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Socio-economic Assessment of Alley Farming*

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6.0 PERFORMANCE OBJECTIVES

1. Discuss the contributions which social science can make at the various stages of alley farming research.
2. Recall a range of information gathering tools for socio-economic assessment, as well as the strengths and weaknesses of each tool.
3. Demonstrate familiarity with the “farming system” and its various subsystems as units of socio-economic analysis.
4. List the key questions in socio-economic evaluation of a new technology.
5. Discuss the role of five major socio-economic factors affecting adoption of alley farming by farmers, namely: land and tree tenure systems, labor requirements, management complexity, differential social prospects, and overall profitability.
6. Discuss the importance of three key issues related to the diffusion of alley farming across Africa, namely: recommendation domain, public support, and international cooperation.

6.1 INTRODUCTION

Realization of the potential benefits of alley farming will depend on the speed and completeness of the adoption and diffusion of the system among potential users. Diffusion and adoption refer to two distinct processes. The diffusion of an innovation means the total process by which an innovation spreads out among farmers until a large number of them have adopted it. Adoption concerns the behavior of individuals in relation to the use of technology, more particularly their reasons for taking up and use of the technology at a point in time. Understanding and improving the prospects for diffusion and adoption of alley farming depend upon effective socio-economic assessment.

This unit describes the way in which the social sciences contribute to the testing and development of alley farming. It presents the farming system as an appropriate framework for socio-economic assessment of alley farming. Finally, it discusses the major socio-economic issues affecting the diffusion and adoption of the technology.

The reader will find additional information on research tools for socio-economic assessment in Volume 2.

In : B R Tripathi and P J Psychas (eds), (1992) The AFNETA Alley Farming Training Manual (Volume 1 - Core course in Alley Farming). AFNETA, International Institute of Tropical agriculture, Ibadan, Nigeria. Pp.6.1- 6.25.

6.2 CONTRIBUTIONS OF SOCIAL SCIENCE TO ALLEY FARMING RESEARCH

The international research literature contains many examples of effective contributions made by social science in technology development. The presence of social science methods and perspectives as part of an interdisciplinary strategy can be especially productive in the case of alley farming research.

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6.2.1 Areas of Effectiveness

The particular areas in which social science can be effective are:

1. **Involvement of farmers, households, and communities** as effective participants in the design, evaluation, and extension of alley farming systems.
2. **Definition of recommendation domains** based on (a) household considerations such as need assessment, gender and age responsibilities, household/community relationships, and (b) socio-economic factors such as market prices of inputs, labor supply and demand, and regional development priorities.
3. **Integrated analysis** of biophysical and socio-economic indicators with respect to (a) the existing production systems and (b) the proposed alley farming systems.
4. **Identification and analysis of social constraints** to wide-scale adoption of alley farming.
5. **Design of appropriate strategies** for community organization and mobilization of resources to promote the technology.
6. **Determination of the socio-economic impacts** of technology innovations, and analysis of their implications for further research.

This list shows that socio-economic assessment can play a role in every stage of an alley farming research project. Researchers should avoid the traditional practice, in which socio-economic assessment occurs only in the first and the final stages of technology development (Figure 6-1).

Ideally, socio-economic assessment will be carried out as part of a multi-disciplinary research effort. There could be three to five members on the research team, including at least one social scientist. Their first joint assignment would be to conduct a survey at the village level. This exercise teaches the team to work together and to understand farmers' perspectives.

In small projects, fielding such a team may not be feasible. However, even a single scientist who keeps socio-economic as well as bio-physical concerns in mind can constitute a one-man or one-woman multi-disciplinary "team". Socio-economic assessment does not have to be highly technical. A range of information gathering tools

with varying degrees of complexity are available to suit the needs and resources of researchers (Table 6-1).

Simple methods can be quite useful, such as including local farmers in discussions of alley farming's potential, or inviting them to a research station to comment on multipurpose trees (MPT) and management trials. Making a labor calendar of farming activities throughout the year is an example of a relatively straightforward but effective analytical method.

