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Participatory Planning and Extension: An Agroforestry Case Study from Plateau State, Nigeria

By

Barry Wayne Hunter

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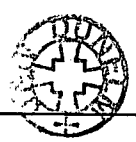
A Dissertation Submitted to the Department of Geography
In Candidacy for the Degree of Master of Science
Faculty of Science

University of Durham
United Kingdom

1999



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By
Barry Wayne Hunter

Key Words: development, planning, extension, agroforestry, Nigeria

ABSTRACT

In 1991 and 1992 the author and the Jos Plateau Environmental Resources Development Programme (JPERDP), embarked on a rural development project in northern Nigeria. The project was aimed at creating agroforestry vision and building agroforestry capacity within the Plateau Agricultural Development Programme (PADP), a Nigerian State institution. The project consisted of a series of participatory workshops, which focused on agroforestry techniques, participatory extension and operational planning. Since agroforestry is a diverse discipline involving crops, trees and livestock, it requires integrative approaches and is well suited to participatory methods.

The project provoked the following questions: "If agroforestry is best accomplished using participatory methods, can it be integrated into an established bureaucracy?" and "What can be learned about a participatory development approach related to the institution in which it is employed ?". These questions form the basis of the dissertation .

In 1993 the author re-visited the agroforestry section of the PADP with the intention of answering these questions. This evaluation formed the basis for a case study. The review methodology included semi-structured interviews, detailed interviews, file and record reviews and a backstopping workshop. Further, a detailed literature search on rural development, extension, agroforestry and the Nigerian situation was completed to provide a framework for analysing the PADP case study.

Results indicated that the project goals of "vision creation" and "capacity building" were only partly achieved because PADP extension methods were not altered; middle level staff were better informed than lower and upper level staff cadres; and PADP resources were not mobilised to address agroforestry concerns. However, technical agroforestry activities within the PADP increased as a partial result of the project.

The original project goals were likely too ambitious. These goals were not shared or fully adopted by the organisation because inadequate attention was paid to PADP's organisational culture when formulating and implementing the project. Further, the weak links between staff levels and between the technical section and extension section of the PADP posed serious constraints to the full adoption of the agroforestry extension project.

To introduce a participatory agroforestry extension project within a large bureaucratic organisation is a considerable task. This study demonstrates the complexities associated with such rural development projects. Given the constraints faced by the author during the project and the constraints faced daily by the PADP, the limited success of the project is understandable. Even with its limitations, the project has provided a valuable, real world example with its inherent complexities and can serve as a guide in future projects.

TABLE OF CONTENTS

Abstract i
Table of Contents ii
Lists of Figures vi
List of Tables vii
Declaration viii
Statement of Copyright viii
Acknowledgements ix

CHAPTER ONE: Introduction
Aims and Objectives 1
Introduction 1
Goals 1
Background 2
Constraints, Scope, and Limitations 3
Document Format 3
Chapter Summary 4

CHAPTER TWO: Development Thoughts, Theories, and Approaches
Aims and Objectives 5
Development Definitions 5
History of Development Thinking 7
Prehistory 8
Development as Growth 8
Neo-Marxist Approach (1960's to Present) 9
Ecodevelopment (Early 1970's to Present) 10
Basic Needs Approach (1976 to Present) 10
New Right (Late 1970's to Present) 11
Anti-Development (1993 to Present) 12
Current Development Approaches 13
Chapter Summary 15

CHAPTER THREE: Extension Theories, Approaches, and Methods
Aims and Objectives 16
Extension Definitions 16
Extension History 18
Extension Approaches 18
Extension Methods and Tools 21
Extension Organisation and Management 24
Rural Development and Extension Interactions 28
Research-Extension-User (Farmer) Linkages 29
Chapter Summary 30

CHAPTER FOUR: Agroforestry: Theory and Methods
Aims and Objectives 31
Agroforestry Definitions 31
Agroforestry Benefits and Constraints 32
Agroforestry Systems and Practices 33
Agroforestry History 34

Rural Development, Extension, and Agroforestry..... 34
Agroforestry Planning..... 40
Agroforestry Monitoring and Evaluation..... 40
Chapter Summary..... 42

CHAPTER FIVE: Nigerian Development, Extension and Agroforestry: An Idealised Agroforestry Extension Model
Aims and Objectives..... 44
Nigeria: Facts and Figures..... 44
Plateau State: Facts and Figures..... 48
Rural Development: The Nigerian Situation..... 49
Extension: The Nigerian Situation..... 50
Nigerian Agroforestry..... 51
Idealised Agroforestry Extension Model..... 52
Chapter Summary..... 52

CHAPTER SIX: Case Study Background
Aims and Objectives..... 55
Plateau Agricultural Development Programme (PADP) Introduction..... 55
Plateau Agricultural Development Programme (PADP) Mandate..... 56
PADP Organisation..... 56
Plateau Agricultural Development Programme (PADP) Planning, Monitoring and Evaluation..... 60
Plateau Agricultural Development Programme (PADP) Extension..... 60
Plateau Agricultural Development Programme (PADP) Agroforestry..... 61
State Afforestation Project..... 62
Pre-Project PADP Agroforestry Extension Model..... 63
Plateau State Tree Related Problems..... 65
1991/92 Agroforestry Project..... 65
Chapter Summary..... 69

CHAPTER SEVEN: Case Study Methods
Aims and Objectives 73
Introduction 73
Study Parameters 74
Methods 75
Method One: File and Record Review 76
Method Two: Detailed Discussions with Agroforestry Co-ordinator ... 77
Method Three: Semi-Structured Interviews 78
Method Four: Backstopping Workshop 82
Conclusion 83
Chapter Summary 83

CHAPTER EIGHT: Results and Discussion
Aims and Objectives 84
Introduction 84
File and Record Reviews..... 85
Detailed Discussions with Agroforestry Co-ordinator..... 85
Interviews..... 90
Backstopping Workshop..... 95
A Revised PADP Extension Model..... 96
Results Summary..... 98

Discussion..... 99
Technical Agroforestry 99
Extension 100
Institutional Arrangements 101
Study Methodology 103
Vision Creation and Capacity Building Approach..... 105
Conclusions 106
Chapter Eight Summary 107

CHAPTER NINE: Conclusions and Recommendations
Aims and Objectives..... 108
Introduction..... 108
PADP Agroforestry Planning and Extension Project Improvements..... 108
Rural Development, Extension, Agroforestry and Institutions..... 109
Recommendations..... 109

REFERENCES..... 111

APPENDIX I 123

APPENDIX II 159

APPENDIX III 165

LIST OF FIGURES

Figure 3.1. Extension components. 17
Figure 3.2. Non-participatory (production) extension approach. 19
Figure 3.3. Participatory (problem solving) extension approach. 20
Figure 3.4. Extension methods decision making key. 23
Figure 3.5. Strategies for financing and providing extension. 24
Figure 3.6. A stylised description of the training and visit extension system. 27
Figure 3.7. Agricultural extension in the context of agricultural development. 28
Figure 4.1. Agroforestry systems. 35
Figure 5.1. Administrative map of Nigeria. 45
Figure 5.2. Ecological map of Nigeria. 46
Figure 5.3. Idealised agroforestry extension model. 53
Figure 6.1. Map of Plateau State showing PADP features. 57
Figure 6.2. Map of Plateau State showing ecological zones. 58
Figure 6.3. Organisational chart of the PADP. 59
Figure 6.4. PADP agroforestry extension model. 64
Figure 6.5. Transfer model. 63
Figure 6.6. Condensed outline of an agroforestry extension project workshop. 67
Figure 6.7. The agroforestry concept as applied in the PADP project. 69
Figure 7.1. The action research spiral 75
Figure 7.2. Interview summary sheets 79
Figure 8.1. Timeline of agroforestry events and activities..... 87
Figure 8.2. Timeline of major constraints during agroforestry programme..... 88
Figure 8.3. Agroforestry definitions by staff level..... 92
Figure 8.4. Perceived and planned unified extension system - headquarters..... 94
Figure 8.5. Perceived and planned unified extension system – north zone..... 94
Figure 8.6. Perceived planned and actual unified extension system – west zone..... 94
Figure 8.7. 1993/94 PADP agroforestry extension model..... 97
Figure 8.8. Elements of organisational life..... 103

LIST OF TABLES

Table 2.1. Comparison and contrasting of development relief. 7
Table 3.1. Detailed descriptions of extension methods. 23
Table 3.2. Research-extension - user linkage models. 29
Table 4.1. Agroforestry benefits and constraints. 33
Table 4.2. Agroforestry practices and systems chart. 36
Table 4.3. Agroforestry planning methods. 41
Table 4.4. Agroforestry impact evaluation. 43
Table 5.1. Country profile. 47
Table 5.2. Nigerian Agroforestry Practices 51
Table 6.1. 1991/92 PADP agroforestry extension project planning matrix (ZOPP). 70
Table 8.1. Agroforestry training included in monthly technology review meetings for the years 1991 to 1993. 86
Table 8.2. Status of planned agroforestry activities..... 89
Table 8.3. Agroforestry definition based on workshop attendance..... 90
Table 8.4. Agroforestry definition by geographic zone..... 91
Table 8.5. Agroforestry definition by training source..... 91

DECLARATION

This work is based upon the individual research of Barry W. Hunter, under the supervision of thesis advisor Dr. Peter J. Atkins. This thesis has not been submitted in whole, or in part, for a degree at any other institution.

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CHAPTER ONE

Introduction

Aims and Objectives

This chapter aims to introduce the goals of the dissertation. Specifically this chapter will:

1. Introduce the topic of rural development;
2. Define the goals of the study;
3. Provide background details;
4. Identify impediments to achieving the study goal;
5. Outline the structure of the document.

Introduction

Rural and agricultural development approaches are as diverse as the organisations which undertake them. From the participatory approaches of the non-governmental organisations (NGO) to the more rigid top-down approaches of the large bureaucratic agricultural development programmes (ADP), one can identify strengths and weaknesses. Many of these strengths and weaknesses have been publicised and debated (Chambers 1983, Gladden and Phillips-Howard 1992, Moris and Copesake 1993, Nelson and Wright 1995, Kidd 1993, Phillips-Howard 1993). The participatory approaches of the NGO's are said to have the best chances of sustainable success when compared to the top-down messages of the large ADP's. However, much analysis has focused on the relationship between the front line agency staff and rural inhabitants often to the neglect of the relationship between front line staff to the organisation for which they work. This project will focus on the staff-organisation relationship. As both the large ADP's and the often smaller NGO's are likely to continue in the agricultural and rural development field, then it is beneficial to explore how the best components of the two approaches can successfully work together.

Goals

The overall goal of this thesis is to gain an understanding of the relationship between a participatory agroforestry planning and extension approach and the established Nigerian agricultural development organisation within which it works. As successful development consists of both reflection and activity, the research component of this project was

accomplished while the author was simultaneously active in strengthening the agroforestry capacity of the organisation. In essence the work can be termed action-research (Whyte 1991).

The overall project goal will be achieved by:

- Building a theoretical framework of development, extension and agroforestry issues, based on relevant literature and personal experience, which will enable a thorough discussion of the case study;
- Assisting the development of the agroforestry section of Nigeria's Plateau Agricultural Development Programme (PADP); while at the same time,
- Monitoring, evaluating and analysing the introduction of a participatory agroforestry planning and extension process within the PADP as an example of a participatory development approach and institution interface.

Background

Nigeria's Plateau State Agricultural Development Programme (PADP) has the mandate of developing agricultural potential in Plateau State, Nigeria, through research, extension, institution building and input distribution. From November 1991 to March 1992 the author (funded by a Canadian International Development Agency Professional Award) and the University of Durham's Jos Plateau Environmental Resources Development Programme (JPERDP), embarked on a project aimed at creating agroforestry vision and building agroforestry capacity within the PADP (JPERDP *Interim Reports* 32-36).

These goals were targeted at alleviating the projected tree product supply shortfall and related environmental concerns within the State (Hunter *et al.* 1993, Buckley 1986, Hyman 1993, Silviconsult 1991). This project relied on participatory methods, especially adult education techniques and rapid rural appraisal, based on the experiences of Abel *et al.* (1989), Davis-Case (1990), Hope and Timmel (1984), and Mascarenhas (1991). The workshops focused on both the technical and non-technical components of agroforestry, which included agroforestry techniques, appropriate two-way interactions with farmers and operational planning. As agroforestry is a diverse discipline involving crops, trees (and other plants!) and livestock, it requires integrative approaches and is well suited to participatory methodology (Chambers 1988).

This leads to the focus of this study. If agroforestry as an integrative discipline is best

accomplished using participatory methods, can such a topic be assimilated into an established bureaucracy? What can be learned about a participatory development approach and its relationship with the institution which employs it? In June 1993 the author re-visited the agroforestry section of the PADP with the intention of answering these questions.

Constraints, Scope and Limitations

Constraints to resource management may be divided into technical, social, financial, legal, and political components (Anon 1983, Kidd 1993, Phillips-Howard 1993a 1993b, Alexander 1989). Some of these constraints have already been documented in similar situations. For example, the PADP utilises the World Bank designed Training and Visiting (T&V) extension system (Benor and Baxter 1984) which follows, in practice, a top-down transfer of technology approach. The T & V system, as applied in Nigeria, has been criticised for poor research-field linkages, improper messages and timing, excessive bureaucracy and a lack of two-way communication (Phillips-Howard 1992). Any of these constraints, could have serious implications for a project such as described herein.

This thesis is limited to a basic investigation of the technical, administrative and bureaucratic constraints within the PADP as they affect the introduced, participatory agroforestry planning and extension process. Political, legal and socio-economic factors will only be addressed when they are directly related and intertwined with the aforementioned constraints.

Limitations to the study included the willingness of people to talk openly about their success and failures, the familiarity of the PADP Staff with the action-researcher i.e. the bature-philic[1] factor (Kidd 1993), minimal funding (as the action-research was funded solely by the author), time delays associated with the preparation of this document (as the work was completed on a part-time basis), political instability and logistical constraints.

Document Format

This dissertation is divided into two sections. Part One is primarily a literature search of development, extension and agroforestry issues and endeavours to build a theoretical base for the analysis of a case study. Part Two is a detailed case study of the introduction of a

[1] Predisposition to people of European origin

participatory approach to agroforestry planning and extension into Nigeria's Plateau Agricultural Development Programme.

The theory before analysis approach has been followed since the author comes from a technical forestry background and has had limited exposure to the theoretical underpinnings of rural development and agricultural extension.

Chapter Summary

The main points of this chapter can be summarised as follows:

- The overall goal of this study is to gain an understanding of a participatory agroforestry planning and extension approach within Nigeria's Plateau Agricultural Development Programme;
- The study goal will be accomplished by the completion of a literature review and then applying this theoretical information to a case study involving the monitoring and evaluating of a participatory planning process;
- The work will be limited to a basic investigation of the technical, administrative, and bureaucratic constraints affecting the adoption of the participatory agroforestry planning and extension approach.

CHAPTER TWO

Development
Thoughts, Theories and Approaches

Aims and Objectives

This chapter and the remainder of Part One aims to build a strong theoretical foundation for the thesis. Specifically this chapter will:

1. Define rural development;
2. Explore the history of rural development;
3. Categorise and discuss current approaches to rural development;

Development Definitions

It can be said that development definitions are like noses: every-body has one. Definitions, both historical and present, have ranged from simply raising living standards through control of the environment and economic growth, to the less tangible goals of self-fulfilment, reliance and liberation. Basically, development has come to mean improved life, however one chooses to measure it.

Todaro (1985) noted that all recent development definitions have three core values in common:

(i) Life-sustenance: the ability to provide basic needs such as food, shelter, health, and protection;

(ii) Self and National -esteem: the ability to improve the quality of life through greater employment, education and cultural opportunities;

(iii) Freedom from Servitude: through an expansion of social and economic choices individuals and their society can limit their dependence on others and the human condition.

Upon review of the above components we can see that the development concept is both a goal, a measurable physical reality and a state of mind, as well as a means or process of achieving that goal.

There are many categories or types development. Usually a descriptive modifier is placed with the word development to identify which category the presenter is referring

to. For instance, commonly used categories include: economic development, social development, urban development, community development, agricultural development and rural development. The focus of this dissertation is development which aims to improve the living standards of rural inhabitants involved in agricultural and natural resource industries. Thus the primary focus of this thesis is on rural and generally agricultural development. However, the author recognises that activities to improve the quality of rural life may take place in both countryside and urban settings. While there are differences between rural and other classes of development, the general term development will be used throughout this paper.

The definition of rural development which guides the actions of this author was adapted from a number of sources including Korten (1980), Ehert and Kidd (1992 - 1995), and Todaro (1985). To avoid the academic arguments which invariably accompany the presentation of any definition, this guide has been kept simple and brief.

Rural development is a learning and constantly evolving process, which may or may not involve outsiders, whereby rural, generally agriculture and natural resource dependent, people overcome problems affecting their lives, so as to raise their living standards to a level sufficient to meet at least their basic needs, in a positive and measurable way.

The basic premise of the above definition is that solving problems requires change. Changes in one's way of knowing, thinking, feeling and doing are prerequisites for development. As change is inevitable, people must do all that they can to ensure that the change results in improvement. In some situations, outsiders have a role to play as they can act as facilitators of this change.

A common misconception among the general public and policy makers alike is that development and relief are one and the same. This could not be farther from the truth. The following table, adapted from Ehert and Kidd (1992 - 1995), provides a means of distinguishing between the two concepts. Further, the table indicates the roles of outsiders (non-community members) in each process (Table 2.1). One can see that development is a long term process aimed at improving living standards whereas relief is a short-term solution to an immediate, often life threatening, problem.

Table 2.1. Comparison and contrasting of development and relief.

RELIEF		DEVELOPMENT
Disaster/Crisis	**PROBLEM**	Poverty Low Living Standard
Survival	**PURPOSE**	Improvement
Giving	**PROCESS**	Awareness and Mobilising
External	**INPUT**	External/Local
Immediate	**TIME**	Long-term
Giver/Provider	**RELATIONSHIP**	Facilitator

Adapted from Ehert and Kidd (1992 - 1995).

History of Development Thinking

Formal thoughts about development have been in existence for about the last 50 years. However, development has obviously be ongoing since human societies formed. This section will categorise and briefly discuss the history of development thinking. It is important to note that numerous theories and approaches have been (and are!) ongoing simultaneously. Much of this section is derived from Todaro (1985) and Toyne (1987). The reader may have noted that the term development thinking was used rather than term development theory. This choice of words was deliberate. Development thought includes both:

(i) theories - which are statements of general principles which govern a process and specify desired outcomes; and,

(ii) approaches - which are the methods of dealing with situations encountered in the application of any given theory.

Matters are further complicated by the fact that practical distinctions between the two are difficult given that development, by definition, is both a process and a goal! In addition, the standard practice of one approach or theory replacing another, as in the physical sciences does not apply to development thinking. In reality, numerous, often contradictory approaches coexist.

Prehistory

Prior to 1945 western, mainstream economics stayed away from development theory. The majority of the third world was colonies and little thought was given to development of these areas and their people. Colonies were simply sources of raw materials for their masters.

Ideas concerning the development of these third world, non-western countries formed on two fronts:

1) reactive nationalism;
2) national movements.

Reactive nationalism, as was the case with Japan, consisted of the realisation that a modern economy was necessary to sustain modern armed forces. While such an idea and the subsequent attempt to realise it could be said to be a form of economic development, it is a process with little concern for the welfare of individual citizens.

National movements, as in India, were in effect populist rebellions against colonial authority and/or oppressive rulers. Attention was focused on the plight of the less affluent segments of society as a means of support. Such focus led to the realisation that the living standards of the poor could be altered.

Development as Growth (1945-1974)

After World War II the concept of development dominated economic theory. The war aims of freedom for all and the post war plans for reconstruction led to a "boom" in the field of development. The basic economic principles of the time centred on capital formation and human resources. The common idea was that all the world's problems could be solved through the application of money and new technologies.

Neo-Keynesian growth models were applied to problems of development. These growth models were centred on such things as target rates of national income growth, incremental capital and investment requirements. Trade was to be the engine that drove the process of development and all segments of society would improve as benefits trickled down through society from the wealthy to the poor.

This modernisation theory envisioned that the development of a modern society

followed a series of stages. Each stage had defined social and economic patterns as well as physiological attributes. Thus a mathematical approach to economics should produce superior results. It did not.

Problems encountered in the application of this modernisation theory were numerous. The economic models ignored the fact that underdevelopment had regional and sectoral roots and was affected by socio-cultural as well as political factors. An even more basic fundamental flaw was discovered - the modernisation theory specified stages of development were not time bound and were affected by other nations. Despite these serious shortcomings, this theory and its related approaches lasted well into the 1970's, albeit with a few minor modifications.

Neo-Marxist Approach (1960's - present)

The relationship between rich and poor countries is at the centre of neo-marxian theory (Amin 1974, 1976 and Baran 1968). It is argued that capitalist development of poor countries is impossible or at the least inappropriate, because the rich countries benefit from the present relationship and will resist any change from the status quo.

Neo-Marxists believe that the current relationship is a form of economic imperialism and exploitation whereby the surpluses and profits generated in poor countries are siphoned away to the rich, dominating countries. Thus if production excesses and profits are drained away, how can one expect poor countries to develop?

During the 1970's the most popular version of Marxist thinking was termed "dependency thinking" which argued that Lesser Developed Countries were trapped by unfair trading relations with the West. Unfair practices included such things as excessive debt and the multinational corporations. This argument was undermined in the 1980's, by the emergence of the Newly Industrialising Countries, such as Taiwan and Korea, which managed to develop autonomous growth.

While there are certainly elements of truth in the neo-marxist theory, it is generally not by itself applied by most development agencies. With the collapse of the Soviet Union the last major world power to promote Marxist development is China. However, the attention the neo-marxists focused on the exploitation of the developing world has certainly added much to current development thinking.

Ecodevelopment (early 1970's - present)

In the early 1970's thoughts began to turn to the environmental limitations to economic development. Earlier theories and approaches had not produced the expected results and answers were being sought. Ideas such as sustainable development (Bruntland *et al.* 1987) and intermediate technology (Schumacher 1974) began to emerge as both explanations for past failures and as solutions to present problems.

Sustainable development has as its basic premise the belief that current development activity aimed at meeting present needs must not compromise the ability of future generations to meet their needs. The recognition that environmental damage and/or degradation affect not only the present generation but also all future generations added much to development planning. The concept of sustainable development implies environmental limits to activity. Some would argue that these limits are not fixed but are defined by the current state of technology.

Intermediate technology or "Small is Beautiful" was presented by Schumacher as a means of addressing the problems that had been encountered in the implementation of the modernisation theory. He noticed that large transfers of western money and technology to the developing world was causing environmental and social damage. Therefore, he proposed that all methods and equipment used in the improvement of third world living conditions should be:

(i) cheap enough that they are accessible to virtually everyone (as this avoids undue concentration of power and wealth and associated social problems);

(ii) suitable for small scale application; (as such actions are less damaging to the environment) and,

(iii) compatible with man's need for creativity.

While concern for the environment and its carrying capacity added much to development thinking - a greater concern for the social components was still lacking.

Basic Needs Approach (1976-present)

A major philosophical transformation occurred within development thinking in the mid 1970's. Given the continuing failure of increases in Gross National Product (GNP) to reach the poorest segments of society, emphasis was shifted towards the direct elimination of poverty. The majority of previous approaches were preoccupied with

increases in GNP and often left out the question of benefit distribution.

Two key concepts of the basic needs approach (BNA) are:

1. that there are minimum family consumption requirements, including food, shelter, clothing and household goods, which are necessary for survival;
2. there are basic community services, such as water, health, education and transport, which are also necessary for survival.

They next question to evolve out of the realisation that there are certain goods and services necessary for a basic existence is "who should make the decisions regarding such basic needs?". Currently, many development professionals would agree that the individual and the community have to be involved with decisions which affect them. This has not always been so. However, there would be less agreement on the definition of participation and even less agreement on the best manner to facilitate local participation.

Chambers (1983) and Chambers *et al.* (1989) were among the first to propagate the idea of "Last First" or "Farmer First". The notion that farmers and other rural inhabitants have intimate knowledge of their environment and a keen perception of the problems they face is the base component of the concept. Chambers and the others went even further, they proposed ways of learning and utilising this indigenous knowledge. Data collection and analysis methods such as rapid and participatory rural appraisal and farming systems research were added to the planning tools available to development practitioners.

However people-centred this approach might be, there are still a number of valid concerns which have been expressed. Criticisms of the BNA approach include concerns that actions may impinge on national authority, have political overtones, discourage industrial growth, and that data collection methods are prone to manipulation.

New Right (late 1970's - present)

In the late 1970's a number of prominent economists including Peter Bauer, Deepak Lal, Harry Johnson, Ian Little, and Bela Bellasa began to lay the foundation for what has been called a counter-revolution in development theory. Central to their idea is the notion that it is the economic aid the West provides the third world that is the root cause

of underdevelopment.

Aid given to the developing world has resulted in the formation of an excessive public sector, zealous economic controls and overemphasis on physical capital formation (Toyne 1987). In other words the West is killing developing world inhabitants with their kindness. Any aid given is borne out of a sense of guilt about colonialism and exploitation. The basic premise of this line of thought is that only "free" enterprise will enable the development of a society.

The current structural adjustment policies of the World Bank and the other large development banks generally follow a "new right" approach to development.

Structural adjustment originally meant that the developed countries were shutting down state subsidised industries such as leather and textiles when competition from developing counties became too costly. This started after World War II and continued into the 1970's. In the 1980's the term was "borrowed" and applied to developing world stabilisation i.e. bringing debt payments into balance and structural adjustment proper i.e. market liberalisation and public sector reform (Toyne 1994).

The effectiveness of structural adjustment (SAP) is in question. Simeon Ajayi (1994) noted that studies on the effectiveness of SAP can be divided into two camps:

1. those by the World Bank and International Monetary Fund (IMF) staff, who generally favour Structural Adjustment Programmes; and,
2. those by independent researchers, who generally do not favour SAP's.

Criticisms of this approach centre around the thought that, once again, social and environmental concerns are not adequately factored into the development equation. Further, it is argued that the attainment of "free" enterprise is almost impossible given the political, legal and economic systems within most developing countries.

Anti-Development (1993 to Present)

Development has been criticised in the last five years by some, who contend that the concept of development is dead or at least a miserable failure. The works of Escobar (1995), Crush (1995) and others discuss this anti-development thinking. They argue that development has its own logic, often very different from economic logic. Thus

unexpected outcomes result from using economic logic in a development context.

Further, the anti-development theorists portray development as an ever-changing phenomenon, evolving to meet the needs of the day. This evolution is development's undoing, since it has led to different interpretations of the development concept among rural peoples, governments, and development workers.

Overall, the anti-development critique approaches the topic of development in a negative manner. In the view of this author and development practitioner, the anti-development outlook is far too negative. While there are elements of truth to the anti-development movement, it is prejudicial to think the situation is hopeless even if some of the results are unexpected.

Current Development Approaches

Given the wide variety of development approaches operating simultaneously it is helpful to think of current approaches in two broad categories:

1) Non-Participatory;
2) Participatory.

A non-participatory approach to development implies that local people are not involved in the development planning, implementation or evaluation processes. In contrast, a participatory approach means that local people are involved with aspects of development that have a direct effect on them.

While such neat categorisations are useful, they are not entirely accurate. As development is both a process and a goal, peoples' involvement may vary greatly from one stage to another or from one component of a project to another. Often non-participatory approaches involve local peoples at some level in the process and "participatory" programmes involve local people in name only! Such are the pitfalls of current development thinking.

Present thinking about participatory development centres on power relationships. The idea that whoever holds power also wields control, is central to current thinking (Nelson and Wright 1995). As a physical scientist, the author of this dissertation likens this theory to Newton's law that "energy is neither created nor destroyed, but merely

changes form". In this case, power is neither created nor destroyed, it merely changes hands.

As noted in Chapter One, the strengths and weaknesses associated with both non-participatory (top-down) and participatory (bottom-up) approaches to development have been well publicised and debated (Chambers 1983, Gladden and Phillips-Howard 1992, Moris and Copesake 1993, Nelson and Wright 1995, Kidd 1993, Phillips-Howard 1993 and many more!). While it is not the author's attempt to recap these discussions here. It is important to look at the positives and negatives of the participatory approach as these form the basis of the thesis.

Oakley (1991) suggests that obstacles to participation can be divided into three broad categories:

1. Structural Obstacles - political and legal environment;
2. Administrative Obstacles - centralised governments, programmes and projects;
3. Social Obstacles - mentality of dependence.

There are some risks or limitations associated with participatory development as noted by Westphal 1994 and Oakley 1991. The first is that many users of participatory methods do not fully appreciate the participatory philosophy. Secondly in a truly participatory process rural peoples decide what problems should be addressed and in what order and this varies from the subject specific nature of most development projects. The third concern is that rural peoples may participate in the development planning process but are often left out of the development action process. Finally participatory processes can be high-jacked by the rural hierarchy and village politics, leading to the lessening of inputs by disadvantaged groups.

The benefits of a participatory approach to rural development, in the opinion of this author, far out-weigh the potential risks. Rural peoples can more accurately identify problems faced by rural peoples by using participatory methods. It allows for local adaptations which can employ scarce resources more efficiently. Using local knowledge reduces base-line data collection costs. Women, young people and the very poor are often neglected and a participatory approach empowers these groups. It also increases the nature and number of self-help initiatives (Uphoff 1986).

Chapter Summary

The main points of chapter two can be summarised as:

- Rural development is defined, by this author, as a learning and constantly evolving process, which may or may not involve outsiders, whereby rural, generally agriculture and natural resource dependent people overcome problems affecting their lives, so as to raise their living standards to a level sufficient to meet, at least, their basic needs, in a positive and measurable way.
- Development thinking since 1945 can be grouped into the following: development as growth, neo-marxist, eco-development, basic needs approach and the new right. The latter four groups are presently ongoing simultaneously, so;
- Current development approaches are often categorised as either participatory or non-participatory, dependant on the level of involvement of the local, affected peoples in the development process;
- While each of the two approaches has strengths and weaknesses, it is the view of this author, that a participatory approach to development is superior.

CHAPTER THREE

Extension:
Theories, Approaches and Methods

Aims and Objectives

Understanding how agencies and individuals interact with one another to improve their lives is a prerequisite to applying theoretical ideas effectively within real world situations. This chapter aims to explore the concept of extension as a building block which enables, the analysis of a case study. Specifically this chapter will:

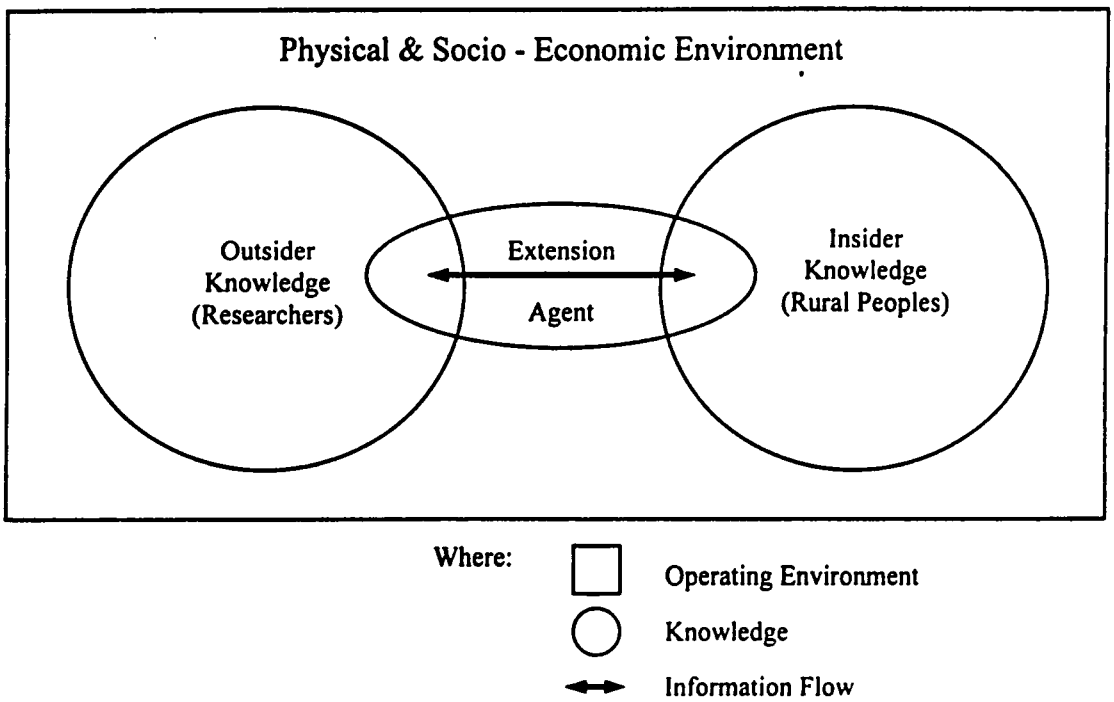
1. Define extension;
2. Explore extension approaches and methods;
3. Investigate the history of extension;
4. Discuss current extension organisation and management;
5. Examine the relationship between rural development and agricultural extension;
6. Probe research - extension - farmer linkages.

Extension Definitions

The term and concept of extension means different things to different people. In China the symbol for extension can be literally translated as "to push a new technology", the German word for extension means to "advise", while the English term extension infers counselling, consulting or disseminating (Albrecht *et al.* 1989, Hoffman 1995). At first glance, such variations appear minor. However, when one considers the contrast between "pushing", "advising" and "consulting" fundamental philosophical differences become apparent. The role of the power relationships concept, as noted in the last chapter, can be seen at work. How then is one to describe the concept if the generally accepted term varies in meaning from society to society?

The simplest way to avoid this trap of multiple connotations is to specify the components or ideas, which are inferred in the term extension (Figure 3.1). The concept of extension implies goals, means of achieving these goals, and a relationship between partners (researchers, extension agents and targeted peoples). Extension is a learning process - who does the learning is not necessarily predetermined.

Figure 3.1. Extension components.



Adapted From: Albrecht *et al.* (1989)

Various authors have defined extension and a number of these descriptions follow.

Albrecht *et al.* (1989) defined extension as the process whereby the extension worker tries to motivate his extension partner and to give him the capability, with the help of encouragement and ideas, to act to solve his acute problems.

Van Den Ban and Hawkins (1996) noted that extension is the conscious communication of information to help people form sound opinions and make good decisions.

Legans (1961) said that "the process of extension is one of working with people, not for them: of helping people become self-reliant, not dependent on others; ... in short, helping people by means of education to put knowledge to work for them.".

Extension can be defined as a policy instrument for inducing voluntary change through communication (Röling 1994).

Agricultural extension refers to the promotion of any aspect of technology development: how people acquire the necessary resources, how new technologies are evolved, what

influences their choice, the kinds of support a given technology requires, how its adoption can be financed and encouraged, and the kinds of protection it entails (Moris 1991).

Up to this point, only the overall concept of extension has been discussed. However, like development, there are many categories or types of extension. Similarly, a descriptive modifier is used to distinguish the extension subject area. Given the subject of this dissertation, agricultural and forestry extension is of prime concern.

This author views agricultural and natural resource extension as a joint learning process whereby outsider knowledge and insider knowledge is exchanged with the aim of improving rural livelihoods through advancements in agricultural and natural resource management.

Extension History

Prior to the 1960's extension was not considered a separate or distinct discipline. During this period extension was usually thought if as a component of rural sociology. By the mid 1960's, extension had emerged as a "stand-alone" science. This was to last for the next 20 years. However, by the early 1980's, extension had largely been drawn back into the fold of rural sociology.

Extension Approaches

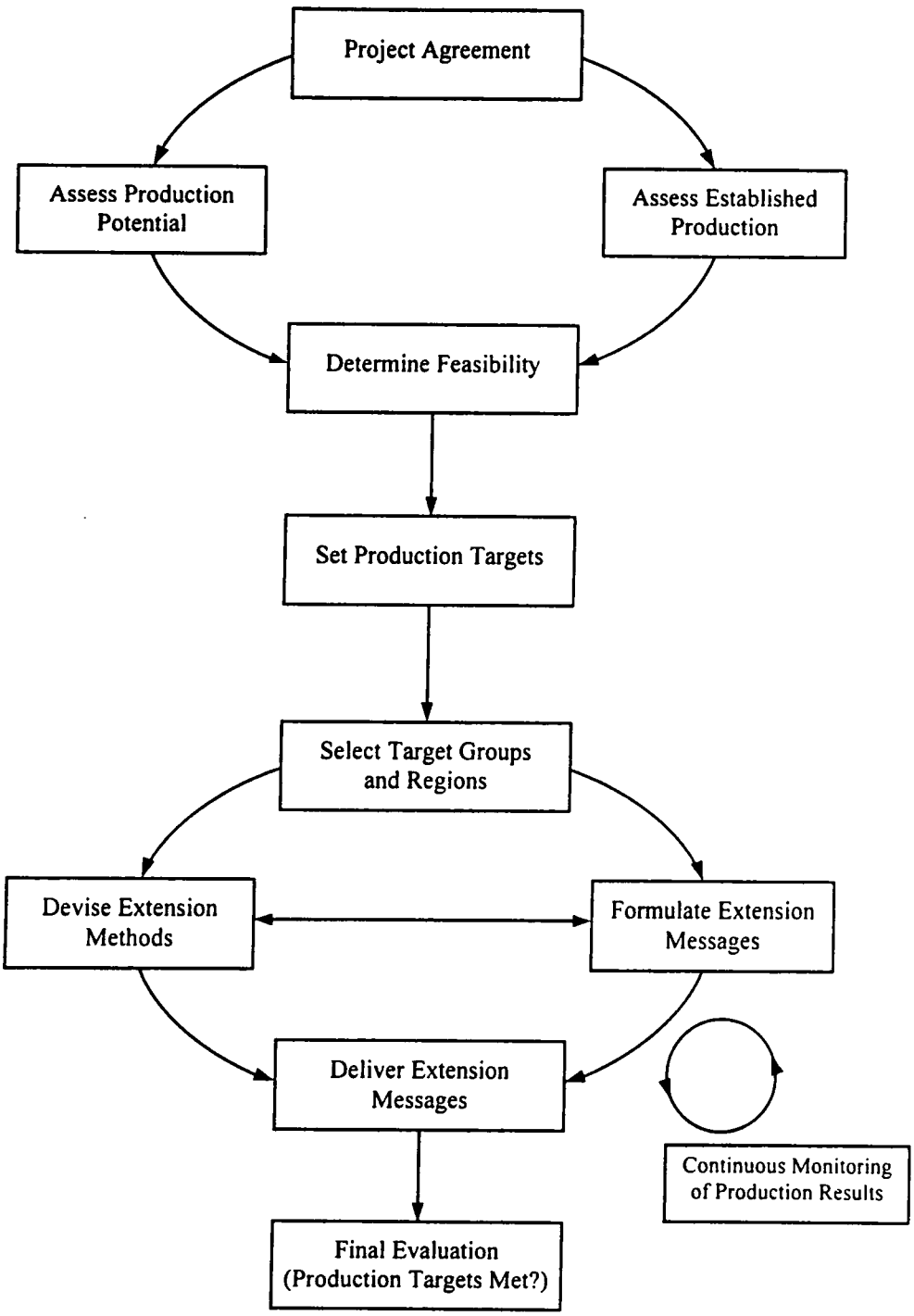
Basically there are two approaches to extension. These approaches correspond to the divisions within current development thinking as outlined in the previous chapter. Albrecht *et al.* 1989, Falconer 1987 , and many others, generally categorise extension activity as either:

A. Non-Participatory, From Above, Production Technology, or Top Down: which implies specified targets and prescribed solutions and focuses on selling technologies to rural users; or,

B. Participatory, From Below, Problem Solving, or Bottom Up: which has a target group orientation, phased or staggered planning and implementation, and focuses on farmer's knowledge and needs.

Figures 3.2 and 3.3 are graphical depictions of the two categories of extension. The diagrams are adapted from Albrecht *et al.* 1989.

Figure 3.2. Non-participatory (production) extension approach.



