

George C. Kajembe

**Indigenous management systems as a basis
for community forestry in Tanzania**

A case study of Dodoma urban and Lushoto districts

CENTRALE LANDBOUWCATALOGUS



0000 0575 9960

40951

Promotoren:

ir. A. van Maaren;
emeritus hoogleraar boshuishoudkunde
dr. P. Richards;
hoogleraar technologie en agrarische ontwikkeling

PN08201, 1750

George C. Kajembe

**Indigenous management systems as a basis
for community forestry in Tanzania**

A case study of Dodoma urban and Lushoto districts

Ontvangen

14 MAART 1994

UB CANDEX

Proefschrift

ter verkrijging van de graad van
doctor in de landbouw-en milieuwetenschappen
op gezag van de rector magnificus,
dr. C.M. Karssen,
in het openbaar te verdedigen
op woensdag 23 maart 1994
des namiddags te vier uur in de Aula
van de Landbouwuniversiteit te Wageningen

120 533601

ABSTRACT

This report presents an analysis of the nature of both indigenous and professionally sponsored community forest management systems in two districts in Tanzania. It describes various types of internally generated forest and tree management systems. It demonstrates that a gap exists between indigenous and externally sponsored management systems. In the externally sponsored projects, the concept of participation implies that rural people should participate in professionals' projects, rather than that professionals should participate in the livelihood projects of rural people. Interventions along these lines generate confrontations, as well as degrees of collaboration and participation between local farmers and projects. The study focusses on three key actor categories to be considered in community forestry projects, i.e. farmers, village extension workers and supervisors. The relations between these actor categories constitute the "middle ground" of community forestry development. This concept refers to the totality of social processes and fields within which the actors attempt to establish common ground for their negotiations over resources and development alternatives. The study seeks to understand how strategic actions and interactions of different actor categories shape the outcome of community forestry projects, as well as how to bridge the gap between internally generated activities and externally sponsored interventions.

**BIBLIOTHEEK
LANDBOUWUNIVERSITEIT
WAGENINGEN**

This thesis has also been published as
Tropical Resource Management Papers No. 6
Wageningen Agricultural University
Wageningen, the Netherlands

PROPOSITIONS (STELLINGEN)

1. Externally initiated models often do not concur adequately with local situations, thus producing "underdevelopment" rather than "development".

(Dit proefschrift)

2. Village extension workers in community forestry projects in Tanzania, represent the on-going social processes rather than the projects.

(Dit proefschrift)

3. To question the sentiments lying behind a profession is controversial. A person who tries in his/her own thinking to escape his/her moralistic system in order to study it objectively is quickly branded as an agnostic, cynic, traitor or worse. Instead of getting professional support for his/her work, he/she must count on blames.

(Dit proefschrift)

4. Foresters in most cases are well-equipped to deal with trees but ill-prepared to deal with people.

(Dit proefschrift)

5. The experimenting, innovative, adaptive peasant farmer is now accepted as the norm not the exception.

(Richards, 1988; Experimenting farmers and agricultural research. Paper prepared for ILEIA workshop on Participatory Technology Development, ILEIA, Leusden, The Netherlands.)

6. Problems cannot be solved by the same type of thinking which created them. So deforestation in the tropics calls for a new thinking.

7. It is regrettably true that while computing things, statisticians sometimes tend to treat people as numbers and to forget that each unit represents a living, feeling person.

8. Absence of evidence is not evidence of absence.

9. In showing the relationships among observed facts, you do not need to reach cosmetic conclusions. Seldom one is able to illuminate the whole truth; more often, the best one can do is to shine a spotlight on one area of the truth.
10. Never fear big words. Long words name little things. All big things have little names such as life and death, peace and war or down, day, night, love and home. Learn to use little words in a big way. It is hard to do. But they say what you mean. When you don't know what you mean, use big words. They often fool little brains.
11. The naive conviction that anything not quantified is ipso facto theoretical is dangerously misleading.
12. If we view knowledge as a house we live in, scientific knowledge will tell us how to construct our house. But, we need artistic knowledge to make our house beautiful, hence we need social knowledge so that we can understand and appreciate forestry as a social or people's business.

DEDICATION

This Thesis is dedicated to my Parents: My mother Lidya Nkunde and my father the late Gabriel Kibimbi Kajembe - "May almighty God rest your soul in eternal peace".