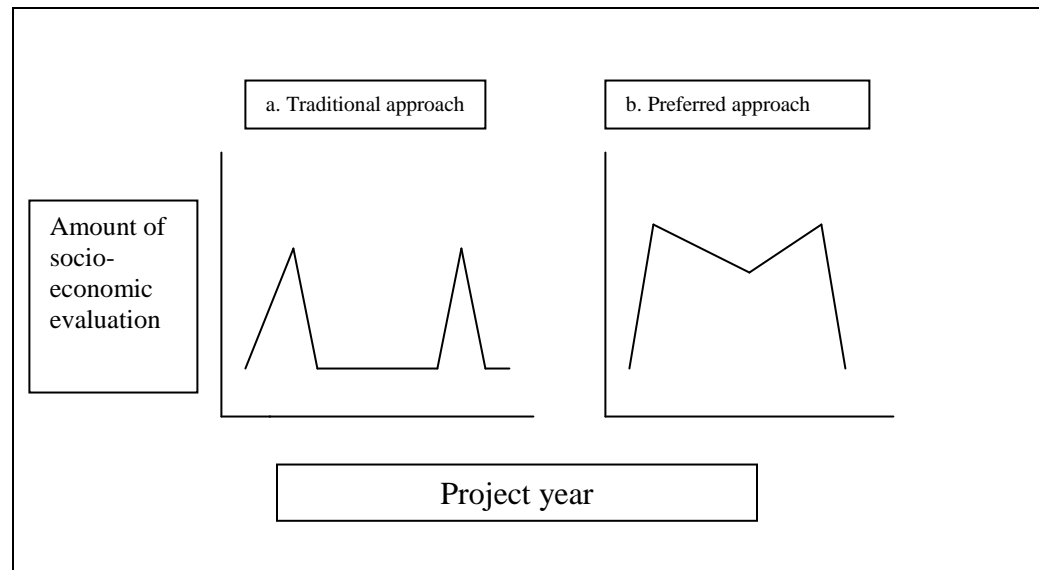


Figure 6.1. The role of socio-economic evaluation in R & D projects

- a) In the traditional approach, socio-economic assessment occurs only during the preparatory survey and the concluding technology impact study
- b) In the preferred approach, socio-economic considerations are actively taken into account throughout the research process

6.2.2 Socio-economic Investigation in AFNETA Research

The AFNETA/NARS collaborative research program provides an example of the role of socio-economic investigation in alley farming research.

Each new AFNETA/NARS project begins with a socio-economic survey. The aim is to begin serious investigation of the critical socio-economic determinants which will ultimately bear on the adoption of alley farming in the project's mandate area. The research teams are expected to acquire a thorough and detailed understanding of traditional systems as practiced by farmers at the various sites, to identify the farmers' conceptions of local constraints and opportunities. The exercise should result in an assessment of potential entry points for agroforestry technologies generally, and alley farming in particular. Additional objectives are to ensure that the research team is farmer-oriented from the start, and to instill in each team the spirit of inter-disciplinarity.

AFNETA favors use of tools of assessment that are simple and quick, can be used in an interdisciplinary manner, and can produce results within a short period of time, with minimum resources. General tools include the following: literature reviews; interviews; short, highly focused questionnaires; and direct observation. Special tools include seasonal calendars (e.g., of rainfall, labor use, prices), historical calendars of past and future land use, and sketch maps or transects to show land use patterns.

The AFNETA strategy recognizes that socio-economic assessment does not begin and end with a single survey. Investigation of the socio-economic determinants is expected to continue throughout the life of a project. Its importance grows as the research moves on-farm for monitoring and evaluation of alley farming technologies. Details of AFNETA's current requirements and recommendations for socio-economic investigation are published in separate network documents.

6.3 FRAMEWORK FOR SOCIO-ECONOMIC ANALYSIS

6.3.1 The Farming System

Any agroforestry technology – and alley farming is no exception – is a means for farmers to achieve their goals and objectives. Thus, to design and evaluate appropriate technologies, it is indispensable to understand the environment in which farmers exist and make decisions. Farmers are part of a social milieu which influences their behavior, aspirations, and decision-making processes. Therefore, effective development and implementation of a new technology require a sound understanding not only of the biological systems involved but also of the human systems.