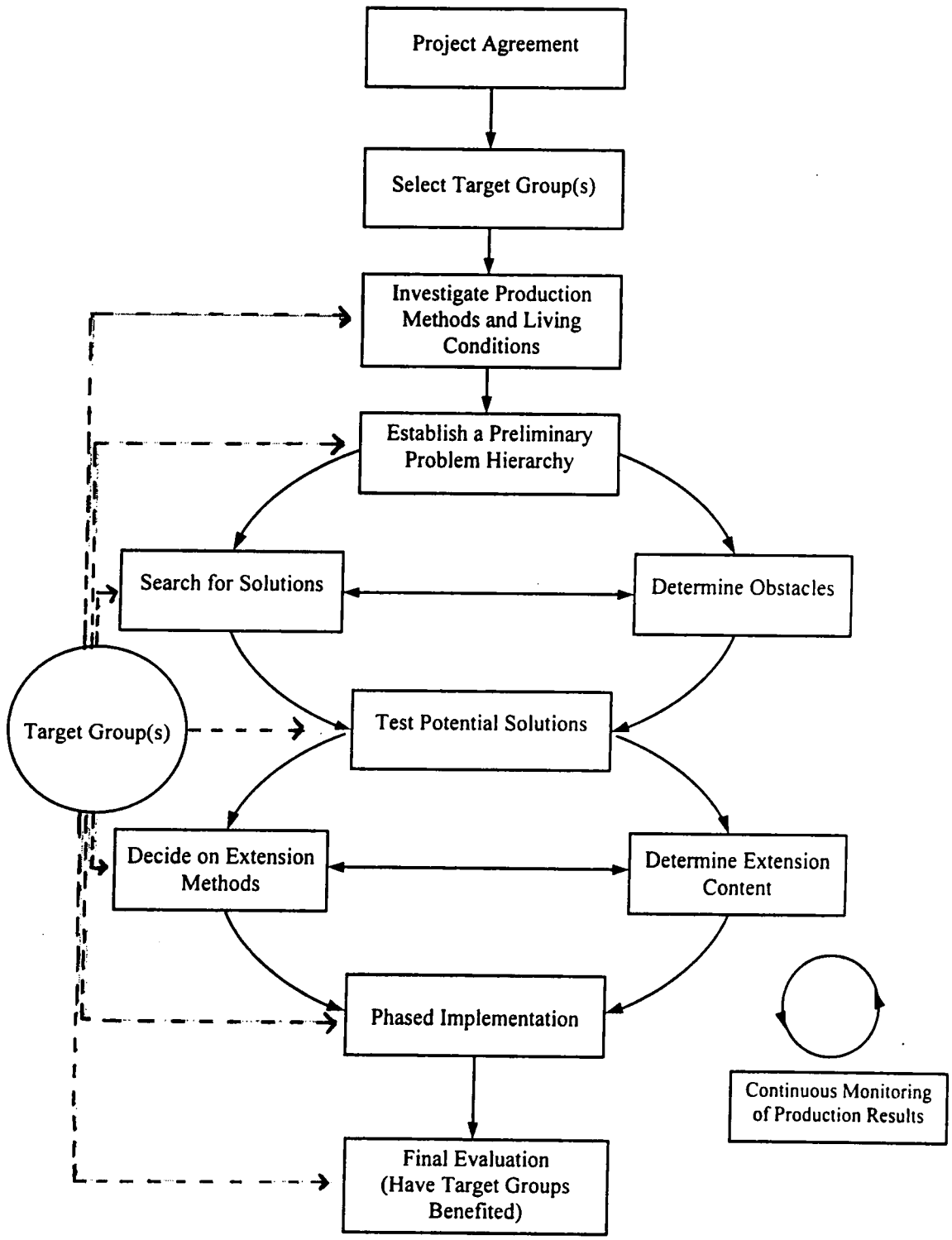
Where:

continuous process

leads to

Adapted From Albrecht *et al.* 1989

Figure 3.3. Participatory (problem solving) extension approach.



Adapted From Albrecht *et al.* 1989

There are few authors who would disagree with the broad generalisation that there are only two categories of extension methods. For example, Coutts (1994), following the lead of others, asserted that there are four extension paradigms: technology transfer, problem solving, education and human development. These approaches are complementary rather than conflicting as each is appropriate to a different situation. In turn, the situation was determined by the level of people skills and the level of situation complexity. However, given the debate around the transfer of technology and the problem solving approach (which require fewer people skills), it is unlikely that the education and human development paradigms (which require substantial people skills), will be dealt with in the near future.

Extension Methods and Tools

If extension is an exchange of ideas between insiders and outsiders, then a forum for this dialogue must be available. These forums or modes of communication are termed extension methods. Given that extension is a learning process, then the theories of adult learning are applicable to the subject. Since adults generally learn by individual action, observation of others, and discussion about event cause and effect, then the most effective extension methods will be those modelled after such learning approaches.

Extension methods are usually grouped into the following categories: mass media, group and individual methods, multimedia including audio-visual materials, folk media and modern information technology. Much of this section is derived from Albrecht *et al.* (1989), Van Den Ban and Hawkins (1988, 1996), Blackburn (1994) and others.

Mass media includes methods, which reach a large audience but usually allow for very little interaction between the insiders and the outsiders. Mass media includes such forums as television, radio, newspapers and other printed materials. These methods are arguably the least expensive, on a per capita basis, of all the categories of extension methods owing to the fact that one simple message is delivered to all participants.

Group methods include discussion forums such as meetings, farm and research institution visits, as well as workshops and training sessions. These group methods are generally less expensive than the mass media and allow greater opportunity for interaction between insiders and outsiders. In addition these methods allow for somewhat tailored messages.

Individual methods are those which allow for one-on-one discussion. This includes such methods as telephone and personal contact, handouts, and individualised letters. Given the demands placed on the extension agent, this extension method is the most expensive.

Multi-media, refers to the use of combination of extension methods. Usually this involves using a mass media method followed by more directed methods such as audio-visual aids which reinforce the mass media message as well as allow more opportunity for insider-outsider interaction.

Folk media means using traditional forms of entertainment such as plays, songs and stories to impart a message. These methods are more frequently used in the less industrialised countries as they are more sensitive to cultural and social issues.

Modern information technology extension methods are usually concerned with computer based communication methods such as mail, networks, and data base access and search. These methods are generally most available in wealthier societies. The amount and timeliness of the information available and the rapidity of accessing it is astounding.

Within each of the above extension method categories, there are a large number of communication channels or tools which can be used as forums or facilitators of outsider and insider interactions. Examples of the communications channels associated with the various extension method categories are found in Table 3.1.

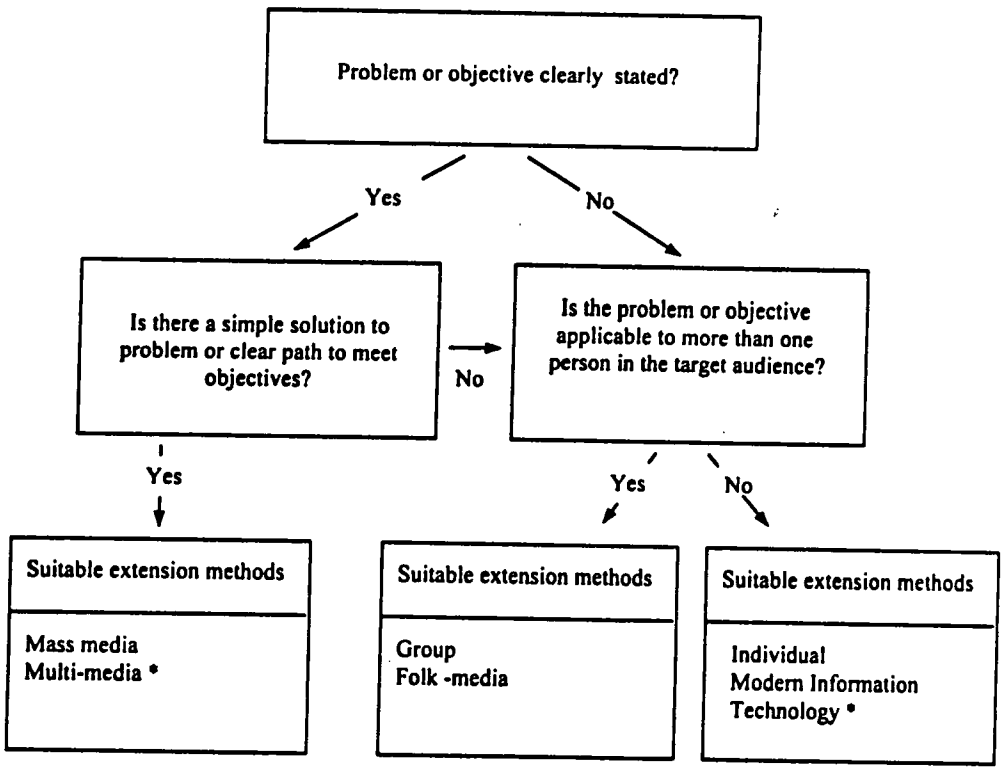
Deciding on which extension method or methods to use, is not a simple matter. The choice depends on such things as; the target community, the knowledge level of both the insiders and the outsiders, the problem(s) to be solved and its solution, as well as the goals of the project/program, and the capacity of the extension organisation. Basically the more complex or hazy the problem or solution is, then the more personal and interactive the extension method must be. Figure 3.4 displays an extension method decision-making key developed by the author.

Table 3.1. Detailed descriptions of extension methods.

Methods	Possible communications channels
Mass Media	• direct mail (brochures, pamphlets) • mass gatherings (shows,, festivals) • contests • exhibits, displays, signs, billboards • newspapers, magazines, newsletters • radio • television
Group	• meetings • tours • demonstrations • workshops, training sessions
Individual	• face-to-face conversation • handouts (samples, leaflets, lapel buttons) • telephone conversation • letter or individualised mailing • individual training
Multi-media	• combinations of extension methods • audio-visual aids
Folk Media	• plays • songs • story tellers
Modern Information Technology	• electronic data base access and search systems • computer networks • interment

Adapted from Woodis *et al.* 1994.

Figure 3.4. Extension methods decision making key.



* Suitable for use in almost any category dependent upon specific use.

Extension Organisation and Management

Successful extension organisations will:

- enable effective communication, with farmers, within the organisation and with researchers;
- be adaptive and flexible to deal with an ever changing environment;
- have motivated staff and will allow them the opportunity to grow as professionals;
- have a clearly defined mandate and role.

Extension organisations can be managed by a variety of agencies including: government ministries and parastatals, educational institutions, non-governmental organisations, commercial firms, co-operatives, and farmer associations. These organisations may be small or large scale in their operations. Further, extension activities may be carried out on a project by project basis.

While historically most funding for extension activities came from governments, there is increasingly a wider array of complex funding and delivery mechanisms (Kidd *et al.* 1997, Rivera and Gustafson 1991). Both the public and private sectors can be involved in the financing and delivery of extension systems. Figure 3.5 shows the various combinations of financing and provision options.

Figure 3.5. Strategies for financing and providing extension.

FINANCING EXTENSION	PROVIDING EXTENSION: Public Provision	PROVIDING EXTENSION: Private Provision
Public Finance	Free public extension service.	Subsidies, Contracts, Vouchers.
Private Finance	Cost recovery by government agents.	Private enterprise.

From: Kidd *et al.* 1997

Since there are two basic approaches to extension (see Figures 3.2 and 3.3), it is understandable then, that there are two basic types of extension organisations. Extension organisations are generally arranged to follow either the transfer of technology approach or the problem solving approach. The nature of the organisation required to implement each of these approaches is very different. One must be designed efficiently and effectively to place the desired information within easy reach of the target audience. The other must encourage a two way flow of information so that farmer-perceived problems are addressed and workable solutions are found.

Moris (1991) described seven organisational alternatives used to provide tropical African farmers with extension advice and agricultural support services. These organisational alternatives include:

- Ministry-operated extension services;
- Export crop parastatals;
- Commercial firms;
- Marketing co-operatives;
- Farmers' and village associations;
- Project-based extension; and,
- Training institutions.

Each of Moris' organisational alternatives follows one or the other of the two major approaches to extension: transfer of technology or problem solving.

The technology transfer approach to extension is imbedded in governments and parastatal organisations throughout the developing world which utilise the World Bank supported "Training and Visit" (T&V) extension system. This system was developed for irrigated agriculture in Israel, and was then diffused rapidly through Asia and Africa (Benor and Baxter 1984). The system is designed to improve agriculture production by ensuring that farmers have regular access to well-trained extensionists who have close links with agricultural research institutions.

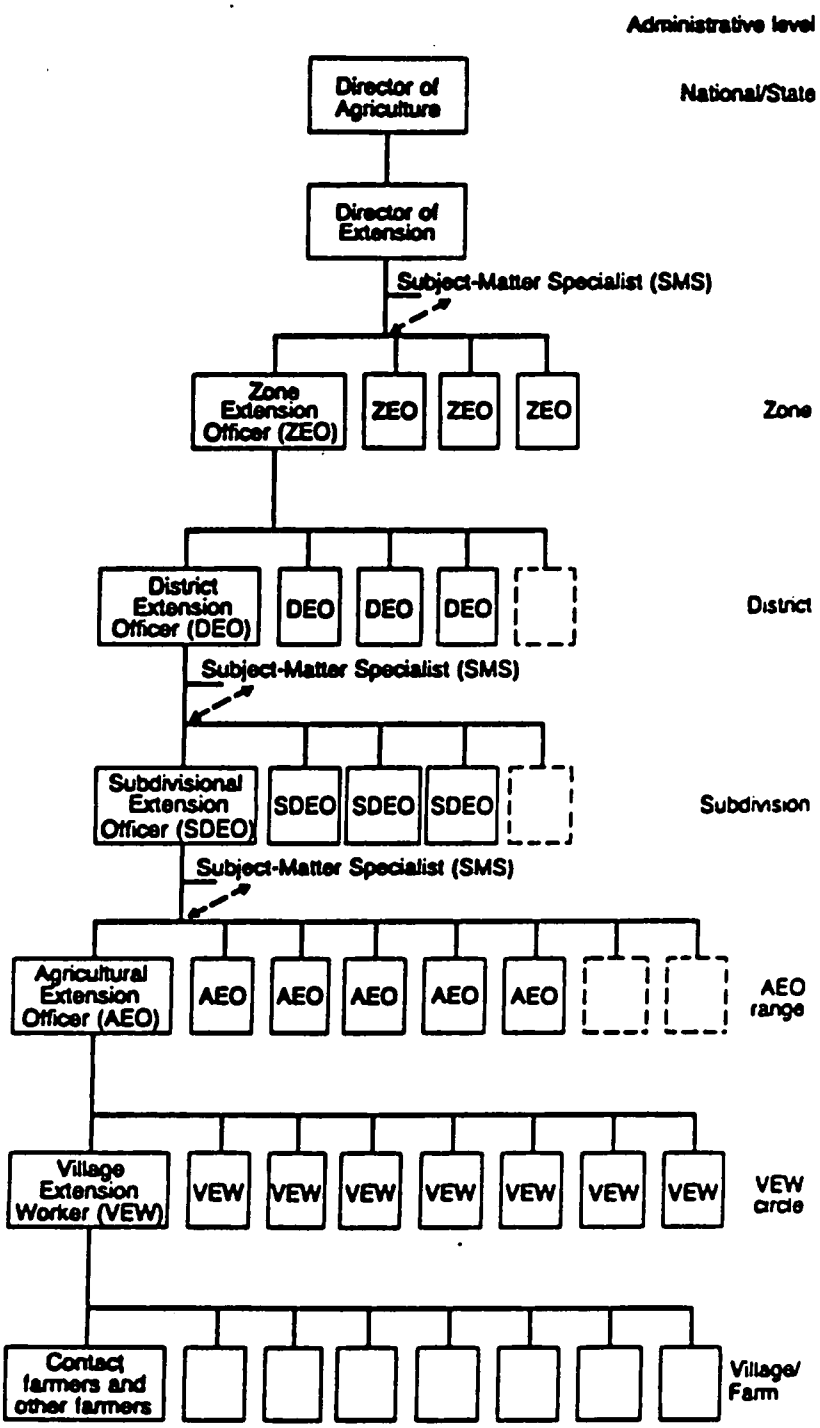
Other organisations, such as commercial firms and marketing co-operatives often use an extension approach, which is production oriented. These organisations have rigidly structured delivery mechanisms.

The T&V system is a hierarchical one. Research provides the extension programme with information and solutions to problems identified by the extension service. Subject matter specialists (SMS) then formulate specific messages which are then provided to the extension staff through regular trainings. Village level extension workers or agents (VEW, VEA) supply these prepared messages to a number of contact farmers on a regular basis. The contact farmers in turn pass the messages on to others in their area. To ensure that the village level workers are successful, they are supervised by area extension officers (AEO) who in turn are responsible to zonal or provincial level extension staff (ZEO, PEO). In geographically large jurisdictions there may be even further subdivisions within the line of command. Figure 3.6 presents a graphical representation of the T & V system (Van Den Ban and Hawkins 1988, 1996).

Criticisms of the T&V system are widespread. The high cost of maintaining the organisations is said to be unsustainable (Van Den Ban and Hawkins 1996, Purcell 1993, Albrecht 1992, Hulme 1991). The system largely ignores women's issues and other divisions within society, especially in Africa where women play a vital role in the agriculture sector and societal differences are common (Percell 1993, Due *et al.* 1987, Kpohazounde 1995, Albrecht 1992). Further, the system has been criticised for its authoritarian nature (Albrecht 1992, Gladden and Phillips-Howard 1993, Hulme 1991) and inappropriate technologies and poor research-extension linkages (Lancini 1987, Venkatesan 1995, Eponou 1995, Roling 1988, Manig 1992, Albrecht 1992). In addition, there are concerns about the lack of qualified staff and their relationship with input provision (Albrecht 1992).

An alternative to transfer of technology extension approach (T&V), is the problem solving approach. This approach is generally favoured by non-governmental and farmers' groups. There is no specific organisation structure associated with the provision of problem solving extension services. However, organisations have to be flexible to meet the demands of the target group and the organisation and must be supportive of their highly trained and highly motivated extension workers.

Figure 3.6. A stylised description of the Training and Visit extension system.



From: Benor and Baxter (1984).

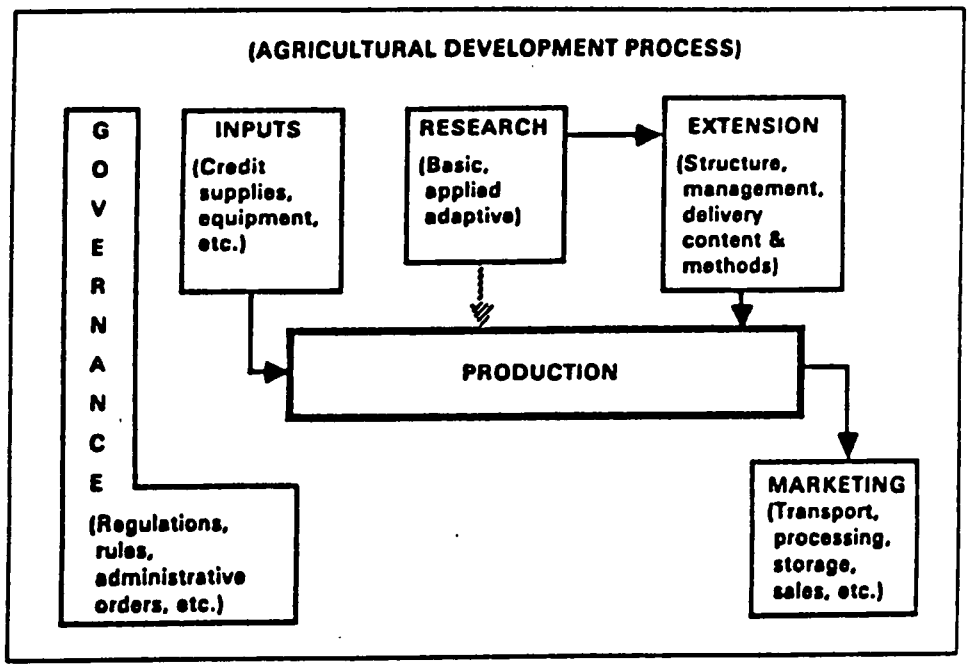
Problem solving approaches to agricultural extension have their difficulties. Such shortcomings, as noted by Odell (1986), Falconer (1987), Nagel (1992) and others, include:

- decision making is time consuming;
- group methods leads to exploitation of common resources;
- aversion to admitting mistakes and shortcomings;
- inadequate appreciation of power relationships;
- special training required for extension agents;
- history of negative legislation and poor rapport with local government staff; and,
- land tenure problems.

Rural Development and Extension Interactions

Rivera *et al.* (1989) indicated that agricultural extension is an interdependent and interactive function within the agricultural development process. Figure 3.7 provides a graphic depiction of this relationship.

Figure 3.7. Agricultural extension in the context of agricultural development.



From: Rivera *et al.* (1989)

From the above illustration, one can see that extension is affected by and effects other forces such as education, infrastructure and government policy.

Baker (1989) stated that rural development encompasses three key elements: rural well being or welfare, resource development and organisational development all aimed at improving the livelihoods of rural people. Further, he went on to say that extension and community development may both be used to achieve "rural development", because extension and community development are processes - courses of action, procedures or a series of steps that lead to change in society.

Research - Extension - User (Farmer) Linkages

Bennett (1989) proposed three models to describe the linkages between research, extension and the knowledge user (Table 3.2).

Table 3.2. Research – extension – user linkage models.

Model	Description
Research Transfer	1. Extension programmes based on the outputs from research agencies. 2. Research identifies users needs. 3. Extension conducts adaptive research. 4. Extension transfers information to users. 5. Extension influences activities of research agencies.
Adult Education	1. Extension identifies users needs and relevant outputs from research agencies. 2. Extension transfers information to users. 3. Extension educates users.
Interdependency	1. Extension and research identify user needs and relevant outputs. 2. Extension transfers information to users. 3. Extension educates users.

Adapted From: Bennett (1989)

Albrecht *et al.* (1989) noted that research and research agencies usually have the following weaknesses:

- Remoteness from practical application – promotion based on publication, etc.;
- Lack of target group understanding – do not involve local people or their ideas;
- One-sidedness – ignore local knowledge and side effects, aim for short-term results;
- Organisational faults – multiplicity of institutions, discontinuity, and institutional rivalries.

Basically, it is the role of extension to ensure that users groups are appropriately connected with research agencies so that their problems are addressed and their constraints are mitigated. In short, extension is the conduit between research agencies and local peoples.

Chapter Summary

The basics of Chapter Three can be summarised as follows:

- Agricultural extension is a joint learning process whereby outsider knowledge and insider knowledge is exchanged with the aim of improving rural livelihoods through advancements in agricultural and natural resource management;
- Extension approaches can be classified as either "top-down/transfer of technology" or "bottom-up/problem solving";
- Extension methods include; mass media, group and individual methods, multimedia, folk media and modern information technology;
- Extension organisations are designed to follow either the transfer of technology approach or the problem solving approach;
- The training and visit (T&V) system of extension, as promoted by the World Bank, is designed to "transfer technology" and has significant shortcomings;
- Alternatives to the T&V system are usually much more participatory (i.e. target group focused) and are generally modelled after farming systems research work;
- Agricultural extension is an interdependent and interactive function within the agricultural development process;
- Extension is the bridging mechanism between research and local user groups.

CHAPTER FOUR

Agroforestry
Theory and Methods

Aims and Objectives

This chapter aims to introduce the concept, the methods and the institutional arrangements of agroforestry. Specifically this chapter will:

1. Define agroforestry;
2. Analyse agroforestry benefits and constraints;
3. Describe agroforestry systems and practices;
4. Discuss agroforestry planning processes;
5. Study agroforestry monitoring and evaluation methods;
6. Investigate the history of agroforestry;
7. Examine the relationship between rural development, extension and agroforestry; and,
8. Explore institutional arrangements.

Agroforestry Definitions

Agroforestry is a component or sub-set of social forestry, whereby trees and shrubs are used to provide social, economic and cultural values to the individual and community. As Dove (1992) noted the terms "social forestry", "community forestry", "farm forestry" and "agroforestry" are often used interchangeably as all refer to the combination of trees and people. Further, he mentioned that the differences between the terms have much more to do with "turf" building within development agencies than it has to do with defining real world systems. While this particular view has been debated (Nair 1993, Tiwari 1986), the relationship between these terms appears undeniable when one reviews the definitions commonly associated with agroforestry.

Bene *et al.* (1977) defined agroforestry as a sustainable management system for land that increases overall production, combines agricultural crops, tree crops and forest plant and/or animals simultaneously or sequentially, and applies management practices that are compatible with the cultural patterns of the local population.

The International Centre For Research in Agroforestry (ICRAF), based in Nairobi Kenya,

is, arguably, the leading force in agroforestry research today. The traditional ICRAF definition of agroforestry is a collective name for land-use systems and practices in which woody perennials are deliberately integrated with crops and/or animals on the same land-management unit. This integration can be either in a spatial mixture or in a temporal sequence. There are normally both ecological and economic interactions between the woody and the non-woody components in agroforestry (ICRAF: Lundgren and Raintree 1983).

Recently however, Roger Leaky, the current director of research at ICRAF, has suggested that agroforestry be re-defined as a dynamic, ecologically based, natural resource management system that, through the integration of trees in farm- and range- land, diversifies and sustains smallholder production for increased social, economic, and environmental benefits (Leaky 1996). He suggests this change because, he says, too many people see agroforestry as a set of distinct prescriptions for land use rather than as a phase in the development of a productive agroecosystem.

Given these definitions, how can one not consider agroforestry to be a part of, or a component of social forestry given that agroforestry is aimed at providing social, economic and environmental benefits - just like social forestry!

A number of authors, including this one, take a much broader view of agroforestry. Often the term is applied to any farming system which incorporates trees and other woody plants (Dove 1992, Abel *et al.* 1989, Rocheleau *et al.* 1988).

The author of this document defines agroforestry as the interaction of crops, trees and other woody plants, and animals within a farming system.

Agroforestry benefits and constraints

To understand the zeal which has accompanied the promotion and adoption of agroforestry by organisations and individuals alike, it is necessary to appreciate the benefits that agroforestry has to offer. However, agroforestry, like any technology, is not immune to problems.

Numerous authors have discussed agroforestry benefits and constraints (Bene *et al.* 1977,

Rocheleau 1988, Nair 1990, Young 1987, 1988 and 1990, Steppler and Lundgren 1988, Weinstock 1985, and others). Agroforestry benefits can be divided into three broad categories: biophysical, social and cultural, and economic. Sometimes the distinction between the categories is hazy. Constraints to agroforestry are often the result of the improper application of the technology within specific biophysical and/or socio-cultural situations. Table 4.1 summarises these, benefit – constraint, discussions.

Table 4.1. Agroforestry benefits and constraints.

BENEFITS	CONSTRAINTS
A. Biophysical	
Improves soil fertility by adding organic matter and/or fixing nutrients.	Woody plants compete with other crops for water, nutrients and light.
Improves microclimate by reducing wind Velocity, drying, and temperature.	Improperly planted trees can provide too much shade to the other crops.
Increases biodiversity.	Some trees are allelopathic and produce toxins which inhibit the growth of other plants.
Reduces soil erosion by wind and water.	Improperly planted trees can increase water erosion problems.
B. Social and Cultural	
Secured land tenure through tree planting.	Secured land tenure through tree planting.
Productive use of marginal common lands.	Tragedy of the commons.
Supply of food for humans and livestock.	
Supply of medicines.	Misunderstood indigenous technical knowledge.
Supply of building materials.	Access, transport.
Raw materials for cottage industry.	Access, transport.
C. Economics	
Cash income from sale of products.	
Creates capital stocks (tree as savings).	Long production period of trees will delay returns and increases risks such as tenure changes, damage, disease, etc.
Spreads the demand for labour over the seasons and years.	Labour costs can increase due to increased complexity of the farming system. Tree and other crops' planting time can coincide.
Diversifies crops can lead to self-sufficiency and reduces risk of market failure, pests, etc.	Adverse interactions between trees and other crops.

Agroforestry systems and practices

The terms system and practice are often confused in agroforestry discussions. An agroforestry system is a specific local example of a practice, characterised by environment, plant species and their arrangement, management, and socio-economic functioning. An agroforestry practice denotes a distinctive arrangement of components in space and time (Nair 1993).

Agroforestry systems are often classified based on the type of components included within the system (King 1979, Nair 1993, Nair 1990, Nair 1985). For example:

- Agrisilviculture - crops and trees;
- Silvopastoral - pasture/animals and trees;
- Agrosilvopastoral - crops, pasture/animals and trees;
- Multi-purpose tree - management of trees for wood, food, medicine, etc.;
- Other - bees (apiculture) and trees, fish (aquaculture) and trees, etc.

Figure 4.1 is a graphical representation of agroforestry systems based on the type of components.

Some authors have stressed that it is important to see agroforestry as an approach to land-use rather than as a fixed arrangement of plants or a particular combination of species (Rocheleau *et al.* 1988, Leaky 1996). Table 4.2 contains a summary of the most common tropical agroforestry practices.

Agroforestry History

Agroforestry did not become established as an "official" scientific discipline and institutionalised until the mid 1970's with the release of John Bene's report for the International Development Research Centre in Ottawa and the subsequent establishment of the International Council for Research in Agroforestry (King 1989).

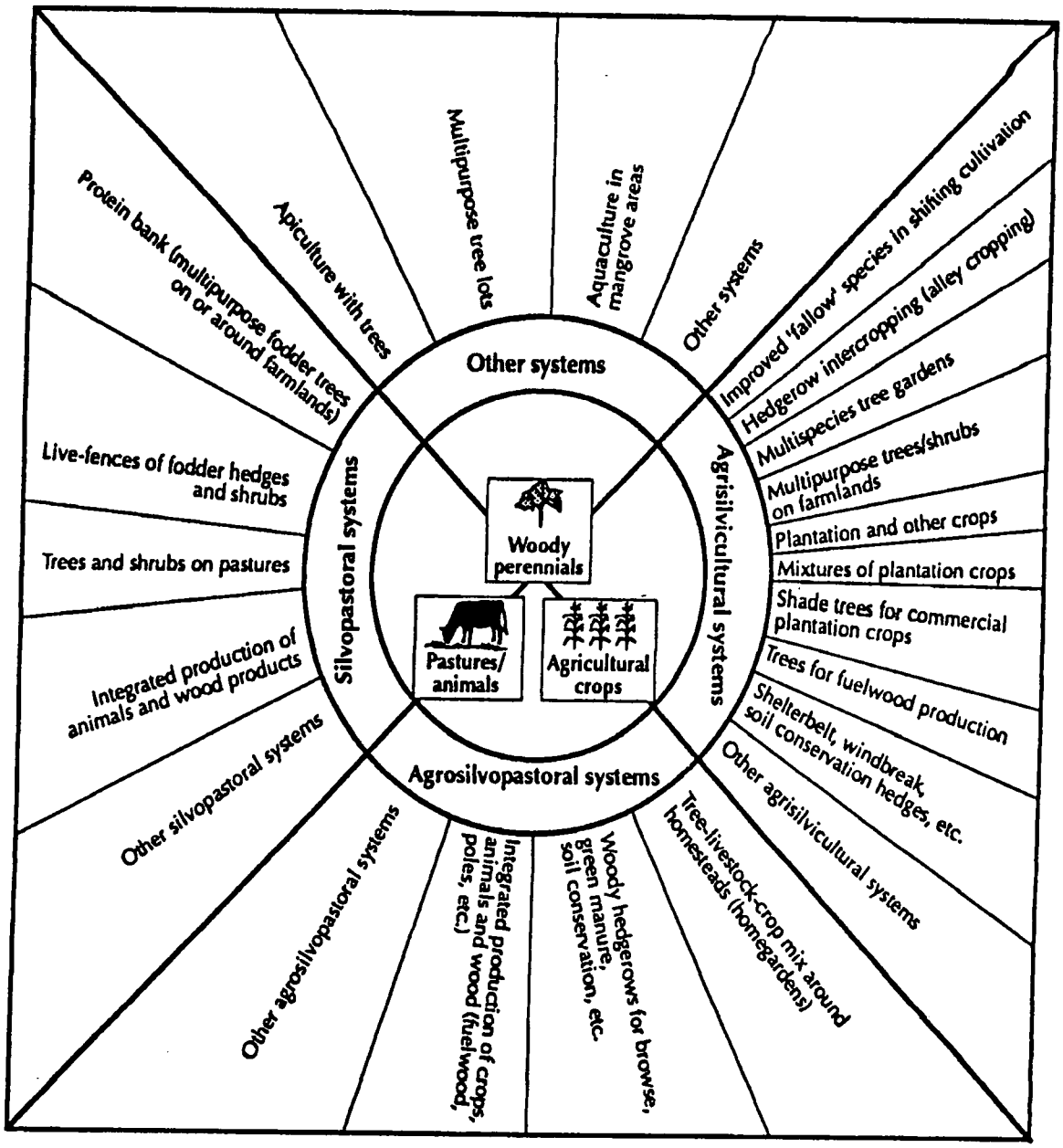
Nair (1993) noted that while the term agroforestry was coined by Bene and others in 1977, a very similar term "agriforestry" and written discussions about incorporating trees into farming were prominent in the mid 1930's.

However, it is evident that agroforestry practices (i.e. the inclusion of tree crops into farming systems) has been practised, at one time or another and in one location or another, since humans established agricultural societies.

Rural development, extension and agroforestry

The links between rural development and agroforestry have been recognised for a long time. With the release of their report in 1997 John Bene and team noted that agroforestry is a new weapon which is available for use in the war against hunger, inadequate shelter

Figure 4.1. Agroforestry systems.



Source: Nair, 1985

Table 4.2. Common agroforestry practices in the tropics.

Agroforestry practice	Arrangement of components	Major groups of components
	AGRISILVICULTURAL SYSTEMS (crops-including shrub/vine/tree crops-and trees)	
Improved fallow	Woody species planted and left to grow during the 'fallow' phase	w fast-growing preferably leguminous h common agricultural crops
Taungya	Combined stand of woody and agricultural species during early stages of plantation establishment	w usually plantation forestry species h common agricultural crops
Alley cropping	Woody species in hedges; agricultural species in alleys in between hedges; microzonal or strip arrangement	w fast-growing preferably leguminous that coppice vigorously h common agricultural crops
Multilayer tree gardens	Multispecies, multilayer dense plant associations with no organised planting arrangements	w different woody components of varying forms and growth habits h usually absent; shade-tolerant ones sometimes present
Multipurpose trees on croplands	Trees scattered haphazardly or according to some systematic pattern on bunds, terraces or plot/field boundaries	w multipurpose trees, fruit trees h common agricultural crops
Plantation crop combinations	1. Integrated dense multistorey mixtures of plantation crops 2. Alternate or other regular arrangements 3. Shade trees for plantation crops; shade trees scattered 4. Intercropping with agricultural crops	w plantation crops such as coffee, cacao, coconut and fruit trees (especially in 1); fuelwood/fodder species (especially in 3) h usually present in 4, and to some extent in 1; shade-tolerant species
Homegardens	Intimate, multistorey combinations of various trees and crops around homesteads	w fruit trees predominate; also other woody species, vines, etc.
Trees in soil conservation and reclamation	Trees on bunds, terraces, raisers, etc., with or without grass strips; trees for soil reclamation	w multipurpose and/or fruit trees h common agricultural species
Windbreaks and shelterbelts, live-hedges	Trees around farmland/plots	w combination of tall-growing spreading types h local agricultural crops

Table 4.2. (continued) Common agroforestry practices in the tropics.

Agroforestry practice	Arrangement of components	Major groups of components
Fuelwood production	Interplanting fuelwood species on or around agricultural lands	w fuelwood species h local agricultural crops
	SILVOPASTORAL SYSTEMS (trees and pastures and/or animals)	
Trees on rangeland or pastures	Trees scattered irregularly or arranged according to some systematic pattern	w multipurpose; of fodder value f present a present
Protein banks	Production of protein-rich tree fodder on farm/rangelands for cut and carry fodder production	w leguminous fodder trees h present f present
Plantation crops with pastures and animals	Example: cattle under coconut crops in south-east Asia and south Pacific	w plantation crops f present a present
	AGROSILVOPASTORAL SYSTEMS (trees and crops and pasture/animals)	
Homegardens with animals	Intimate, multistorey combination of various trees and crops, as well as animals around homesteads	w fruit trees predominate; also other woody species a present
Multipurpose woody hedgerows	Woody hedges for browse, mulch, green manure, soil conservation, etc.	w fast-growing and coppicing fodder shrubs and trees h similar to alley cropping and soil conservation a not present: but usually kept nearby

Table 4.2. (continued) Common agroforestry practices in the tropics.

Agroforestry practice	Arrangement of components	Major groups of components
	OTHERS	
Apiculture with trees	Trees for honey production	w honey producing (other components may be present)
Aquaforestry	Trees lining fish ponds, tree leaves used as 'forage' for fish	w trees and shrubs preferred by fish (other components may be present
Multipurpose woodlots	for various purposes (wood, fodder, soil protection, soil reclamation, etc.)	w multipurpose species; location-specific species (other components may be present)

Note: w = woody, h = herbaceous, f = fodder, a = animals

□

Adapted from: Nair (1993)

and environmental degradation. Further he noted that this weapon has been in the arsenal of rural people since time immemorial, and may be more useful since no radical change in the life style of rural people was required.

It is important to note that agroforestry is not a goal for development but rather is a means to achieve a goal (Duchhart *et al.* 1989)

Hoskins (1987) noted that as agroforestry moves out into farmers' fields then overall development issues, especially at the policy level, become more important. As a tool for development, agroforestry will yield the greatest benefits when the technology is placed in the hands of farmers and when political decision makers support this.

The link between extension and rural development was discussed in the last chapter. However there are differences between agricultural extension and agroforestry extension.

Hoskins (1987) suggested that the combinations of social and political factors which are involved in promoting trees in traditional farming and livestock systems are unique and thus require special emphasis. Yet agroforestry extension is often compared to agricultural extension and the methods used are not tailored to include the special legal status of tree crops in many societies, the long time horizon before benefit provision, different labour requirements and many others.

Scherr (1992) mentioned that while agroforestry extension efforts are slated to increase greatly in the 1990's, little effort has been expended on assessing the effectiveness of such activities. How then is one to be sure that agroforestry efforts will contribute to rural development?

Given that: (1) change is an inevitable part of development and (2) extension is an instrument of change and (3) agroforestry has the potential to improve rural livelihoods, then it is reasonable to assume that agroforestry extension has a role to play in improving the quality of life for rural peoples.

Agroforestry planning

Muller and Scherr (1990) indicated that four types of information are necessary for planning successful agroforestry designs. Namely;

- Biophysical characteristics - of the project area that affect tree growth or crop/animal/tree interactions or management;
- Priority needs - primarily of the target group;
- Opportunities and constraints - to agroforestry including ecological, cultural/societal and economic concerns;
- Existing information - about agroforestry in the project area from both farmers and outsiders, including research stations.

Many authors, including, Muller and Scherr 1990, Buck 1990, Warkentin *et al.* 1990, Rocheleau *et al.* 1988, Wiersum 1990, Duchhart 1989 have discussed agroforestry planning methods. Table 4.3 compares and contrasts different planning methods (Adapted from Muller and Scherr 1990).

Warkentin *et al.* (1990) discussed the development of a computer run, knowledge-based expert system for planning and design of agroforestry systems. Since that time, expert systems seem to have fallen out of fashion. This is likely due to the difficulties in successfully modelling "integrative" subjects such as agroforestry systems and the general lack of input data on specific sites.

As agroforestry is a diverse discipline involving crops, trees (and other plants!) and livestock, it requires integrative approaches and is well suited to participatory planning and evaluation methodology (Chambers 1988).

Agroforestry monitoring and evaluation

The combination of technical components (hard-ware) and non-technical components (soft-ware) within agroforestry causes great difficulties for anyone who attempts to monitor or evaluate any agroforestry project.

Table 4.3. Agroforestry Planning Methods.