PREFACE

I would like to start by expressing my gratitude to the Committee for the Admission of Graduates from Non-Dutch Universities acting on behalf of and answerable to the Executive Board of Wageningen Agricultural University for the confidence they have shown in me on the fact that I was exempted from undertaking the doctoral qualifying examinations.

The decision to come and study at Wageningen Agricultural University has proved to be a good one. I consider myself extraordinarily fortunate to have been working under the Promoters whose interests so closely matched my own. I would like therefore to express my heartfelt appreciation to Prof. Ir. A. van Maaren and Prof. Dr. P. Richards for their intellectual stimulation, professional guidance, encouragement and sincere interest on the study.

I would also like to thank Ir. K.F. Wiersum for his scholarly comments on this study, logistical support and friendship since I arrived in Wageningen. Ir. K.F. Wiersum guided me through the intricacies of the Dutch University system which for a Tanzanian scholar is at times quite mystifying. From my first working day Ir. K.F. Wiersum and other members of the Department of Forestry, both academic and administrative, have helped to make me feel at home. I thank each of them for their encouragement and commitment to making sure things worked out well.

I am very much indebted to the computing assistance from Ir. J.J. Jansen. His skills, persistence and accuracy helped me to conquer the seemingly large pile of data. Furthermore, in the process he taught me how to do many computations myself. The help rendered by Ir. Boukje Wijnia in translating the abstract into Dutch is highly acknowledged. Similarly, I wish to express my sincere acknowledgement to Mrs Heleen van Haaften for drawing my attention to the question of interface between bureaucrats and farmers.

A particular rewarding aspect of my study in Wageningen Agricultural University has been the contacts I have had with a number of academicians. Specifically I would like to thank Ir. Berry Lekanne dit Deprez of the Department of Rural Development Sociology and Mrs M.M. Skutsch of the University of Twente for reading and re-reading my thesis drafts and agreeing to listen to my sometimes provocative arguments during our prolonged discussions. I must admit that I have drawn quite a lot from their wealth of knowledge and experience on issues of agrarian development.

My struggle with the Dutch language was, of course, at times a source of amusement to staff and my fellow graduate students, and sometimes as it is said in English "we got our wires hopelessly crossed." My conclusion is that the Dutch language and culture is

indeed full of strange mystery, ready for further exploration and discovery.

In Tanzania, the help rendered by my research assistants: Messrs Makonda, Sumbi, Masawe, Kahema, and Mrs Karume and Miss Amina Akida is highly acknowledged. Similarly the help offered by the officials of Dodoma Village Afforestation project and Soil Erosion Control and Agroforestry Project is sincerely acknowledged.

I must emphasize the critical role played by my wife, Happy Thecla Kajembe, during the entire period of the study. Happy took over the most difficult part of our family life for undertaking responsibilities and duties in addition to her own job. Our children shared the difficulties with her and helped me to concentrate on this study. I am certain that without their help, patience and encouragement I could never have found the time to complete this study. I thank them deeply for their sacrifices and indeed for making those difficulties not only bearable but transforming them into opportunities for our common future.

I will in years to come remain deeply indebted and appreciative of the financial support from Wageningen Agricultural University for funding the theoretical part and publication of the study. The field work enjoyed a handsome financial support from Osborn Forestry Policy Grants Programme, World Wildlife Fund, Washington, DC and that of Sokoine University of Agriculture, Morogoro, Tanzania. Moreover, I wish to express my gratitude to the authorities of Sokoine University of Agriculture for granting me a study leave and agreeing to reduce my work load to the minimum when I was in Tanzania for the field work.

I cannot conclude this note without thanking the farmers and village extension workers who were prepared to be both objects and subjects of this study. The high response rates and the conscientiousness with which they answered the many questions showed their interests on the study. Indeed, without their cooperation this thesis would never have been written.

Lastly, I would like to say that all good things of this study are "common property" but the shortcomings are solely mine.