The appropriate unit of analysis for alley farming technology is the farming system (Figure 2). A farming system comprises sub-systems of household, agricultural production, and other on-farm and off-farm activities. Within the household, there is the household head, whether male or female (implicitly referred to as the farmer, the beneficiary of technology), as well as the other members of the immediate or extended family. The household system provides purpose and organization to the multiple activities, specifically in decisions related to establishing priorities, allocating resources, implementing activities, utilizing and distributing outputs, and assessing the overall performance of the farming system. Furthermore, it is the household which organizes and manages all relationships of the farming system with the external environment.

Household goals and priorities deal with physical and psychological needs, which may be summarized as: security of basic needs such as food, clothing and shelter; generation of income and favorable cash flow; conservation and increase of the resource base; recreation and leisure; and recognition and acceptance in the community. There are differences in goals among members of a household. For example, the objective of food security for some members (e.g., producing enough beans, maize and cassava) may compete with or complement the objective of cash generation for other members (e.g., buying land and animals, paying children's school fees).

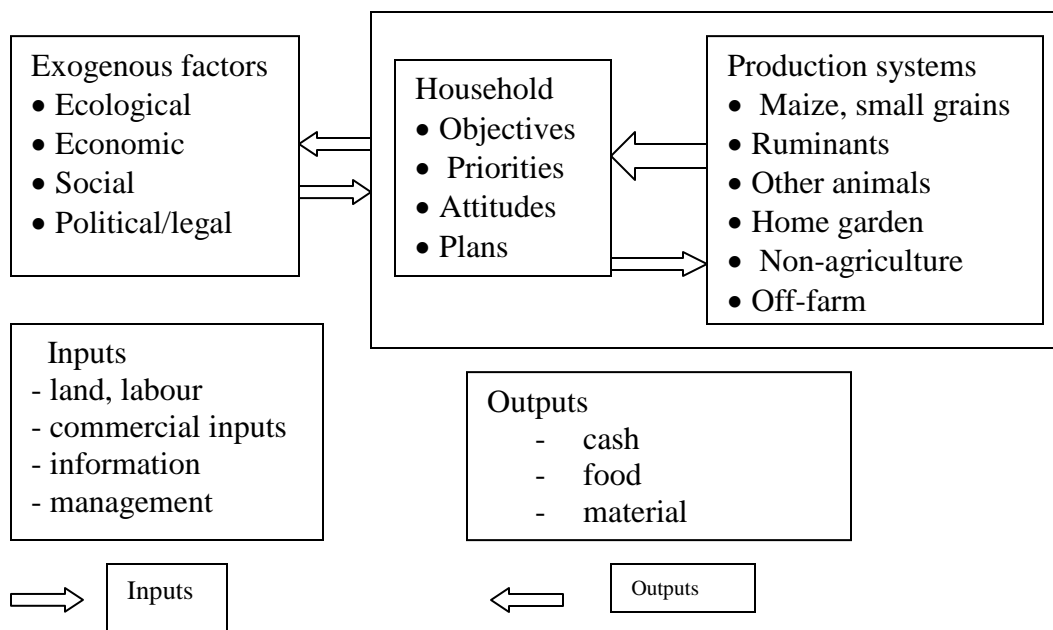


Figure 6.2. A small farming system, showing relationships between the household, production systems, and external socio-economic factors

The resources employed by the household to achieve its objectives are land, labor, capital, and management. These differ in quantity, quality and suitability, depending on location, timing, and/or source. For example, not all plots of land are the same in terms of how and when they can be used. The quantity and quality of *labor* will vary depending on which member of the household is providing it, (e.g., mature male, young female, or very old person), the type of activity to be performed, and traditional customs regarding gender and age-group duties. *Capital status* refers to investments (infrastructure, equipment, tools, animals), operational capital (cash in hand, savings, off-farm employment), and outstanding debts. The management resource is the ability to make informed decisions on the organization, planning, and implementation of farm activities, and to monitor, evaluate, and learn from successes or failures. The *management resource* is correlated to the age, education, and experience, of the managers.

A farming system usually includes a mixture of on- and off-farm enterprises due to the household's need to diversity, spread and reduce risks, and to try to optimize use of scarce resources. This makes the analysis of individual enterprises difficult, if not impossible. Therefore, the major task for farming systems analysis (and for technology analysis) is to identify relevant subsystems or sets of enterprises that “make management sense” – particularly from the perspective of resource allocation and resource use efficiency. A production system defined on the basis of land use will probably be a suitable technical unit for defining and analyzing crop, livestock, and/or tree interactions.