Method	Analysis Level	Target Group Participation	Information Collected	Who Implements	Expertise Required	Speed
Rapid Rural Appraisal (RRA)	Individual, Group, Household	respondents, opportunity for unsolicited comments	Variable, usually needs assessment, opportunities and constraints	project staff, special teams	Interview and visualisation techniques,	Variable, usually less than 4 weeks
Participatory Rural Appraisal (PRA)	Individual, Group, Household	respondents and active participants in decision making	Needs, opportunities, and constraints	local peoples, project staff, special teams	Visualisation, listening, group facilitation	variable
Formal Survey	Individual or Household	respondents	Needs assessment, opportunities and constraints	extension workers, special teams	Survey design, statistics, computers	extended time periods necessary
ICRAF Diagnostic and Design (D&D)	Household, Community, Sub-region	respondents, opportunity for unsolicited comment	needs, opportunities and constraints	multidisciplinary team of experts	D&D training, technical expertise	1 - 3 weeks
Participatory D&D	Household, group	negotiation	needs, opportunities and constraints	extension workers	group facilitation techniques	very brief at many locations
Agroecosystem Analysis	Community, other levels occasionally	respondents with opportunity for unsolicited comment	needs, opportunities, and constraints plus existing information and biophysical site characteristics	multidisciplinary team of experts and knowledgeable local people	training in agroecosystem analysis, local and/or technical expertise	1 week or less
Landscape Planning	Community, locality, subregion	negotiation	needs, opportunities, constraints plus existing information biophysical site characteristics	co-ordinated by land managers with involvement of local and regional planners, farmers and local authorities	landscape planning	several months
Land Evaluation	Subregion, region	little or none	biophysical site characteristics, existing information	land-use specialists	land evaluation, technical expertise	usually more than 1 year

Adapted from: Muller and Scherr, 1990.

The monitoring and evaluation of agroforestry is often complex due to:

- the integrative nature of the subject;
- the fact that multiple products are produced at different times;
- the lack of technical information about agroforestry systems and components;
- the fact that non-monetary benefits (i.e. soil conservation, erosion control, etc.) often result;
- the long time scale (horizon) associated with tree crop and non-monetary benefit production;
- the subsistence nature of most agroforestry farming systems (Scherr and Muller 1991a, Scherr and Muller 1990).

The assessment, monitoring and evaluation of social agroforestry projects and programmes has been discussed by many authors (Scherr and Muller 1991a, Scherr and Muller 1990, Davis-Chase 1990, Duchart *et al.* 1989, and others). Table 4.4 describes some methods of evaluating agroforestry programme/project impact. This table was adapted from Scherr and Muller (1990).

Chapter Summary

The main points of this chapter can be summarised as follows:

- Agroforestry can be defined as the interaction of crops, trees (woody plants) and animals in a farming system;
- Agroforestry is a subset or component of social forestry whereby trees and shrubs are used to provide social, economic and cultural values to individuals and communities;
- Agroforestry benefits and constraints can be categorised into: Biophysical, social/cultural and economics;
- Agroforestry systems are classified based on the type of components within the system such as agrisilviculture, silvopastoral, and agrosilvopastoral;
- Agroforestry has been ongoing since before written history, but the term was not really applied by the international community until 1977;
- Agroforestry is a means of achieving rural development;
- Agroforestry planning, monitoring and evaluation are complex issues and a wide variety of procedures are available.

Table 4.4 Methods for agroforestry impact evaluation

Method	Expertise required	Farmer participation in evaluation	Methodological problems	Appropriateness for different types of impact[1,2]					
				Trees grown	Land use changes	Farmer Knowledge/ attitudes	Products/ services availability	Costs benefits	Types of participants
Sequenced visual records	mapping or photographic expertise	none	identification of project/ non-project areas and of agroforestry interventions	2	1	3	3	3	3
Informal farmer surveys	interviewing skills	as respondents, but potential for feedback	representativeness of sample	3	3	2	1*	2*	1
Formal farmer surveys	statistical skills, survey management, interviewing skills	as respondents	sample selection, statistical evaluation, question formulation	3	3	1	1*	3	1
Farmer meetings/ workshops	facilitation skills	as collaborators	structure and management to facilitate free of exchange of views	3	3	2	2	2*	1
Formal field surveys	statistics, survey management, mensuration	minimal	sample selection, statistical evaluation, field measurement methods	1	1	3	3	3	2
Informal field surveys	mensuration, observational skills	minimal	representativeness of sample	2	2	2	3	3	2
Trend analysis of project records	analytical skills	none	regular compilation of data	1	2	3	1	2	1
Case studies of households or communities	social and economic evaluation, mensuration, communication skills	as collaborators	selection of representative cases	3	3	1	1	1	3

1 According to authors' judgement
2 Ranking scale: 1 = most appropriate; 2 = appropriate for rough indicators; 3 = less appropriate.
* indicates subjective, qualitative evaluation.
Adapted from Scherr & Muller 1990.

CHAPTER FIVE

Nigerian Development, Extension and Agroforestry: An Idealised Agroforestry Extension Model

Aims and Objectives

This chapter aims to briefly explore the Nigerian approach to rural development, agricultural extension and agroforestry, as outlined in the previous chapters. Further this chapter will present a model for introducing the ideal agroforestry extension project into a Nigerian agricultural development organisation. Specifically this chapter will:

1. Describe Nigeria and Plateau State;
2. Investigate Nigerian rural development;
3. Research Nigerian agricultural extension;
4. Explore Nigerian agroforestry methods;
5. Examine the relationship between rural development, extension and agroforestry in Nigeria.
6. Build a model of the ideal agroforestry extension system.

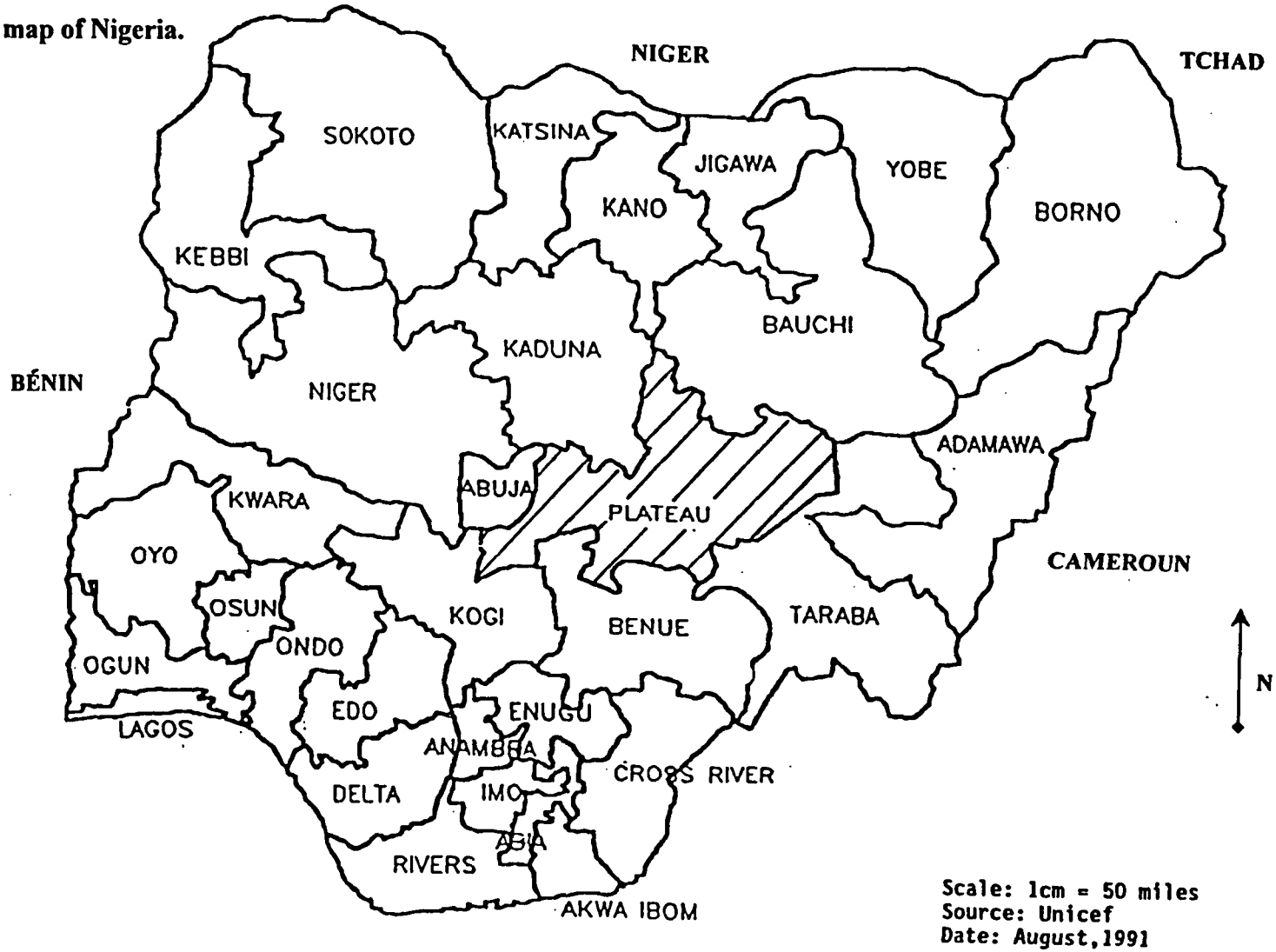
Nigeria: Facts and Figures

The information in this section is derived from the Europa World Yearbook (1989), C.I.D.A. (1990), CUSO (1988), NCMM (1985) and others. Table 5.1 provides a summary of this section. This information is correct as of 1993.

Nigeria covers an area of 923,768 sq. kilometres in West Africa and consists of thirty States and a Federal Capital Territory. Abuja, the capital city, is located in approximately the geographic centre of the country (Figure 5.1).

The ecology varies from Mangrove swamps along the Atlantic coast through Rainforest and Savannah to near desert or Sahel in the far north (Figure 5.2). With such varying ecosystems it is natural to find many different cultures and languages. Table 5.1 provides a concise description of the land, its resources and its people.

Figure 5.1. Administrative map of Nigeria.



Adapted from Adegbhin and Igboanugo (1990).

Figure 5.2. Ecological map of Nigeria.

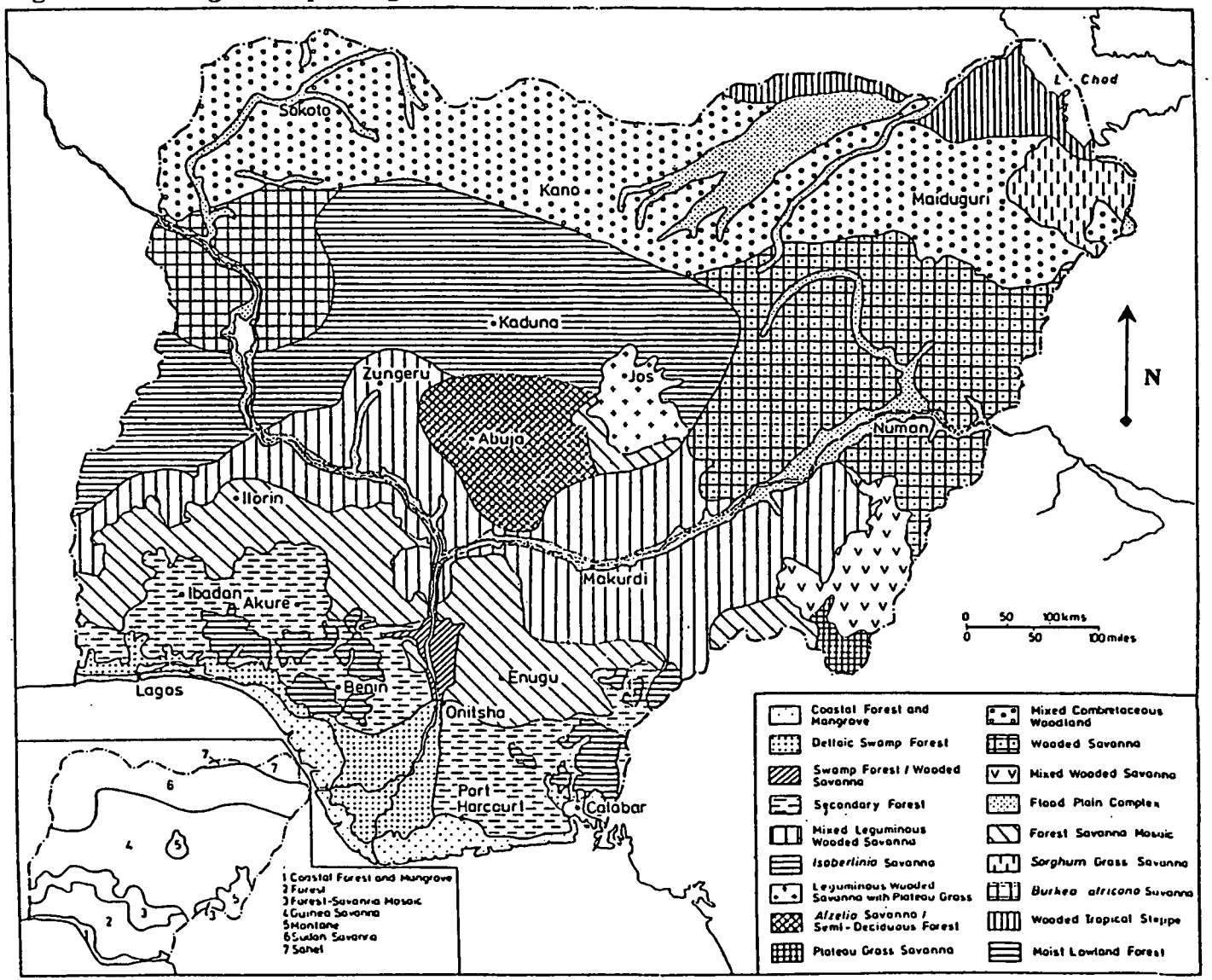


TABLE 5.1. Country profile.

GEOGRAPHY Vegetation Zones: Mangrove swamps, Tropical Rainforest, Wooded Savannah & Sahel Topography: Plains, highlands, troughs and river valleys
PEOPLE Over 250 ethnic groups. The largest groups are: Hausa-Fulani, Yoruba, and Ibo.
LANGUAGES English is the official language but many of the ethnic groups have their own languages with the major ones being Hausa, Yoruba and Ibo. There are more than 250 regional languages and dialects.
RELIGION As a percentage of the population; 47% Islam, 35% Christianity and 18% Traditional Beliefs.
CLIMATE Monsoonal with rainy and dry seasons; temperatures range from 19°C in winter to 35°C in summer. Dry season starts in November and lasts until March. The rainy season occurs during the remainder of the year.
RESOURCES Crude oil, coal, gold, lead, limestone, marble, tin.
PRINCIPAL CROPS Cocoa, cotton, tobacco, tea, coffee, rubber, oil palm, wheat, rice, sugar, maize, yams, cassava, beans, coconut
ECONOMICS Naira; 1N = 100 kobo GNP per capita: C$ 700 (1989) Inflation rate (1980 - 1986): 10.5% External public debt as % of GNP: 44.2 Principal trading partners: England, Other EEC nations, United States, Japan, Korea, India Principal exports: crude oil, petroleum products, cocoa, groundnuts, cotton, rubber Principal Imports: machinery, raw materials, consumer goods, rubber
POPULATION Estimate 1987: 106.6 million Density: 103 persons/km2 Average Annual Growth: 3.3% % Population under 15 years old: 51% Life Expectancy at Birth: 51 years Infant Mortality Rate per 1000 live Births (1987): 49

Source: CIDA 1990, CUSO 1988, and NCMM 1985

Flora Shaw coined the name Nigeria in 1898 to designate the British Protectorates on the Niger River. However the area's history did not start with the British or with European trading activities, although the British have played a large role in shaping what we now call Nigeria. People have lived in the area since about 10,000 BC and later formed both large ancient kingdoms and independent small-scale societies. The three parts of the country; the North, East and West have all had different histories and backgrounds. But were amassed into a single State by the European trading Nations who first arrived in the area in the mid 15th century. Nigeria gained independence from Britain in 1960 and since then has had as many years of military rule as of civilian government. Presently the country is in highly unstable period of transition from military rule to democracy.

With an estimated 106 million people, the country is the most populous in all of Africa. The official language is English but three ethnic groups predominate: Hausa, Yoruba and Ibo, in the north, west and east respectively. However, there are over 250 ethnic groups within the country.

Plateau State: Facts and Figures

Plateau State is located in the north central region of the country referred to as the Middle Belt and has a land area of 29,193 square kilometres (approximately 3.2% of the country).

The state capital is Jos. The population of the state is approximately 1.2 million and most of the people are of the Birom ethnic group with a strong Hausa and Fulani presence. Apart from English, Hausa is the most widely spoken language. The population is roughly 60% Muslim and 40% Christian.

Geographically the State consists of a plateau, with an average elevation of 1400m, surrounded by wooded savannah plains, which have an elevation of approximately 900m. Predominant vegetation zones include leguminous wooded savannah and wooded tropical steppe. The climate on the plateau is much cooler than the rest of the area owing to its elevation. Daily temperatures average 22°C over the year. Mean annual precipitation in Jos is 1400 mm.

Much of the plateau has been disturbed by tin mining, which went on in the area, on a commercial basis from 1904 until about 1985.
With 70% of the population being rural dwelling, it is not surprising that 68% of the workforce is involved in agriculture. Apart from the cereal crops such as maize, shorgum, accha, millet the temperate climate of the Plateau allows for the production of vegetables. Vegetable crops include potatoes, carrots, beans, peas and tomatoes. Animals such as pigs, goats, sheep, chicken and cattle are raised for meat.

Trees play an important role in the agricultural production systems of the small-scale farmers in the State. Trees provide fuel, medicine, shade, food, fodder and a variety of other products. The tree resources of the State can be divided into four categories. Namely, native woodlands (forest reserves), mine reclamation areas, farm and village trees as well as communal forest areas. The former two categories are under State control whereas local residents directly administer the farm and village trees and the communal forest areas.

Since the average peasant farm size in the State is about 0.1 hectares then all of the desired benefits i.e. food, income, wood fuel must be derived from a very small land base. This integration of production presents a unique challenge to resource managers and is the basis of agroforestry.

Rural Development: the Nigerian Situation

Approaches to development within Nigeria are diverse as elsewhere in the world. A logical framework or categorisation for reviewing Nigerian development is pre and post independence.

Balabkins (1982) noted that Nigeria did not follow the nationalist approach of Japan or Pakistan as it might not be in the best interests of the Nigerian business man, since political and nationalistic activity would affect dealings with expatriate merchants and trading partners.

In the mid to late 1970's two alternative paths, capitalist and socialist approaches, to national development were proposed and debated (Nnoli 1981). Both approaches were supported by world superpowers.

A Structural Adjustment Programme (SAP) for the country was initiated in 1986. According to Phillips (1987) the main objectives of the SAP were to:

- restructure and diversify the productive base of the economy so as to reduce dependence on the oil sector and on imports;
- achieve fiscal and balance of payments viability over the period;
- build a foundation for sustainable non-inflationary, or at least minimal inflationary, growth;
- lessen the dominance of unproductive investments in the public sectors and improve the sectors' efficiency as well as to encourage the growth of the private sector.

In general, agricultural development aims to increase both farmers' income and food production. Agricultural policy within the country was guided by a document produced by the Federal Ministry of Agriculture in 1988, which shared this vision. In keeping with SAP, the agricultural policy aimed at privatisation and government withdrawal from the sector (production, processing and distribution) while focusing on the small-scale farmer. There were six specific elements to the policy. Firstly, the attainment of self-sufficiency in basic food production. Secondly, to increase production of agricultural raw materials for industry. Thirdly, to increase production and processing of export crops. Fourthly, to modernise agricultural production, storage and distribution. Then, to increase rural employment, income and standard of living and finally to improve the protection of agricultural land and the environment.

Following the outline of rural development thinking presented in Chapter Two, one can categorise Nigerian agricultural development policy as "New Right". Given that the policy fits within the guiding SAP framework which emphasises economic diversity (i.e. export crops and raw materials) as well as improving efficiency (i.e. modernisation) among other new right traits.

Extension: The Nigerian Situation

Since the mid 1970's agricultural extension services within Nigeria have been organised under agricultural development projects/programmes which usually followed the Training and Visit approach to extension. Despite low farmer to extension agent ratios (1:600 to 1:300) adoption rates and yield increases were low. In 1986, the World Bank attributed

these poor results to an absence of well-trained extension agents and to an absence of proper technical messages for the mixed cropping system common to most farmers in the country (Venkatesan and Schwartz, 1991) .

However, the World Bank's analysis does not appear as insightful as that of Akingbode (1982) who stated that extension in Nigeria has faced the following problems for at least the last 75 years:

- conflicting extension roles i.e. advice as well as law enforcement;
- long decision making process i.e. bureaucracies;
- unavailability of farm input i.e. no materials for farmers to use with respect to. new technologies;
- low extension staff motivation;
- inefficient research - extension - farmer linkages;
- a lack of adult education skills among extension workers.

Further, Igben and Nwosu (1987) agreed with the above shortcomings and added the problems of inadequate transportation arrangements for extension agents.

Nigerian Agroforestry

Agroforestry systems and practices within in Nigeria are as diverse as the country's ecology. Adegbehin and Igboanugo (1990) prepared an overview of Nigerian agroforestry and a summary of their work appears in Table 5.2.

Table 5.2. Nigerian agroforestry practices.

Southern Nigeria: Rainforest and Derived Savannah	Northern Nigeria: Guinea, Sudan and Sahel Savannah
Shifting cultivation.	Scattered farm trees.
Homestead gardens.	Shelterbelts.
Taungya system.	Livestock with tree crops. (Silvipastoral)
Alley farming.	Livestock, trees and food crops together. (Agro-silvipastoral)

Derived from Adegbehin and Igboanugo (1990).

Idealised Agroforestry Extension Model

Hoffmann (1992) stated that there is no such thing as an ideal extension system. To determine the most suitable approach he recommends asking a series of questions. Does the extension approach contribute to a sustainable solution of the target group's problem? Does it suit the situation? Is it without contradictions? Is it applied and managed appropriately? Can it be financed on a long-term basis? Basically, he recommends that an extension approach be assembled and developed for each situation, rather than chosen from a box of ready prepared alternatives.

While the above questions were not specifically asked prior to commencing the agroforestry extension project, such a reflective process was undertaken. Upon review of the Nigerian situation it was felt that the ideal agroforestry extension model would need to ensure a two-way flow of information between farmers and researchers and follow a joint learning or problem solving approach to agroforestry. Further an ideal system would recognise the site specific nature of most agroforestry techniques and interactions and provide relevant and timely technical and material inputs. Finally an ideal system needs a flexible and responsive organisational structure with knowledgeable and motivated staff. Putting the above noted ideal system into a graphical model would resemble Figure 5.3.

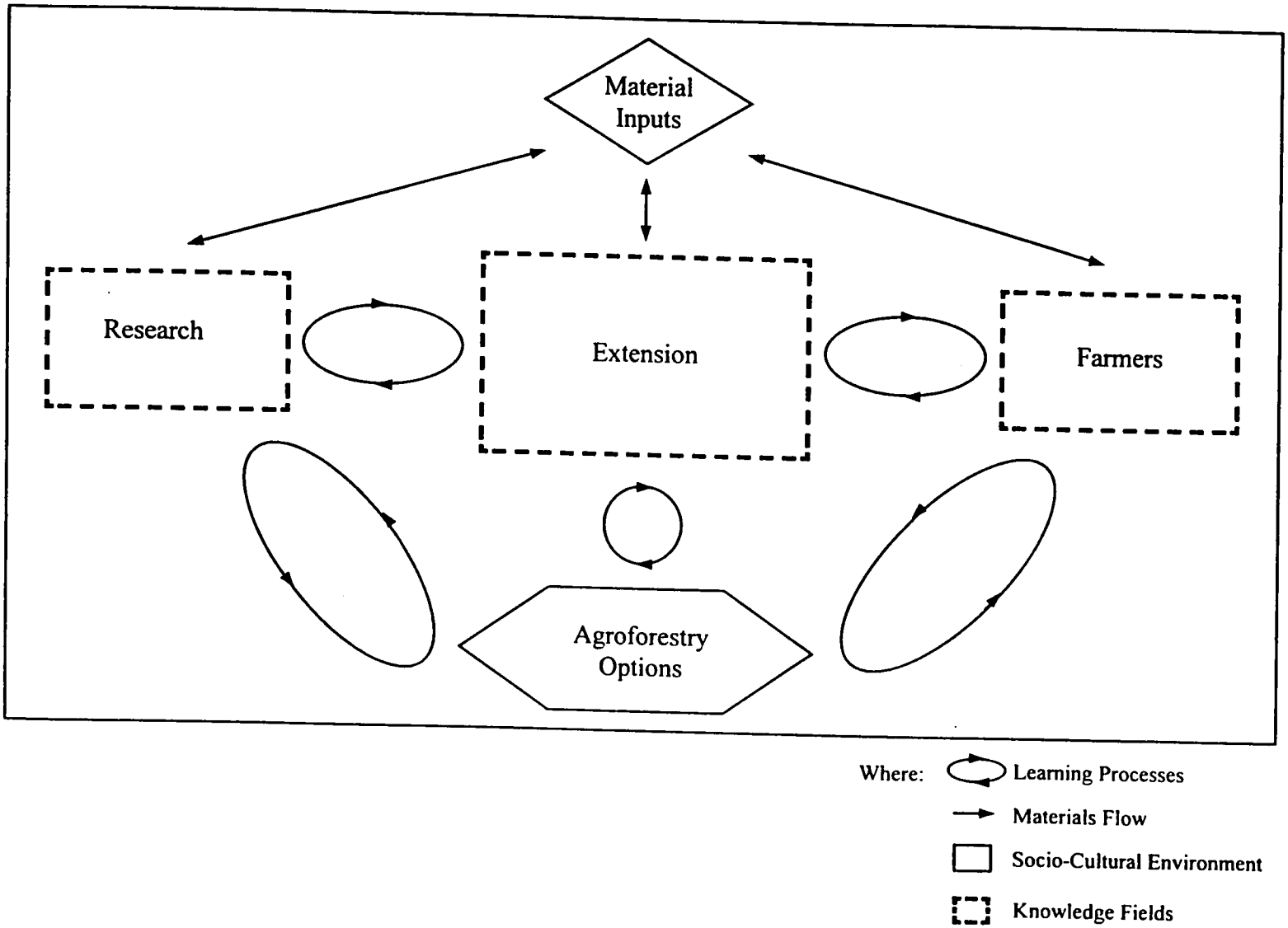
This all leads to the query; will this model of agroforestry extension actually function as planned? The case study, which forms the remainder of this dissertation attempts to answer this question.

Chapter Summary

The main points of chapter five can be summarised as follows:

- Current Nigerian development policy is dominated by structural adjustment programs.
- Agricultural extension, within Nigeria, has faced a wide variety of hindrances since its establishment over 75 years ago.
- Extension problems include conflicting extension roles, unavailability of inputs, low staff motivation, bureaucracies, poor linkages between research-extension-farmer and lack of extensionist adult education skills.
- Nigerian agroforestry practices can be categorised according to ecological site types (e.g. those practised in the high forest and those in the savannah.

Figure 5.3. Idealised agroforestry extension model.



- Common agroforestry practices in the north of Nigeria include scattered farm trees, shelterbelts, as well as livestock with tree crops and sometimes with food crops.
- There is no one ideal agroforestry extension system. However, the most suitable agroforestry extension model is one that recognises the strengths and weaknesses of the current development and agricultural extension system.
- The author believed that the ideal system would encourage a two-way flow of information, follows a problem-solving approach to agroforestry, recognises the site specific nature of agroforestry, provides relevant and timely advice and inputs, has a knowledgeable and motivated staff and a responsive organisational structure.

CHAPTER SIX

Case Study
Background

Aims and Objectives

This chapter aims to provide background about the Plateau Agricultural Development Programme (PADP) and the agroforestry extension project undertaken in 1991/92. This will enable a more insightful analysis of the introduction of this participatory agroforestry project into the PADP. Such an analysis forms the remainder of this dissertation. Specifically this chapter will:

1. Introduce the PADP;
2. Describe the mandate of the PADP;
3. Describe the organisational structure of the PADP;
4. Describe the planning and monitoring approach of PADP;
5. Describe PADP linkages with other agencies;
6. Describe the extension system utilised by PADP;
7. Describe the 1991/92 agroforestry project which forms the basis of this case study.

The PADP planning officer and the agroforestry co-ordinator provided much of the information about PADP presented in this chapter.

Plateau Agricultural Development Programme (PADP) Introduction

The PADP is one of the World Bank Funded, Multi-State Agricultural Development Projects. The project facilitation team was launched in July, 1985 but the project began full operations in June, 1987 when the loan became effective. The programme was expected to terminate in June, 1992 when the loan came to an end.

The Programme is state wide covering an area of 54,000km^2 with an approximate population of 3.9 million. The programme aims to assist an estimated 365,504 farm families.

Plateau Agricultural Development Programme (PADP) Mandate

The objectives of the Plateau Agricultural Development Programme are:

- to increase food crop production and incomes of small scale farmers;
- to develop the agricultural potential of the State through improved technology and adaptive on-farm agricultural research;
- to assist the State in rationalising agricultural activities through commercialised input distribution and the development of a small but effective extension service
- to prepare for the transfer of the greater share of the responsibility of the project appraisal and supervision to State institutions.

PADP Organisation

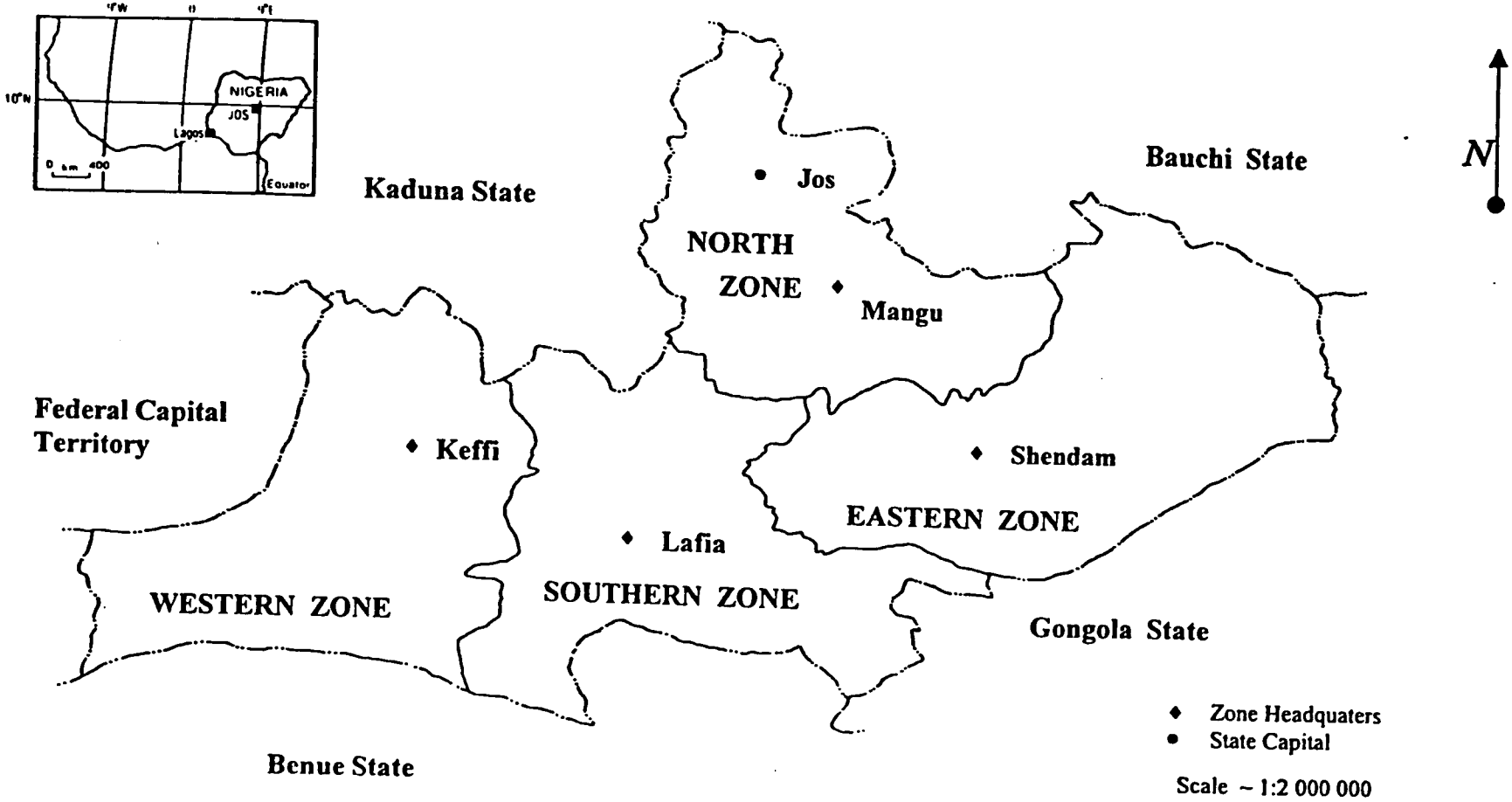
The Programme divides the State into four administrative zones as shown in Figure 6.1. However when carrying out adaptive research and other trails the zonal structure, which is administrative based, does not give good ecological representation. Therefore the project area is divided into three broad ecologically homogeneous zones. Namely; mid-altitude, southern guinea savannah, and sub-sudan (Figure 6.2).

A Programme Manager, who is based in the State capital Jos, manages the programme. A programme management unit assists the Programme Manager. The Programme Manager receives direction from the Agricultural Development Programme Executive Committee. The programmes in the various States are co-ordinated by the Federal Agricultural Co-ordinating Unit (FACU) based in the city of Ibadan. The Programme Manager oversees eleven separate departments ranging from administration and input procurement through technical services and extension to planning, monitoring and evaluation. Figure 6.3 is an organisational chart of the Plateau Agricultural Development Programme.

It is important to note that the agroforestry section has alternated between the technical services branch and the extension services branch. However, during most of the time of this study the agroforestry staff answered to the Head of Technical Services.

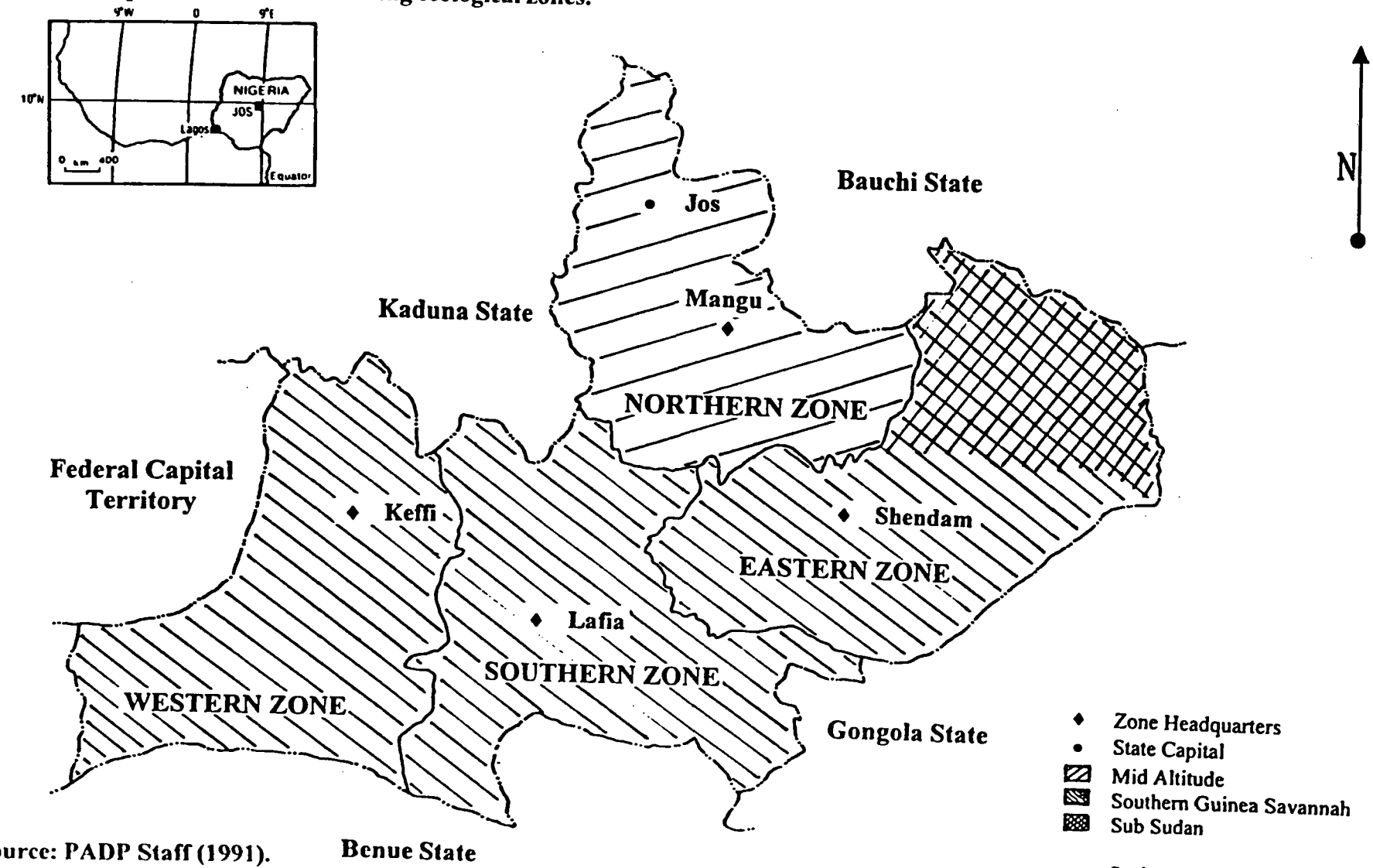
A Zonal Programme Manager, who is responsible to the Programme Manager, manages each of the zones. The structure of the zone mirrors the headquarters set-up.

Figure 6.1. Map of Plateau State showing PADP features.



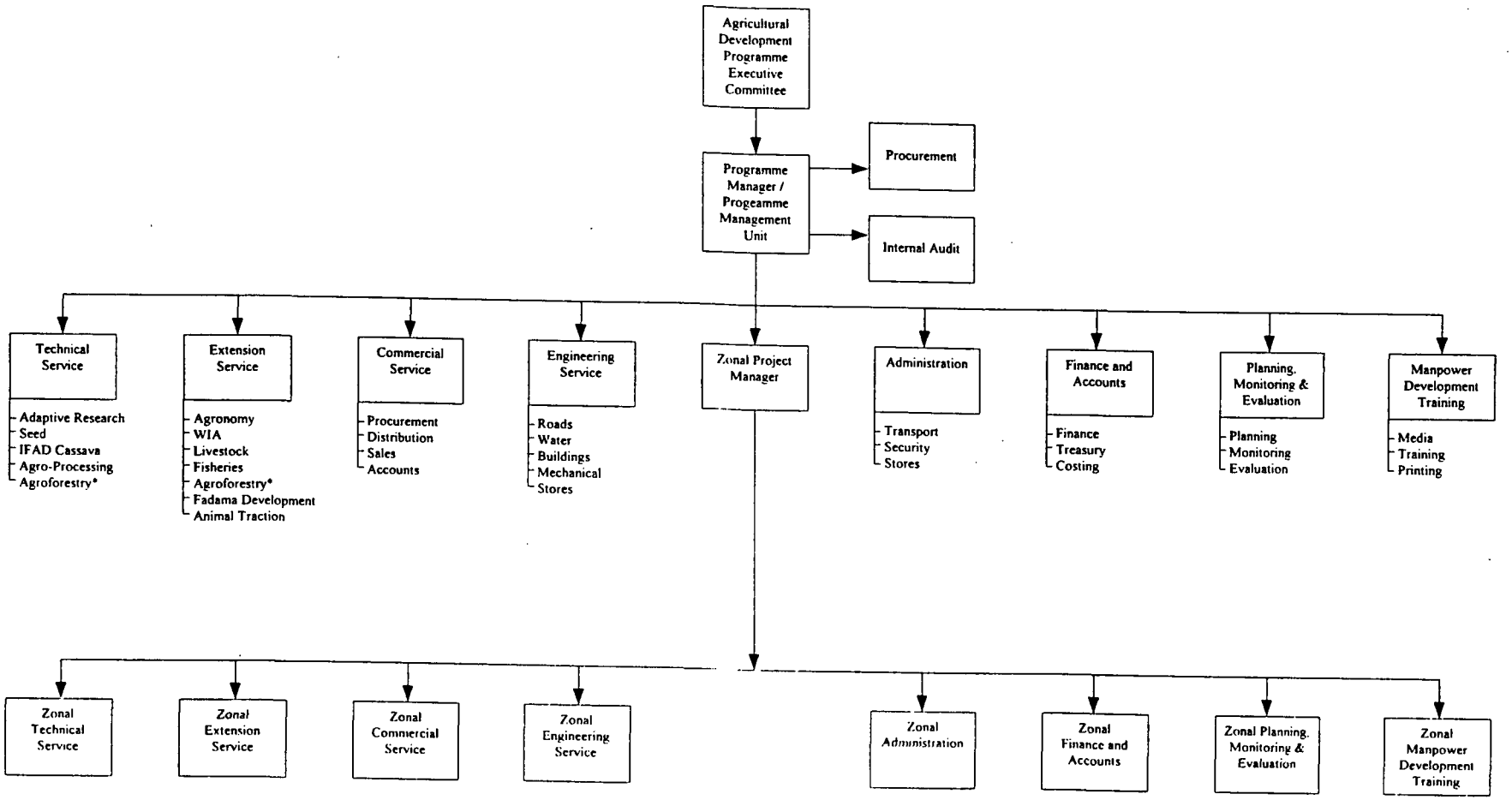
Source: PADP Staff (1991).