SUMMARY

In the last two decades, efforts to stimulate farmers to grow and manage trees in Tanzania had little positive impact. Most of the externally sponsored interventions were based on orthodox forestry techniques. Indigenous knowledge and skills were neglected. No attention was given to the idea that local people were capable not only of developing viable solutions to local problems based on their understanding of local solutions, but also of conducting practical field experiments in response to local constraints and opportunities. Most foresters in Tanzania were skeptical about farmers' knowledge and experimentation, partly because farmers seldom recorded their accomplishments in writings, rarely wrote papers on their discoveries and did not attach names and patents to their inventions. However, it was clear that many activities associated with innovative rural development, such as "agroforestry" had been practiced by local people for many generations without any external help. This study sought to demonstrate empirically the existence of a gap between indigenous and professional forest/tree management systems; analyze how project interventions generated confrontations, as well as degrees of collaboration and participation; and develop a model which could bridge the gap between internally regenerated initiatives and externally sponsored interventions.

The research applied a multi-method approach. This approach facilitated the collection of both quantitative and qualitative types of data and information. Even though each of these research methods (i.e. Participant observation; formal surveys; tree inventories, social interface; detachment and reflection; consultation of documented materials) were applied individually, they were developed and used in an integrated fashion, and the resultant data were analyzed both individually and collectively. Participant observation involved observation of the community, group, and household activities. It provided the context within which other methods were applied. Formal surveys were carried out to solicit classification, factual and opinion information and data. Tree inventories were carried out in the agricultural land owned by the households which participated in the surveys. In these inventories the farmer was the teacher and the researcher the student. Social interface approach enabled the researcher to understand the social meanings of transformations which took place in the projects studied. Detachment and reflection required the researcher to be objective. The study insisted that in order to understand what made our social world, we should study human behaviour with the same "detachment" as does the chemist with regard to a reaction in a test tube. Three methods were used to analyze the data: statistical analysis of quantitative data and content as well as structural-functional analysis of qualitative information.

As indicated by the study the main causes for deforestation are

complex social ones, rather than simple biological ones. The pervasive overpopulation explanation, although superficially plausible and widely taken advantage of, does not withstand detailed examination of most cases of contemporary tropical forest destruction. The study indicates that once the exclusive focus on apparently uncontrollable population growth as a source of the problem is abandoned, then there is nothing inevitable about what is happening to the tropical forests. Community forestry has been mentioned as one potential solution to readdress deforestation. A distinguished feature of community forestry programmes is active participation of the local people with external involvement being of supportive rather than direct. But, Peoples' participation can only be achieved if internally regenerated initiatives are taken into account. All forms of external interventions necessarily enter the existing life-worlds of individuals and groups affected and thus pass through certain social and cultural filters. Indeed, external community forestry interventions in Tanzania were both mediated and transformed by the existing indigenous knowledge and practices of the local areas.

The most common management system in the study areas is the cultivation of scattered trees on the farmlands. When the forests are reclaimed for farming, some indigenous tree species of socio-economic importance are retained on the farms. In addition to these indigenous trees some valuable exotic trees have also been raised. This indicates that farmers are well aware of the importance of both indigenous and exotic trees. Farmers and professional foresters were found to classify trees rather differently. While foresters contrasted "indigenous" with "exotic" species; farmers contrasted "local" with "new" species. Familiar exotic tree species such as *Mangifera indica* were being regarded by farmers as local species. Furthermore, local people initiatives were found to be out of phase with externally sponsored interventions. Farmers had started with agroforestry practices at the time when they were recommended to cut down trees, and at present the extension services were recommending intercropping especially with exotic tree species while farmers planted most of these species in the farm boundaries. The study showed that farmers were experts when it came to regeneration and tending of trees; and that foresters had more to learn than teach. Generally, there appeared to exist a gap between internally regenerated initiatives and externally sponsored interventions.

The social organization of the household is a major determining factor for a functioning management system. Households organize labour and are the focus of the decision-making process, distribution of authority, property rights and obligations among members. However, the survival strategy of a farmer is not restricted to the household level only but also to the supra-household level. Forest management systems at the communal (supra-household) level were found to be rather passive. They consisted mainly sets of recognized use-rights. Indeed, they were concerned

mostly with regulating who has the right of access to particular forest/tree resources and excluded others. Their intention was not to achieve biological goals, such as forest regeneration.

