LECTURE-6

LEARNING OBJECTIVE: TO KNOW ABOUT PLANNING FOR AGROFORESTRY – CONSTRAINTS, DIAGNOSIS & DESIGN METHODOLOGY

AGROFORESTRY PLANNING OF FARMS

- Agroforestry is the management of interactions between trees, crops and livestock in each of the farms plots, aiming to reach the objectives set by the farmer or the family
- Interactions are the effects of one component over another component
- Interactions are always not positive it may negative and compete for the different resources For example. Dense canopy trees in cropped areas create a shade to the underground crop and thus the interaction may fall on negative side
- The manager must take advantages of positive interactions and eliminate or reduce negative interactions
- The agroforestry planning of farms allows manager to manage interaction in order to maximize production, value and conservation
- The agroforestry planning of farms is applicable to farms of all sizes

- Researchers in developing countries are trying to reach out to farmers through on-farm experimentation.
- The partnership is still somewhat one sided.
- Scientist go out to the farmers and bring back information to help them
- Decide how best to make their technologies more relevant to their client's needs.
- What is needed is a communication channel in which information about technology and research needs and priorities flows with equal ease in both directions.
- The farmer or other land user makes the final decision on whether or not to adopt an agroforestry technology for use in a particular land use system.
- In order to help agroforestry researchers, ICRAF's team of anthropologists, economists, agricultural and forestry researchers - together with participating men and women farmers have developed a methodology for the diagnosis of land management problems and the design of agroforestry solutions.

- This is simply a systematic approach for applying to agroforestry the common sense medical principle that 'diagnosis should precede treatment'.

CONSTRAINTS OF AGROFORESTRY

- The interference of trees decreases the crop yield which is lower than the monocropping
- The tree canopy absorbs maximum light and causes competition for light
- Felling of trees causes damage to the arable crop
- Competition for moisture between trees and arable crops is maximum when the trees have not deep tap root system
- Some of the trees serves as host to pest that harm main crop
- Agroforestry system requires more for its management
- Longer gestation period for tree delay the returns to the farmer
- Farmers give more weightage to field crops compare to tree crop
- Certain tree species produce chemical exudation which affects the growth of agriculture crops

THE GENESIS OF D&D

- Agroforestry in itself is described as 'a new name for an old practice'.
- The D&D methodology is an adaptation of old or existing methodologies to the specific needs and conditions of agroforestry.
- Several methodologies have been developed for holistic evaluation and analysis of land use systems. The most significant among these are:

i) Farming Systems Research /Extension (FSR/E)
ii) Land Evaluation methodology

- Each of these two was developed with specific objectives and conditions. For example, the FSR/E was developed in response to the failures or inadequacies of the traditional transfer-of-technology extension methods that were initiated to disseminate the researcher-driven green revolution technologies to resource-poor, small scale farmers.
- FSR/E was designed to be interdisciplinary and holistic as well as demanding farmer involvement from the outset The D&D arose, in the words of J.B. Raintree, who directed

its development at ICRAF, "Out of the demands of the agroforestry situation. It gives a special focus on agroforestry related constraints and opportunities within existing land use systems and highlights agroforestry potentials that might be overlooked by other methodologies. For example, for most FSR/E practitioners, the trees within the farming system tend to be invisible".

WHAT IS D&D?

DIAGNOSIS AND DESIGN

D&D is a methodology for the diagnosis of land management problems and design of agroforestry solutions. It was developed by ICRAF to assist agroforestry researchers and development fieldworkers to plan and implement effective research and development projects.

THE KEY FEATURES OF THE D&D:

A. FLEXIBILITY

D&D is a flexible discovery procedure which can be adapted to fit the needs and resources of different users.

B. SPEED

D&D has been designed with the option of a 'rapid appraisal' application at the planning stage of a project with in-depth follow up during project implementation.

C. REPETITION

D&D is an open-ended learning process. Since initial designs can almost always be improved, the D&D process need not end until further improvements are no longer necessary.

CRITERIA OF A GOOD AGROFORESTRY DESIGN

There is no substitute for good design. A good agroforestry design should fulfill the following criteria:

A. PRODUCTIVITY

There are many different ways to improve productivity with agroforestry: increased output of tree products, improved yields of associated crops, reduction of cropping system inputs, increased labour efficiency, diversification of production, satisfaction of basic needs, and

other measures of economic efficiency or achievement of biological potential.

B. SUSTAINABILITY

By seeking improvements in the sustainability of production systems, agroforestry can achieve its conservation goals while appealing directly to the motivations of low income farmers, who may not always be interested in conservation for its own sake.

C. ADAPTABILITY

No matter how technically elegant or environmentally sound an agroforestry design may be, nothing practical is achieved unless it is adapted by its intended users. This means that the technology has to fit the social as well as the environmental characteristics of the land use system for which it is designed.

WHO CAN MAKE USE OF D&D?

- Researchers
- Extension officer
- Government field workers
- NGOs

BASIC PROCEDURE OF D&D

The basic logic of the D&D discovery procedure is displayed in the following table 1. The process can be subdivided into small steps and used selectively for varying purposes, but the hierarchical logic of D&D is quite robust and generally applicable to virtually any problem in technology design. The more detailed procedural suggestions are best thought of optional steps for collecting and processing the information needed to answer the basic question shown in the table 1. At any time you feel you are getting lost in the details, simply return to this outline of basic procedures for a reorientation to know where you are in the process.