Figure 6.2. Map of Plateau State showing ecological zones.



Source: PADP Staff (1991).

Figure 6.3. Organisational chart of Plateau Agricultural Development Programme.



Source: PADP Staff (1993)

Plateau Agricultural Development Programme (PADP)

Planning, Monitoring and Evaluation

The programme follows a programming, budgeting and monitoring system developed by the Federal Agricultural Co-ordinating Unit (FACU). This system involves:

- preparation of an annual action plan with clearly stated goals and objectives;
- dividing the action plan into sub-programme and sub-components with specific annual targets;
- division of these annual targets into monthly targets and specific actions;
- preparation of timeline charts;
- detailing total staff and fixed asset requirements for each operation;
- preparation of a budget;
- preparation of monthly cash flows;
- monthly reviews of progress and expenditure;
- preparation of quarterly work plans, cash flow projections and budgets
- mid-year review and subsequent alteration of yearly plans;
- physical monitoring of planned activities;
- reporting to management.

Additional planning and evaluation tools include core and ad-hoc surveys to determine impact and assess potential. Specific tools include large-scale reconnaissance surveys, market price surveys, village listing surveys and others.

Plateau Agricultural Development Programme (PADP) Extension

PADP uses the standard T&V system with very few modifications (see Chapter Three for a full description of the T&V system). These modifications include having extension agents responsible for dealing with the provision of inputs (i.e. fertiliser) as well as providing technical advice.

The extension methods used by the organisation include: group (farmer field days) and individual (contact farmer meetings) with the occasional use of mass media (radio, television, posters).

Further, the programme uses a unified system of extension which means that one extension agent is responsible for technical assistance in the fields of crops, livestock, fisheries, agroforestry and women issues (Venkatesan 1994).

Plateau Agricultural Development Programme (PADP) Agroforestry

As previously mentioned, the agroforestry section of the PADP usually fell under the direction of the Technical Services Department. Within the technical section, an Agroforestry Co-ordinator, based at the Jos headquarters, was responsible for the overall definition and implementation of the agroforestry programme. Further there was supposed to be an Agroforestry Subject Matter Specialist in each zone. But as of 1991, the start date of the agroforestry project, these individuals had not been seconded from the Ministry of Agriculture.

The overall objective of the technical services department is to raise farmers' crop production and incomes through the adoption of suitable and affordable technologies. Of special concern are those technologies that will increase production and utilisation of farm produce and reduce crop losses. Specific objectives of the department are numerous. They include: encouraging farmers to adopt new technologies through the establishment of on-farm (OFAR) and small plot adoption technique (SPAT) research/demonstration plots; teaching farmers new production techniques by embarking on a T & V extension system; working with the State Forestry Project II to creating awareness among farmers about the importance of agroforestry; and others (Anon 1991).

The linkage between the PADP and the State Afforestation project is apparent from the above objectives. This relationship needs to be further elaborated upon. The Ministry of Agriculture through the World Bank funded State Forestry Project Units raises tree seedlings for use within the project area. Plateau Agricultural Development Programme village extension agents are supposed to communicate recommended agroforestry techniques to farmers and to assist in the distribution of seedlings. The PADP is also to advise the Afforestation Project about potentially useful tree species.

So what is the State Afforestation Project, what are its goals and how does this co-operation between agencies occur?

State Afforestation Project

The Afforestation project is designed to implement the government policy of increasing the local, regional and national resource base by mobilising the population to undertake tree planting. Officially termed the Plateau State Project Unit of the World Bank assisted Afforestation II Project the objective of the unit is to promote farm forestry within the northern parts of the state. It became operational in 1988.

The functions of the Afforestation Project include:

- raising of seedlings;
- distribution of seedlings;
- extension activities related to tree protection and crop tending;
- monitoring of both nurseries and planted seedling survival;
- training of both staff and farmers;
- research such as species trials and nursery techniques;
- women in forestry group.

The Plateau State Project Unit Manual (1988) states that "agroforestry must be oriented towards .... the needs of people which differ between ethnic groups, localities and individuals" and that "the final decision as to what is done in each particular case lies with the certain community or the individual farmers who knows his needs better than anyone else". The tie with the PADP is further evidenced by the manual, which states that there is to be close collaboration with the PADP.

However, in practice, the close collaboration between the PADP and the Afforestation Project did not occur. The reasons for this lack of co-operation are complex. But are best summed up by noting that administrative and bureaucratic "empire building" were evident and this coupled with the technical difficulties associated with mixing trees with agricultural crops, resulted in minimal collaboration (Twyman 1992, Dr. Costas Varelides, Pers. Com., 1991/2, Dr. Andrew Kidd, Pers. Com., 1991/2, 1997). In effect the two organisations went about their business in relative isolation.

Pre-Project PADP Agroforestry Extension Model

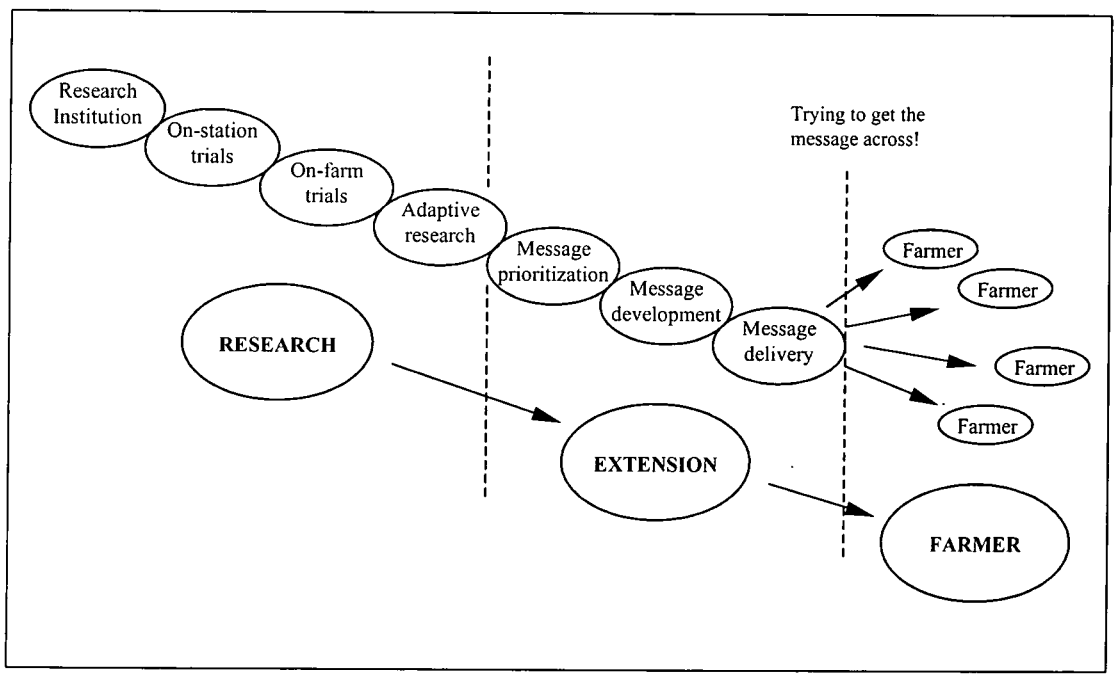
The PADP agroforestry extension model has the following components:

- it follows a Training and Visit Extension system;
- it has linkages with the State Afforestation Project, the primary producer of tree seedlings but this interaction is weak ;
- it seeks to create awareness among farmers about agroforestry;
- it follows a unified system of extension and thus one agent delivers multi-sectoral messages;
- it has ties to research institutions;
- it conducts research and trials in-house and with farmers;
- provides material inputs as well as advice.

Figure 6.4 provides a graphical description of the PADP agroforestry extension process.

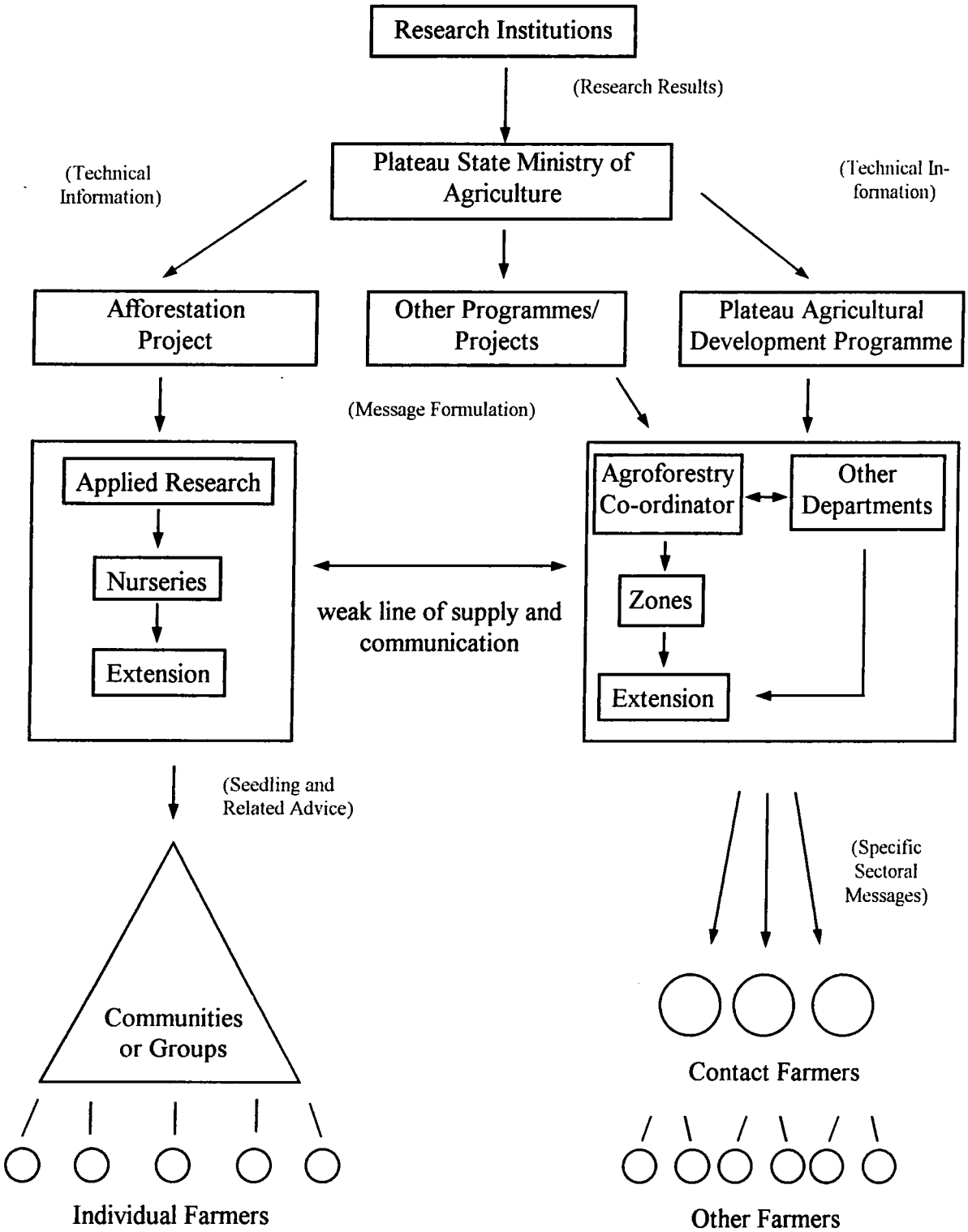
The basic linakges between research, extension and farmer can be distilled from the above noted diagram. A basic model developed by Ehert and Kidd (1994) is very applicable to the PADP situation (Figure 6.5).

Figure 6.5. Transfer model.



Source: Ehert and Kidd (1994).

Figure 6.4. PADP agroforestry extension model.



Plateau State Tree Related Problems

Prevailing conditions in Nigeria, in the early 1990's, of population growth, economic decline, commercialisation of agriculture and the structural adjustment programme have led to a requirement for increased domestic production of goods. As a result, pressure to use the land more intensively had increased.

Indiscriminate felling of trees for fuelwood, agriculture and tin mining coupled with the lack of a positive public perception about the benefits of trees has resulted in an ever-decreasing wood supply and environmental damage. From a socio-economic viewpoint, over 90% of the areas fuel requirements are met by wood. The environmental problems of soil erosion and the loss of soil nutrients are the most serious. The activities of the PADP appeared to have had little effect upon these problems.

The tree resources of the State are either currently inadequate or projected to be inadequate, to meet the demands of the regions' inhabitants (Hunter *et al.* 1993, Buckley 1986, Hymen 1993, Silviconsult 1991).

The forest estate, as outlined in Chapter Five, has been sub-optimally managed. Sub-optimal management, in this case, probably results from poor information transfer rather than a lack of appropriate technology, given the amount of forestry and agroforestry information readily available. This poor information transfer is evident when one reviews the ideal agroforestry extension model presented in chapter five with the PADP model of extension presented above.

In 1991 the author, along with others, attempted to improve this poor information transfer situation.

1991/92 Agroforestry Project

From November 1991 to March 1992 the author (funded by a Canadian International Development Agency Professional Award) and the University of Durham's Jos Plateau Environmental Resources Development Programme (JPERDP) assisted by People Oriented Development of the Evangelical Church of West Africa (POD of ECWA),

embarked on a project aimed at creating agroforestry vision and building agroforestry capacity within the PADP.

The project aimed at alleviating the projected tree product supply shortfall and related environmental concerns within the State (Hunter *et al.* 1993, Buckley 1986, Hyman 1993, Silviconsult 1991). This project relied on participatory methods, especially adult education techniques and rapid rural appraisal (RRA), based on the experiences of Abel *et al.* (1989), Davis-Case (1990), Hope and Timmel (1984), and Mascarenhas (1991).

The T&V extension system employed by the PADP was not immune to the problems noted in Chapters Three and Five. As such, the project team felt that a participatory approach to agroforestry may yield better results. The team hoped to move PADP extension methods towards the "idealised" extension model, as outlined in the last chapter.

The project team's faith in this approach was bolstered by comments in the literature such as:

- "...agroforestry is a diverse discipline involving crops, trees and livestock, it requires integrative approaches and is well suited to participatory methodology" (Chambers 1988);
- "...RRA might complement very nicely the training and visit system of agricultural extension (Benor and Baxter 1984) as a means of generating a flow to extension workers of good communication for farming practices" (Chambers 1988).

The author, the PADP agroforestry co-ordinator, JPERDP staff and POD of ECWA staff, designed a series of workshops. Next these workshops were delivered, by the author and the agroforestry co-ordinator, to each of the four PADP Zones. These workshops focused on both the technical and non-technical components of agroforestry. Specifically, the workshops included sessions on agroforestry techniques, appropriate two-way interactions with farmers (including RRA) and operational planning (Figure 6.6). It was hoped that the PADP would gain a better understanding of the concept of agroforestry and of its potential usefulness within local farming systems as well as become exposed to illustrate alternative (and likely more appropriate) extension methods. Appendix I contains a full report for one

Figure 6.6. Condensed outline of an agroforestry extension project workshop.

CONTENTS

ACKNOWLEDGEMENTS..... i

CONTENTS..... ii

PREFACE..... iii

INTRODUCTION..... 1

DAY ONE..... 2
- Opening Address..... 2
- Participant Self-Introduction..... 2
- Workshop Organisation..... 2
- River Code and Sustainability..... 3
- Agroforestry: Its Importance for farmers and PADP..... 4
- Joint Learning: Farmer Knowledge and Rapid Rural Appraisal..... 5
- Farmer Interaction: Village Sketch Map..... 6

DAY TWO..... 7
- Field Trip: What Different AF Techniques Are There?..... 7

DAY THREE..... 10
- Complexity of Farming Systems and AF: Joint Learning with Farmers.. 10
- Rapid Appraisal Techniques..... 10
- Compilation and Presentation of Rapid Appraisals..... 11

DAY FOUR..... 25
- Situational Analysis in Communities: Village Meetings..... 25
- Learning-by doing: Village Meeting..... 26
- Farming Systems and Agroforestry..... 27
- PADP Action: What Can Be Done?..... 28
- Workshop Appraisal: Dislikes and Likes..... 29

APPENDIX I Workshop Participants

APPENDIX II River Code

APPENDIX III Bukuru Learning Farm

APPENDIX IV Field Forms

of the zonal workshops. The workshop reports were published in the University of Durham's JPERDP publication series.

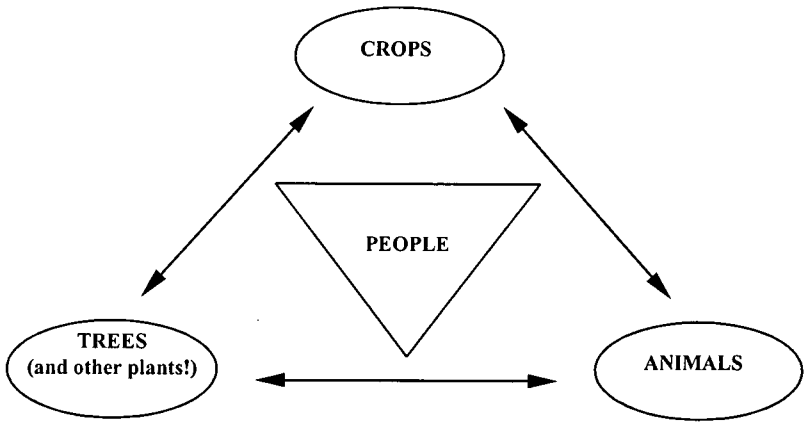
Two goals; vision creation and capacity building guided the workshops. This vision creation and capacity building approach was promoted by an NGO working in Plateau State and it appeared to hold promise for use in the PADP (Ehert 1997).

The strategy to achieve these goals centred on the training workshops delivered at the Zonal level to predominately middle managers. It was anticipated that the workshop participants would embrace the ideas put forth in the training sessions and would promote them when they subsequently returned to their duties. It was hoped that such a "push" from the field (i.e. the Zones) and from individuals who had some authority (i.e. the middle managers) would result in the organisation, as a whole, adopting some or all of the material on offer.

Given that the PADP was in the process of "unifying" (i.e. incorporating/integrating livestock, fisheries, gender, agroforestry and crops) their extension systems, the project team felt that agroforestry could play a unique role as an integrative discipline. This co-ordinating role was deemed important because PADP did not seem to have a mechanism in place to ensure that sectoral technical messages were compatible or integrated. To assist the team in promoting agroforestry as the "co-ordinating" discipline, the broadest possible definition of agroforestry was used during the training workshops. The workshops promoted the idea that agroforestry is the interaction of crops, livestock, trees (and other plants!) within the farming system. Figure 6.7 displays a diagram of the agroforestry concept as applied within the PADP project.

The 1991/92 agroforestry extension project ended with a one day objectives oriented planning (ZOPP) workshop. This meeting enabled the development of a matrix which outlined goals and objectives, means of achieving these aims, as well as important assumptions which accompany the aims and actions. Table 6.1 is a reproduction of the final ZOPP matrix from the 1991/92 agroforestry workshop series.

Figure 6.7. The agroforestry concept as applied in the PADP project.



After the workshop series ended the JPERDP and POD of ECWA provided the PADP with follow-up or backstopping support services. For instance, JPERDP staff made themselves available to PADP upon request and POD of ECWA invited PADP staff to their own internal training sessions. When the Zonal agroforestry came on seat in mid 1992, they attended a POD of ECWA agroforestry training session.

However it remains to be seen if the agroforestry project attained its goals. The next chapter describes the procedures used by the author to determine whether or not the project aims were achieved.

Chapter Summary

The main points of chapter six can be summarised as follows:

- The PADP provides extension services and inputs throughout Plateau State, Nigeria using a hierarchical organisation and a zonal structure;
- The PADP uses ecological similarities to divide the State into three areas for conducting adaptive research and other trials;
- The PADP employs the Training and Visit extension system with an emphasis on one agent delivering technical messages in a wide array of disciplines (unified extension);
- The PADP follows a programming, budgeting and monitoring system developed by the Federal Agricultural Co-ordinating Unit based in Ibadan;
- The PADP is supposed to have close links with the State Afforestation Project but in practice this co-operation does not occur;

Table 6.1. 1991/92 PADP agroforestry extension project planning matrix (ZOPP).

SUMMARY OF OBJECTIVES / ACTIVITIES
OVERALL GOAL: Fulfillment of PADP's Mandate
PROJECT PURPOSE: PADP will provide relevant services, coordinated by AF staff, which will enhance and sustain the relationships between CROPS, TREES (and other plants), and LIVESTOCK. This will contribute to a higher level of agricultural development, leading to higher standards of living for farm families.
RESULTS / OUTPUTS: 1. PADP personnel are familiar with AF perspective, concepts and technologies; they interact appropriately among themselves and with other organizations 2. Appropriate interaction with villagers on AF perspectives, concepts and technologies 3. Villagers become more aware of AF perspective and concepts and further incorporate AF technologies into their farming systems
ACTIVITIES: 1. CAPACITY BUILDING WITHIN PADP 1.1. Training of PADP personnel in AF and in appropriate interaction with villagers 1.1.1. AFC & SMSs 1.1.1.1. AFC & AFSMSs join learning-by-doing workshop of POD of ECWA at their Bukuru Learning Farm 1.1.1.2. AFSMSs & Livestock SMSs do four-day AF workshop 1.1.1.3. Further learning-by-doing during creation of AF demonstration farms (see below) 1.1.1.4. On-going training: concepts & technologies of AF; and, appropriate interaction with villagers 1.1.1.4.1. Obtain training information and materials, for HQ and for Zones. Photocopying of relevant inputs. 1.1.1.4.2. For all AFSMSs together, each month, rotating around the zones 1.1.1.4.3. For individual SMSs, giving follow-up on training and monitoring activities 1.1.2. Field extension workers 1.1.2.1. FNTs: training on concepts and technologies of AF and on appropriate interaction with villagers 1.1.2.2. Learning-by-doing while setting up demonstration sites (see below) 1.1.2.3. Joint-learning with communities in problem identification and option generation (see below) 1.1.2.4. Joint-learning with communities while implementing potential solutions (including trials) 1.1.3. Other training inputs 1.1.3.1. Pre-season training on AF concepts 1.1.3.2. Mid-season training on AF concepts 1.1.3.3. Regular input in MTRMs on AF perspective, on concepts or problems rather than individual technologies 1.2. Establishment of AF sites (for learning-by-doing training, demonstration, trial and seed multiplication) 1.2.1. At Zonal level on seed farms 1.2.1.1. Procure seed and other materials 1.2.1.2. Initial establishment scheduled and organized 1.2.1.3. Management carried out in collaboration with AF, crop, livestock and extension personnel (to include collection and appropriate storage of seed) 1.2.2. At FNT grounds 1.2.2.1. Procure seed and other materials 1.2.2.2. Initial establishment scheduled and organized 1.2.2.3. Management carried out in collaboration with AF, crop, livestock and extension personnel (to include collection and appropriate storage of seed) 1.2.3. In communities; following interaction with villagers and in response to problems identified 1.2.3.1. Seed and the necessary back-up organized at Zonal level in response to community demand 1.3. Regular interaction among Coordinators, SMSs and extension personnel 1.3.1. At MTRMs 1.3.2. Regular meetings at HQ level 1.3.3. Regular meetings at Zonal level 1.4. Networking with other organizations for ideas, information, input and training 2. INTERACTION WITH VILLAGERS 2.1. Joint-learning with villagers during RRAs on environmental and production problems in farming systems 2.2. Project identification with villagers during village meetings 2.2.1. Presentation of findings of RRAs and reflection on the nature of problems identified 2.2.2. Generation of options for solving the problems identified 2.3. Implementation of village projects 2.3.1. Reflection on requirements for project implementation and on initial scale of project 2.3.2. Necessary inputs obtained locally and/or provide by PADP 2.3.3. Project implementation jointly by villagers and extension personnel 2.3.4. Provision of necessary follow-up and further training; participatory monitoring & evaluation 2.4. On-going joint-learning through project identification and implementation 2.5. Use of media services to put across AF perspective 3. ON-GOING INTERACTION WITH VILLAGERS FOCUSING ON CAPACITY BUILDING IN VILLAGES TOWARD SELF-RELIANCE IN AF

Table 6.1. Continued.

OBJECTIVELY VERIFIABLE INDICATORS	MEANS / SOURCES OF VERIFICATION	IMPORTANT ASSUMPTIONS
OVERALL GOAL:		1. No major change in policy that would detrimentally affect PADP 2. Funding of PADP continued
PROJECT PURPOSE: All communities further incorporate AF perspective into farming systems, with enhanced and sustained crop and livestock production and tree-resource use, contributing to improved livelihoods for farm families. By the end of 1994 all communities that PADP is working with should have begun at least one AF initiative.	Reports of various Ministries and Programmes, and field reports.	1. See point 1 at Results level
RESULTS / OUTPUTS: 1a) By the end of July 1992 all extension staff will have undergone learning-by-doing training on AF concepts and technologies and on appropriate interaction with villagers 1b) On-going monthly training and monthly follow-ups held 1c) By the end of July 1992 the Zonal AF sites will be established and some technologies will have been incorporated in FNT grounds 1d) Regular meetings of crop, livestock, AF and extension officers held at Zonal and HQ levels 1e) Communication established with other organizations 2a) By the end of 1992 all extension workers will have completed joint-learning exercises (e.g. an RRA sketch map and transect) in each of their communities, some of which should then be presented and discussed at FNTs 2b) By the end of February 1993, village meetings to discuss environmental and production problems in farming systems and decide on community projects will have been held 2c) Most community AF projects will start implementation during the 1993 rainy season, with each extension worker having at least one project in each community 2d) Quarterly television or radio programmes on AF organized 3. Communities further implement their own AF projects	1a) Workshop reports available 1b) Records of AFC & SMSs 1c) Field visits to AF sites 1d) Minutes of meetings 1e) Reports; letters file etc.; newsletters etc. 2a) Records of extension workers and SMSs 2b) Records of extension workers and supervisors 2c) Records of extension workers and field visits 2d) Programmes on air 3. Records of extension staff and field visits	1. No significant change in organization of PADP (see also point 1.4 at Activities level) 2. See points 1 & 2 at Activities level 3. See points 2 & 3 at Activities level
ACTIVITIES:		1.1 Trainers available and training materials obtained; no problems with time scheduling 1.2 Sites made available and inputs obtained 1.3 No time scheduling problems 1.4 Other organizations willing to cooperate 2. Villagers cooperate with PADP's initiatives; extension workers' capacity sufficiently built, they follow their workplan, and are given the necessary timely back-up 3. PADP long-term in villages

- The PADP agroforestry programme is co-ordinated and implemented by the Agroforestry Co-ordinator based in Jos;
- The pre-project PADP agroforestry extension structure did not address the sub-optimal management of the State's tree resources;
- The 1991/1992 project aimed at creating agroforestry vision and building agroforestry capacity with the hope of contributing to the larger goal of improving the management of the State's tree resources;
- The project defined agroforestry in a general manner i.e. agroforestry is the interaction of crops, trees (and other plants!) and livestock in a farming system;
- The project strategy involved training middle level staff within each zone with the anticipation that these staff would encourage the adoption of the agroforestry concept within PADP;
- The workshops centred on technical agroforestry and appropriate interactions with farmers;
- It was hoped that agroforestry would emerge as the co-ordinating discipline within a "unified" extension system given its integrative nature;
- The workshop series ended with a final planning exercise that produced a ZOPP matrix outlining anticipated activities, monitoring and evaluation means, and relevant assumptions;
- The workshops were followed up with backstopping exercises with the JPERDP and POD of ECWA.

CHAPTER SEVEN

Case Study Methods

Aims and Objectives

This chapter aims to describe the methods used to monitor and evaluate the introduction of a participatory agroforestry planning and extension approach into the Plateau Agricultural Development Programme. Specifically this chapter will:

1. Define the objectives of the study;
2. Identify the parameters of the study;
3. Describe data collection procedures;
4. Describe data analysis procedures;
5. Rationalise both data collection and analysis procedures.

Introduction

The Plateau Agricultural Development Programme and the 1991/1992 participatory agroforestry planning and extension project were described in the previous chapter. This chapter describes the procedures used to monitor and evaluate the attainment of the project goals of creating agroforestry vision and building agroforestry capacity within the PADP. The agroforestry project relied on participatory methods, especially adult education based techniques and rapid rural appraisal (RRA), based on the experiences of Abel *et al.* (1989), Davis-Case (1990), Hope and Timmel (1984), and Mascarenhas (1991). The basic question to be answered is "Did the introduction of these topics have an impact on the PADP?".

The primary sources of information used in the development of the monitoring and evaluating procedures included:

- Whyte (1991), Lewin (1946) and Kemmis *et al.* (1988) for action research (PAR);
- RRA Notes # 10, Werner and Schoepfle (1987) for interviewing techniques;
- Abel *et al.* (1988), Hope and Timmel (1984), Mascarenhas (1991) for workshop techniques and RRA methods;
- Davis-Case (1990) for participatory monitoring and evaluation;
- Carruthers and Chambers (1981), Chambers (1980) for triangulation/multiple approaches;

- Chamber's (1980, 1983, 1988) for the five rural development biases: spatial, project, personal contact, dry season, politeness and protocol;
- GRAAP[1] and LePSA[2] for visualisation and reflection methods;
- RRA Notes, Chambers (various) and others for Rapid Rural Appraisal and Participatory Rural Appraisal (PRA) techniques.

Study Parameters

It is important to note that this investigation is limited to the impact of the project on the PADP and does not deal with the "on the ground" impacts of the project or the PADP on the lives of rural peoples.

Further, since the author was not only researching the impact of the agroforestry project but also attempting to alter the future course of the project, then the term action-research aptly describes the work. As such the strengths and weaknesses associated with a participatory action approach apply to this work. Strengths include the co-operative relationship between practitioner and the researcher, "big picture" view of the situation, offers new ideas to both practitioners and researchers (Albrecht 1992). Weaknesses include the unpreparedness of researchers for PAR, unequal relationship between researcher and practitioner usually due to educational differences, long time requirements, personal involvement of the researcher and work ownership issues (Albrecht 1963 and Ehert 1997).

The procedures described herein were formulated, primarily on-site in Nigeria, in 1993. As such, the author did not have access to the wealth of information stored in northern Universities nor was much of the recent literature on the subject available.

In addition the work was undertaken during a period of great uncertainty within Nigeria. The presidential elections had been annulled and the military had taken control of the country in a bloodless coup. Moreover, opposition to the moves by the military had been increasing with large scale civil disobedience including nation-wide strikes by the petrochemical, transportation and banking sectors as well as by the academic community.

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[1] **G**roupe de **R**echerche et d'**A**ppui pour l'**A**utopromotion **P**aysanne from an NGO in Burkina Faso.
[2] **L**earner centred, **P**roblem posing, **S**elf-discovery, **A**ction oriented methods from an NGO in Kenya.

To further heighten tensions, Chief Abiola, the likely winner of the recently annulled elections, had announced his intention to return from exile in England.

The action-research was funded entirely by the researcher and as such finances were limited.

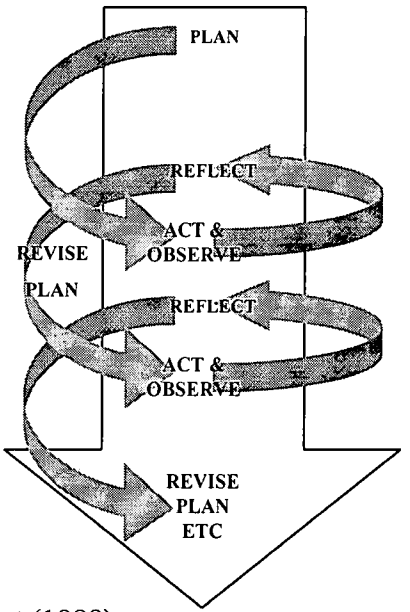
Methods

The participatory action research associated with this study comprised of four nested and complimentary methods or steps:

1. File and Record Reviews at PADP headquarters;
2. Discussions with the Agroforestry Co-ordinator;
3. Interviews in select zones;
4. Backstopping workshop at Headquarters with participation by all Zones.

The study was conducted in the order identified above as it allowed the participatory action research spiral to function properly. This spiral of planning, action and evaluation leading to another level of planning, action and evaluation and so forth is the basic premise of PAR. This allows for a step by step approach to gaining insight into how complex situations function (Lewin 1946, Whyte 1991 and others). The following graphic best illustrates the nature of action research (Figure 7.1).

Figure 7.1. The action research spiral.



From: Kemmis and McTaggart (1988).

The four methods were used to ensure that triangulation of information sources occurred. Triangulation refers to the process of collecting information from a number of sources so that in the final analysis the usually highly subjective information is supported.

In short, a review of the file and records at headquarters allowed for the opportunity to gain a basic insight into activities ongoing within the PADP before and after the project. The meetings with the agroforestry co-ordinator offered the chance of clarifying the filed information as well as gaining first hand knowledge of the situation. The in-depth interviews were conducted to allow for the expansion of the basic insights gained in the earlier steps and to explore in greater detail the workings of the PADP. The final planning workshop was held to review collective organisational thoughts and actions as well as to provide encouragement and support to the staff in a coaching or back stopping manner.

Method One: File and Record Review

The file and record reviews conducted at the PADP Headquarters centred on two components; (1) agroforestry related messages developed and delivered at the monthly technology review meetings (MTRM's) and (2) the status of the activities identified in the project planning (ZOPP) matrix developed during the final planning workshop.

The examination of the agroforestry messages, which were developed and delivered both before and after the agroforestry workshop, allowed for comparisons with respect to message content and complexity as well as the indicating the overall importance and nature of the subject within the organisation.

A review of the status of the planned activities provided a brief overview of the accomplishments of the project. In the same vein, it identified potential shortcomings of the project.

The methods involved in this step of the process were relatively simple. All activities undertaken by the PADP are documented as per standard operating procedures. Thus to see what has happened one merely needs to request the relevant records, and then read the documents as well as "between the lines". Sometimes what has not been completed is

more indicative than that which has been completed. The PADP staff were very helpful when providing records.

The outputs produced during this step include a summary table of MTRM agroforestry messages by year and a description of other agroforestry activities undertaken since the original workshop series. Both of these items were fuel for step two.

Method Two: Detailed Discussions with the Agroforestry Co-ordinator

The information collected from the files was reviewed with the agroforestry co-ordinator. Together the author and the agroforestry co-ordinator revisited the agroforestry planning matrix. Later each of the planned activities was ranked as complete, incomplete or partly complete. The agroforestry message records were also discussed.

In general the agroforestry co-ordinator agreed that the files contained accurate descriptions of the works undertaken but did not well reflect the conditions under which the works were completed. Therefore the author and the co-ordinator prepared time-lines of agroforestry related highlights and problem events.

The primary method used during this step was open and honest two-way communication between the author and the agroforestry co-ordinator. The author believes that this was only possible because of the relationship between the two persons involved was based upon mutual respect and friendship. The discussion was documented with written notes and with tabulated information.

One of the topics discussed included where to conduct further action research. The limited time and funds available dictated that not all Zones could be visited nor could all regions within each zone be visited. Therefore it was decided that interviews would only be conducted in limited portions of two Zones: the North and the West. The selection of these two Zones was based on the perception, of both the author and the agroforestry co-ordinator, that the North Zone was the most active in terms of agroforestry, while the West Zone was least active in terms of agroforestry.

The products of this step included: confirmation of the MTRM agroforestry training table, a list of ZOPP planned activities indicating status, timelines of highlights and problems, field notes, and a firm decision about where to conduct step three.

Method Three: Semi-Structured Interviews

Discussions in the United Kingdom with International Institute for Environment and Development (IIED) and the Overseas Development Institute (ODI) lead to a pre-field work decision to use Venn Diagrams as the main interviewing tool. The plan was to use to information gathered in steps one and two plus the author's knowledge of the initial workshop series to arrive at a suitable topic(s) for exploration using these diagrams.

Prior to visiting the North and West Zones, which were identified in the last step, the author and two experienced research assistants discussed the anticipated Venn diagram method and proceeded with a few trial interviews. These trial interviews did not go well. Further discussions between the author and the research assistants revealed that the concept was not well understood by the researchers or by the trial interviewees. Since field time was very limited it was decided to use slightly more traditional and familiar interviewing techniques.

The Jos Plateau Environmental Resource Programme had previously employed the two research assistants. Both of the assistants had received extensive training in interviewing, RRA/PRA and observational techniques. Further the author and the research assistants had successfully worked together previously on a fuelwood study.

It was decided to use a relatively open-ended interviewing technique combined with an adaptation of an RRA wealth-ranking tool. This adaptation involved using cards (small squares of paper) as a visualisation tool to rank, in a relative sense, differing pieces of related information. An interview summary and checklist form was developed and a few trail interviews were conducted. This new and improved interview format seemed to work much better. Figure 7.2 displays the interview summary and checklist.

Figure 7.2. Interview summary sheets.

AGROFORESTRY
INTERVIEW SUMMARY & CHECK LIST

HEADER INFORMATION:

Informant: Surveyor:

Position: Date:

Zone:

Training/Education:

INTRODUCTION:

This interview is a component of a research project aimed at identifying the strengths and weaknesses of the current agroforestry programme within the PADP. The overall purpose of the work is to improve the delivery of agroforestry messages and programme planning. It is not an evaluation of your job performance and your responses will remain confidential. Thank-you for your time and assistance.

AGROFORESTRY:

1. Did you attend the AGROFORESTRY workshop(s) undertaken last year?

YES or NO

2. Did you attend any other AGROFORESTRY related training?

YES or NO

3. Do you know anything about AGROFORESTRY? YES or NO

If YES: Can you draw a diagram which describes the concept of AGROFORESTRY?

DIAGRAM TO BE DRAWN ON A SEPARATE SHEET.

••• PROBING TO ARRIVE AT A WRITTEN DEFINITION •••

DEFINITION:

4. What AGROFORESTRY information sources are supposed to exist both within the PADP and outside? Can you quantify the "amount" of information for each source?

••• PREPARE A LIST OF AF INFORMATION SOURCES AND USE CARDS TO DETERMINE QUANTITY OF EACH SOURCE, SUMMARIZE IN TABLE BELOW •••

Page 1

INFORM. SOURCE						
QUANTITY						

5. Where does AGROFORESTRY information actually come from? How does the previous list and card distribution vary?

INFORM. SOURCE						
QUANTITY						

6. How important is each of the unified system of extension componente in terms of overall performance or message delivery?