In the studied projects, people's participation concept is used in the sense that rural people participate in the professionals' projects, and not the other way round; that is participation in their "livelihood projects". Participation was conceived as a "package deal" which involved a discrete set of interventions that took place within a defined step-by-step programme of implementation, delivering inputs and services to already identified beneficiaries. The paternal attitude of project officials has led to the situation whereby local people developed a syndrome of submissive behaviour. Local people were not involved in any stage of planning and evaluation, only used as implementers. Therefore, in actual sense development of people's participation concept as advocated by the projects studied remained rhetoric. Furthermore, a major problem of intervention practices emerged out of the contradiction between the official assumption of uniformity in household farming and the diversity that actually existed in the process of implementation. Similarly, the formal communication system or policy discourse used by the projects had its inherent rigidities and limitations, since it was governed by a set of procedures which the village extension workers couldn't apply when confronted with a more relevant and highly diverse local strategies and types of discourse used by farmers.

Thus, two fundamental features of the social interface between externally sponsored interventions and internally regenerated initiatives were revealed. First, the clash between project development model, which was based on the rationale and underlying concepts concerning the delivery and distribution of project resources, and the strategies and interpretations of the village extension workers who were responsible for the implementation of the strategy. Secondly, the power and influence which individual farmers and groups of farmers exerted over the kinds of intervention strategies devised by the projects as a result of their day to day struggles.

Consequently the study indicated three actor categories to be considered in community forestry development projects: Farmers; village extension workers and supervisors. The "triangle" of relationships of these actor categories constitutes the social arena or what I called "the middle ground" of community forestry development in Tanzania. This "middle ground" refers to the totality of social processes and fields within which the actors attempt to establish "common ground" for their negotiations over resources and development alternatives. This model was developed as a means to open "windows" into these social realities and to observe how the strategic actions and interactions of these actors shaped the outcome of the planned interventions. The middle ground model calls for an understanding of these key actor categories as

a way of bridging the gap between internally regenerated initiatives and externally sponsored interventions.

An important prerequisite for the proper functioning of the different actor categories is the existence of well-adjusted forest policy. The current rigid paramilitary orientation of the forest policy in Tanzania, with its restrictive and punitive approach has been a major factor in the breakdown of some traditional forest management systems. Local people have been divorced from the management of forest resources. Forest law still reflects earlier policies directed primarily towards conservation (*sensu* absolute preservation). The law has not so far been conceived as a positive agent of forest development, but merely as a means of preventing the misuse of forests, and has developed chiefly in terms of litigation. The consequences of this emphasis on deterrent and punitive aspects of forest law is that the law becomes an obstacle to forest development. Favourable forest policy environment is required if people's participation is to pass from rhetoric to reality. There are certainly no clear-cut solutions. One scenario would involve the development and experimentation of rather bold policy measures aimed at creating and effective community forestry capability. Among the potential options to be considered and tested are: creation of two forest divisions; division of forest protection and division of afforestation; and transferring some of the forest management functions to the local people.

The road ahead, like the trail behind for community forestry development in Tanzania, promises to be rocky and fraught with pitfalls. Policy evolution, and to a certain degree policy revolution, should be pursued with one eye on the types of policy reforms that are needed and the other on the political realities at hand. Somehow the political will to support these reforms must be tapped. Like anything else, good policy depend on good information. Therefore, if foresters want to improve the existing forest policy, they should initiate an action by putting forward viable alternatives to policy makers.

TABLE OF CONTENTS

PREFACE		i
SUMMARY		iii
TABLE OF CONTENTS		vii
LIST OF TABLES		x
LIST OF FIGURES		xi
LIST OF APPENDICES		xi
LIST OF ABBREVIATIONS		xii
CHAPTER 1	INTRODUCTION	1
1.1	Background	1
1.1.1	Location and size of Tanzania	1
1.1.2	Topography and agro-ecological zones	1
1.1.3	The rural sector	3
1.1.4	Forest sector	5
1.2	The problem statement	12
1.3	Structure of the thesis	17
CHAPTER 2	THEORETICAL ORIENTATION	21
2.1	Deforestation: An impending reality in the tropics	21
2.1.1	Existing trends	21
2.1.2	Why is all this happening?	22
2.1.3	The need for change	25
2.2	Community forestry: A potential solution to the dwindling tropical forest resources	26
2.3	People's participation: an essential ingredient in community forestry development	30
2.3.1	Dimensions of participation	31
2.3.2	Present state of participation in community forestry in Tanzania	35
2.4	Indigenous management systems: a neglected ingredient in community forestry development	36
2.4.1	The turning point	36
2.4.2	Indigenous knowledge	37
2.4.3	Indigenous forest management practices	40
2.4.4	Organization of indigenous management systems	43
2.4.5	Dynamics of indigenous forest management systems	50
2.4.6	Relevance of indigenous management systems in community forestry development	53
2.5	Interface between indigenous forest management systems and project interventions	54
2.5.1	The dilemma of people-oriented projects	54
2.5.2	Interventions as a multiple reality	57
2.5.3	Social interface: an inevitable consequence of planned intervention	60