The household belongs to larger communities such as village, ethnic group, and/or nation. Emanating from these relationships are societal rules, expectations and institutionalized patterns of behavior that must be adhered to by every member of the community. These rules and patterns extend to the control and use of resources (land,

trees, livestock, etc.) gender and age group rights and duties, community obligations, concepts of wealth, etc. Thus, the social environment shapes and influences the behavior, priorities, and aspirations of the household and the farmer.

6.3.2 Key Questions in Socio-economic Evaluation

Farming Systems Analysis

The adoption potential of a new technology is evaluated in the context of a farming system. To be specific, the following questions should be answered for analysis of alley farming technology:

1. What is the recommendation domain for alley farming? A recommendation domain defines the types of farming systems that are important for the successful introduction and management of a technology. These target farming systems should be defined at least in terms of the chief characteristics of the household, available resources, and production systems.
2. Can one introduce multipurpose trees (MPTs) with crops and/or animals and achieve better economic efficiency in terms of using the scarce resources of the target farmers/households? What and how do the farmers and households gain or lose?
3. What economic complementarities or conflicts with other production activities (e.g., use of labor, cash) are likely to arise within the farming system as a result of the introduced technology?
4. How and to what extent does the alley farming technology reduce variability of crop or livestock performance due to risk and uncertainty factors?
5. Who in (a) the household and (b) the community will make the decisions and implement the changes associated with the technology? Who stands to benefit from the increased production or productivity? Who stands to lose? How does the technology contribute to the realization of the goals of the farmers *vis-à-vis* their status in the community? Are there any potential conflicts with usual customs, for example, those affecting tree or land management and use?
6. Which national economic or development policies, institutional regulations, and/or infrastructural support and services are likely to facilitate or impede the potential application of the technology by farmers?

By seeking answers to these questions, researchers will identify the critical socio-economic determinants for the design and evaluation of the alley farming technology. Because answers depend on the specific situation of the farming system during a given period, socio-economic analysis is location- and time-specific. For this reason, extrapolation or prediction of such results over a range of farming systems should be done with the utmost care.

Cost-Benefit Analysis

To assess the acceptability of the alley farming technology, it is essential to specify its structural and functional aspects, namely: species, propagation, spacing, establishment, fertilization, weeding, plant protection, harvesting, etc. On this basis, one can answer the following questions:

1. What are the resource requirements for all operations?
2. What is the magnitude of real benefits in relation to the farmer's objectives?
3. What are the net returns per unit of land, labor, and/or cash inputs, in the short-term and long-term?
4. To what extent can the technology's benefits be predicted under favorable and unfavorable conditions?
5. What is the anticipated time scheduling for successful establishment of proposed changes and realization of benefit streams?

Such information is derived from both on-station and on-farm research. If only on-station results are used, there tends to be an unintentional effect of overestimating the real benefits and of underestimating the real costs of the technology for the farmer. The most serious constraint to analysis is the probably current scarcity of scientific information on many structural and functional aspects of alley farming.

6.4 ADOPTION OF ALLEY FARMING: FIVE MAJOR ISSUES

Researchers at IITA, ILCA, ICRAF, national programs, and external institutions have been conducting socio-economic assessments of alley farming in Africa since the early 1980s. There is still a great deal of work to be done in this important field of research. However, experience so far has identified the major factors that should receive prominent attention.

A later section (6.5) will cover the issues which relate to the diffusion of alley farming across sub-Saharan Africa. This section (6.4) presents five major socio-economic factors which determine whether individual farmers and communities choose to adopt alley farming technology, namely:

- Land and tree tenure,
- Labor requirements,
- Management complexity,
- Differential social prospects for adoption, and
- Profitability.