••• USE HEADER CARDS and BLANK CARDS TO DETERMINE DISTRIBUTION AND SUMMARIZE IN THE TABLE BELOW •••

	CROPS	LIVESTOCK	AGRO-FORESTRY	FISHERIES	WOMEN IN AGRIC.
% OF TOTAL					

7. In practice what actually happens? How does the planned distribution of topics differ from the above?

	CROPS	LIVESTOCK	AGRO-FORESTRY	FISHERIES	WOMEN IN AGRIC.
% OF TOTAL					

Page 2

EXTENSION: STAFF-FARMER & STAFF- STAFF INTERACTIONS

8. Discuss your last three (3) contacts with farmers and/or extension staff. The choice of farmer or other staff is dependent on position. i.e. SMS's discuss staff contacts while VEA's discuss farmers!

••• The content of the discussion and the nature of the interaction i.e. whether a message was passed either downwards or upwards, record the basic information below •••

DISCUSSION SUMMARIES:

A. Who?
What?

Where?
When?
Nature?

B. Who?
What?

Where?
When?
Nature?

C. Who?
What?

Where?
When?
Nature?

9. Have you ever discussed AGROFORESTRY with a farmer or another staff member during your regular duties?

YES or NO

IF Yes, What was the content of the Discussion?

10. Review all of the information collected and allow the respondent the opportunity to change their answers!!

Page 3

A total of 25 interviews were conducted. The seven interviews at headquarters included three subject matter specialists, the agroforestry co-ordinator, the assistant director of extension and the director of the womens' programme. The nine interviews in the west zone included six village extension agents, one block extension supervisor, the zonal extension officer and the agroforestry subject matter specialist. The nine interviews in the north zone included five village extension agents, two block extension supervisors, an area extension officer, and the agroforestry subject matter specialist.

The interview centred around seven slightly different topics:

- header information (i.e. respondent position, location, education, etc.);
- attendance at any agroforestry related training;
- understanding of agroforestry;
- planned and actual sources of agroforestry information;
- understanding of unified extension;
- practice of unified extension;
- interactions with other staff and/or farmers.

Some of the information such as header information and attendance at agroforestry training were simply noted down on the checklist. Later this information was entered into a spreadsheet and used to sort the data set.

Asking the respondents to draw a diagram of the agroforestry concept and elaborate their own definition assessed their understanding of agroforestry. It was hoped that the sketch would serve as a visual tool to help both the interviewers and the respondents work better together. Later the author scored each respondent diagram and/or definition from zero to four. The definition of agroforestry from the 1991/92 workshop series indicated that there were four components to the agroforestry concept: crops, trees, livestock and people. A point was given for each aspect of the concept found in the respondents definition. A score of four meant that the definition given perfectly matched the agroforestry definition from the original workshop series, while a score of zero or one meant that the respondent had little understanding of agroforestry as presented in the workshop series. This score was also entered into a spreadsheet.

When discussing planned and actual sources of agroforestry information, or any information for that matter, it is often difficult to simply talk about percentages or relative ranking of each source. Therefore cards were used to aid both the interviewer and the respondent in more accurately quantifying or ranking agroforestry information sources. In brief, each respondent was asked where should agroforestry information come from. The interviewer then wrote the source, or drew a picture, on a card. The cards were then spread out before the respondent. Next the respondent was given 10 to 20 cards which he used to rank the various information sources. The interviewer recorded the number of cards in each category and the total numbers of cards given on the interview summary sheet. Similarly the respondent was asked, "does this actually happen?" and if reality differs would they please describe the actual condition using the cards in the same manner. This information was recorded on the interview summary form. Later the numbers of cards were converted to percentages for each information source category. This information was entered into a spreadsheet.

The planned and actual messages or performance within the unified system of extension was also discussed using cards. In this case the respondent was given ten cards and asked to rank the five sectors of unified extension; crops, livestock, agroforestry, fisheries and women's issues which had a previously prepared pictorial header card. Again the differences between planned and actual scenarios were explored. The responses were recorded on the summary sheet, later converted to percentages and entered into a spreadsheet.

To explore the methods of interaction between the respondent and other PADP staff or farmers open-ended discussions were held. Basically the respondent was asked to talk about their last three contacts. By probing the interviewer was to determine who where they talking to, what did they talk about, where did the conversation take place, when did the interaction occur and what was the nature of the conversation (i.e. top down or bottom up). The interviewer recorded only the basics of the conversation on the summary form. Later this information was reviewed, coded based on the nature of the conversation and entered into a spreadsheet.

By the end of this step a spreadsheet containing all of the data had been prepared. This data was then sorted by zone, position or organisational level and the data summarised into charts, tables and graphs using the built in Microsoft Excel functions. Given the small sample size, formal statistical tests were not completed.

Method Four: Backstopping Workshop

The final step in the field-work was the design and delivery of a one-half day workshop for middle and senior level Zone and Headquarters staff. The workshop borrowed the GRAPP philosophy of: TO SEE, TO REFLECT and TO ACT. Thus the workshop had three primary sessions:

1. What is agroforestry and how is it suited to the PADP?;
2. What has been accomplished and what problems were encountered?;
3. What are our future options?.

The workshop had two roles as far as the author was concerned. First it was a backstopping exercise to assist the PADP staff with agroforestry issues and to help improve the situation. Second it also allowed the opportunity to triangulate works accomplished and problem areas with the other information sources such as interviews, files reviews, etc.

Most of the workshop was conducted using small group methods. The workshop participants were grouped by zone and proceeded to (1) develop a definition of agroforestry, (2) explore agroforestry options within "sample" villages from their areas, (3) prepared lists of accomplishments and impediments and (4) developed a strategy to improve the agroforestry component of their work. Of special note, the "sample" villages were drawn from real world RRA village-transacts and sketch-maps from villages visited in the initial workshop series. At the end of each session, a plenary was held and the information was shared with each group. All information was recorded by the workshop participants on large poster paper and was placed on the walls for all to see.

These papers and the author's notes were used to prepare a workshop report that was later distributed to workshop participants.

Conclusion

Given the author's predisposition to participatory methods, it is understandable that the monitoring and evaluation methods used followed a participatory approach. Further, the multiple method / triangulation approach appeared to offer the best chance of assessing the PADP agroforestry system quickly and accurately given the limited budget. Discussions about the suitability of the methods and their ability to be replicated will be presented in the next chapter along with the results.

Chapter Summary

The main points of chapter seven can be summarised as follows:

- The investigation was limited to the effects of the workshop series on the PADP, and was not an investigation of the effects of the project on rural farm families;
- Field-work was conducted during a very turbulent period in Nigeria's history with limited resources;
- The monitoring and evaluation exercises followed a participatory action-research approach;
- Data was collected using a number of complementary and nested methods;
- Data collection tools included file reviews, detailed discussions with the agroforestry co-ordinator, interviews in two zones and a backstopping workshop;
- The data collected via the four methods was triangulated to ensure that the information derived was sound;
- Much of the information was entered into a spreadsheet, summarised and then analysed.

CHAPTER EIGHT

Results and Discussion

Aims and Objectives

This chapter aims to present and discuss the information gathered during a 1993 review and backstopping mission to the Plateau Agricultural Development Programme agroforestry extension project. This project had begun approximately one and a half years earlier with a series of workshops aimed at creating agroforestry vision and building agroforestry capacity. Specifically this chapter will:

1. Present the findings of the monitoring and evaluation exercises;
2. Assess the effectiveness of the PADP agroforestry project's "vision creation" goal;
3. Determine the productiveness of the PADP agroforestry project's "capacity building" goal;
4. Discuss the overall suitability of the PADP agroforestry project methods and goals;
5. Explore the impact of PADP's organisational culture on the project.

Introduction

Fieldwork, as described in the previous chapter, was undertaken over a one-month period spanning portions of August and September 1993.

In summary; files and records were reviewed, detailed discussions with the agroforestry co-ordinator (AFC) were conducted at PADP headquarters in Jos, 25 interviews were conducted at PADP's Headquarters as well as in the North and West Zones, and a backstopping workshop involving middle and some upper level staff from all four PADP Zones and Headquarters was held in Jos.

The basic results of this monitoring and evaluation exercise will be analysed and discussed herein.

File and Record Reviews

The content of monthly technology review meetings (MTRM) is an important indicator of PADP's organisational activities as the content of these meetings forms the basis for extension message development. The agroforestry component of the MTRM for 1991, 1992 and 1993 are displayed in Table 8.1.

The reader can see that the percentage of agroforestry training within the MTRM increased from 0% prior to the agroforestry workshop series to over 21% one year after the agroforestry workshop series. Further, the complexity of agroforestry training also increased from simple "tree" related training (i.e. tree crop management) to more involved "integrated" training such as fodder banks. Fodder banks are tree and shrub gardens grown close to animal pens to allow for livestock feeding. While there are likely other factors that increased the prominence of agroforestry within the PADP it seems reasonable to assume that the agroforestry workshop series did have some effect on the organisation's activities.

Additional file and record review information will be presented in conjunction with material from the detailed discussions with the agroforestry co-ordinator.

Detailed Discussions with the Agroforestry Co-ordinator

Discussions with the agroforestry co-ordinator about his agroforestry programme problems and milestones resulted in the production of Figure 8.1. This timeline indicates agroforestry activities undertaken from 1979, when the PADP was still a trial project, through to September 1993. The reader can see that activities greatly increased after 1991.

Figure 8.2 indicates a few of the major problems faced by the agroforestry co-ordinator during implementation of the agroforestry programme. Major problems included difficulties in co-ordinating with the Afforestation Project, inadequate transport and political unrest.

Table 8.1. Agroforestry training included in monthly technology review meetings for the years 1991 to 1993

Year	Total Number of Training Sessions	Number of Agroforestry Training Sessions	Agroforestry Training as a Percent of Total Sessions	Agroforestry Topics
1991	26	0	0%	None
1992	24	4	16.7%	1) Nursery Establishment 2) Tree Crop Management 3) Management of Young Trees During the Dry Season 4) Apple Transplanting
1993	28	6	21.4%	1) Honey and Bees 2) Contours and Vertiver Grass 3) Fodder Banks and Feed Gardens 4) Live Fencing and Planting Seedlings 5) Management of Fodder Banks 6) Beehives

Figure 8.1. Timeline of agroforestry events and activities.

1979-1987

- Industrial forestry component to trial Agricultural Development Programme (2200 ha of plantations established) centred on fast growing exotics such as teak, gmelina, pine and eucalyptus

1988

- General introduction of agroforestry to extension
- No specific programme except beekeeping

1989

- Alley farming training at the International Institute for Tropical Agriculture (IITA)
- Forestry Vocational Training Centre (FVTC) Course - Introduction to agroforestry
- Attending other occasional trainings at IITA
- No specific programme in place this period

1991

August

- World Bank (WB) mission into small ruminants and alley cropping

November

- **Agroforestry Extension Project Workshop series began**

1992

January

- Zonal AF subject matter specialists seconded from Ministry of Agriculture (MOA) in place in North, West and South Zones

February

- **Agroforestry Extension Project Workshop series ends**

March

- WB supervision mission split technical services and extension: Agroforestry to be under extension: pre March 1992 agroforestry was under technical services

March/April

- Bee keeping survey in association with JPERDP

June/July

- People Oriented Development of ECWA training for agroforestry subject matter specialists

June to August

- 1-hectare demonstration plots established in all 4 Zones: included alley farming, fodder gardens and cover crop techniques

September

- Agroforestry back to Technical Services from Extension

October

- PADP judged best ADP in Nigeria by the WB

November

- Subject matter specialists attended workshops in small ruminants/alley farming systems and adoption of alley farming by Nigerian farmers

1993

May

- International Livestock Centre for Africa (ILCA) trials at Ganawuri incorporated into PADP

July

- Afforestation Project extension staff take-over
- North Zone AF SMS attended FVTC course - Afforestation for Non-foresters

August

- On-Farm Adaptive Research (OFAR) into slope stabilisation using grasses

August/September

- **Monitoring, evaluation and planning of agroforestry extension project**

Figure 8.2. Timeline of major constraints during agroforestry programme implementation.

1988-1991

- Agroforestry Co-ordinator to be link-man between Afforestation Project and PADP: this never worked as funding/cost to be shared not workable

1992-1993
May to April

- Vehicle problems - transport usually unavailable

1992
December

- Fuel shortages

1993
January/February

- General Workers Strike in State establishments

August/September

- Vehicle down

The above timelines indicate three main points: (1) an agroforestry programme was lacking prior to the workshop series, (2) agroforestry activities were concentrated on the technical aspects of the subject, and (3) the agroforestry co-ordinator faced serious constraints, well beyond his control, since the PADP started operations.

The agroforestry extension workshop series produced a detailed ZOPP project planning matrix as outlined in Chapter 6 (Table 6.1). This matrix included specific activities to be undertaken. The author and the agroforestry co-ordinator reviewed this planning matrix, along with relevant PADP files and personal knowledge, with the aim of classifying the specified activities as complete, incomplete, or partly complete. Table 8.2 displays the results of this exercise. In general it can be said that activities related to the technical aspects of agroforestry were completed or partly completed while activities related to appropriate interactions with farmers (i.e. participatory extension) were not undertaken.

Table 8.2. Status of planned agroforestry activities.

ACTIVITIES:	STATUS: PARTLY
1. CAPACITY BUILDING WITHIN PADP	
1.1. Training of PADP personnel in AF and in appropriate interaction with villagers	
1.1.1. <u>AFC & SMSs</u>	
1.1.1.1. AFC & AFSMSs join learning-by-doing workshop of POD of ECWA at their Bukuru Learning Farm	Partly
1.1.1.2. AFSMSs & Livestock SMSs do four-day AF workshop	Partly
1.1.1.3. Further learning-by-doing during creation of AF demonstration farms (see below)	Complete
1.1.1.4. On-going training: concepts & technologies of AF; and, appropriate interaction with villagers	Incomplete
1.1.1.4.1. Obtain training information and materials, for HQ and for Zones. Photocopying of relevant inputs.	Complete
1.1.1.4.2. For all AFSMSs together, each month, rotating around the zones	Partly
1.1.1.4.3. For individual SMSs, giving follow-up on training and monitoring activities	Partly
1.1.2. <u>Field extension workers</u>	
1.1.2.1. FNTs: training on concepts and technologies of AF and on appropriate interaction with villagers	Partly
1.1.2.2. Learning-by-doing while setting up demonstration sites (see below)	Complete
1.1.2.3. Joint-learning with communities in problem identification and option generation (see below)	Incomplete
1.1.2.4. Joint-learning with communities while implementing potential solutions (including trials)	Incomplete
1.1.3. <u>Other training inputs</u>	
1.1.3.1. Pre-season training on AF concepts	Incomplete
1.1.3.2. Mid-season training on AF concepts	Complete
1.1.3.3. Regular input in MTRMs on AF perspective, on concepts or problems rather than individual technologies	Partly
1.2. Establishment of AF sites (for learning-by-doing training, demonstration, trial and seed multiplication)	Partly
1.2.1. <u>At Zonal level on seed farms</u>	
1.2.1.1. Procure seed and other materials	Partly
1.2.1.2. Initial establishment scheduled and organised	Partly
1.2.1.3. Management carried out in collaboration with AF, crop, livestock and extension personnel (to include collection and appropriate storage of seed)	Partly
1.2.2. <u>At FNT grounds</u>	
1.2.2.1. Procure seed and other materials	Complete
1.2.2.2. Initial establishment scheduled and organised	Complete
1.2.2.3. Management carried out in collaboration with AF, crop, livestock and extension personnel (to include collection and appropriate storage of seed)	Complete
1.2.3. <u>In communities</u>; following interaction with villagers and in response to problems identified	Incomplete
1.2.3.1. Seed and the necessary back-up organised at Zonal level in response to community demand	Partly
1.3. Regular interaction among Co-ordinators, SMSs and extension personnel	
1.3.1. At MTRMs	Partly
1.3.2. Regular meetings at HQ level	Partly
1.3.3. Regular meetings at Zonal level	Partly
1.4. Networking with other organisations for ideas, information, input and training	Partly
2. INTERACTION WITH VILLAGERS	**INCOMPLETE** (All 2.0 activities)
2.1. Joint-learning with villagers during RRAs on environmental and production problems in farming systems	
2.2. Project identification with villagers during village meetings	
2.2.1. Presentation of findings of RRAs and reflection on the nature of problems identified	
2.2.2. Generation of options for solving the problems identified	
2.3. Implementation of village projects	
2.3.1. Reflection on requirements for project implementation and on initial scale of project	
2.3.2. Necessary inputs obtained locally and/or provide by PADP	
2.3.3. Project implementation jointly by villagers and extension personnel	
2.3.4. Provision of necessary follow-up and further training; participatory monitoring & evaluation	
2.4. On-going joint-learning through project identification and implementation	
2.5. Use of media services to put across AF perspective	
3. ON-GOING INTERACTION WITH VILLAGERS FOCUSING ON CAPACITY BUILDING IN VILLAGES TOWARD SELF-RELIANCE IN AF	**INCOMPLETE**

During detailed discussions with the agroforestry co-ordinator it was decided to concentrate further investigations in PADP Headquarters as well as the North and West

Zones. The primary reason for this was a lack of time and resources to explore all four zones. Further it appeared that the North Zone was the most active in agroforestry issues while the West Zone was the least active. Visiting both zones should provide the opportunity to see the full range of responses to the initial workshop series.

The following quotes from the agroforestry co-ordinator best summarise the discussions:

- "I can't see what's going on due to transport problems.";
- ".... before you [the author] came along I didn't really know what agroforestry was.".

Interviews

In total, twenty-five interviews were conducted. Seven were from PADP headquarters and nine were from each of the North and West Zones. The interviews centred on training, agroforestry understanding and information sources, the unified system of extension and actual interactions between staff and farmers. Each of these components will be dealt with separately. Persons from as many staff cadres as available were interviewed. Middle level managers and field staff were the primary interviewees. Upper level staff including the Programme Manager, the Zonal Programme Managers and the Chief Extension Officer were not available for interviews.

Appendix II contains the raw monitoring and evaluation data. The names of the respondents have been obscured as was promised during the interviews.

The average definition of agroforestry given by the respondents who attended the agroforestry workshop series was greater than that of those who did not attend (Table 8.3).

Table 8.3. Agroforestry definition based on workshop attendance.

Workshop Series Attendance	Average Definition	Number of Interviewees (n)
Yes	3.1	9
No	2.5	16

Agroforestry understanding, based on definition, was approximately equal at Headquarters and in the North Zone and both were greater than in the West Zone (Table 8.4)

Table 8.4. Agroforestry definition by geographic zone.

Zone	Average Definition	Number of Interviewees (n)
Headquarters	3.0	7
North	3.1	9
West	2.1	9

Agroforestry trainings were conducted both within PADP (in-house) and at other agencies (outside). Outside trainings were usually at POD of ECWA and should be considered as follow-up to the agroforestry extension project. It appears that outside trainings were more effective than in-house training based upon agroforestry definitions given by respondents (Table 8.5). Note that in-house training includes all agroforestry training held within PADP not just the agroforestry workshop series. This suggests that many of PADP's in-house trainings were not that effective.

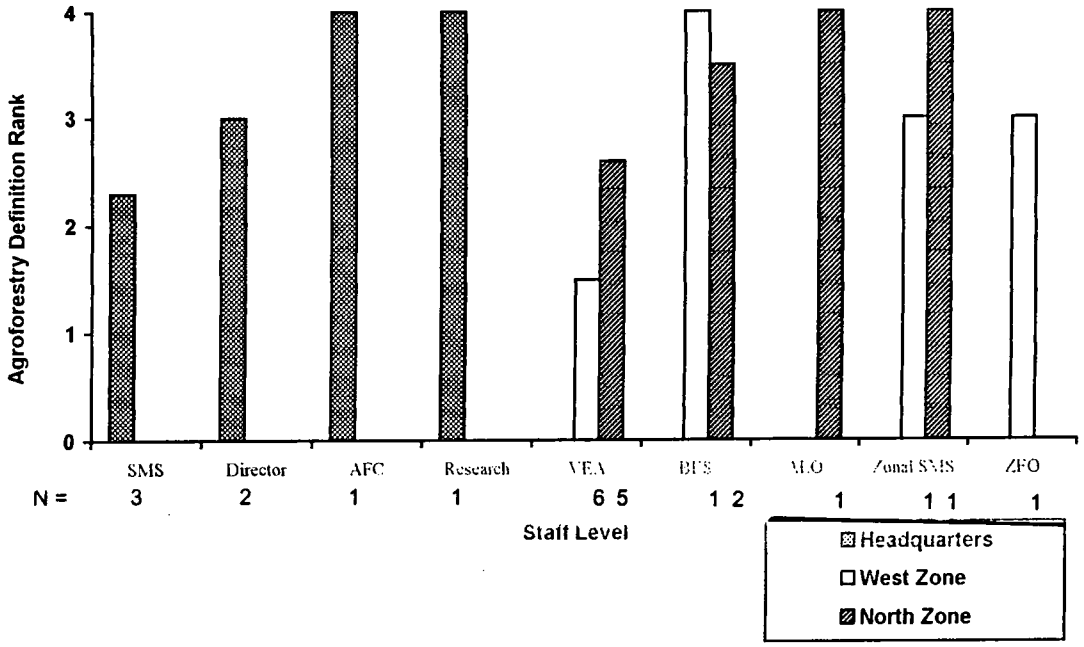
Staff level affected the definition of agroforestry given by the respondents. It appears that as staff level increases then so does the understanding of the agroforestry concept. This general trend was clearly evident in Headquarters and the North Zone but was less clear in the West Zone (Figure 8.3).

Table 8.5. Agroforestry definition by training source.

Training Source	Average Definition	Number of Interviewees (n)
In-house	2.5	17
Outside	3.4	5

Note that 3 interviewees received no agroforestry training.

Figure 8.3 Agroforestry definitions by staff level.



Agroforestry definitions did not seem to be affected by the educational level of the respondents.

Distance from the Zonal headquarters also played a role in the agroforestry definitions given. In general the farther away from headquarters the respondent worked, the poorer their definition of agroforestry.

The interview discussions centred on planned and actual agroforestry information sources did not prove useful. The interviewee perceptions of the questioning varied too much among the participants and between respondents and interviewers to allow for meaningful analysis. As these differences did not become apparent until the interview analysis stage it was impossible to rectify the situation.

The perceptions of the unified system of extension varied greatly among the respondents. A unified system of extension means that one agent delivers messages in a number of fields (i.e. fisheries (FISH), crops, livestock (LIVE/ST), agroforestry (AF), and gender issues (WIA)). Therefore it is critical to know the importance of any subject area within

the system if one is understand how the whole system functions. In general the headquarters staff placed a much greater emphasis on crops while the Zonal staff felt that all five subjects should be treated approximately equally (Figures 8.4, 8.5, 8.6).

However, within Headquarters, there are great differences between staff levels. For instance, research staff indicated that crops comprised 60% of the planned and actual messages while agroforestry, fisheries, livestock and women's issues each comprised 10% of the remaining messages. The agroforestry co-ordinator also noted a similar trend. Departmental directors however felt that all five subjects were planned as equal (20% each) but that actual practice strongly favoured crops.

In the North Zone there were few differences between the perceptions of the subject matter specialists (SMS) and the village extension agents (VEA) about the planned and actual unified extension system. Both thought that all five subjects should be more or less equal but that crops actually received more attention. Further the north zone SMS indicated that agroforestry was planned as more important than the other components and actual practice. Intermediate staff levels (i.e. area extension officers (AEO) and block extension supervisors (BES)) had similar perceptions of the unified system of extension as the other staff cadres.

In the West Zone both the SMS and the VEA indicated that all five subjects were planned to be approximately equal but actual practice varied greatly with crops receiving the greatest amount of attention. However the zonal extension officer (ZEO) indicated that crops were planned to be a larger component of the unified system of extension and did actually receive more attention.

Figure 8.4. Perceived Planned and Actual Unified System of Extension in PADP Headquarters (n = 7).

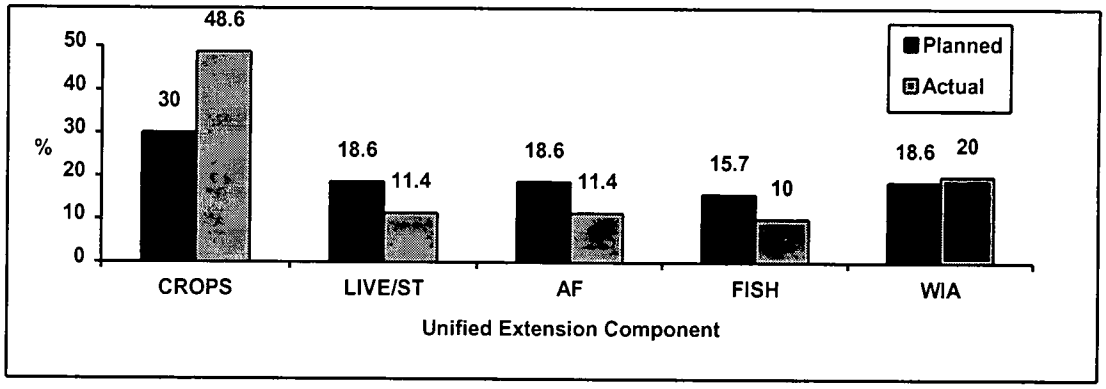


Figure 8.5. Perceived Planned and Actual Unified System of Extension in PADP North Zone (n = 9).

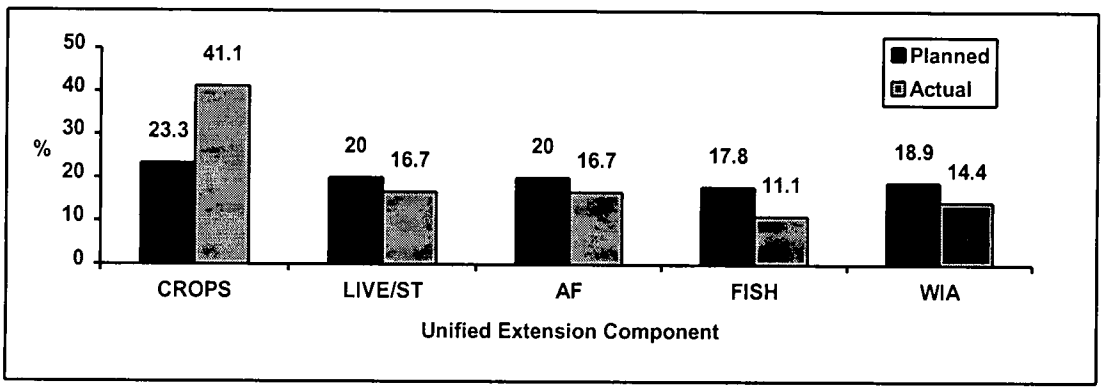
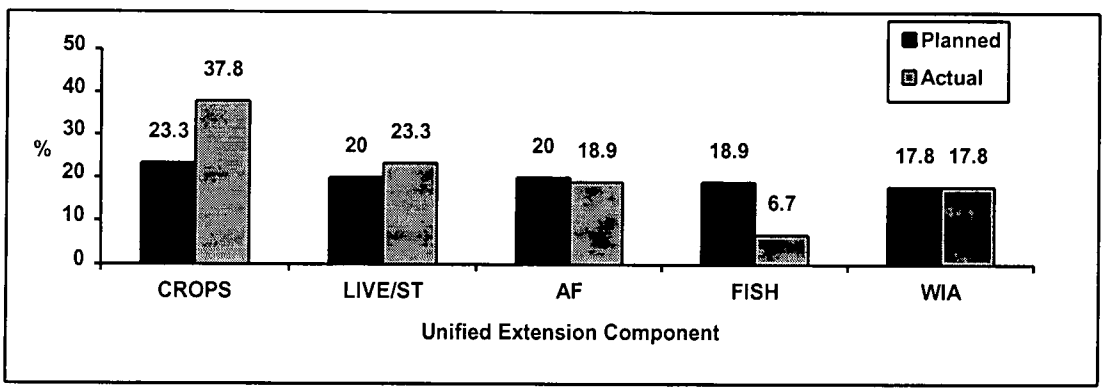


Figure 8.6. Perceived Planned and Actual Unified System of Extension in PADP West Zone (n = 9).



Interactions among staff and with farmers varied greatly between zones and headquarters as well as between staff levels. Unidirectional as well as two-way discussions were both reported. For the purpose of this study, the main point to note is that no respondent mentioned using any of the participatory planning, joint-learning or Rapid Rural Appraisal (RRA) techniques which were presented to the PADP during the workshop series. Sometimes it is not what is said, but rather what is not said, that is important.

Backstopping workshop

A half-day long backstopping workshop aimed at improving agroforestry planning within the PADP was held in early September, 1993. The workshop borrowed the GRAAP philosophy of "To See, To Reflect and To Act". As such the workshop centred on (1) revisiting the concept of agroforestry, (2) reflecting on suitable interventions and interactions with farmers, (3) reassessing current activities and (4) refining or modifying agroforestry plans. Workshop participants were predominantly middle level staff from all zones and headquarters. Only selected points from the workshop will be presented and discussed herein. Appendix III contains the full backstopping workshop report and readers are encouraged to view the complete document.

The agroforestry definitions formulated by the workshop participants closely matched that which was presented during the earlier agroforestry trainings. The participants maintained a good understanding of the agroforestry concept.

North Zone staff felt that a larger number of agroforestry interventions were suitable in their area as compared to the other Zones. All the participants agreed that a large number of agroforestry interventions are available but that any one technique may not be suitable for all PADP Zones. It can be said that all of the participants recognised the variety of agroforestry techniques.

The workshop participants noted numerous constraints to village level interventions. North Zone staff listed four times as many constraints as the other Zones. Further the insights of the North Zone staff were far more in-depth than those of the other zones. Many participants from the West, South and East Zones indicated that "the poor attitudes"

of farmers and funding shortages were two of the main constraints faced by the PADP in undertaking village level interventions. The North Zone staff indicated that a wide variety of factors including limited staff and transport, access, inadequate government support, political instability, and ecology inhibited village level interventions.

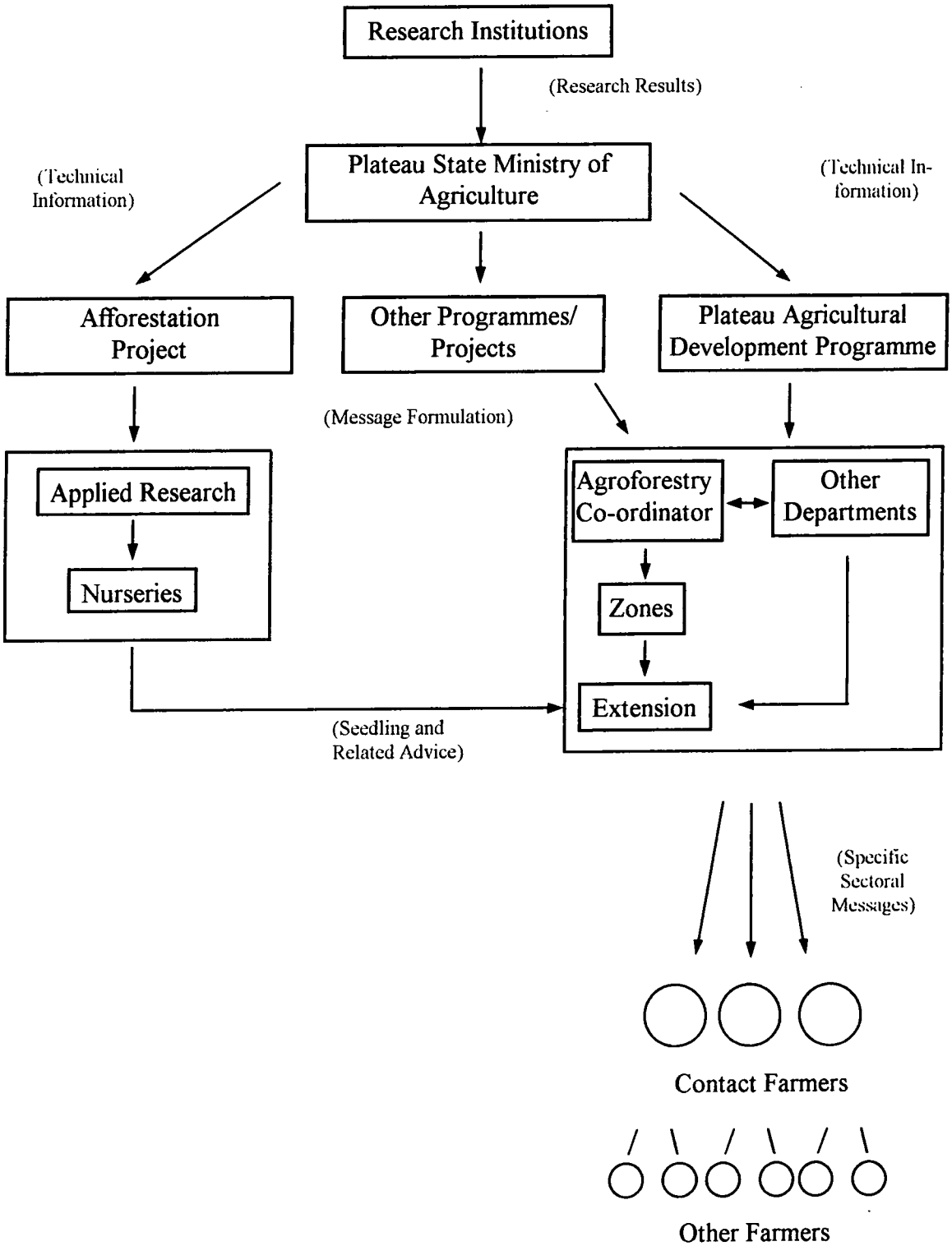
Suggested strategies or actions to improve the PADP agroforestry programme from the participants varied. Suggestions ranged from having outside institutions conduct a diagnostic survey (preferably using RRA), to increased training for staff, to providing additional incentives to staff and farmers, plus many others.

A Revised PADP Extension Model

The agroforestry extension model changed after the 1991/1992 workshop series. However, this alteration had more to do with a World Bank directive to incorporate the extension services of the Afforestation project than the workshops. Figure 8.7 provides a graphic description of this change.

The workshop series may have enabled the PADP to more effectively adapt to the change, but the monitoring exercise was not structured to allow for the evaluation of this idea.

Figure 8.7. 1993/94 PADP Agroforestry Extension Model.



Results summary

Based upon triangulation of the results of the monitoring and evaluation exercises, it can be said that:

1. Agroforestry activities within the PADP such as MTRM's, applied research and trainings increased in terms of quantity and quality after the 1991 workshop series;
2. Agroforestry activities within the PADP focussed on the technical aspect of the subject;
3. Extension methods or activities of the PADP were not altered to accommodate the participatory methods (i.e. RRA, Joint Learning Approach) which were presented during the agroforestry workshop series. Further unified extension system expectations and practice varied widely;
4. The incorporation of the Afforestation project's extension staff altered the PADP extension model;
5. Agroforestry understanding increased within the PADP especially among North Zone and Headquarters based middle level managers and those who received outside training;
6. Upper level staff from both Headquarters and the Zones were not involved in either the monitoring and evaluation exercises or the initial workshop series;
7. PADP recognises the problems facing them as they implement an agroforestry program but often look to other agencies and individuals for solutions rather than attempting to overcome shortcomings with the resources available to them;

In essence the project goals of vision creation and capacity building were only partly realised. Why?

Discussion

Unexpected outcomes from development projects are no surprise to development practitioners. The project goals of vision creation and capacity building were only partly achieved. Does this mean that one should admit defeat and surrender? The author believes not. However, one must be willing to critically examine the project, and their role within it. The discussion will be categorised into five sub-sections: technical agroforestry, extension, institutional arrangements, vision creation and capacity building, and methodology.

Technical Agroforestry

Agroforestry activities increased after the 1991 workshop series. While partially owing to the vision creation and capacity building initiative, the increase was also affected by other factors. The first factor was the addition of agroforestry subject matter specialists to the Zonal staff, planned prior to the agroforestry extension project. Further there was increased pressure on the PADP from the World Bank to unify their extension services and incorporate the Afforestation Project's extension services. However there is little doubt, in the author's opinion, that the agroforestry project strengthened the ability of the PADP to use the increased resources and respond to pressures in a more effective and constructive manner.

Chapter Four, reviewed numerous authors' discussions of agroforestry benefits and constraints (Bene *et al.* 1977, Rocheleau 1988, Nair 1990, Young 1987, 1988 and 1990, Steppler and Lundgren 1988, Weinstock 1985, and others). The PADP project exhibited many similar biophysical, economic, as well as social and cultural characteristics.

In particular, Kerkhof (1990) conducted a review of 21 agroforestry projects in 11 African countries. Comparisons between this study and Kerkhof's will prove useful for discussion purposes. While a common aim of agroforestry has been to boost crop production, he found that no hard proof of this being accomplished under field conditions. Therefore he suggests that the other benefits of agroforestry namely, firewood, tree produce and environmental are better targets and selling points.

Extension

Extension did not share the same successes as technical agroforestry. In particular, perception differences between Headquarters and the Zones, and between staff levels are troubling. Upon review, the author could find no official reference to the intended split of messages between the five subject areas. Message content should vary to incorporate differences between areas and their ecology (as outlined in Chapter 5). There appears to be a lack of direction within the PADP regarding the appropriate message mixes for different zones. This will decrease the effectiveness of the unified extension system.

Since the technical and extension aspects of development are separate within the PADP organisation, agroforestry, a technical component, did not function as a unifying subject within the unified extension system. Thus the hope that agroforestry would act as a co-ordinator did not materialise. Hence, there was no mechanism to ensure that the integration and coherence of subject matter messages.

Had agroforestry played a co-ordinating role then it is likely that some aspects of appropriate interactions with farmers would likely have been adopted. The effectiveness or importance of agroforestry within the extension section may have been increased by the incorporation of Afforestation Staff, as described in Figure 8.7. While this incorporation was the result of a World Bank directive, its benefits certainly intertwined with those of the agroforestry workshop series.

Kerkhof (1990) noted that a wide range of extension approaches have been used throughout Africa, and that none have been wholly effective. He stressed that it was very important for extension staff to get into the field and meet with people for a project to be successful. Since the PADP project emphasised a learning process, and a two-way communication approach to dealing with farmers and within the organisation itself, the potential to improve the workings of the PADP exists.

As discussed in Chapter Three, there are two approaches to extension: top-down and bottom-up. While the PADP project promoted a participatory or bottom-up approach, it was not adopted by the PADP organisation. Some of the reasons for the non-adoption are discussed herein. Many of the reasons relate to PADPs organisational arrangements,

which have little to do with the merits or demerits associated with an extension approach. Therefore the success or failure of a participatory approach cannot be determined from this study alone.

Institutional Arrangements

The promotion of the agroforestry concept among primarily middle level managers did not result in the anticipated "push" within the organisation. It is probable that the exclusion of upper level management from the workshops hindered project goals achievement. Without their involvement: (1) few management concerns reaching the trainers, and (2) an information void was formed between middle staff and other levels, and (3) there was not adequate support for the agroforestry co-ordinator. Further, as upper management did not fully understand the integrative and non-specific nature of agroforestry, they were not supportive of a flexible and interactive extension system with the agroforstry sector in a co-ordinating role.

Moris (1991) indicated that since the workforce within African extension services is sharply divided by rank, salary level and responsibilities, it is difficult to achieve effective teamwork within an agency. The information void within the PADP ranks certainly supports this hypothesis.

Ehert (1997) noted that the backstopping activities provided to the PADP through POD of ECWA and the Jos Plateau Environmental Resource Development Programme maintained cordial relations between all of the agencies involved. However, those relations did not change ground – level activities to the benefit of rural peoples. This author cannot comment on the effect of the agroforestry project on rural people, because that is outside the scope of the study. However, it must be noted that Ehert's paper is based solely on personal observation and opinion. No formal studies of the impact of PADPs agroforestry programme on rural peoples have been undertaken. Thus a connection between the vision creation and capacity building approach within the PADP and the livelihoods of rural peoples cannot be readily established.

One cannot presuppose that NGO's perform better than government ministries. Moris (1991) found that developing world projects run by NGOs had a similar number of

successes and failures. Kerkhof's (1990) review found no differences in success rate between projects managed by government extension agencies and those co-ordinated by non-governmental agencies. Further, some of the best results emerged from projects with effective co-operation between NGOs and government agencies. Perhaps, both the PADP and POD of ECWA can benefit from each other.

