National Institute of Community Development, 1968), p. 20; and Arthur T. Mosher, "The Extension Process," in Borton, ed., *Selected Readings to Accompany Getting Agriculture Moving*, p. 309.
6. See, for instance, Heisey, *op. cit.*, pp. 12-13; and Moussouros, *op. cit.*, pp. 69-70.
7. Batten, *Communities and Their Development*, p. 200.

CHAPTER 13: SUPPORTING SERVICES, EVALUATION, AND PHASE-OUT

1. Experience with very good repayment rates among small farmers is reported from Ethiopia in Lele, *op. cit.*, p. 93; from Bangladesh in an address by Michael Lipton in 1976 reported in "The Small Farmer and Credit." *ADAB News*, 4, 10, September 1977, pp. 1-2; and from Latin America in *New Approach to Agricultural Credit*, FAO Agricultural Development Paper No. 77 (Food and Agriculture Organization of the United Nations, 1964), p. 11.
2. See "The Small Farmer and Credit," *ADAB News*, pp. 2-3.
3. One major study even found that repayment rates correlated positively with the size of interest rates. See Morss, *et al.*, *op. cit.*, p. 291. See also "The Small Farmer and Credit," *ADAB News*, pp. 2-4.
4. These savings clubs are described in Christopher Howse, "Small Beginnings in Central Africa," in Stamp, ed., *op. cit.*, pp. 135-138.
5. Lele, *op. cit.*, pp. 113-114.

CHAPTER 14: MULTIPLYING OUR EFFORTS

1. Paulo Freire, of course, has written a good deal about this process. For ideas in its practical application see Paulo Freire, *Pedagogy in Process. Letters to Guinea-Bissau* (New York: The Seabury Press, 1978).

CHAPTER 15: BUILDING INSTITUTIONS

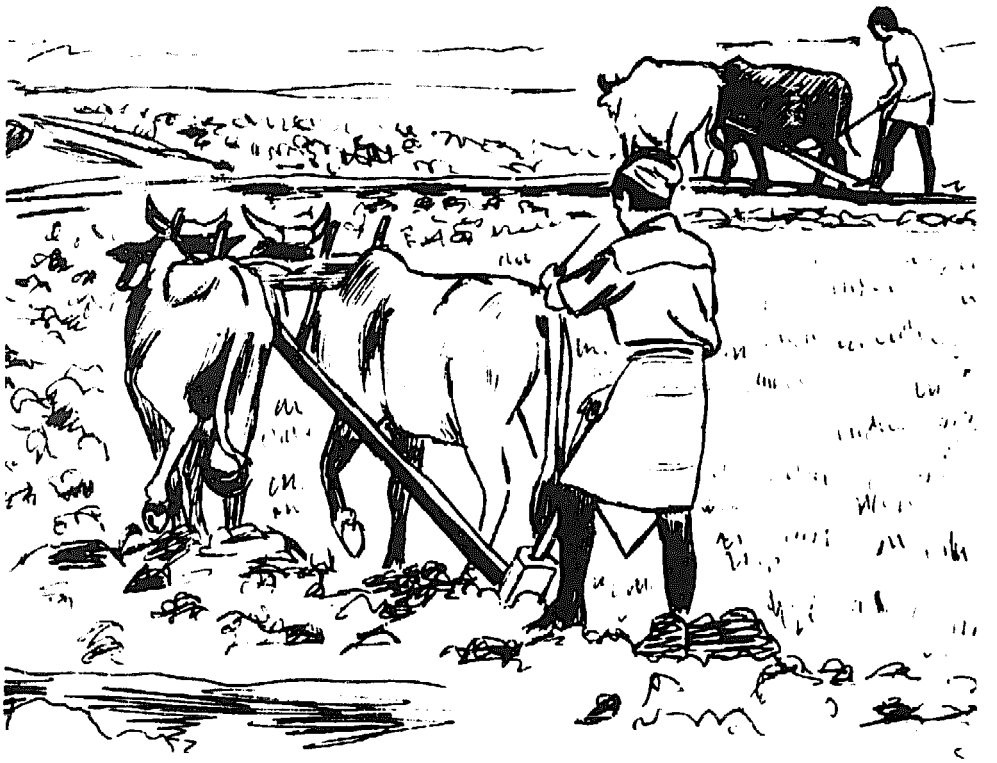
1. David Fledderjohn in Richard B. Hill, ed., *Shaping Our Future. Report of a Regional Technical Consultation on Rural Development* (Washington, D.C.: American Freedom From Hunger Foundation, April 1977), p. 21.
2. Howse, *op. cit.*, p. 134.
3. Stoesz, *op. cit.*, p. 122.
4. Tragen, *et al.*, *op cit.*, pp. 32-33.
5. Note comments in Stoesz, *op. cit.*, pp. 123-125; and Coombs with Ahmed, *op. cit.*, p. 104.
6. Tragen, *et al.*, *op. cit.*, pp. 33-34.
7. See Fledderjohn, *op. cit.*, p. 23.
8. Sen, *A Richer Harvest*, p. 130.
9. *Ibid*, p. 126.
10. *Ibid.*
11. Tragen, *et al.*, *op. cit.*, p. 26.
12. Fledderjohn, op. cit., p. 21.
13. Howse, *op. cit.*, p. 133.
14. Sen, *A Richer Harvest*, p. 107.
15. See, for instance, the experiences reported by Rainer Schickele, "Motives and Criteria for National Agricultural Planning," in Borton, ed., *Selected Readings To Accompany Getting Agriculture Moving*, p. 504.
16. See Sen, *A Richer Harvest*, pp. 404-405.