6.4.1 Land and Tree Tenure Systems

Alley farming involves planting trees in addition to annual crops. Tree planting may be subject to special rules. Some people may not be allowed to plant trees or may need to get the permission of another person before planting. These rules vary from region to region and even from village to village, so it is impossible to generalize about

them. However, researchers and extension workers should consider the following factors when advising farmers on alley farming (or on tree planting for other purposes):

1. Different land-tenure rules may apply to different categories of land. For example, in many parts of southeast Nigeria, compound land is distinguished from other farmland, and within farmland, “near fields” from “distant fields”. While an individual householder will usually be allowed to plant trees around his own compound, this may not be the case with other categories of land.
2. The various members of a household (adult males, adult females, children) may have different kinds of rights over land. In many areas, women are not considered to be owners of land, and may need permission from their husbands before planting trees. However, this need not prevent them from practicing alley farming.
3. People renting land, whether they are from the same community or from outside the community, may have only short-term rights over land, and therefore, may be unable to plant trees. In other cases, tenants are able to plant trees if they obtain the landowner’s permission.
4. In some areas, the community or the extended family may exercise control over the use of land. Land (or some types of land) may be shared out annually by the group, so that the individual farmer will be unlikely to have the same piece of land in the next season. In other cases, the community may dictate the cycle of land rotation. In either situation, the farmer will have little incentive to plant trees, even if he is allowed to, because it is unlikely that he or she will gain the long-term benefit.

The issue of tree tenure is separate from that of land tenure. Rights over trees are often distinct from rights over land. According to Fortmann (1985), issues under tree tenure include the right to own or inherit trees, the right to plant trees, the right to use trees and tree products, the right to dispose of trees, and the right to exclude others from the use of trees and tree products. These various rights differ widely across cultural zones and have a major influence on the social acceptability of alley farming and other agroforestry interventions. In some areas, planting a tree may give the planter rights over the land on which it is planted. In such situations, planting of trees by people with temporary claims to land is usually met with suspicion and opposition by landowners.

6.4.2 Labor Requirements

The main cost of alley farming to the farmer is the extra labor involved in establishing trees and pruning the hedgerow trees. Estimations of labor requirements fall in the range of 40 to 85 hours/ha/pruning in a four-meter alley system. One to three prunings may be required per cropping season. Some extra labor may also be involved in carrying foliage to animals.

These labor costs may be partially or completely offset because alley farming reduces the need for labor for clearing new land. Additionally, alley farming may reduce labor for weeding and for collecting animal feed from the bush. If the alley

farm is established by direct seeding, the labor requirements for planting are small (in wetter environments).

Available information on the labor requirement for alley farming is scanty and variable. However, in general, the system appears to require less total labor than conventional bush-fallow farming. The labor costs and the net returns to labor are major determinants of the overall profitability of alley farming. Labor costs may become an important concern if the additional labor has to be hired and/or supplied by the household at peak labor periods in the agricultural calendar.

6.4.3 Management Complexity

Alley farming is a composite technology involving trees and/or food crops, grasses and/or animals. It is thus a fairly complex and management-intensive technology, requiring careful planning, timely implementation, and close supervision. For both tree and crop components, it is essential to obtain good planting materials, establish them in the right season, use an appropriate combination of plant spacing, manage them to reduce competition (e.g., shading, water use), monitor pests and diseases, protect trees in the off-season (especially against small stock), make sure that MPTs do not invade the alleys, etc. If the farmer does not manage the components properly, he or she may experience serious problems. Such regimes probably require progressive farmers with good management skills or farmer training before implementing the technology. Even extensionists may experience problems with alley farming because it requires a multi-commodity/multi-disciplinary systems strategy.

Tree management, in particular, may present some difficulty to farmers. Although farmers are familiar with the management of trees under the bush-fallow system and plantation tree crops, tree management under alley farming may involve a number of innovative activities, namely:

- Planting and establishing trees within arable farms;
- Managing the trees for optimum productivity to provide mulch and fodder,
- Cutting and carrying foliage to feed animals;
- Altering land use and rotation patterns.

Learning these innovations may require time and effort, affecting the speed and ease of adoption.

6.4.4 Differential Social Prospects for Adoption

The issue of social security and equity should always be considered when the introduction of a new technology is planned. What will be the impacts of alley farming technology on the roles, priorities, and opportunities for men, women, and children in the household and community? What will be the prospects of adoption by different types of households and farmers (e.g., resource-rich, resource-poor, women farmers). While it is unfair to expect any technology *per se* to adequately address these socio-political concerns, alley farming can be expected to have different effects on various types of

households. It is essential to identify them early in the process of technology development.