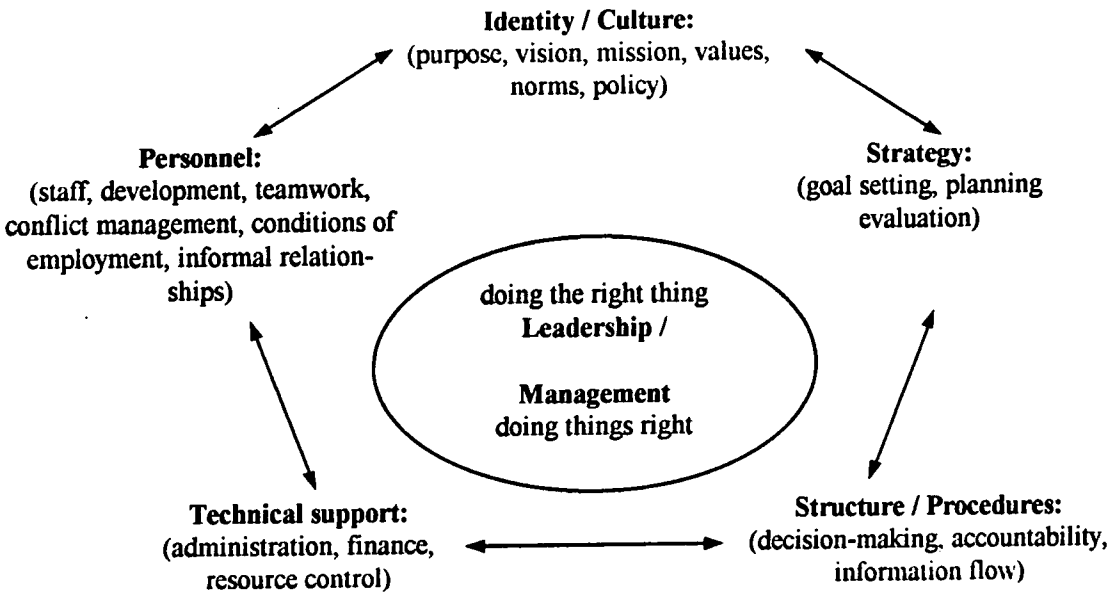
Kerkhof (1990) noted that many participatory agroforestry projects begin with preconceived ideas of local problems and their solutions. However these preconceptions are often proved wrong. The ability to recognise the correct problems and deal with those problems flexibly is crucial to the success of any project. Perhaps the PADP agroforestry planning and extension project needed to emphasise the identification of weaknesses and strengths within the organisation.

Alan Kaplan and the others at the Community Resources Development association in South Africa have explored the development organisation system (Kaplan 1996, Taylor *et al.* 1997). They contend that the organisational system consists of interlocking elements which are interdependent. All elements affect the proper functioning of the whole system. The six key elements of the organisational system are (1) identity/culture, (2) strategy, (3) structure /procedures, (4) technical support, (5) personnel and (6) leadership/management. Figure 8.8 illustrates this inter-relationship which can guide us in summarising the organisational aspects of the PADP agroforestry planning and extension project.

While the workshop series focused on certain aspects of all six elements of organisational life, it inadequately addressed several components of each element. For instance, within the identity/culture element, the workshop series focused on aspects of purpose, vision and mission but neglected values, norms and policy. Within the strategy element, the project addressed planning methods but overlooked the importance of established evaluation methods. The weakest component of PADP organisational life, from the agroforestry project perspective, is the structure/procedures element. The project did not adequately consider the differences between staff levels in decision-making, accountability, or information flow. The technical support element was not clearly addressed during the workshop series or in the follow-up review exercise. The

PADP project did encourage staff development and teamwork but largely ignored conditions of employment, and informal relationships.

Figure 8.8. Elements of Organisational Life.



Source: Adapted from Kaplan (1996) and Taylor *et al.* (1997)

Study Methodology

The review upon which this dissertation is based must be carefully explored to determine its strengths and weaknesses so that the results can be weighed accordingly. The reader will recall that first, a review of the file and records at headquarters was conducted. This allowed the opportunity to gain a basic insight into activities ongoing within the PADP before and after the project. Subsequently, meetings with the agroforestry co-ordinator offered the chance to clarify the file information and gain first hand knowledge of the situation. In-depth interviews were then conducted to expand the knowledge gained from earlier steps, and to explore in greater detail the workings of the PADP. The final planning workshop was held to review collective organisational thoughts and actions, and to provide staff with encouragement and support via coaching or back stopping.

On the positive side, the review methods allowed for triangulation of information from a number of sources. On the negative side, the sample size from each source was small because of budget, time, and political constraints. As a result of the limited sample size, the interview data was not subjected to statistical testing.

No review would be complete without a brief discussion of the background and the potential biases of the reviewer. One can question the validity of a technical scientist conducting seemingly social science research. A number of papers have noted that foresters, like this author, have shortcomings in the non-technical components of the systems with which they work.

Moris (1993) noted that professionals being prepared for work in natural resources fields such as forestry, are mainly trained in primary production skills. Nevertheless they take up positions requiring extension skills. This conflict between training skills and job skills inevitably leads to problems.

Van Gelder and O'Keefe (1995) argue that classical foresters need to adjust their attitudes to tackle the problems of rural forestry so that they recognise the range and value of local people's experience. The classical attitude of a forest policeman and a plantation specialist must be changed to incorporate a participatory approach in dealing with local peoples and the woody components of their farming systems.

Dove (1992) suggests that social scientists should devote greater time to examining the beliefs of foresters regarding local peoples since an obvious disparity exists between the two groups. Since participatory planning aims for joint learning between foresters/extensionists and rural people, then this difference in problem perception will cause difficulties.

The author's background did not fully prepare him for all aspects of social science research. However, he recognises these limitations and has attempted to address them in his work.

Vision Creation and Capacity Building Approach

The vision creation and capacity building approach used in the original workshop series was chosen from a number of possible alternatives to organisational development. This approach has been controversial.

Kidd (1993) and Phillips-Howard (1993 a,b) debated the basis for reclamation policy on the Jos Plateau. Both highlighted the PADP agroforestry project in their work. The vision creation and capacity building approach used in the agroforestry extension project was favoured by Kidd and questioned by Phillips-Howard.

Kidd (1993) suggested that this vision creation and capacity building approach to agroforestry within the PADP held promise as a viable development approach. Its strengths include (1) reduced the reliance on outsiders, (2) a learning process approach which allows flexibility and adaptability, (3) issue exploration within the PADP itself. Finally, the agroforestry goals are neither capital intensive nor external resource dependent.

Phillips-Howard (1993b) conceded that many points about the agroforestry project and its approach were commendable. He was however, concerned that the approach did not adequately consider: (1) the preoccupation of government extension staff with their own livelihood problems, (2) that projects aimed increasing soil fertility using leguminous tree have generally failed in Africa, (3) that farmers simply want more fertiliser, capital and labour because they already understand their own farming systems and, (4) the important issues of budgetary allocation and informalism within the PADP.

Upon scrutiny, validity can be found in points by both authors. For instance, Phillips-Howard was correct that the project did not adequately concern itself with staff livelihood issues. On the other hand, Kidd was correct that a learning process approach allows for greater flexibility and adaptability.

In the opinion of the author, it is reasonable to question the "one-time" nature of the workshops. Further, one could argue that the wrong participants were targeted, the follow - up was insufficient, and the time-requirements were too great. One can always find fault

in the chosen methodology after the fact. However, given the knowledge of the day, the available time, finances and material resources, the vision creation and capacity building focus was a logical and defensible course of action.

Conclusions

The scope of the agroforestry project was limited by finances, time and power. Therefore the PADP was under no strong obligation to adopt the goals of the project. Even so, the PADP did incorporate certain elements provided they were useful and fit within their organisational culture with minimal change. Given that the current Training and Visit extension system employed by the PADP lacks flexibility, it is understandable that changes were not implemented. Further, the staff would not adopt the participatory planning and extension system, as it could be detrimental to their relationship with upper management and the prime funding agency. However, the technical aspects of the agroforestry concept were incorporated because the PADP is geared toward accepting changing technical information.

In retrospect, the original project goals of vision creation and capacity building were probably too ambitious. Inadequate attention was paid to PADP's organisational culture when formulating the goals and conducting the workshops. As such, the goals were not fully adopted. The weak links between staff levels and between the technical and extension sections, posed the most serious constraints.

By applying the GRAAP process (to see, to reflect and to act) to the project and its outcome, one can more fully explore the strengths and weaknesses of the approach and thus learn from the experience. Conclusions and recommendations about agroforestry planning and extension resulting from this reflective learning process are presented in the next chapter.

Chapter Eight Summary

The main points of chapter eight can be summarised as follows:

- Technical agroforestry activities within the PADP increased as a partial result of the project;
- The project goals of "vision creation" and "capacity building" were only partly achieved since:
    - PADP extension methods were not altered;
    - The lower and upper level staff were less informed than the middle level staff;
    - PADP resources were not mobilised to address agroforestry concerns;
- The PADP incorporated any elements of they project which fit within their organisational culture without requiring major changes;
- The agenda of using agroforestry as a unifying subject within the "unified" extension system was only partly realised due to the weak links between staff levels and between the technical and extension sectors;
- The addition of zonal agroforestry subject matter specialists increased the level of activity within the organisation. It is difficult to separate the effects of the project from the addition of staff;
- Alterations to the PADP extension system did not occur. As such, the success or failure of a participatory extension system cannot be determined from this study alone;
- Even with the constraints of financing, timing, and political instability, the chosen methods did ensure triangulation of information;
- Inadequate attention was paid to PADPs organisational culture when setting the agroforestry project goals and conducting the project;
- The limited scope of the agroforestry extension project, in terms of finances, time and power did not encourage the PADP to fully adopt the goals of the project;
- In retrospect, the original project goals of vision creation and capacity building were too ambitious.
- The vision creation and capacity building approach, while controversial, was a logical and defensible course of action;

CHAPTER NINE

Conclusion and Recommendations

Aims and Objectives

This chapter aims to briefly draw general conclusions and present recommendations about the introduction of participatory agroforestry planning and extension approaches within developing world institutions. Specifically this chapter will:

1. Highlight actions could have improved the performance of the PADP agroforestry planning and extension project;
2. Present recommendations about the introduction of participatory agroforestry planning and extension approaches into Third World development institutions.

Introduction

Chapter one introduced two questions: "If agroforestry, as an integrative discipline, is best accomplished using participatory methods, can such a topic be assimilated into an established bureaucracy?" and "What can be learned about a participatory development approach and its relationship with the institution in which it is employed?".

PADP Agroforestry Planning and Extension Project Improvements

The PADP agroforestry vision creation and capacity building could have been improved, in my opinion, in a number of ways.

First, a thorough needs assessment should have been conducted at the onset of the project. This would have insured that the project addressed the needs of PADP and the rural peoples, while allowing the project team the opportunity to fully appreciate the organisational culture.

Second, the project should have more fully involved the extension section of the PADP when formulating the project and designing the workshops. Since agroforestry falls within the technical section, a gulf exists between the aspirations of the agroforestry section and the practicalities of the delivery system.

Third, upper management should have been involved to a much greater extent. As noted in the previous chapter, the absence of senior managers contributed to the information void. Further, there was a lack of support for agroforestry to be a unifying force.

Fourth, the organisational culture of the PADP should have been addressed more thoroughly. The elements of organisational life, as noted in the last chapter, were not wholly considered during the formulation, execution or evaluation of the project. In particular, the decision-making, accountability and information flow aspects of the structure/procedures element were neglected.

Moris (1991) summarised it best when he said, "bureaucracies have a very limited capacity to tolerate innovations". These points are paramount for the design, delivery and evaluation of institutional changes.

Rural Development, Extension, Agroforestry and Institutions

Rural development aims at improving people's lives. Extension is a method of sharing information. Agroforestry is a specific tool. An institutional framework is the glue that binds them together. Development practitioners often overlook the linkage between the components. For real change to occur, this oversight must be addressed. Rural development, extension, and agroforestry must function in unison within the institutional framework to achieve success.

Recommendations

1. Promote projects and programmes that advance the agroforestry benefits of producing wood, protecting the environment and producing other tree products (fodder, fruit, medicine, etc.).
2. Reduce the focus of using leguminous species to increase soil fertility.
3. Promote agroforestry as a component of a larger system rather than as a product in isolation.
4. Perform a detailed needs assessment of the target agency, prior to undertaking the project, to increase the validity of the vision creation and capacity building approach to rural development projects.

5. Consider all aspects of organisational life when designing, delivering or evaluating any development institution building projects.
6. Involve senior managers in the formulation, implementation and evaluation of any rural development related project.
7. Foster understanding by rural development practitioners that bureaucracies have a limited capacity to incorporate change.
8. Appreciate the linkages between rural development, extension, agroforestry and institutions.

Complexities associated with rural development projects have been demonstrated in this brief analysis. To introduce a participatory agroforestry extension project within a large bureaucratic organisation is a considerable task. Given the constraints faced by the author during project implementation, monitoring and evaluation, as well as the constraints faced daily by the PADP; the limited success of the project is understandable. Even with its limitations, this project has provided a valuable, real world example of inherent complexities and can serve as a guide in future projects.

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Appendix I
Workshop on Agroforestry
February 4 –7, 1992

Jos Plateau Environmental Resources Development Programme (JPERDP)

Plateau Agricultural Development Programme (PADP)

Workshop on

Agroforestry

held at

PADP WESTERN ZONE – Keffi

4 – 7 February 1992

Prepared by:

Workshop Participants and Trainers

as

JPERDP Interim Report No. 35

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CONTENTS

Page

ACKNOWLEDGEMENTS i

CONTENTS ii

PREFACE iii

INTRODUCTION 1

DAY ONE 2

Opening Address 2
Participant Self-Introduction 2
Workshop Organisation 2
River Code & Sustainability 3
Agroforestry: Its Importance for Farmers and PADP 4
Joint Learning: Farmer Knowledge & Rapid Rural Appraisal 5
Farmer Interaction: Village Sketch Map 6

DAY TWO 7

Field Trip: What Different AF Techniques Are There? 7

DAY THREE 10

Complexity of Farming Systems and AF: Joint Learning With Farmers 10
Rapid Appraisal Techniques 10
Compilation and Presentation of Rapid Appraisals 11

DAY FOUR 25

Situational Analysis in Communities: Village Meetings 25
Learning-by-doing: Village Meeting 26
Farming Systems and Agroforestry 27
PADP Action: What Can Be Done? 28
Workshop Appraisal: Dislikes and Likes 29

Appendix I Workshop Participants
Appendix II River Code
Appendix III Bukuru Learning Farm
Appendix IV Field Forms

PREFACE

Previously, plans for Agricultural Development have placed little or no emphasis on soil conservation or sustainability of agricultural output. The resultant effect has been that soils are degraded and decreasing yields are being realised even with the use of inorganic fertilizer.

Agroforestry concepts try to address the problem of soil degradation and decreasing output from our soils through simple agroforestry interventions/ opportunities, suitable for the small-scale farmer.

The series of Workshops was timely, as Agroforestry has recently been introduced into the ADP under the Unified Extension system. They gave the ADP and the opportunity to explore agroforestry concepts and how these relate to the work of the ADP in its interaction with farmers.

It is hoped that the Workshop series will have assisted our Extension Agents in being better equipped toward the promotion of agroforestry to the benefit of rural farmers. It is also hoped that the reports will also serve as reference material for future training on agroforestry in the ADP.

Yusufu Nyam
Programme Manager, PADP

INTRODUCTION

The purpose of this report is to describe the activities undertaken during the agroforestry workshop held in Keffi from February 4 to 7, 1992 such that the participants will be able to repeat the exercise. The overall objective of the workshops was to build agroforestry vision and capacity within the Plateau Agricultural Development Programme.

Agroforestry is a diverse discipline incorporating crops, trees (and other plants!) and livestock in farming systems and as such it involves a wide range of technical specialists as well as the farmers themselves. This complexity of subjects and participants requires that a participatory approach be used when programme planning and institutional capacity building. Working and thinking **with** people is better than working and thinking **for** them.

The report is divided into four sections, each describing one day's activities. Day One was spent exploring what agroforestry actually is and its role in the farming system. Day Two consisted of a visit to an agroforestry learning farm. Day Three focused on working with farmers to identify and solve real problems. Day Four concluded the workshop with reflections on PADP action. It was compiled using the papers from group discussion and the Zonal report prepared from the notes of the daily reporters.

It is hoped that the reader will utilise the information presented in a manner similar to the way a village meeting should be planned. This means that the reader is challenged **to see** what we did, **to reflect** on why we did it and **to act** by making agroforestry an effective component of their work.

DAY ONE

Objectives:

- **introduce participants**
- **arrange organisational details**
- **introduce sustainability**
- **define AF**
- **highlight importance of AF for farmers and PADP**
- **introduce indigenous knowledge & rapid rural appraisal**
- **prepare a village sketch map**

Opening Address

The day started with a short opening ceremony, presided over by the Zonal Programme Manager (ZPM).

Participant Self-Introduction

The workshop began by giving everyone the chance to get to know the other participants. This was done by self-introduction with everyone sitting around in a large circle. Going around the circle each person introduced themselves using the following format:

- Name
- My present position in PADP
- My field experience so far
- What I think about agroforestry
- One interesting farmer-comment about trees

Most people were of the opinion the agroforestry was all about establishing Eucalyptus plantations or fruit-tree orchards. Others thought that agroforestry was the planting of trees alongside crops.

A listing of workshop participants and trainers appears in Appendix I. The workshop had the pleasure of having two senior members of the State Afforestation Project in attendance.

Workshop Organisation

Next there was a short introduction of the way in which the workshop would be organised. Each participant was given a tentative programme for the workshop.

At this point a workshop reporter (to oversee the task of daily note taking) and a timekeeper (to make sure the various sessions keep to time) were appointed. As most of the workshop consisted of small group work the participants were then divided into groups of about 4 persons (Appendix I).

River Code & Sustainability

The workshop proper began with the River Code (see Appendix II). This short play was a useful introduction to the overall emphasis of the workshop and provided the opportunity to generate some discussion on the need for sustainability in farming systems and the place of agroforestry in this. The implications for PADP as an organisation working for agricultural development were also considered.

After the River Code had been acted out, the participants gathered into their four discussion groups and were asked to consider the following questions:

- What did you see happen in the play?
- What different approaches were used to help the two men across?
- What does each side of the river represent?
- What do these two approaches mean in terms of agricultural sustainability?
- What role does agroforestry play in the sustainability of farming systems?
- What implications does this have for the work of PADP?

Once the groups had finished their discussions, everyone came back together and presented in plenary what they had discussed.

The groups agreed that:

- to do things **with** people is better than doing it **for** them.
- doing things **with** people enables them to learn to be self-sufficient and they can then sustain themselves when left alone.

It was clear that if there was to be sustainability in a farming system then measures need to be taken not only to ensure continuity of production but also to improve the natural resources with little dependence on external inputs.

By incorporating an agroforestry perspective in a farming system, a depletion of natural resources (in terms of soil, soil fertility, trees etc.) can be reduced. The sustainability of the farming system can thus be enhanced. Those external inputs used can also be used more effectively and efficiently.

This may mean that agroforestry has a role to fill within PADP if the organisation is to further the sustainability of farming systems.

Agroforestry: Its Importance for Farmers & PADP

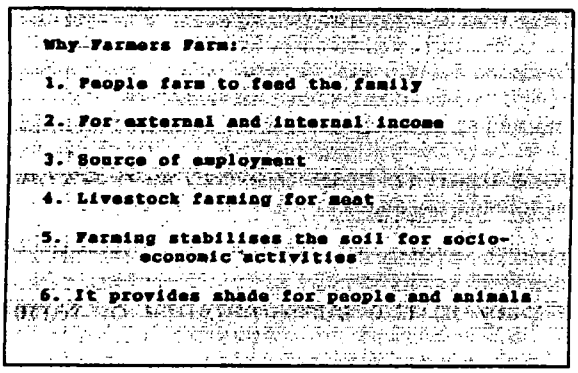
Everyone was able to perceive a link between sustainability of farming systems and agroforestry, and that this had implications for PADP's mode of operation.

To look at this in more detail, the groups were asked to consider:

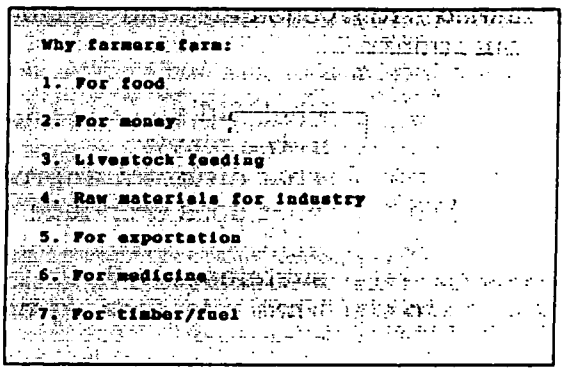
- Why do farmers farm?
- What is PADP's mandate?
- What is agroforestry? - Where does it fit?

As the groups illustrated, farmers farm for a whole range of reasons:

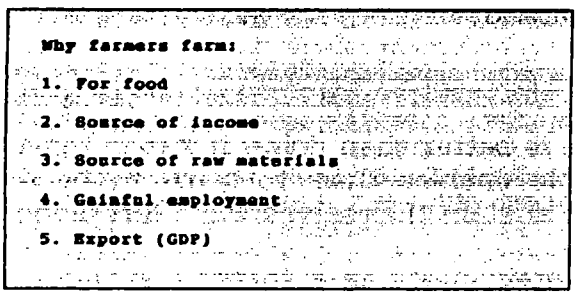
Answers given by Group 1:



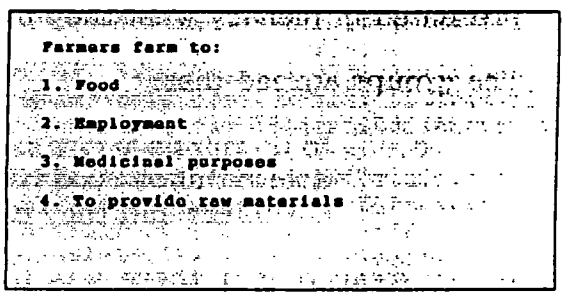
Answers given by Group 2:



Answers given by Group 3:



Answers given by Group 4:



A review of PADP's mandate revealed that the aim of the organization is to assist farmers in achieving their goals. Especially in food production and income generation activities.

PADP's MANDATE

- Increase food production and small farmers income.
- Effective extension and research.
- Input distribution.
- Prepare State institution to undertake appraisal and supervision.

Further, during the discussion, it was decided agroforestry should be defined as:

> **the interaction between crops, trees (and other plants) and livestock in a farming system;**

and it is this interaction which is manipulated by farmers while farming to achieve their goals. Agroforestry is a central component of the farming system and therefore also of PADP's mandate.

For this reason, among others, it is logical that the interactions in the farming system, be investigated by PADP as a means of supplying longer lasting solutions to farmers' problems. This is central to the idea of the unified system of extension.

Joint Learning: Farmer Knowledge & Rapid Rural Appraisal

Since we agreed during the River Code that it is better to do things with people rather then for them, it stands that we must place a high value on the farmers' knowledge if we are to have an effective two way relationship. Most workshop participants agreed that a farmer knows more about his own area than anyone else and as such this knowledge should be utilised. But how?

Rapid Rural Appraisal (RRA) was therefore briefly introduced as a set of tools aiding more effective interaction with farmers. This led us to our first visit to the villages and our first interactions with the farmers. Groups 1 and 2 went to Tilla whereas Groups 3 and 4 travelled to Dorowa.

Farmer Interaction: Village Sketch Map

A village sketch map, an RRA technique, was drawn by each of the groups in their respective villages. This was accomplished by standing on a high point, usually a small hill that looked out over the area and roughly mapping the relative location of various crops, trees and other forms of land-use as well as the topographical (streams, hills, etc.) and man-made features (roads, buildings, etc.).

Drawing a sketch map with farmers.

DAY TWO

Objectives:

- see and discuss various AF techniques during visit to Bukuru Learning Farm of POD
- reflect upon complexity of farming systems and AF

Field Trip: What Different AF Techniques Are There?

If agroforestry is the interaction between crops, trees (and other plants!) and livestock, what sort of interventions are applicable? How can an organisation involved in agricultural development, such as PADP, utilise such techniques?

In order to set about answering these questions, the day was spent visiting the Bukuru Learning Farm of People Oriented Development (POD) of ECWA. A handout on the Learning Farm, was given to each participant (see Appendix III). These highlight the philosophy behind the farm and include plans on the layout as well as notes on the techniques.

Learning at the Learning Farm as Andy points out a livestock pen and intensive fodder garden.

The farm was established over the past two years by the Community Development Officers (CDOs) of POD during their training workshops. In that respect it became a "learning" farm, where the CDOs were able to learn-by-doing. Also, many of the techniques and plants have not been attempted previously in the area

and so the learning experience about those particularly suitable to the environment can continue.

The farm was developed because it was seen that if farming systems are to be sustainable then much more emphasis needs to be put on agroforestry or ecofarming, particularly for resource-poor farm families. This would then reduce input-dependency, make more efficient utilisation of those inputs required and lead to sustained increases in soil fertility.

In this way the development of the Bukuru Learning Farm recognises that **sustainable agriculture** is that which is:

o	ecologically sound	- consider soil quality - go for high diversity in considering the natural environment as a guide
o	economically viable	- within farmers' financial means - outside dependence should be avoided
o	socially acceptable	- consider beliefs & traditions, taboos etc. of the people - consider the hierarchy of the village and the area (working with prevailing community structures)
o	politically possible	- adjust to Government policies - work towards improvement of policies

The tour focused on the inter-relationship between crops, livestock and trees, and how this can be manipulated for sustained improvements in the farming system.

Among the plots seen were:

- o alley cropping with Leucaena and Gliricidia and maize as the alley crop
- o erosion control with contour lines of trees and grasses
- o Tephrosia hedgerows for alley cropping
- o Lablab and other cover crops in a maize field
- o diversification with the incorporation of fruit trees
- o intensive fodder garden made by establishing a stylo fodder bank for feeding livestock in the morning before releasing for free grazing
- o animal pen for cows, sheep and goats and presently used to keep two bulls used for ox-ploughing
- o tree nursery - large- and small-scale both using local materials
- o woodlot with various multipurpose trees

An alley cropping system.

A summary of the different agroforestry techniques seen or discussed during the visit is as follows:

- o woodlots with multipurpose management
- o reclamation forestry leading to multipurpose use
- o windbreaks
- o fruit trees in combination with crops, strips for fodder and erosion control
- o hedgerow intercropping (alley cropping)
- o mulching (tree biomass transfer)
- o erosion control by contour lines with trees and shrubs
- o erosion control by contour lines with fodder for cut and carry (zero-grazing)
- o living fences
- o boundary planting
- o fodder banks & intensive fodder gardens
- o honey production
- o tree plantations with pastures
- o improved fallows and cover crops
- o undercropping

DAY THREE

Objectives:

- **introduce & undertake RRA techniques**
  - **village sketch map**
  - **village transect**
  - **farmer knowledge matrices**
- **compile information & present in plenary**

Complexity of Farming Systems & AF: Joint Learning With Farmers

The discussions the previous days, the first visit to the villages and the visit to Bukuru had shown how diverse and complex farming systems in the region are. It was also clear that the nature of AF was therefore as diverse and complex as the farming systems themselves.

There is little 'scientific' expertise on the interactions between crops, trees and livestock in a farming system. We know also, however, that an agroforestry perspective is important for sustainability in agriculture. This then leaves us with a dilemma. If the issues are so diverse and complex what messages can be developed by PADP?

It was agreed that this leaves PADP in a difficult position, yet one that it could not ignore.

If there is little 'scientific' understanding how are we then to assist the farmers? The participants thought that the farmers had knowledge of their place and that this meant that the farmers had to become our resource persons. In that way a process of joint learning could begin where the personnel from PADP interact closely with the farmers and together analyses the situation and discuss the AF possibilities.

In order to begin to look inside the diverse and complex nature of the farming system we need to have some methods that can be used to generate information of sufficient quality and in a reasonably short space of time. We cannot wait to get all the answers from research. We need to do something now.

Rapid Appraisal Techniques

The participants were therefore introduced to some rapid appraisal techniques which could be used in joint learning with the farmers and assist in structuring our understanding of a place. This would then enable us to analyse the situation much more easily.

It was recalled that we had already carried out one such exercise, the village sketch map on the first afternoon of the workshop. Next we were introduced to:

- village transect
- informal interviews
- farmers' knowledge matrix
- trend lines
- village meeting

However not all of the introduced techniques were to be undertaken during the workshop. Only the transect, matrix and village meeting were practised in addition to the previously completed sketch map.

The village transect is completed by walking with villagers from a high point (e.g. hill top) to a low point (e.g. a river) or vice versa in the farming system, so that all of the characteristic zones in the farming system could be identified on a cross sectional diagram. While walking over each characteristic zone of the farming system differences in soils, crops, trees, livestock, and other land uses were noted. In addition the farmer perceived problems within the zones was recorded. Possible agroforestry interventions which may alleviate the problems and benefit the various land use components were identified and discussed with the farmers. An example of the form used to record the information can be found in Appendix IV.

Farmer knowledge matrices concerning soil fertility and tree uses were also completed. Examples of both data recording forms can be found in Appendix IV. The soil fertility or land use matrix involves an exploration of fertility management within the various land forms and soil types. The tree-use matrix is concerned with aspects of management as well as tree uses from the villagers point of view.

The village meeting will be discussed later on in this report.

The other RRA techniques were simply mentioned as other information generating options and were not discussed in detail.

Compilation and Presentation of Rapid Appraisals

The groups put what they had found out in the villages onto large sheets of brown paper and presented them in plenary. Some of the problems associated with the farming systems and possible AF opportunities were highlighted. All of the information was collected with local farmers and their knowledge of the area proved very useful in getting a good overall picture of the environment.

The sketch maps produced are shown in Figures 1 - 4. A good sketch map is simple, accurate and shows information pertinent to the task at hand. In our case the sketch should show the cropping pattern and other land-uses within the local community.

Figures 5 - 8 display the village transects. Village transects accurately depict the farming system ecological zones and associated problems which were identified with the farmers. Small pictures along the transect greatly improve the readability of the transect especially for villagers who are non-literate.

Farmer knowledge matrices developed with the participants and the farmers appear in Figures 9 - 12.

Figure 1. Sketch Map: Tilla (Group One)

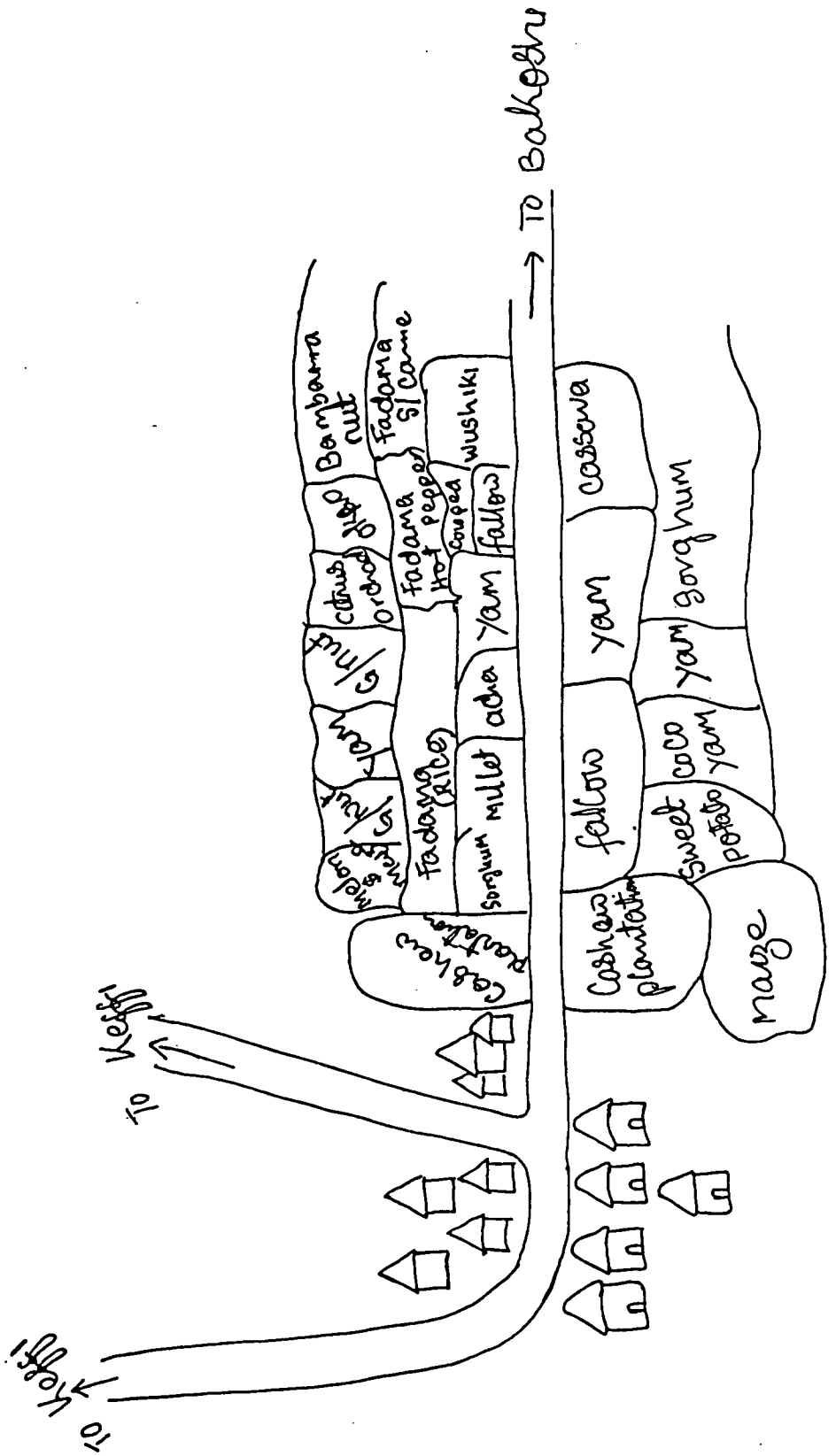


Figure 2. Sketch Map: Tilla (Group Two)

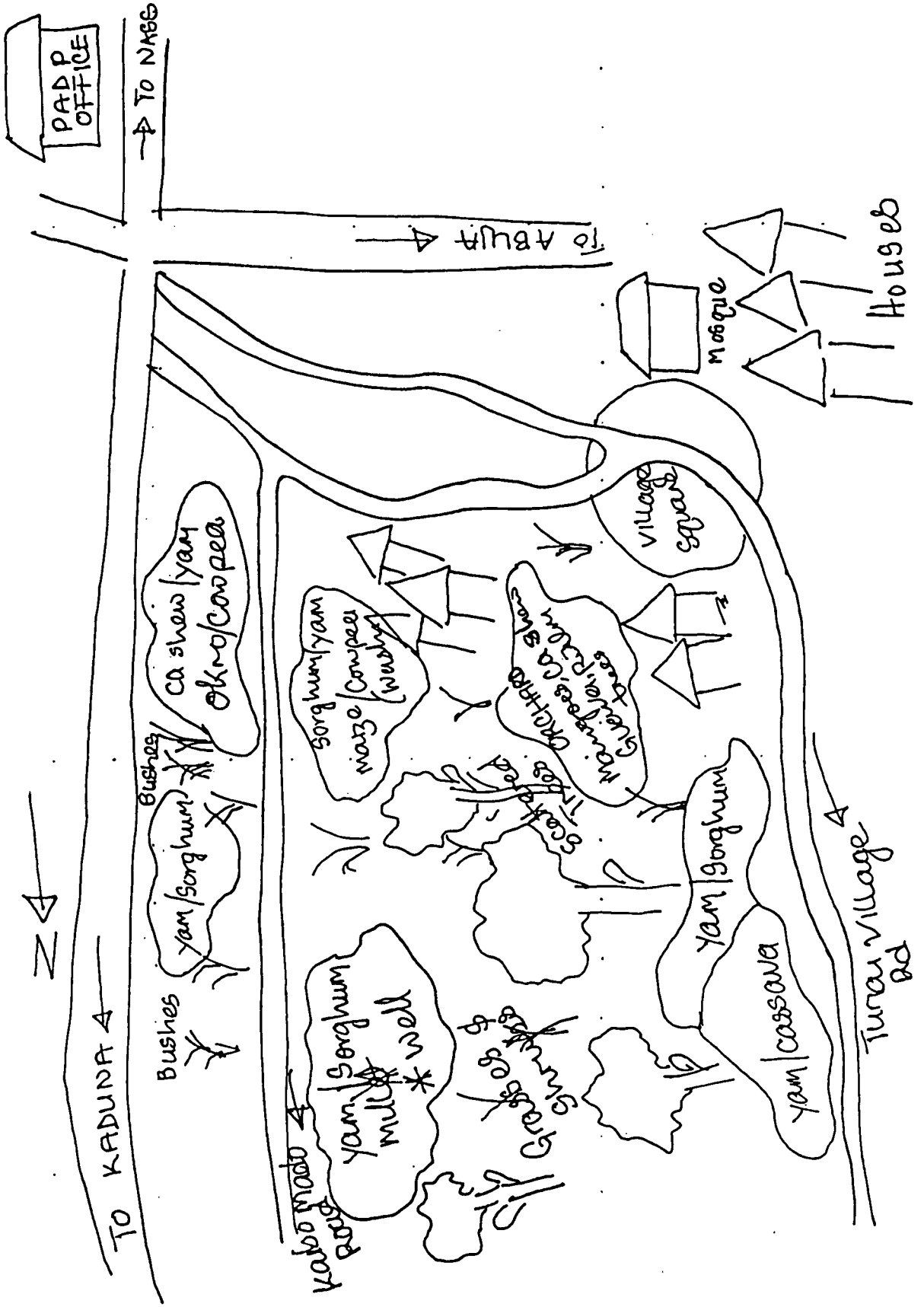


Figure 3. Sketch Map: Dorowa (Group Three)