CHAPTER 3	RESEARCH OBJECTIVES AND METHODOLOGY	69
3.1	Research objectives and conceptual framework	69
3.1.1	Overview	69
3.1.2	Research objectives	70
3.1.3	Conceptual framework	70
3.1.4	Research questions	71
3.2	Methodology	72
3.2.1	Research phases	72
3.2.2	Units of analysis and type of data collected	72
3.2.3	Description of research methods	73
3.2.4	Data analysis	77
3.3	Summary	80
CHAPTER 4	DESCRIPTION OF THE STUDY AREAS	81
4.1	Justification as to the choice of the study areas	81
4.2	Dodoma urban district	81
4.2.1	Geographic and socio-economic description	81
4.2.2	Dodoma village afforestation project	86
4.2.3	The study villages	87
4.3	Lushoto district	89
4.3.1	Geographic and socio-economic description	89
4.3.2	Soil erosion control and agroforestry project	93
4.3.3	The study villages	95
CHAPTER 5	FOREST MANAGEMENT SYSTEMS	99
5.1	Management practices in private lands	99
5.1.1	Configuration of trees in the farms	99
5.1.2	Reasons for tree planting	102
5.1.3	Balance between indigenous and exotic species	109
5.1.4	Regeneration and tending techniques	109
5.1.5	Uses	114
5.2	Household social organization	118
5.3	Management systems at a supra-household level	123
5.4	Summary	125
CHAPTER 6	THE DILEMMA OF EXTERNALLY SPONSORED INTERVENTIONS	127
6.1	People's participation perspective	127
6.2	Social interface perspective	131
6.2.1	Complexities of implementing project interventions	132
6.2.2	Strategies of village extension workers	133
6.2.3	Farmer reaction, resistance and strategies	139
6.3	Summary	140

CHAPTER 7	THE MIDDLE GROUND MODEL	143
7.1	Overview	143
7.2	The concept of a model	143
7.3	The key actors	144
7.3.1	Re-orienting the village extension workers	145
7.3.2	Bureaucratic re-orientation	146
7.4	Operationalization of middle ground model	146
7.4.1	Running participatory workshops	146
7.4.2	The role of the workshop facilitator	148
7.4.3	Village extension workers to be employed by the local farmers' organizations	149
7.4.4	Empowering the farmers	149
7.5	Summary	150
CHAPTER 8	REFLECTIONS	151
8.1	Study limitations	151
8.2	Theoretical aspects	153
8.2.1	"Hard" versus "Soft" forest management systems	153
8.2.2	Classical forestry versus community forestry	154
8.2.3	Intervention as interaction	155
8.2.4	The assumption of a "vacuum" unwarranted	156
8.2.5	Dichotomies in community forestry development in Tanzania	156
CHAPTER 9	CONCLUSIONS AND RECOMMENDATIONS	161
9.1	Conclusions	161
9.2	Policy recommendations	162
9.2.1	Current situation	162
9.2.2	Strategies ahead	164
9.3	Prospects and outlook	165
REFERENCES		167
APPENDIX	Household questionnaire form	185
SAMENVATTING	(Abstract in Dutch)	189
ABOUT THE AUTHOR		194