Table 6.1 Basic procedure of D&D

D&D Stages	Basic Questions to answer	Key factors to consider	Mode of inquiry
Prediagnostic	Definition of the land use systems and site selection (which system to focus on?)	Distinctive combinations of resources, technology and land user objectives	Seeing and comparing The different land use systems

	How does the system work? (How is it organized, how does it function to achieve its objectives?)	Production objectives and strategies, arrangement of components	Analyzing and describing the system
Diagnostic	How well does the system work? (What are its problems, limiting constraints, problem-generating syndromes & intervention points?)	Problems in meeting system Objectives (production short-falls, sustainability problems Casual factors, constraints and interventions points	Diagnostic interviews and direct field observations Troubleshooting the problems, subsystems
Design & Evaluation	How to improve the system? (What is needed to improve system performance?)	Specifications for problem solving or performance enhancing interventions	Iterative design and evaluation of alternatives
Planning	What to do to develop and disseminate the improved system?	Research and development needs, extension needs	Research design project planning
Implementation	How to adjust to new information?	Feedback from on-station research, on-farm trials and special studies	Re-diagnosis and re-design in the light of new information

D&D IS AN ITERATIVE PROCESS

The basic D&D process is repeated throughout the project implementation stage to refine the original diagnosis and improve the technology design in the light of new information from on-farm research trials, more rigidly controlled on-station investigations, and eventual extension trials in a wider range of sites. As shown in the following flowchart, the iterative D&D process provides a basis for close feedback complementarily between different project components. By adjusting the plan of action to new information, the D&D process becomes self corrective. In an integrated agroforestry research and extension programme, the pivotal decisions are taken in periodic meetings which evaluate new results and revise the action plan accordingly. The process continues until the design is well optimized and further refinement is deemed unnecessary. You can enter the cycle at any point, but the ultimate fine-tuning and dissemination of the technology will most likely be accomplished by the farmers themselves.

KEY CONCEPTS OF D&D

a) D&D is system specific

b) Definition of the system for D&D purposes

A land use system is defined as a distinctive combination of three interrelated factors: the land resources, exploited by a particular technology, to satisfy the production objectives of a particular type of land user.

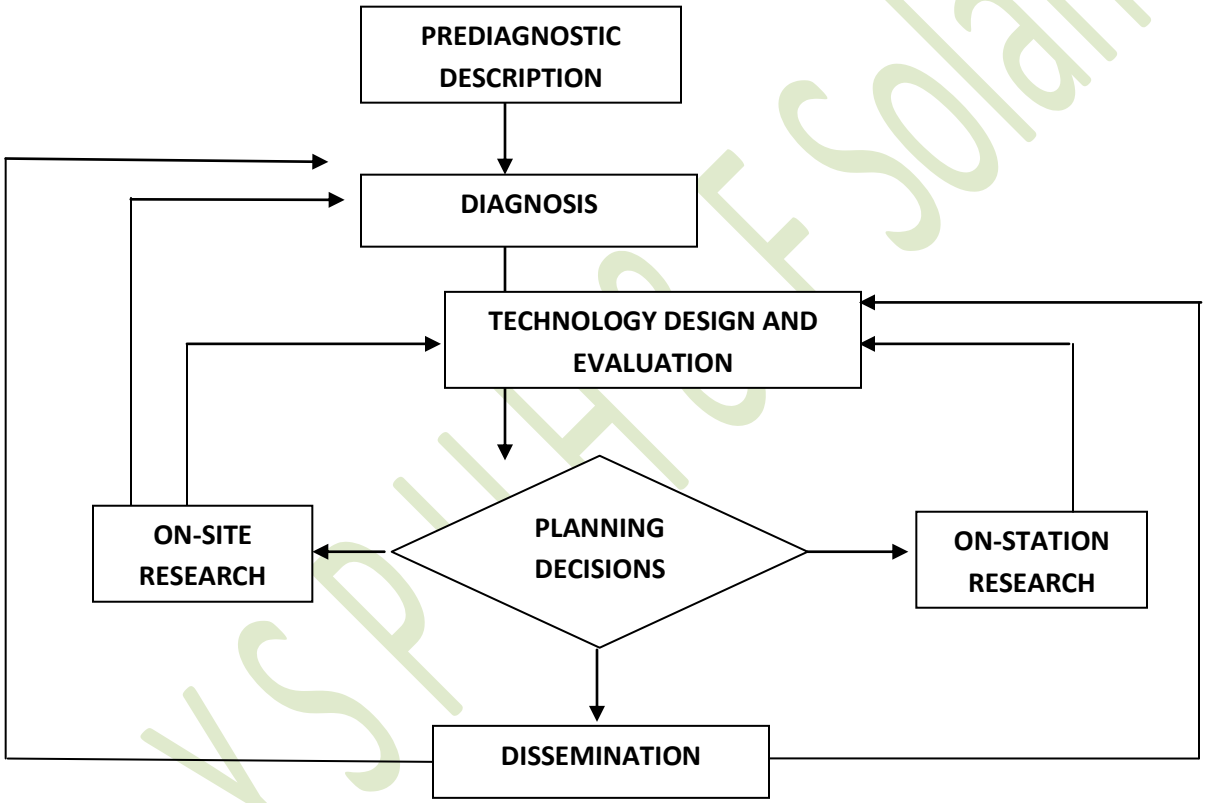

Fig. 6.1 D&D IS AN ITERATIVE PROCESS

C) The diagnosis leads to 'specifications' for interventions

The end product of diagnostic procedure is a set of functional specifications:

- What the system needs
- How these needs can best be satisfied

D) Specifications suggest 'candidate technologies'

E) 'Technology specifications' complete the design

- The actual choice of component species

- Spatial arrangement
- Management practice, etc.

F) The design reveals research needs and extension opportunities

G) If at first you do not succeed, try and try and try again