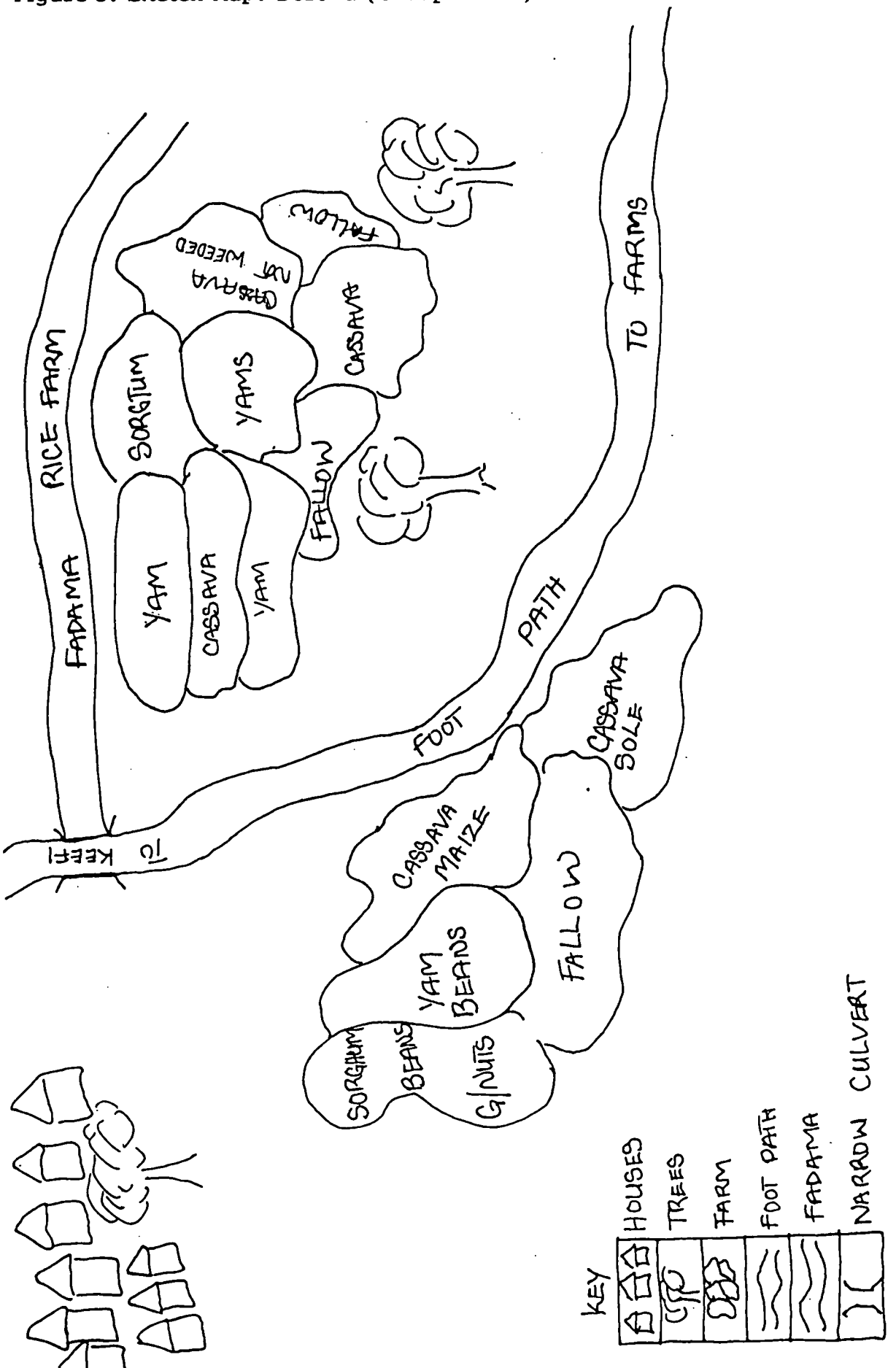
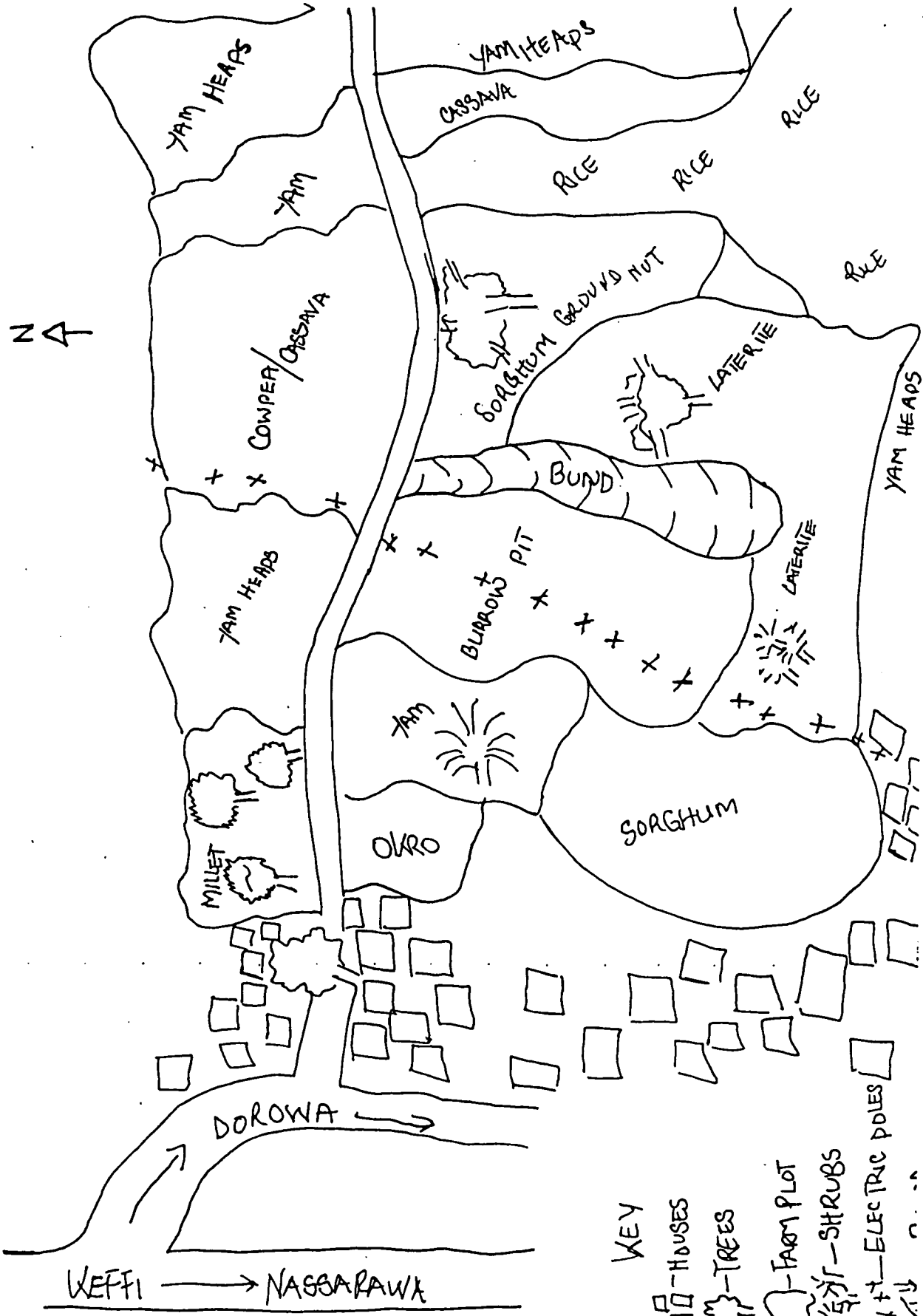
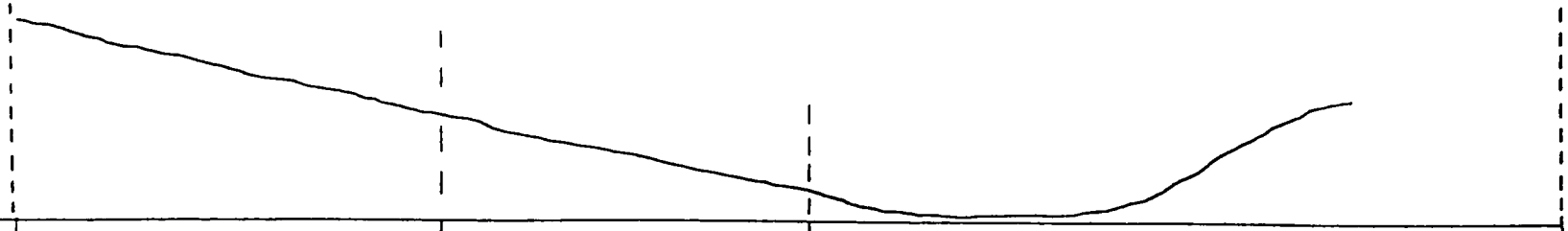


Figure 4. Sketch Map: Dorowa (Group Four)



Village Transect Village: TILLA Group: 1



Soils	SANDY LOAM (JKAWA)	CLAY LOAM	FADAMA (CLAY)
Crops	GROUNDNUT, COWPEA, SORGHUM + YAM	PEPPER, SPINACH, OKRO, MAIZE	RICE, SUGAR CANE, PEPPER + VEGETABLES
Livestock	COWS, SHEEP + GOATS (SEASONAL)	COWS, SHEEP + GOATS	COWS, SHEEP + GOATS
Trees	LOCUST BEAN, CASHEW, DINYA	GIGINYA, CASHEW, LOCUST BEAN.	OIL PALM DINYA BANANA
Other Land-Use	SUITABLE FOR MOULDING BLOCKS FOR BUILDING	SUITABLE FOR PLASTERING	—
Problems	STRIGA TERMITES	DEPLETION OF NUTRIENTS THROUGH SOIL EROSION	ANIMALS (PIGS) FLOODING
AF Opportunities	ALLEY CROPPING ASHES COVER CROPS (FALLOW AREAS)	PLANTING OF LEGUMINOUS FODDER EG. G/NUT, COWPEA, PIGEON PEA, SOYA BEANS, CONTOUR WITH GRASSES + SHRUBS	

Figure 5. Village Transect: Tilla (Group One)

Figure 6. Village Transect: Tilla (Group Two)

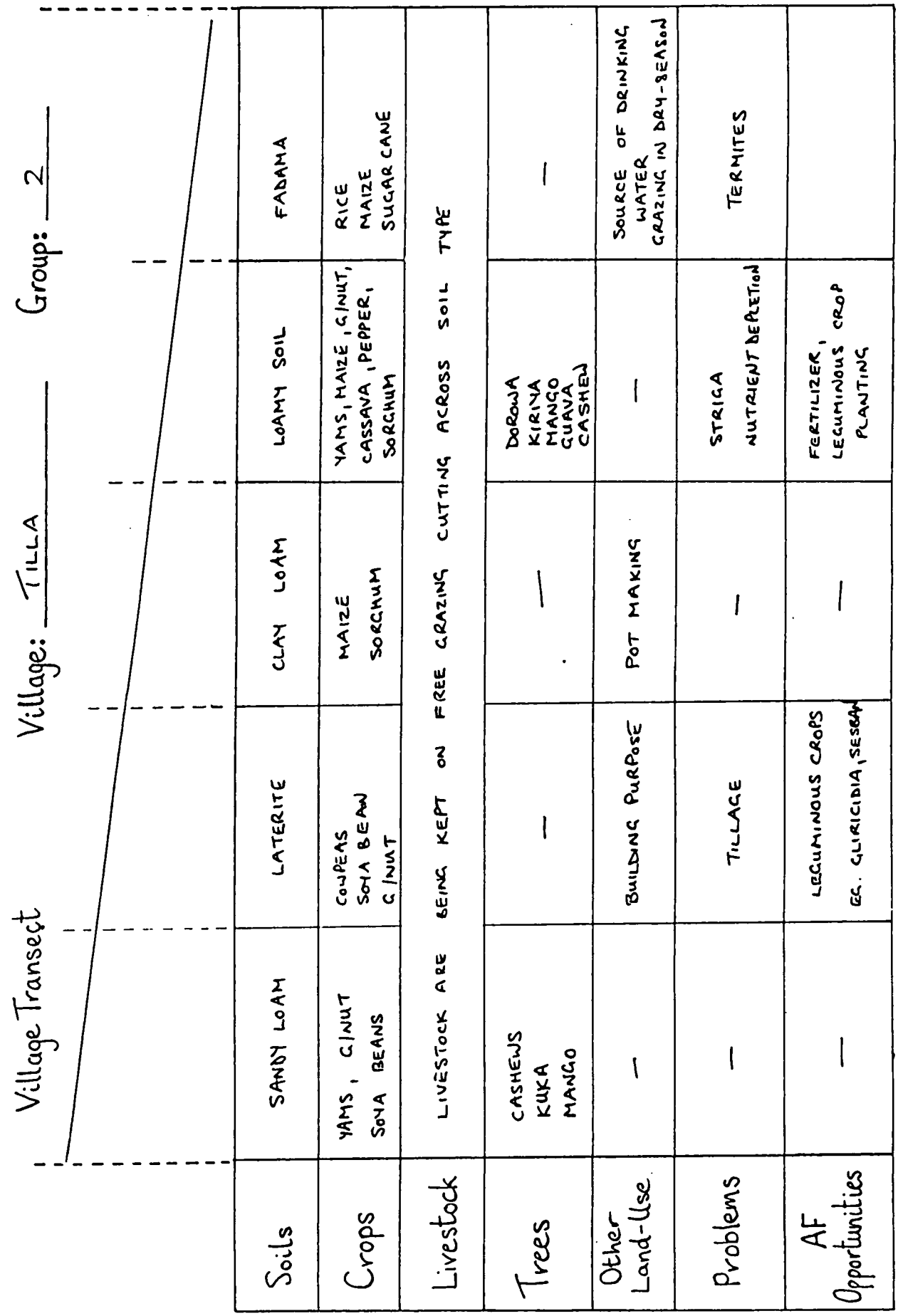
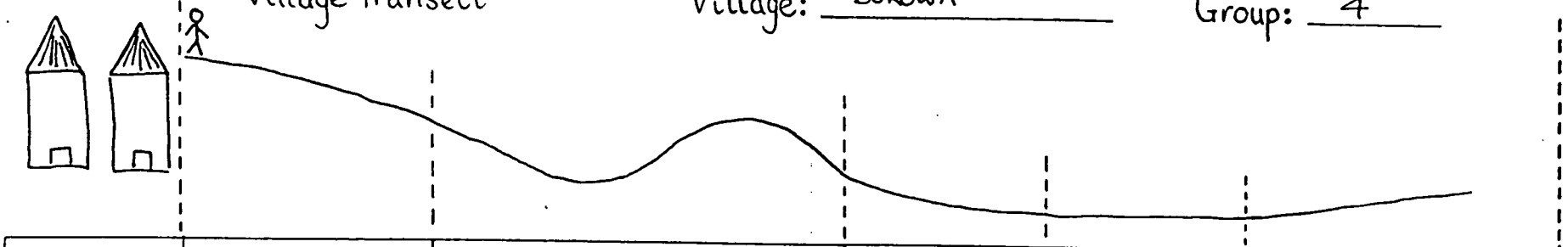


Figure 7. Village Transect: Dorowa (Group Three)

Village Transect Village: DOROWA Group: 4



Soils	LOAMY SOIL	LATERITE	LOAMY SAND	CLAY LOAM	LOAMY LIGHT SOIL
Crops	OKRO YAM MAIZE SORGHUM	—	YAM SORGHUM MAIZE G/NUT	RICE	YAM MAIZE
Livestock	GOAT CHICKS	SHEEP & GOATS	CATTLE SHEEP GOATS	CATTLE	CATTLE
Trees	ORANGE, BABA, CASHEW, LALLE, ADURUKU, TUNPADIYA	SHRUBS	LOCUST BEAN KADAI BAUSHE	BAUSHE	LOCUST BEAN
Other Land-Use	BUILDING	BUILDING (LOCAL FLOOR)	—	BUILDING WALL PLATERING	—
Problems	HARD PAN	UNPRODUCTIVE	STRIGA	REDUCED YIELD IRON TOXICITY	FALLOW
AF Opportunities	OX PLOUGH	ANIMAL DUNG	CROP ROTATION & ANIMAL DUNG	DRAINAGE	LEGUMES

Figure 8. Village Transect: Dorowa (Group Four)

Figure 9. Land-use Overview: Tilla Fertility Matrix (Group One)

Land-use overview matrix — TILLA — GROUP 1

Landform	Soils	Crops	Fertility Management	Trees
SLOPEY	SANDY LOAM	G/NUT COWPEA SORGHUM YAM	FARMYARD MANURE (SHIT)	DINYA LOCUST BEANS CASHEW
	CLAY LOAM	PEPPER SPINACH OKRO MAIZE	FARMYARD MANURE (SHIT)	GIGINYA CASHEW LOCUST BEAN
	FADAMA (CLAY)	RICE SUGAR CANE PEPPER VEGETABLES	—	OIL PALM DINYA BANANA

Land-use overview matrix

TILLA GROUP 2

Landform	Soils	Crops	Fertility Management	Trees
UPLAND	LOAMY SOIL	YAM, MAIZE, G/NUT, CASSAVA, SORGHUM, PEPPER	UREA NPK	DOROWA KIRIYA MANGO GUAVA CASHEW
	SANDY SOIL	YAMS SOYA BEANS G/NUT	NPK	CASHEW KUKA MANGO
	CLAY LOAM	MAIZE SORGHUM	NPK UREA	—
	LATERITE	COWPEA SOYA BEANS G/NUT	—	
FADAMA		RICE MAIZE SUGAR CANE	UREA NPK	

Figure 10. Land-use Overview: Tilla Fertility Matrix (Group Two)

Land-use overview matrix DOROWA GROUP 3

Landform	Soils	Crops	Fertility Management	Trees
UPLAND	SANDY LOAM	SORGHUM COWPEA	FERTILIZER ANIMAL DUNG	KALGO, GUAVA, DOROWA, MANGO, PALM, GIGINYA, KANJU, TSAMIYA
		YAMS SORGHUM CASSAVA	FERTILIZER ANIMAL DUNG	KALGO GMELINA BAUSHE GUAVA
	LOAMY SOIL	YAMS CASSAVA	FERTILIZER ANIMAL DUNG	BAUSHE GWANDAN DAJI KALGO MIJIN KADE
	CLAY LOAM	CASSAVA YAMS	FERTILIZER ANIMAL DUNG	TUFASHIYA DOROWA MIJIN KADE GWANDAN DAJI
FADAMA	CLAY SOIL	RICE	FERTILIZER ONLY	SHRUBS

Figure 11. Land-use Overview: Dorowa Fertility Matrix (Group Three)

Land-use overview matrix DOROWA GROUP 4

Landform	Soils	Crops	Fertility Management	Trees
UPLAND	LATERITE (TSAKUWA)	—	—	SHRUBS
	LOAMY LIGHT SOIL (FARIN KASA)	YAMS CASSAVA SORGHUM MAIZE	—	BAURE DOROWA KADENYA MANGO
	LOAMY SOIL (BAKIN KASA)	OKRO YAMS MAIZE SORGHUM	ANIMAL DUNG	CITRUS GUAVA ADURUKU BABA LALLI TUMPAPIYA
FADAMA	CLAY LOAM	RICE	UREA CAN	BANANA TUMPAPAYA

Figure 12. Land-use Overview: Dorowa Fertility Matrix (Group Four)

Rather than reproduce each of the tree-use matrices the participants were asked to select three different or unusual trees and list their uses.

Summary of Group 1:

Three unusual trees and their uses:

1	Mango	Woodfuel, food, medicine, shade/shelter
2	Oil palm	Woodfuel, food, medicine, oil
3	Neem	Woodfuel, medicine

Summary of Group 2:

Three unusual trees and their uses:

1	shea nut (kadanya)	woodfuel, charcoal, food, oil resins, shade/shelter, medicine, livestock feeds
2	lalle	medicine, cosmetics
3	aduruku	poles, fodder, medicine, shade, charcoal

Summary of Group 3:

Tree species & their importance:

1	Dorowa	Wood, food, fodder, medicine & shelter
2	Tsamiya	Food, fodder & medicine
3	Gwandan daji	Wood, food, fodder & medicine

Summary of Group 4:

Three different trees:

1	Aduruku	fodder, poles, medicine, charcoal, shade
2	Mango	food, woodfuel, medicine, shade/shelter
3	Dorowa	food, medicine, wood, fodder, shelter

Day Four

Objectives:

- **prepare and undertake village meetings**
- **reflect on experiences, the causes of some problems of farming systems and the role of AF**
- **examine the implications for PADP**
- **reflect on workshop**

Situational Analysis in Communities: Village Meetings

Following rapid appraisal of the communities, for an organisation like PADP involved in agricultural development, it is important to move onto action to improve the situation.

We have seen that an agroforestry perspective is important for sustainable improvements in agriculture. Also that AF is as diverse and complex as the farming systems themselves. It is important then that since the farmers have an understanding of their situation we analyses what we have found out with them. Together we need to recognise the problems and potentials and discuss possible options for intervention. The process must always be moving towards action.

This led to some discussion of the way in which this could be carried out most effectively in villages.

Some thoughts on an effective pattern for a village meeting were presented and was then practised by those individuals who would lead the village meetings. The pattern should be:

- **to see** the situation that exists in the village by presentation and discussion of some of the RRA exercises and by asking questions to generate further insights. This enables the situation noted during the exercises to be confirmed and for a consensus of the present reality to be reached. It is then important:

- **to reflect** upon the situation by highlighting some of the perceived problems and then discussing their consequences and causes. This should lead to comparison of how the situation used to be in that area and what people do elsewhere and so leading to option generation. The process should then lead the villagers on:

- **to act** by trying out one or more of the options generated, with the extension service acting in a supporting role.

To prepare for the village meeting Groups 1 & 2 (Tilla) and Groups 3 & 4 (Dorowa) spent about one hour selecting the best village transect and land-use matrix of their respective villages and making any improvements that the group desired. Selection criterion included clarity, legibility and accuracy. The two Group's then selected one person to act as the facilitator. A practice village meeting was then undertaken by one of the village teams with the other workshop participants acting as the villagers. The facilitator tried to follow the principles outlined above and the trainers and other participants offered suggestions and improvements which would help the presentation.

Learning-by-doing: Village Meeting

Off we go to the villages again since, it is important to try things out for ourselves and learn by doing.

For logistical reasons everyone went to Tilla first. After finishing in Tilla we moved onto Dorowa. Both meetings were held in the shade of trees near the centre of the villages.

The meeting in Tilla was hampered by the absence of many of the farmers who worked with the workshop participants on the earlier appraisal exercises. However the meeting did get better as the presenters explained what had been done. It seemed that the villagers understood some of the techniques we discussed but were not that interested in trying them out.

After having a meeting that did not go all that well, it was particularly encouraging to then have a good meeting in Dorowa. The meeting started a bit late as it was market day and most of the village participants were at market. However many of the villagers showed up as soon as it was known that we were present. A lively discussion followed concerning fertilizer and soil fertility. Some of the villagers wanted fertilizer to improve their farms whereas other knew that fertilizer is in short supply and would not likely be available and wished to discuss other techniques which might help.

The suggested pattern of **to see, to reflect** and **to act** was followed through and showed that the process was a useful one for creating awareness and analyzing problems.

The farmers in Dorowa showed that they are able to recognise the sort of problems they face and to see that AF may offer possible solutions. They recognised the need to try things out in a process of joint learning about possible interventions and were interested in working with PADP.

The meetings illustrated the value of analyzing the situation **with** farmers rather than **for** them, particularly, as with AF, when the situation is so diverse and complex and so little 'scientific' expertise exists.

To see and **to reflect** with villagers: The value of analyzing the situation **with** people.

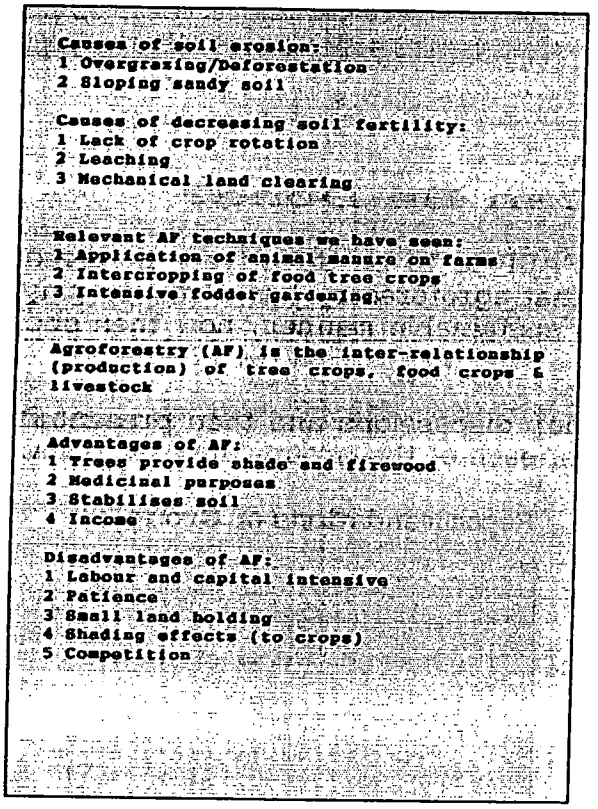
Farming Systems and Agroforestry

Since some of the problems apparent in the farming systems and the possibilities for more sustainable agriculture using agroforestry approaches had been highlighted, it was thought that it would be useful to reflect on this some more by considering, in small group discussions:

- what are the causes of soil erosion and decreasing soil fertility?
- what methods of agroforestry have we seen in practise?
- list advantages and disadvantages of agroforestry.
- redefine agroforestry based on our new knowledge.

The answers generated during the group discussions follow:

Thoughts of Group 1:



Causes of soil erosion:
1 Overgrazing/Deforestation
2 Sloping sandy soil

Causes of decreasing soil fertility:
1 Lack of crop rotation
2 Leaching
3 Mechanical land clearing

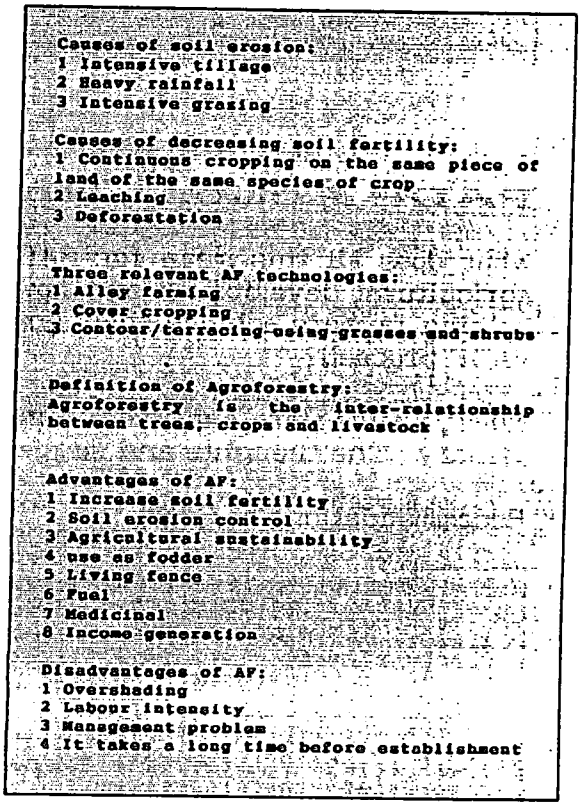
Relevant AF techniques we have seen:
1 Application of animal manure on farms
2 Intercropping of food tree crops
3 Intensive fodder gardening

Agroforestry (AF) is the inter-relationship (production) of tree crops, food crops & livestock

Advantages of AF:
1 Trees provide shade and firewood
2 Medicinal purposes
3 Stabilises soil
4 Income

Disadvantages of AF:
1 Labour and capital intensive
2 Patience
3 Small land holding
4 Shading effects (to crops)
5 Competition

Thoughts of Group 2:



Causes of soil erosion:
1 Intensive tillage
2 Heavy rainfall
3 Intensive grazing

Causes of decreasing soil fertility:
1 Continuous cropping on the same piece of land of the same species of crop
2 Leaching
3 Deforestation

Three relevant AF technologies:
1 Alley farming
2 Cover cropping
3 Contour/terracing using grasses and shrubs

Definition of Agroforestry:
Agroforestry is the inter-relationship between trees, crops and livestock

Advantages of AF:
1 Increase soil fertility
2 Soil erosion control
3 Agricultural sustainability
4 use as fodder
5 Living fence
6 Fuel
7 Medicinal
8 Income generation

Disadvantages of AF:
1 Overshading
2 Labour intensity
3 Management problem
4 It takes a long time before establishment

Thoughts of Group 3:

Causes of soil erosion:
1 Excessive use of heavy machinery for tillage
2 Heavy rainfall
3 Deforestation/Excessive grazing

Causes of decreasing soil fertility:
1 Continuous cropping
2 Leaching
3 Erosion

Methods of AF:
1 Alley cropping
2 Contour planting
3 Grazing seasonal

Definition of AF:
Inter-relationship between agric. crops, forestry crops and livestock

Advantages of AF:
1 Increase soil fertility
2 Control soil erosion
3 Sources of fuel, woodlot, medicine etc.
4 Feeds - Fodder
5 Wind break to farms and houses

Disadvantages of AF:
1 Shading effect to crops
2 Takes longer period to get the benefit
3 Management problem

Thoughts of Group 4:

Causes of erosion:
1 Intensive tillage
2 Overgrazing
3 Deforestation

Causes of decreasing soil fertility:
1 Leaching
2 Continuous cropping
3 Erosion

Relevant AF techniques:
1 Scattered trees
2 Animal dung
3 Fodder for livestock

Agroforestry:
Inter-relationship of arable crops, livestock and trees

Advantages of AF:
1 Improves soil fertility
2 Increases crop yields
3 Increases income
4 Provides shade & electric poles
5 Provide feeds for livestock

Disadvantages of AF:
1 Many spaces required
2 Too complex
3 Skills are needed
4 High cost

PADP Action: What Can Be Done?

What does all this mean for PADP? If PADP is to be effectively involved in agricultural development and now sees that agroforestry has a role to play in helping farmers achieve their goals in a sustainable manner, how then should PADP proceed?

These issues were examined in small group discussions and then presented in plenary. The thoughts and suggestions of each of the groups appears below.

Recommendations of Group 1:

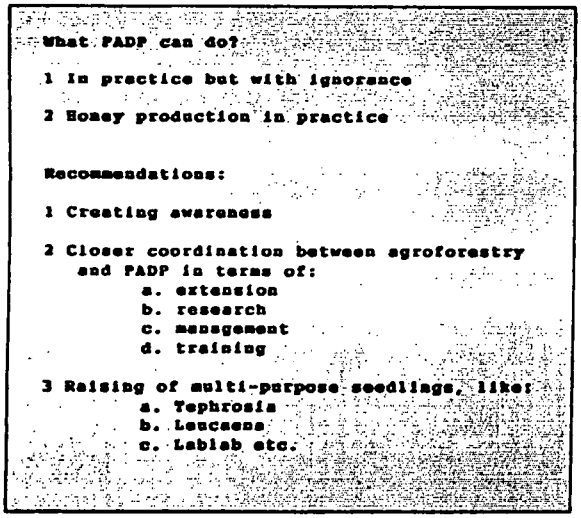
Suggestions on line of action:
1 Training of extension staff on agroforestry
2 Agroforestry components be farmed with farming systems
3 Farmers to be involved in training on agroforestry
4 Publicity of agroforestry activities through the media and other related agencies
5 Research to be intensified on the field of agroforestry (production & usage)

Recommendations:
1 Transfer of all agroforestry functions to PADP for effective implementation
2 Decentralisation of nurseries for specific and easier distribution of seedlings
3 Include the production of multi-purpose leguminous trees into the production of seedlings
4 Training of staff at all levels (extension, research and training) in agroforestry
5 Publicity of agroforestry activities through the media, publications & related agencies

Recommendations of Group 2:

What we can do:
1 Selection of pilot schemes
2 Hold meetings with more villagers
3 Acquisition of seeds/seedlings for alley cropping (Leucaena, Vetiver, Panicum)
4 Conduct demonstrations by every VEA on either alley cropping or contour farming
5 Identification of local suitable trees and grasses
6 Assist farmers to establish more small nurseries, self and community

Recommendations of Group 3:



What FADP can do?

1 In practice but with ignorance

2 Honey production in practice

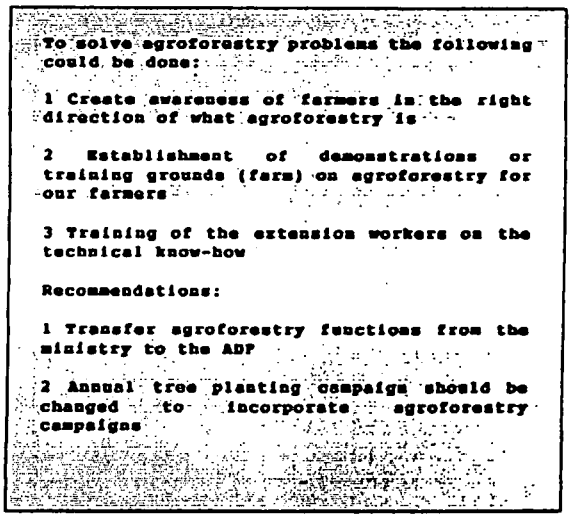
Recommendations:

1 Creating awareness

2 Closer coordination between agroforestry and FADP in terms of:
- a. extension
- b. research
- c. management
- d. training

3 Raising of multi-purpose seedlings, like:
- a. Tephrosia
- b. Leucaena
- c. Lablab etc.

Recommendations of Group 4:



To solve agroforestry problems the following could be done:

1 Create awareness of farmers in the right direction of what agroforestry is

2 Establishment of demonstrations or training grounds (farm) on agroforestry for our farmers

3 Training of the extension workers on the technical know-how

Recommendations:

1 Transfer agroforestry functions from the ministry to the ADP

2 Annual tree planting campaign should be changed to incorporate agroforestry campaigns

Workshop Appraisal: Dislikes and Likes

Finally going around the circle of participants everyone had a chance to say:

- o one thing I disliked about the workshop, and
- o one thing I liked about the workshop

The comments made can be summarised as follows:

Dislikes

-People not time conscious
-Feeding
-Transportation
-Timing
-Unavailability of appropriate transport

Likes

-Group discussions
-Trainers' involvement
-Farmers' participation
-RRA techniques
-Bukuru Learning Farm
-Interaction with farmers
-Training methods
-Learning-by-doing
-Got understanding of AF
-Training of different levels
-Enthusiasm of village
-Use of visual aids

Appendix I

Workshop Participants

APPENDIX 1 - Workshop Participants

The groups which worked together during the small-group discussions and the fieldwork in Tilla and Dorowa are as follows:

Group 1 - Tilla

Simon Anzolo
Teresa Bangson (SMS/WIA)
Gideon Dewan (BES)
Saiadu Adamu (AEO)
Adamu Shuaibu (VEA)

Recorder - Day 1

Group 2 - Tilla

Inusa Babuje (ZRO)
Peter Awotu (DCEO)
Janet Sunday (SMS/WIA)
Haruna Pam (VEA)
Yahuza Umar (ZSO)

Recorder - Day 2

Group 3 - Dorowa

Helen Micah
Haruna Eshi (SMS)
Jibrin Jonah (BES)
Abubakar Moh (AFA)
Alex Wash (ZEO)

Recorder - Day 3

Group 4 - Dorowa

Ibrahim Amushi (AEO)
Dung Bot (FDO)
Tijani Haruna (AA)
Umaru Tanko (SMS)

Recorder - Day 4

TRAINERS:

Barry W. Hunter - IFS/CIDA
Samuel Jok - PADP
Andrew D. Kidd - JPERDP

Appendix II
Raw Data

Appendix II
Raw Data

Abbreviations

Headers

Name	
Positio	Position
Zone	
DIST.	Distance from Headquarters
Educ.	Formal Education
Works?	Attended 1991/92 Workshops
Train?	Additional Agroforestry Training
Def'n	Definition of Agroforestry (Scored 0 to 4)
Sex	
HTS	Head of Technical Services
ZPM	Zonal Programme Manager
SMS	Subject Matter Specialist
BES	Block Extension Supervisor
AEO	Area Extension Officer
AFC	Agroforestry Co-ordinator
DIR	Director of Extension
ZEO	Zonal Extension Officer
PM	Programme Manager
RO	Research Officer
MOA	Ministry of Agriculture
OGN	Other Government Organisations
FARM.	Farmers
AFFOR	Afforestation Project
RES.INS.	Research Institutions
NGO	Non-governmental Organisation
FACU	Federal Agricultural Co-ordinating Unit
MTRM	Monthly Technology Review Meetings
FNT	Fortnightly Training
WORK	Workshops (Additional Training)
PUB.	Publications
LGC	Local Government Council
F/Day	Field Days
EXTDEP	Extension Department
FORProG	Forestry Programme (State Ministry of Natural Resources
REVmt	Bi-annual Review Meetings
Scol	Formal schooling
MIDsea	Mid Season Training
Crops	
LIVE/ST	Livestock
AF	Agroforestry
FISH	Fisheries
WIA	Women in Agriculture
EXTENSION	F/S & S/S INTER. Farmer / Staff and Staff / Staff Interactions
AF DISC.	Agroforestry Discussions

Position

P/RO	Principal Research Officer
SMS	Subject Matter Specialist
WIA	Women in Agriculture
LS	Livestock
Fish	Fisheries
AssDirExt	Assistant Director of Extension
AFC	Agroforestry Co-ordinator
BES	Block Extension Supervisor
ZEO	Zonal Extension Officer
VEA	Village Extension Agent
AF	Agroforestry

Zone

HQ	Headquarters
W	Western Zone
N	Northern Zone

Education

BSc	Bachelors Degree
HND	Higher National Diploma
OND	Ordinary National Diploma
Diplo	Technical diploma
Cert.	Certificate (short term technical)

Extension Interactions

U	Bottom - Up Conversation
D	Top – Down Conversation
U/D	Combination

BASIC INFORMATION										ACTUAL INFORMATION SOURCES																															
NAME	POSITIO	ZONE	DIST.(km)	EDUC.	WORKS?	TRAIN?	DEF'N	SEX		HTS	ZPM	SMS	BES	AE	BEA	VEA	AFC	DIR	ZEO	PM	RO	MOA	OGN	FARM.	AFFOR.	RES.INS	NGO	FACU	MTRM	FNT	WORK	PUB.	LGC	F/DAY	EXTDEP	FOR.ProG	REVmt	Scol
	P/RO	HQ	0	BSc-Agr	YES	NO	4	M				25	5			5	15																						
	SMS-WIA	HQ	0	HND-H/E	YES	NO	0	F			15	15			20		15	10		5								30		20								
	SMS LS	HQ	0	OND-I/s	YES(1/2)	NO	3	M				20				30														5								
	SMS-Fish	HQ	0	HND/PGD	NO	YES-MTR	4	M				10	10			10		10	10	10	10	3		7		7		10			20			10	20			
	DIR-WIA	HQ	0	BSc-H/EC	NO	NO	3	F		35	25	10	15		10								5												3		
	AssDirEX	HQ	0	HND-Agr	YES	NO	3	M																30	20	20												
	AFC	HQ	0	HND-For	YES	YES	4	M				5					30								15	15	25		10									
	BES	W	67	Diplo-Agr	NO	YES-P/Sea	4	M				16	3			7			17		30							7	10	10			10					
	ZEO	W	0	BSc-Pest	YES	YES-Affor	3	M									30							10	25	25											
	VEA	W	20	Cert-Farm	NO	YES-M/S	1	M																						100								
	VEA	W	10	Cert-Agr	NO	NO	3	F				40				20														100								
	VEA	W	12	OND-Irr	NO	YES-FNT	1	M								20					30							10	40								
	VEA	W	16	Cert-Agr	NO	NO	2	M				10				30					30								30								
	VEA	W	0	OND-Agr	NO	YES-FNT	1	M				60				20					20							10	20								
	VEA	W	42	OND-Agr	NO	YES-FNT	1	M									50											30		20							
	SMS AF	W	0	HND-Soil	NO	YES-POD	3	M				30				30										5		5	15							15	
	VEA	N	15	OND-Agr	NO	YES-FNT	3	M								30										10			30	5			5			5	
	VEA	N	12	OND-Agr	NO	YES-POD	3	M				30									20																50
	VEA	N	0	HND	NO	YES-FNT	2	M								40													50								50
	VEA	N	23	Cert-Agr	YES	YES	3	M									27											10	30							20	
	SMS AF	N	0	HND-Soil	NO	YES-POD	4	M				10	20			30												27	30	13	3						
	BES	N	12	HND	NO	YES-FNT	3	M				60					10											10	30								
	AEO	N	0	HND	YES	YES-WOR	4	M				60	30	10																							30