For example, levels of education, both formal and informal have been found to influence technology adoption through four effects:

- **The innovation effect**, whereby better educated farmers know the why, what, when, and how of the technology, its cost and benefits, and where to look for information and capital;
- **The allocation effect**, whereby optimal choices in the use of available resources are made;
- **The worker quality effect**, whereby tasks are performed better,
- **The externality effect**, whereby others are helped to learn and adopt.

Generations of adoption studies have emphasized the role of education in adoption. Even where larger farm size and greater extension contact were found important variables in adoption, both of these variables were found to be highly correlated with the level of education.

Experience with the Green Revolution in Asia shows that, although the technology packages were originally characterized as scale-neutral, large farms became early and major adopters. Thus, a technology may itself be scale-neutral, but returns to scale may prevail in adoption, because of the ability of the large farms to spread learning and acquisition costs over a larger volume of output.

Large farmers usually have better access to information and capital because of their better education and greater contact with the supply sources related to the technology. They can become the early adopters and derive the benefits of early adoption such as premium returns and capitalization of those returns in increased investment. Unless special programs for information dissemination to the resource-poor farmers are promoted, such farmers are likely to remain as laggards and miss the benefits of a new technology.

6.4.5 Overall Profitability and Acceptability

When all the costs and benefits are taken into account, is alley farming profitable? This critical issues has received increasing attention from researchers in recent years. They have examined the profitability question from two perspectives: the costs and benefits for the farmers, and those for society as a whole.

Small-scale farmers tend to be most concerned with the short- and medium-term costs and benefits. Alley farming increases their crop yields and animal productivity. It also allows them to extend the cropping period, reducing the area of land that would be needed under the bush fallow system. Alley farming does not require capital lay out other than for seed. Because it reduces, or eliminates, the need for fertilizer, it may actually result in a saving of short-term capital. The extra costs of alley farming must be balanced against these benefits and savings. The major cost factor, as mentioned previously, is increased labor.

Research has shown that alley farming with crops only (no livestock component) is more profitable than traditional bush fallow rotation. The calculations assume a foliage yield of three tones of dry matter per hectare and a labor input for pruning of 18 person-

days per year. Studies have found the net value of alley farming to be 14 to 59% greater than the bush fallow system. Alley farming with a livestock component will be profitable if it increases net output by 20-30% for sheep and 30-40% for goats – assuming that 25% of the hedgerow foliage is fed to the animals. The attractiveness of alley farming to farmers under appropriate conditions has been demonstrated by the spontaneous spread of the technology from pilot project areas, for example, in southwest Nigeria.

Tangible benefits of alley farming are not always apparent to farmers in the establishment phase. During carefully managed on-station trials by trained personnel, IITA's prototype maize/cowpea system begins to improve yields significantly in the second year. Under less favorable conditions on actual farms, however, the improvement usually does not show until the third year after the hedgerows have been planted. The trees have to be established and well-maintained for roughly 10-15 years in order to derive significant long-term benefits. The tree can also provide indirect benefits, such as in yam staking (Table 6-2). This initial time lag may pose a constraint to small farmers. Even when they have a pressing need to conserve soil fertility, their staying power for the initial period may need to be enhanced through incentive structures such as soft credit. Farmers have indicated their willingness to plant trees under three conditions:

1. Ability to secure tree seedlings at no cost;
2. Possibility of interplanting trees with food crops without adverse effects on crop yields;
3. Possibility of earning some income from the trees (e.g., sale of stakes).

Village	Yield, t/ha ^a		Yield increase		Value of yield increase	Benefit /cost ratio ^a
	Staked	Unstaked	t/ha	%	Naira/ha ^b	
Yandev1	25.5	6.9	18.6	269	3627	10.4
Yandev2	12.1	7.1	5.0	70	990	2.8
Amaladu	20.0	11.0	9.0	81	1782	3.1
Nyikwagh	33.5	17.7	15.8	89	3128	8.9
Abari	19.4	10.5	8.9	85	1762	5.0
Zalibiam1	27.7	20.8	6.9	33	1366	3.9
Zalibiam2	18.0	17.0	1.0	6	198	0.6
Isherev	30.5	23.0	7.5	33	1485	4.2
Average	23.3	14.2	9.1	83	1801	5.1

a. Benefit/cost ration is derived by dividing the values of increased yield by the cost of cutting and carrying *leucaena* stakes.

b. 1 Nairo= \$1.40 (1983 rates)

Recent research in Nigeria and elsewhere has shown that socio-economic acceptability relies very heavily on cost-sharing devices between government and rural farmers, as well as on the availability of an active and persistent extension service, and the potential for some direct economic output from the trees in the system.