CHAPTER 16: INTEGRATED PROGRAMS

1. See William Rich, *Smaller Families Through Social and Economic Progress* (Washington, D.C.: Overseas Development Council, 1973).
2. Hill, *op. cit.*, p. 19.
3. E.R. Watts, "The Way Ahead," in Watts, ed., *op. cit.*, p. 2.
4. Arensberg and Niehoff, *op. cit.*, p. 60.
5. J. Benton Rhoades, "Agricultural Missions Today and Yesterday," *International Review of Mission*, p. 352.

CHAPTER 17: OVERALL PROGRAM DYNAMICS

1. Niall Watson, "Nomads in Kenya: Too Many Animals and Not Enough Land," in Stamp, ed., *op. cit.*, p. 113.



"For programs to be truly successful, they will have to be guided by an understanding of the people's needs, motivations, values, and viewpoints, and of the possible consequences of the social processes they are setting in motion. Program leaders will need to have a feel for the delicate balances between the value of change and a respect for the society's traditional values. . ."

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World Neighbors is an international organization of people joining together to help their neighbors in developing countries of Asia, Africa and Latin America. Aiming at self-development and self-reliance, and with strong emphasis on motivating and training local, national leaders in each country, World Neighbors assists people in increasing food production, improving health, gaining access to family planning information and services, and promoting small-scale industries. It was sparked by a sermon preached in 1951 by Dr. John L. Peters, a minister and former Army chaplain.

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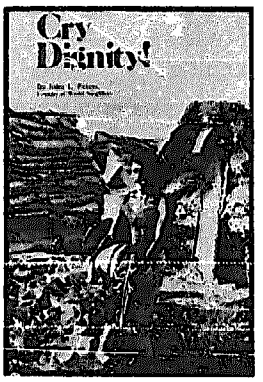

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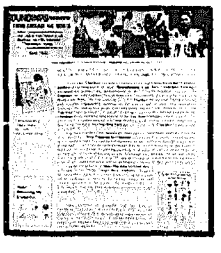
- Inadequate supply of relevant materials which can be easily understood by local groups.
- Insufficient training of extension workers who are able to communicate development information.
- Lack of reliable, available materials which are not expensive.

World Neighbors Development Communications has produced over 100 relevant visual materials, filmstrips, flipcharts, books, and pamphlets on family planning, agriculture, health and nutrition and communications.



To keep development workers better informed, two quarterly newsletters are published. World Neighbors In Action is an appropriate technology newsletter published in English, Spanish and French. Soundings From Around The World, shares information on communications materials. The annual subscription for each newsletter, with airmail postage, is U.S. $3.00.

Communication training workshops are conducted by the department staff during continuing visits to the program areas. Educators learn to make and use filmstrips and projectors, posters, flipcharts and flannel graphs. New ideas concerning communication are always related to the actual work in the programs. Participants explore techniques in counteracting family planning rumors, motivating people to try new ideas in agriculture, family planning and health, and encouraging people to take part in activities to improve the community's standard of living, as well as their own.