BASIC INFORMATION										PLANNED INFORMATION SOURCES																															
NAME	POSITIO	ZONE	DIST.(km)	EDUC.	WORKS?	TRAIN?	DEF'N	SEX		HTS	ZPM	SMS	BES	AEO	BEA	VEA	AFC	DIR.	ZEO	RO	PM	MOA	OGN	FARM.	AFFOR	RES. INS.	NGO	FACU	MTR	FNT	WORK	PUB	LGC	PRE	Scol	MIDsea	Revmtg
	P/RO	HQ	0	BSc-Agr	YES	NO	4	M				25	5			5	15												30		20						
	SMS-WIA	HQ	0	HND-H/EC	YES	NO	0	F			15	15			35		15	15			5										5						
	SMS LS	HQ	0	OND-I/s	YES(1/2)	NO	3	M				15				15	25												35	10							
	SMS-Fish	HQ	0	HND/PGD	NO	YES-MTRM	4	M				13	10			13		7	7	10	7	3		7	3	13		7									
	DIR-WIA	HQ	0	BSc-H/EC	NO	NO	3	F		25	25	20	10		15								5						20	20							
	AssDirEX	HQ	0	HND-Agr	YES	NO	3	M																50	30	20											
	AFC	HQ	0	HND-For	YES	YES	4	M									10								15	35	15		25								
	BES	W	67	Diplo-Agr	NO	YES-P/Sea	4	M				14	7			10			3	33								7		10							
	ZEO	W	0	BSc-Pest	YES	YES-Affor	3	M									30							10	25	25							10				
	VEA	W	20	Cert-Farm	NO	YES-M/S	1	M																						100								
	VEA	W	10	Cert-Agr	NO	NO	3	F																						90	10							
	VEA	W	12	OND-Irr	NO	YES-FNT	1	M				40					20													40								
	VEA	W	16	Cert-Agr	NO	NO	2	M									20				30									10	40							
	VEA	W	0	OND-Agr	NO	YES-FNT	1	M				10					30				30									10	10							
	VEA	W	42	OND-Agr	NO	YES-FNT	1	M				50					20				30																	
	SMS AF	W	0	HND-Soil	NO	YES-POD	3	M											40											40		20						
	VEA	N	15	OND-Agr	NO	YES-FNT	3	M				30					30										5			5	30							15
	VEA	N	12	OND-Agr	NO	YES-POD	3	M				20					25													25	25							5
	VEA	N	0	HND	NO	YES-FNT	2	M																										20	40			20
	VEA	N	12	OND	NO	YES-FNT	2	M				70																								10	20
	VEA	N	23	Cert-Agr	YES	YES	3	M									40													10	20						30
	SMS AF	N	0	HND-Soil	NO	YES-POD	4	M										10												16	20	38	16				
	BES	N	15	OND-Agr	YES	YES-AFCU	4	M				10	20				30													10	30							
	BES	N	12	HND	NO	YES-FNT	3	M				30									10										60							
	AEO	N	0	HND	YES	YES-WORK	4	M				30	10	20							40																	

NAME	BASIC INFORMATION									PLANNED U.E.S.						ACTUAL U.E.S.				
	POSITIO	ZONE	DIST.(km)	EDUC.	WORKS?	TRAIN?	DEF'N	SEX		CROPS	LIVE/ST	AF	FISH	WIA		CROPS	LIVE/ST	AF	FISH	WIA
	P/RO	HQ	0	BSc-Agr	YES	NO	4	M		60	10	10	10	10		60	10	10	10	10
	SMS-WIA	HQ	0	HND-H/EC	YES	NO	0	F		20	30	20	10	20		40	10	10	10	30
	SMS LS	HQ	0	OND-I/s	YES(1/2)	NO	3	M		20	20	20	20	20		50	10	10	10	20
	SMS-Fish	HQ	0	HND/PGD	NO	YES-MTRM	4	M		20	20	20	20	20		50	10	10	10	20
	DIR-WIA	HQ	0	BSc-H/EC	NO	NO	3	F		20	20	20	20	20		30	20	20	10	20
	AssDirEX	HQ	0	HND-Agr	YES	NO	3	M		20	20	20	20	20		50	10	10	10	20
	AFC	HQ	0	HND-For	YES	YES	4	M		50	10	20	10	20		60	10	10	10	20
	BES	W	67	Diplo-Agr	NO	YES-P/Sea	4	M		20	20	20	20	20		30	20	10	20	20
	ZEO	W	0	BSc-Pest	YES	YES-Affor	3	M		30	20	20	20	10		40	30	10	10	10
	VEA	W	20	Cert-Farm	NO	YES-M/S	1	M		20	20	20	20	20		40	20	20	0	20
	VEA	W	10	Cert-Agr	NO	NO	3	F		20	20	20	20	20		30	30	20	0	20
	VEA	W	12	OND-Irr	NO	YES-FNT	1	M		30	20	20	20	10		40	20	20	10	10
	VEA	W	16	Cert-Agr	NO	NO	2	M		20	20	20	20	20		30	20	20	0	30
	VEA	W	0	OND-Agr	NO	YES-FNT	1	M		30	20	20	10	20		40	20	20	0	20
	VEA	W	42	OND-Agr	NO	YES-FNT	1	M		20	20	20	20	20		40	40	40	10	10
	SMS AF	W	0	HND-Soil	NO	YES-POD	3	M		20	20	20	20	20		50	10	10	10	20
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	VEA	N	12	OND	NO	YES-FNT	2	M		20	20	20	20	20		60	20	10	10	0
	VEA	N	23	Cert-Agr	YES	YES	3	M		20	20	20	20	20		30	20	20	20	10
	SMS AF	N	0	HND-Soil	NO	YES-POD	4	M		20	20	30	20	10		50	10	20	10	10
	BES	N	15	OND-Agr	YES	YES-AFCU	4	M		20	20	20	20	20		30	20	20	10	20
	BES	N	12	HND	NO	YES-FNT	3	M		20	20	20	20	20		50	10	20	10	10
	AEO	N	0	HND	YES	YES-WORK	4	M		30	20	20	10	20		30	20	20	10	20

NAME	BASIC INFORMATION								EXTENSION F/S & S/S INTER.				
	POSITIO	ZONE	DIST.(km)	EDUC.	WORKS?	TRAIN?	DEF'N	SEX	NO. 1	NO. 2	NO. 3		AF DISC.
	P/RO	HQ	0	BSc-Agr	YES	NO	4	M	U/D(AF)(s/f)				
	SMS-WIA	HQ	0	HND-H/EC	YES	NO	0	F	U/D(train)(s/s)	U/D(train)(s/s)			YES
	SMS LS	HQ	0	OND-I/s	YES(1/2)	NO	3	M	U/D(L/S)(s/f)	D(L/S)(s/f)	U/D(L/S)(s/f)		YES
	SMS-Fish	HQ	0	HND/PGD	NO	YES-MTRM	4	M	U/D(fish)(s/f)	D(Res)(s/s)	U/D(train)(s/f)		YES
	DIR-WIA	HQ	0	BSc-H/EC	NO	NO	3	F	U/D(WIA)(s/f)	U/D(WIA)(s/f)	D(train)(s/s)		YES
	AssDirEX	HQ	0	HND-Agr	YES	NO	3	M	D(Sup)(s/s)	U/D(FERT)(s/f)	U/D(FERT)(s/f)		YES
	AFC	HQ	0	HND-For	YES	YES	4	M	U/D(af)(s/s)	U(af)(s/s)	U/D(af)(s/s)		YES
	BES	W	67	Diplo-Agr	NO	YES-P/Sea	4	M	D(SUP)(s/s)	U/D(FISH)(s/f)	D(AGR)(s/f)		YES
	ZEO	W	0	BSc-Pest	YES	YES-Affor	3	M	D(SUP)(s/s)	D(RES)(s/f)	D(SUP)(s/s)		YES
	VEA	W	20	Cert-Farm	NO	YES-M/S	1	M	U(AGR)(s/f)	U/D(AGR)(s/f)	U/D(AGR)(s/f)		YES
	VEA	W	10	Cert-Agr	NO	NO	3	F	D(L/S)(s/f)	D(L/S)(s/f)	U/D(AGR)(s/f)		YES
	VEA	W	12	OND-Irr	NO	YES-FNT	1	M	U/D(AF)(s/f)	U/D(Loan)(s/f)	U/D(AGR)(s/f)		YES
	VEA	W	16	Cert-Agr	NO	NO	2	M	D(AF)(s/f)	D(af/AGR)(s/f)	U/D(AF)(s/f)		YES
	VEA	W	0	OND-Agr	NO	YES-FNT	1	M	U(AF)(s/f)	D(AF)(s/f)	D(AF)(s/f)		YES
	VEA	W	42	OND-Agr	NO	YES-FNT	1	M	U/D(AF)(s/f)	U/D(AF)(s/f)	U/D(AF)(s/f)		YES
	SMS AF	W	0	HND-Soil	NO	YES-POD	3	M	D(train)(s/s)	U/D(AF)(s/s)	U/D(AF)(s/f)		YES
	VEA	N	15	OND-Agr	NO	YES-FNT	3	M	U/D(AF)(s/f)	U/D(AF)(s/f)			YES
	VEA	N	12	OND-Agr	NO	YES-POD	3	M	D(train)(s/s)	U/D(AGR)(s/f)	U/D(AGR)(s/f)		YES
	VEA	N	0	HND	NO	YES-FNT	2	M	D(AGR)(s/f)	U/D(AF)(s/f)	U/D(AF)(s/f)		YES
	VEA	N	12	OND	NO	YES-FNT	2	M	D(FERT)(s/f)	D(TREES)(s/f)	D(TREES)(s/f)		YES
	VEA	N	23	Cert-Agr	YES	YES	3	M	D(FISH)(s/f)	D(AF)(s/f)	U/D(AGR)(s/f)		YES
	SMS AF	N	0	HND-Soil	NO	YES-POD	4	M	D(AF)(s/s)	U/D(AF)(s/s)	U/D(AF)(s/s)		YES
	BES	N	15	OND-Agr	YES	YES-AFCU	4	M	D(AF)(s/f)	U/D(AGR)(s/f)	D(TRAIN)(s/s)		YES
	BES	N	12	HND	NO	YES-FNT	3	M	D(AGR)(s/f)	D(TREE)(s/s)	U/D(AGR)(s/f)		YES
	AEO	N	0	HND	YES	YES-WORK	4	M	D(TRAIN)(s/f)	U/D(SUP)(s/s)	D(TRAIN)(s/s)		YES

Appendix III
Agroforestry Planning Workshop
September 3, 1993

Plateau Agricultural Development Programme
Agroforestry
Planning Workshop

September 3, 1993

Jos, Nigeria

Prepared by: Workshop Participants
Compiled by: Barry W. Hunter

TABLE OF CONTENTS

Introduction		1
Session One:	Agroforestry Concepts and Techniques	1
Objectives		1
What is agroforestry?		2
Definitions & Diagrams		2
Plenary Discussions		3
What agroforestry techniques are available?		4
Where are these techniques appropriate?		4
Plenary Discussions		4
Session Two:	Zonal Agroforestry Benefits and Constraints	5
Objectives		5
What is a strategy?		5
Village strategies		6
Plenary Discussions		8
Constraints to village level interventions		8
Plenary Discussions		9
Session Three:	PADP Agroforestry Programme	9
Objectives		9
Strategies/Actions to incorporate agroforestry		10
Plenary Discussions		11
Conclusion		11
Appendix I		12
Sample Village Sketch Maps and Land-use Transects		

Introduction

The purpose of this report is to summarize the discussions which occurred during the agroforesty workshop held on September 3, 1993 at the Headquarters of the Plateau Agricultural Development Programme (PADP) in Jos. The workshop was intended to be a follow-up exercise to the agroforestry vision creation and capacity building workshop series undertaken from November 1991 to February 1992.

The original workshop series centered on participatory approaches to programme planning and extension as well as technical agroforestry interventions. Given the interdisciplinary and complex nature of agroforestry, such a people-oriented approach should work best. The basic philosophy being; *that it is better to work and plan* ***with*** *people rather than working and planning* ***for*** *people.*

The overall objective of this follow-up workshop was, **to see** what we have accomplished, **to reflect** on our successes and shortcomings, and **to act** to increase the effectiveness of the agroforestry programme. Programme planning, not training, was the focus of the workshop. Workshop participants included middle and upper level staff from all four PADP Zones and Headquarters.

The workshop lasted a half day and involved, (1) re-visiting the concept of agroforestry, (2) re-flecting on suitable agroforestry interventions and interactions with farmers, and (3) re-assessing our current activities and (4) re-acting by modifying and refining our agroforestry plans.

Session One: Agroforestry Concepts and Techniques

Objectives

(1) Review the definition/concept of agroforestry.
(2) Review appropriate agroforestry interventions and techniques.

The workshop participants divided themselves into two groups, and considered three broad questions.

i) What is agroforestry?
ii) What agroforestry techniques are there?
iii) Where are these techniques appropriate?

Group A included personnel from the East and West zones, while Group B consisted of personnel from the North zone. Due to transportation problems South zone based staff did not attend the first session of the workshop. The reflections of each group are presented below.

What is agroforestry?

To answer this question the groups formulated a definition and produced a diagram depicting the concept of agroforestry.

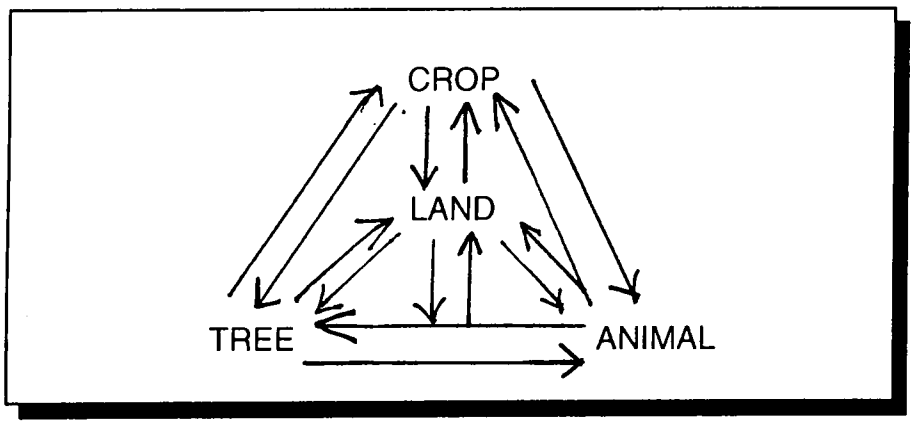
Definitions:

GROUP A: *Agroforestry is an integrated approach of farming system involving the growing of crops, trees, the raising of animals, all aiming at* ***AGRICULTURE SUSTAINABILITY***

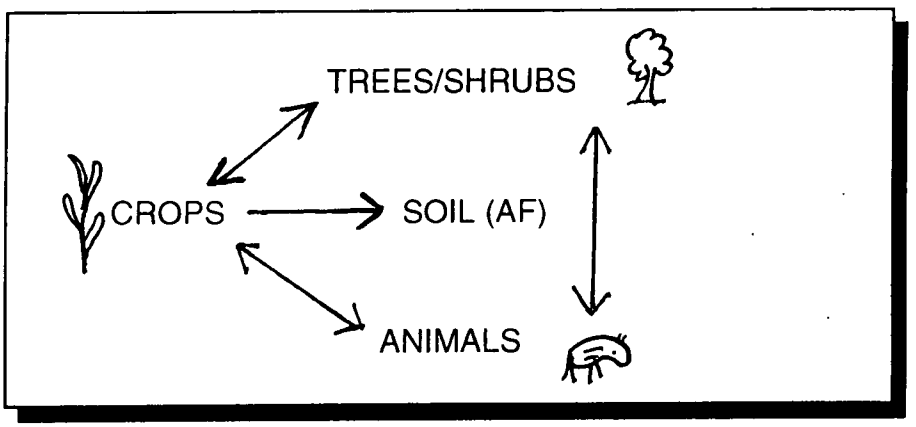
GROUP B: *Agroforestry involves the integration of trees, crops and livestock on a given piece of land (ecosystem) for the sustainability of the ecosystem.*

Diagrams:

Group B diagramed the concept of agroforestry as follows:



Group A's diagram of the concept follows:



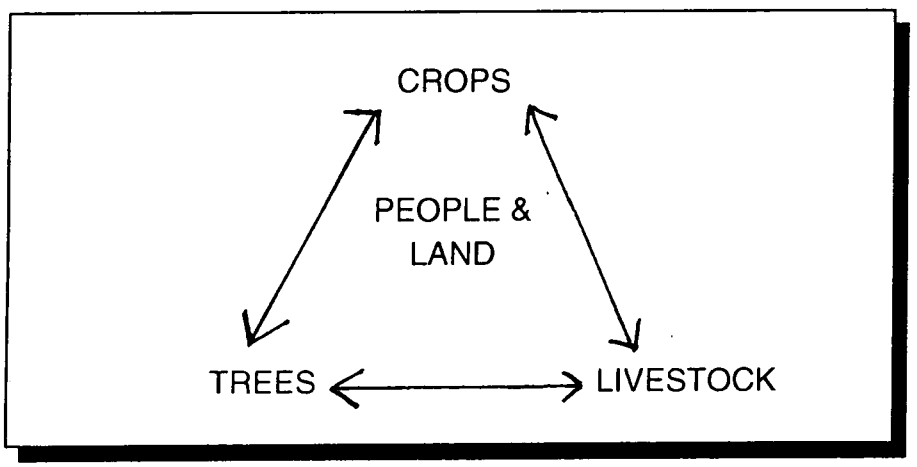
Plenary Discussions

To stimulate discussion and share ideas each group presented their diagram and definition to the other group in a plenary session. Comparing each groups' perceptions about agroforestry with the ideas developed during last years' workshop series, one can see that the participants have retained a lot of knowledge about the concept.

The earlier workshops described the concept of agroforestry as:

the interaction between crops, trees (and other plants) and livestock in a farming system.

This interaction can also be shown as a diagram:



What agroforestry techniques are available?
Where are these techniques appropriate?

Each of the groups was asked to compile a list of agroforestry techniques that were appropriate for their zones. As Group A contained people from a number of zones the discussion was particularly lively within that group.

The following frame contains a reproduction of the lists prepared by each group.

Group A List of Agroforestry Tecniques	Group B List of Agroforestry Techniques
1) Contouring farming*	1) Border Line Tree
2) Intensive fodder garden	2) Dispersed tree cropping
3) Alley farming	3) Alley cropping
4) Shelter Belts	4) Live fencing
5) Woodlots	5) Grass Ledge-row/Contour line
6) Afforestation	6) Fodder garden
7) Cover Crops	7) Fodder bank
8) Mixed Farming	8) Woodlots
	9) Improved fallow
Suitable Interventions for East and West Zones	10) Shelter belts
	11) Wind breaks
* Not Suitable for West Zone	Suitable Interventions for North Zone

Plenary Discussions

The lists generated by each group were then presented in a plenary session so that, all participants were exposed to each others ideas.

Everyone agreed that:

(1) there are a large number of agroforestry interventions available;

(2) that any one technique may not be suitable for all PADP Zones.

Session Two: Zonal Agroforestry Benefits and Constraints

Objectives

(1) Recognize the ecological and social differences of each zone.
(2) Identify zonal problems and planning constraints.

To accomplish the objectives of this session, the participants were asked to develop an agroforestry strategy which would assist a typical village from their Zone. Further, the participants were asked to note any problems or constraints that may be encountered when devising and implementing their strategy.

A sketch map and a land-use transect provided each group with basic information about their sample village. Sample villages were "constructed" for each zone based on problem areas and typical sites identified during last years agroforestry workshop series. Much to the delight of the staff, the villages were named after each of the Zonal Extension Officers.

The sketch maps and land-use transects for each sample village can be found in Appendix 1.

The staff from the South zone arrived in time to undertake this exercise so three groups completed this assignment.

What is a strategy?

It was noted that a good strategy has five components, which correspond to the following questions:

Who will do it?
What to do?
Where to do it?
When to do it?
Why do it?

Each of the groups was asked to think carefully about these questions as they assisted the villagers in solving their problems.

The subsequent sections will present specific village strategies, as well as note the problems and constraints which may effect the implementation of such strategies.

Village Strategies

Group A prepared the following:

"Kurmin Alex" Group A. (East and West Zones)

	Soil Types	Problems Identified	AF strategy
1)	Sandy Loam (Laterite)	Fertilizer, stray Fulani cattle	Alley farming for fert. problem
2)	Sandy Loam	erosion, fertilizer, stray animals	Contour farming for erosion control and cover crops
3)	Gravel soil	fertilizer, stray animals	live fencing
4)	Sandy Loam	gully erosion and fertilizer	critical area tree planting and wooden check dams
5)	Fadama clay	wind and water erosion	wind breaks, diversional drains and grass
6)	River	erosion	trees and grass on banks

Group A then went on to answer the five questions which are the components of a good strategy.

Who will do it?

Farmers with extension agents
VEA
RES
REA;

What to do?

Create awareness
Demarcating
Research trials;

Where to do it?

At the village level;

When to do it?

When problem is noticed/identified;

Why do it?

To address/solve the problems.

Group B from the North Zone listed some of the problems faced in their zone based on the sketch map and land-use transect provided, and indicated which techniques might be of assistance. The group hastened to add that this was a preliminary problem list and, of course, other techniques could be useful interventions. Note that the interventions indicated in the problem frame correspond to the intervention numbers from the previous session.

Problems	Intervention
Run-off	3,5,8,9
Poor soil	2,3,9,6
Wind storms	1,8,2,3,9
Fuelwood Problem	10,11
Land hunger	3,2
Pasture/Over-grazing	4,6,7

South Zone staff (Group C) reviewed the information from their zone and prepared the following strategy:

Problems	**Solutions**	**Interventions/Strategy**
A. Striga problem	-crop rotation -general legume intercropping -early cropping	Who? Farmer/resource persons /extension agent When? Planting season Where? Farm Why? Solutions to problem
B. Erosion	-contour farming -stabilization (grass) - diversions/bunds and water ways -fodder banks	Who? Farmer Where? Site When? All year round Why? To control erosion
C. Wind and Water Erosion	-wind breaks -cover crops -fodder banks -mulching	Who? Farmers/Extension agent Where? Site of problem When? All the year round Why? To control erosion
D. Weeds and Flooding	-drainage channels	Who? Farmer/Extension staff Where? Site of problem When? At the onset of the problem Why? To remove excess water and to control weeds

Plenary Discussions

Again each of the groups presented their plans to all participants. Discussions revealed that even though the various groups devised different strategies, a number of basic ideas could be distilled out. Common points included:

1) there are many techniques, both agroforestry and otherwise, which may be available to alleviate a given problem; and
2) the use of any given technique is governed by local conditions;

Constraints to Village Level Interventions

It was noted during discussions that while preparing a strategy to address specific village level problems was relatively simple, implementing any given strategy was not. Each of the three groups was then asked to prepare a list of problems and/or constraints which may affect the implementation of the strategy they had prepared.

Group A. (East and West Zones) noted the following impediments to implementation:

(1) Acceptability by farmers
(2) Cost / Funding
(3) Availability of materials - seedlings
(4) Training / Manpower

Group B. (North Zone) noted the following constraints:

(1) Limited staff and resource personnel
(2) Logistic problems - transportation and accommodation
(3) Co-operation among farmers/extension agents
(4) Accessability to the location
(5) Crowded schedules of staff
(6) Funding problems
(7) Delay in result realization
(8) Farmer poor resources base
(9) Inadequate government support
(10) Political instability discourages interventions and sponsors of agricultural programs
(11) Land tenure problems
(12) Poor relationship between local leaders and their subjects
(13) Poor incentives to staff affect commitment
(14) Ecology of the environment in question
(15) Poor attitude of farmer (bush burning, over-grazing, etc.)
(16) Type of inhabitant - permanent settlements and migrants. (nomads) affect programs

Group C. (South Zone) recorded the following constraints:

(1) Decrease of striga population takes a long time
(2) Construction of soil structure will increase cost of production
(3) Establishment of wind breaks takes a long time and also increases the cost of production
(4) Rate of adoption of new technology by farmers is very slow / farmers attitudes

Plenary Discussions

Each of the groups presented their lists of constraints to implementing their village level strategy to all participants. After comparing and contrasting the various lists, the workshop participants agreed that a number of common elements could be found. Such commonalities included:

- Relationship between Farmers and PADP
- Logistics
- Delay in result realization
- Funding / Intervention costs
- Farmer concerns and attitudes
- PADP staff concerns and attitudes

At our level, apart from using the resources allocated as efficiently as possible, there is little we can do about logistical and funding concerns. However, if we can show our work has significant benefits and successes, perhaps additional funding will be made available.

Discussions then centered on relationships and client / staff concerns. This is a problem area where we have much more control. We need to do all that we can to ensure that our communication is "two-way." It is as important to listen as it is to talk. Such basic actions will improve relationships between farmers and staff as well as staff and staff. Farmers are not always the problem. Sometimes it is our approach.

Session Three: PADP Agroforestry Programme

Objectives

(1) Recognize planning and operational constraints to utilizing agroforestry techniques.
(2) Identify actions and strategies to address constraints and incorporate agroforestry more fully in PADP operations.

To accomplish the objectives of this session the participants were asked to consider the wide variety of planning and operational constraints faced in the implementation of the agroforestry programme and then offer suggestions that would enable PADP's programme to be more fully integrated into PADP operations. Each group prepared a list of actions on brown paper and the results were shared in a plenary session.

Strategies / Actions to incorporate agroforestry

Many of the constraints to agroforestry implementation were noted in the previous section. Actions as determined by each group to improve the implementation of the agroforestry programme are shown below:

Group A. Strategies to incorporate agroforestry more fully into PADP operations:

(1)	Undertake an immediate diagnostic survey in AF in all zones of the PADP by the mandated research institution / other specialised organizations.
(2)	Source for resource persons based on problems identified and as specified above
(3)	Provide adequate training for supervisors (SMS, R/Scrpt, ZRO, ZEO) PADP responsibility.
(4)	Afforestation programmes / nurses be incorporated into the PADP. PADP; MANR and LGC to take action.
(5)	Mobility for all cadres of staff in AF be ensured, PADP responsibility.
(6)	Source for extra funds for AF programmes.
(7)	Specific targets for VEA's and R/Assts on AF be outlined during implementation. PADP, D (TS), D (EXT), D (PME) for action.

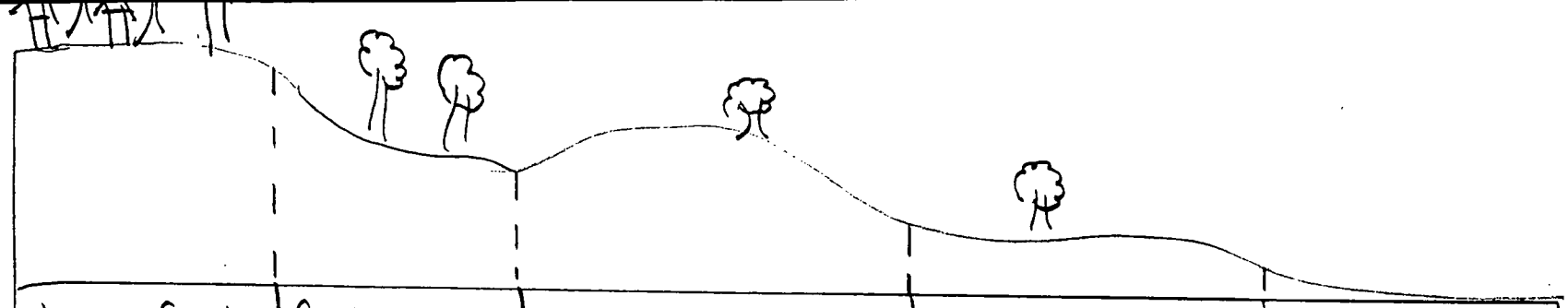
Group B. Incorporation of agroforestry into PADP operations

(1)	Programmes readiness to fund the agroforestry programme
(2)	Training of PADP personnel (SMS) (BES) (VEA)
(3)	Identification of agroforestry required areas by agroforestry SMS & VEA's.
(4)	Awareness through extension staff and the media.
(5)	Incorporation of nursery demonstration and supervisors from afforestation programmes and M.O.A.
(6)	Identification of plant species required for programme. (AFC / SM)
(7)	Intensification of agroforestry demonstration models (Zonal agroforestry SMS)
(8)	Adequate facilities be provided by government.
(9)	Adequate incentive to staff and farmers by PADP.
(10)	Defined responsibilities of agroforestry staff.
(11)	Government should enact and enforce agroforestry edicts.
(12)	All SMS agroforestry be provided with transportation for effectiveness.

Group C. Strategies to improve AF in PADP

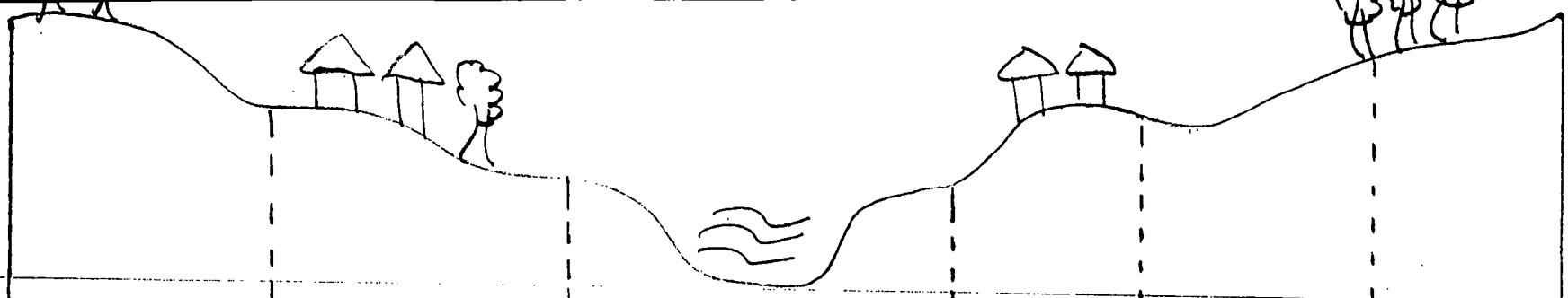
(1)	Diagnostic survey (RRA) extension / media.
(2)	Creation of awareness extension / media.
(3)	Production of audio-visuals at cheaper rates.
(4)	Intensify tree planting and maintenance of existing woodlots.
(5)	Give incentive to farmers and staff.
(6)	Constant training of extension staff (SMS).

Composite Village: East Zone (GRUPOA)



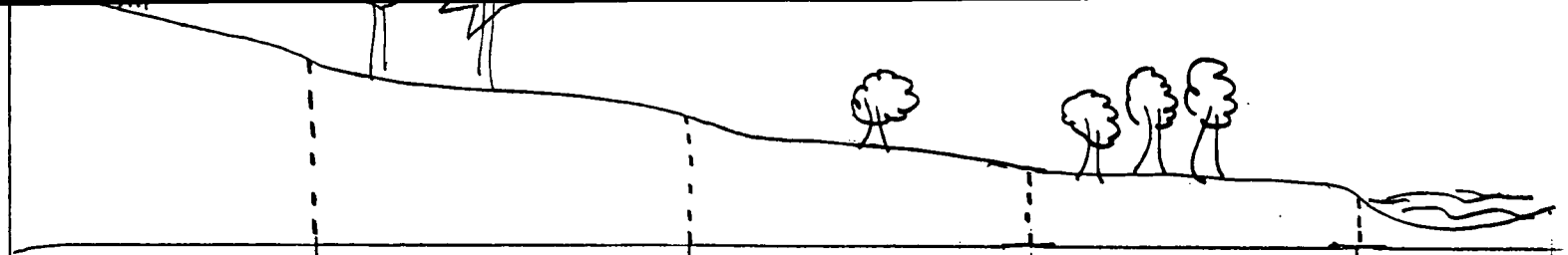
Soils	Loamy Sand with Laterite (Jigawa)	Sandy Loam with Laterite.	Sandy Loam	Fadama Clay	River.
Crops	Maize Okra Sorghum Ghnut	maize Sorghum	Upland Rice Yam Beni seed	vegtables Rice.	
Trees	PawPaw Dogon Ywo Dinya	Gano Kargo Kukuki	Giyaye.	Giyaye Fig.	
Livestock	Seasonal grazing	Stray Animals (seasonal)	Stray Animals (Seasonal)	Stray Animals (Year Round Grazing)	
Problems	Striga Poor Soil Fertility	Weeds. Insect Pests Striga	Striga Weeds. Animals.	Flooding Weeds Animals Striga.	

Composite Village : North Zone
(GROUP B)

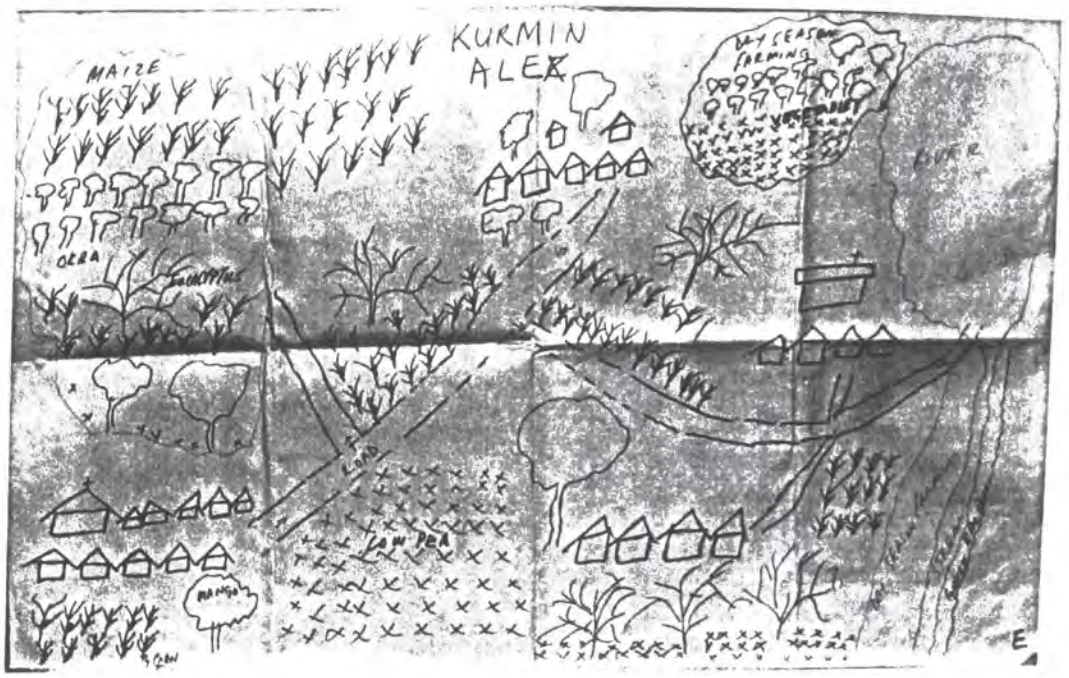


Soil	Sand with Gravels	Sandy	Clay loam	Sandy Loam	Sand with Gravels	Gravels
Crops	maize G. corn	G. Nuts maize Guinea Corn	Coco yam Fadama Farms → vegtables	G. Nuts maize G. corn Acha.	maize G. Corn	—
Livestock	Seasonal Grazing	Seasonal Grazing	Year-round grazing/feeds	Seasonal Grazing	Seasonal Grazing.	Free grazing
Land-uses	Building Fencing	Building materials	Fishing Mining	—	Building	Building Materials
Problems	Poor Soils	Erosion	Flooding Erosion Animals	Poor Soils Erosion.	Poor Soils	

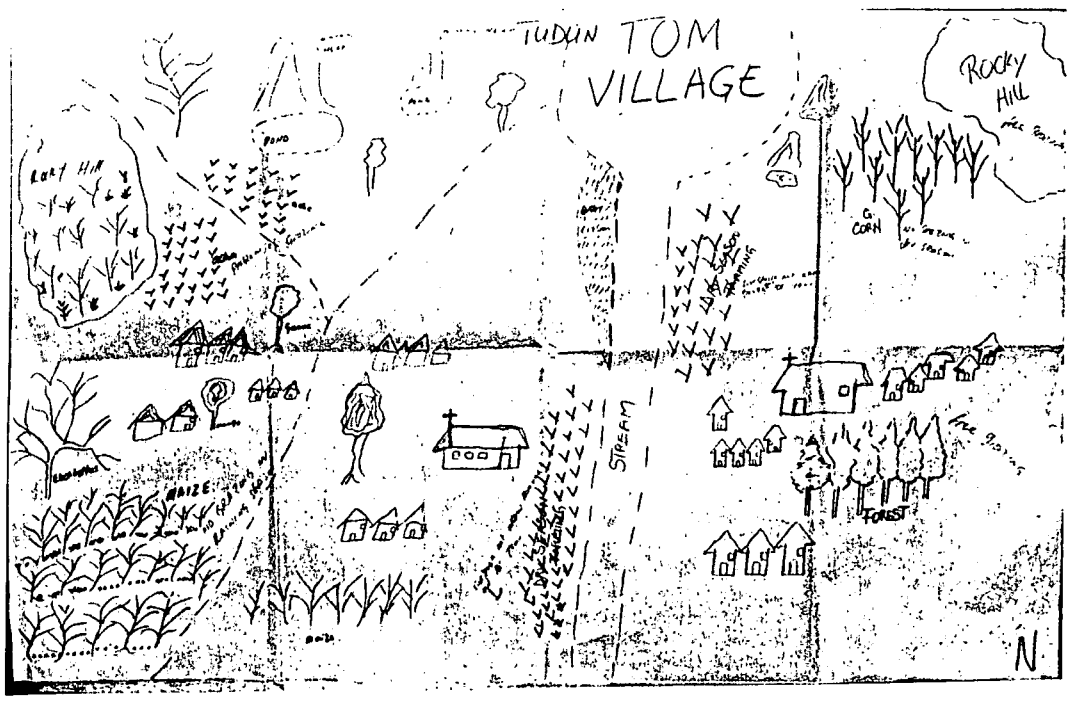
Composite Village : South Zone
(GROUP C)



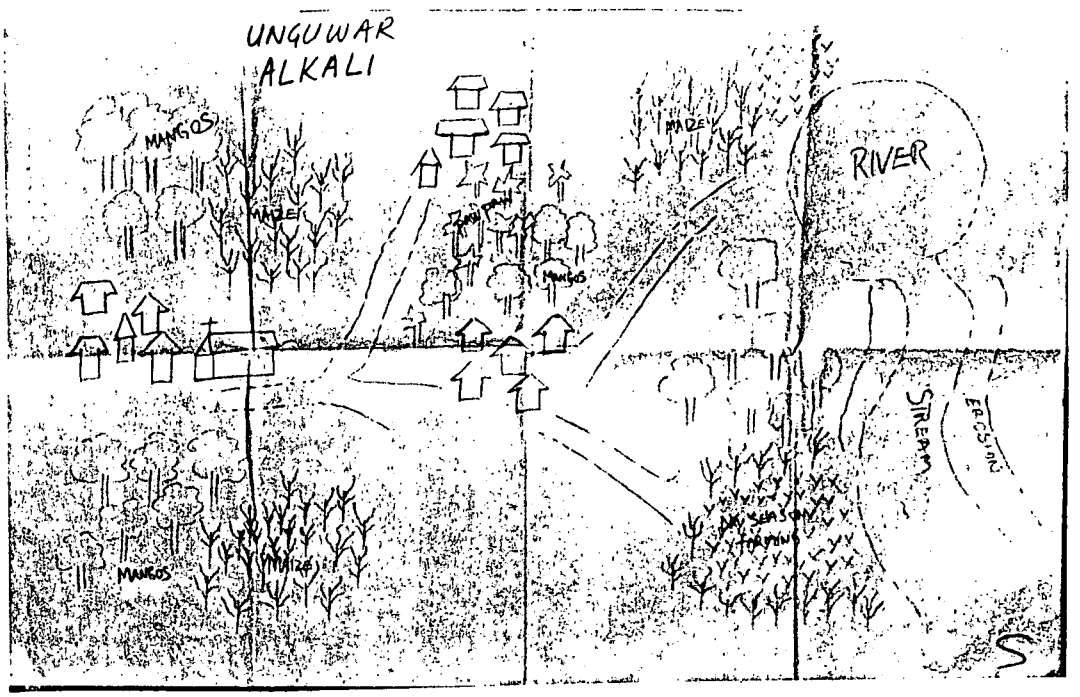
Soils	Laterite (Jigawa)	Loamy Sand (Farin Yashi)	Sandy Loam (kansin Tano)	Clay (Tabo)	River (RaFi)
Crops	Sweet Potato Guinea Corn	Cassava Beniseed cotton	maize millet Yam	Rice Vegtables Coco Yam	
Livestock	Seasonal Grazing	Seasonal Grazing Sheep, goats & cattle	Seasonal Grazing	Seasonal Grazing cattle	
Trees		Mangos Palm trees Locast Bean	"Orchard" Trees	"Orchard" Trees	
Problems	Striga	Erosion	wind & water erosion	weeds & Flooding	



Kurmin Alex. East Zone Composite Village. (GROUP A)



Tudun Tom Village. North Zone Composite Village. (GROUP B)



Unguwar Alkali. South Zone Composite Village. (GROUP C)