The benefits to society as a whole are mainly long-term in nature: resource conservation for future generations, stabilized and sustainable food and livestock production systems, reduced reliance on imported chemical fertilizer and/or protein feeds, a stronger rural economy. The long-term benefit of alley farming for soil conservation

may not be easily apparent, particularly if land is not scarce. This is because soil degradation occurs slowly, so its implications are also understood slowly. Researchers have argued that policy makers should consider the benefits of alley farming in a national context when deciding whether or not to subsidize adoption of the technology by farmers.

6.5 DIFFUSION OF ALLEY FARMING: THREE MAJOR ISSUES

6.5.1 Recommendation Domain

At the present state of knowledge, alley farming can be recommended with confidence for areas with rainfall over 1200 mm with a bimodal distribution and a soil pH of over 5.2. This recommendation domain reflects the conditions in the areas where it has received most research attention.

The recommendation domain is rather small in relation to the total area of tropical Africa where land pressure, soil degradation, and erosion are serious problems requiring urgent solution. Alley farming is a highly promising low-cost technology for these areas to ameliorate the soil problems and to provide food for people and feed for livestock. However, there is a high degree of diversity within the tropics in relation to resource endowment, and physical, environmental, and institutional conditions. If alley farming is to be considered a potential solution for the problems of this vast region, it has to be developed into a highly robust technology adaptable to these diverse conditions.

Adaptive research is thus a prerequisite for broad diffusion of alley farming. As discussed in Unit 3, the major thrust of current alley farming research in Africa is testing and adapting in the current humid-zone, non-acid soil prototype in all agroecological zones and in numerous countries. Such adaptive research constitute the primary objective of AFNETA's program of collaborative research with national agricultural research systems (NARS). It is also a research objective at IITA, ICRAF, and ILCA. These efforts are expected to lead to the development of stable alley farming prototypes for subhumid, semi-arid and highland areas, and for acid soils. As the research emphasis shifts to on-farm investigation (a process that has already begun), the prototype models will be further fine-tuned to suit varying socio-economic conditions within the agroecological zones.

An integral part of this process will be the thorough testing of alley farming using a wider set of food crops. The best-practice technology on station for the tree/crop system has been developed with maize, a shallow-rooted crop. In the humid tropics, maize is not the most important crop. Cassava, yam, cocoyam, and a variety of other crops and vegetables are grown in mixed cropping systems rather than as sole crops. The problems and potentials of establishing alley farms and their performances under such complex cropping systems are not yet adequately known. Accordingly, no precise recommendations are available for farmers to grow crops other than maize. This might prove a bottleneck in the adoption of alley farming technology by farmers who might be interested in root and tuber crops, plantain, etc.

6.5.2 Scientific, Institutional, and Public Support

Public support is necessary for successful promotion of alley farming among farmers. Champions, promoters, and sponsors will be needed at various levels. Seven important issues requiring public support are listed below:

1. Incorporation of alley farming in the priority research agenda of universities and research institutions;
2. Inclusion of concepts and practices of agroforestry, including alley farming, in the teaching curriculum of universities, colleges, and schools of agriculture which turn out future extensionists and development agents;
3. Creating institutional and legal frameworks for providing incentives to farmers;
4. Launching special programs for raising public awareness about the long-term consequences of soil degradation and the role of alley farming in alleviating the problem;
5. Modifying land tenure systems to suit the adoption of alley farming. Since returns to investment in alley farming will accrue over a long period, farmers require a long-term, secure right of cultivation to make necessary investments in alley farms;
6. Making special provisions for subsidies, tax concessions, cost-sharing, and soft credits for those situations where initial personal benefits of alley farming to farmers are few but the social benefits are many. The farmers may have to be paid to “love the land” so as to maintain its future productivity, because even when the farmer is the owner of the land, he may not see far into the future.
7. Ensuring that adequate institutional infrastructure is in place to promote and support the technology. A long-term commitment to extension work will be required from governmental or non-governmental agencies. Infrastructure for the procurement, storage, treatment, and propagation of MPT seeds and seedlings is especially critical.