LIST OF TABLES

Table 1.	Village categories in Lushoto district	96
Table 2.	Relationship between household tree growing efforts and socio-economic factors in Dodoma urban district	100
Table 3.	Relationship between household tree growing efforts and socio-economic factors in Lushoto district	101
Table 4.	Planted exotic tree species in Lushoto district	103
Table 5.	Planted indigenous tree species in Lushoto district	104
Table 6.	Retained indigenous tree species in Lushoto district	105
Table 7.	Planted exotic tree species in Dodoma urban district	106
Table 8.	Planted indigenous tree species in Dodoma urban district	107
Table 9.	Retained indigenous tree species in Dodoma urban district	108
Table 10.	Traditionally protected tree species in dodoma urban district	115
Table 11.	Land-use decision-making	119
Table 12.	Land acquisition methods	120
Table 13.	Identified tree/forest management systems	125
Table 14.	Indigenous versus professional management practices	126
Table 15.	Indigenous and externally sponsored institutions in Dodoma urban district	128
Table 16.	Indigenous and externally sponsored institutions in Lushoto district	128

LIST OF FIGURES

Figure 1. Map of Tanzania	2
Figure 2. Public Forest Administration	9
Figure 3. Conceptual framework	71
Figure 4. Location of Dodoma urban district	82
Figure 5. Dodoma urban district: Study villages	88
Figure 6. Location of Lushoto district	90
Figure 7. Lushoto district: Study villages	97
Figure 8. The middle ground model	143
Figure 9. Sequences for a participatory workshop	147

LIST OF APPENDICES

Appendix 1. Household questionnaire form	185
--	-----

LIST OF ABBREVIATIONS

DFB	Division of Forestry and Beekeeping
DGIS	Directoraat Generaal International Samenwerking
DOVAP	Dodoma Village Afforestation Project
FAO	Food and Agriculture Organization of the United Nations
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit
ILO	International Labour Organization
ITCZ	Intertropical Convergence Zone
LIDEP	Lushoto Integrated Development Project
LIPWP	Labour Intensive Public Works Programme
MGM	Middle Ground Model
MNRT	Ministry of Natural Resources and Tourism
MTNRE	Ministry of Tourism, Natural Resources and Environment
PMO	Prime Minister's Office
SECAP	Soil Erosion Control and Agroforestry Project
SIDA	Swedish International Development Agency
TFAP	Tanzania Forestry Action Plan
TIP	Traditional Irrigation Project
TIRDEP	Tanga Integrated Rural Development Programme

CHAPTER 1 INTRODUCTION

1.1 Background

1.1.1 Location and size of Tanzania

Tanzania is situated on eastern part of Africa, south of the equator between latitudes 2 and 10 south and longitudes 30 and 40 east. It is situated between three great lakes namely: Victoria in the north, Tanganyika in the West and Nyasa in the south. The Indian ocean lies on east, with a coastline extending some 800 kilometers. Tanzania shares common borders with some of the eastern and central African states namely: Kenya and Uganda in the north, Rwanda, Burundi and Zaire in the west and Zambia, Malawi and Mozambique in the south (Fig. 1).

Tanzania is the largest country in East Africa with 945,130 km², of which 20,000 km² are water covered. Except for the coastal belt, most of the country is located on the central African plateau, 1000 - 1500 meters above sea level.

The country has a population of 23.2 million according to the national census carried out in 1988, growing at the rate of 2.8 % per annum (MNRT, 1989). About 80 % of the population live in rural areas, mostly in about 8,000 villages. Agriculture is the mainstay of the economy providing 40 to 50 % of the GNP; 80% of exports and 90% of employment. The chief agricultural export crop was formerly sisal, but now cotton, coffee, cashew nuts and to a lesser extent tobacco, tea and pyrethrum are exported. Volumes have declined over the years due to reduced commodity prices in international market, internal policies including villagization and purchasing arrangements, and the increase in cost of imported petroleum. In the early 1980s the economy entered a spiral of falling production leading to lower production. Agriculture became more subsistence oriented as rural people retreated to own food production in the face of unfavourable market conditions.