The degree of public support for these issues will depend on the public perception of the importance of alley farming and the urgency of the problems it addresses, including soil degradation and land scarcity. One important factor that influences public support for a new agricultural innovation is the national policy on food self-sufficiency. If food importation rather than the development of domestic agriculture is the accepted public policy, alley farming is unlikely to get any attention.

Public perception is partly derived from the stock of knowledge in a country. A strong intellectual commitment to alley farming would help to mold public perception in its favor. Agroforestry and alley farming are new sciences, and as yet, many scientists, technicians, and administrators in agriculture have not accepted the concept of growing trees to benefit crops.

6.5.3 International Cooperation

Given the size, complexity and geographical coverage of the problem, a high degree of international support and cooperation in research, extension, and capacity-building will be required for successful diffusion of alley farming. Collaboration among IITA, ILCA, and ICRAF in promoting AFNETA is a good example of such an effort.

AFNETA is playing a pioneering role in technology diffusion by promoting collaborative research, providing experimental seeds and other materials, and helping information exchange through various means (newsletter, publications, seminars, workshop, training). However, networks such as AFNETA and the ICRA-supported Agroforestry Research Network for Africa (AFRENA) are rather small and necessarily limited in scope. Eventually, national governments and institutions will need to play a much larger role.

6.6 FEEDBACK EXERCISES

All answers can be found in the text and figures of Unit 6.

1. a) List five ways in which social science can contribute to alley farming research:
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
- b) Imagine you are designing a five-year alley farming research program, following the research strategy outlined in Unit 1, Section 7. List all possible points at which socio-economic assessment could make a significant contribute to the program.

2. a) Table 6-1 provides information on six different information gathering tools. Which would be most useful when time and money are especially scarce? Which would be most appropriate in the early stages of a research program? In the later stages?
- b) Name at least two methods for gathering relevant socio-economic information that are not mentioned in table 6-1.

3. The following statements concern farming systems concepts. Circle T for true statements or F for false one:
 - i) A farming system does not contain any sub-systems because it is the smallest possible unit of socio-economic analysis. T F
 - ii) Exogenous economic factors provide inputs to each household. They also receive certain outputs from each household. T F
 - iii) "Capital status" refers to a village's access to the capital city. T F
 - iv) Production systems defined on the basis of land use are more convenient units of analysis than household enterprises. T F

4. List five major socio-economic factors which determine whether farmers adopt alley farming technology, and briefly cite an example of each factor.

Issue 1: _____

Example: _____

Issue 2: _____

Example: _____

Issue 3: _____

Example: _____

Issue 4: _____

Example: _____

Issue 5: _____

Example: _____

5. Alley farming has been designed to help smallholders in addressing problems of soil degradation, land pressure, and soil erosion. Recall that the system can be recommended with confidence for areas with rainfall over 1200 mm with a bimodal distribution and a soil pH of over 5.2. Adaptive research efforts are underway to expand the recommendation domain into areas with drier climates and/or more acidic soils.

Based on what you have learned about alley farming, indicate the geographic areas or areas, land use system(s), and target farmers in your country or neighboring countries which would appear to have high adoption potential. For example, a Kenyan might write “Embu District” as a possible high-potential area, “Coffee/banana/maize intercropping with stall-fed cattle” as a land use system, and “Cash-poor farmers with < 1 ha” as target farmers.

Area(s): _____

Land use system(s): _____

Target farmers: _____

6. Section 6.5.2 in the text cited seven measures for promotion of alley farming. Referring to the high-potential adopters you suggested in question 5, can you suggest actions by governmental or non-governmental agencies that – in your opinion – might best enhance the prospects of alley farming in you country or region?

7. Write the full form of the following acronyms.

- AFNETA _____

- ITA _____

- ICRAF _____

- ILCA _____

- NARS _____

SUGGESTED READING

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