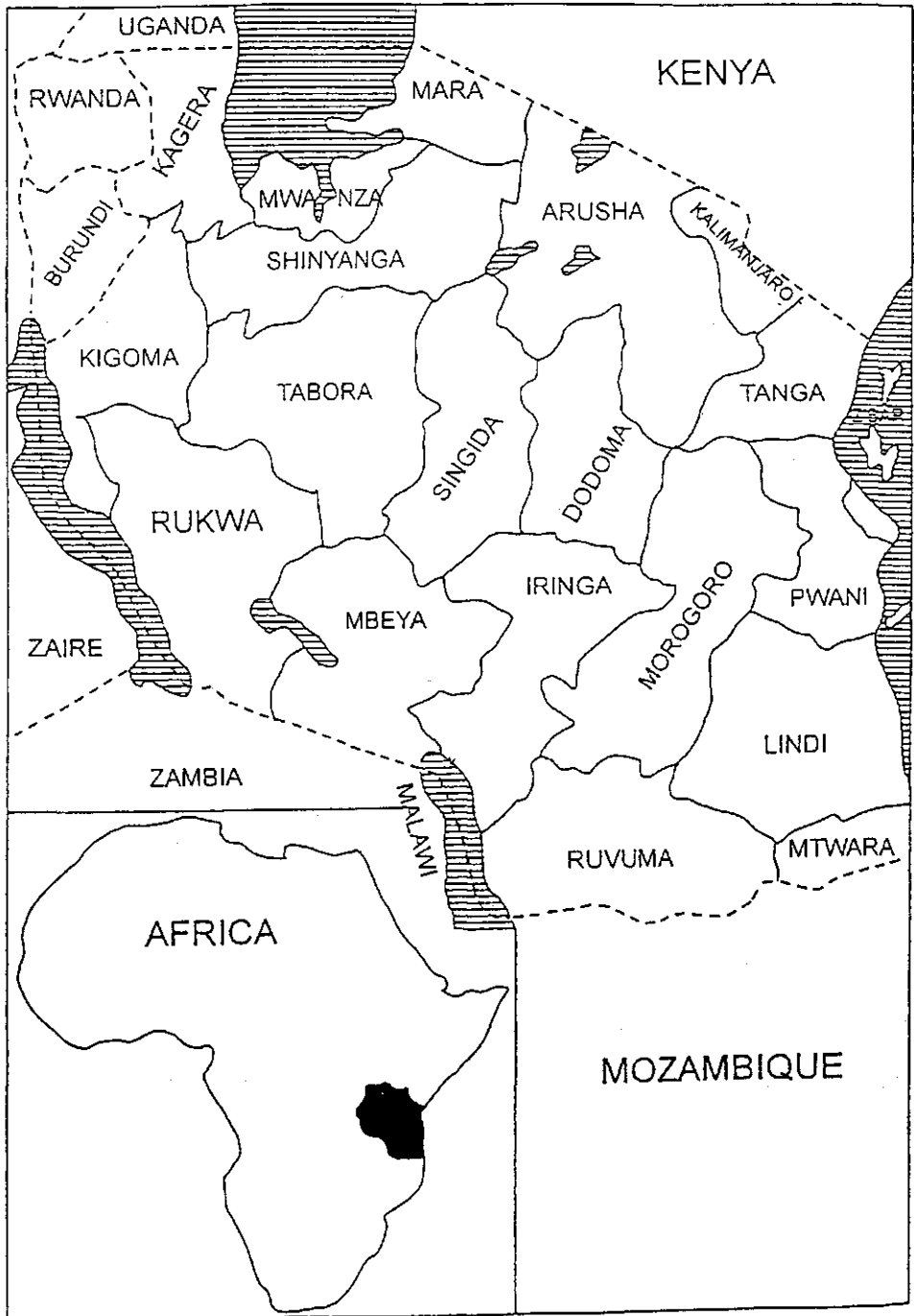
1.1.2 Topography and Agro-ecological zones

There are four distinct topographical regions namely: The coastal plain which rises from the sea to 200 m; the central plateau with elevations up to 1000 m; the river complex; and the high volcanic and massif mountains, the highest being the northern highlands with Mount Kilimanjaro and Mount Meru.

Four ecological zones can be identified in Tanzania, and related to farming systems: Coastal zone, based on cassava, coconut, macadamia nut and banana with little livestock; Upland plateau; this zone has a gradient from primarily agricultural with no livestock (in areas associated with heavy tsetse fly infestation) to primarily pastoral

Figure 1 Map of Tanzania

UNITED REPUBLIC OF TANZANIA



Scale : not to scale

(extremely low rainfall). Livestock utilize about 50 - 60 % of the total land area, but contribute only about 5% of GDP; Highland zone; in this zone the northern highlands are the highest (Mt. Kilimanjaro is almost 6000 m), while those in the south rise to 2000 m or more.

Variations in the agro-ecosystems reflect differential access to market, and extension contact, as well as adaption to latitudinal potentials. The best documented agro-ecosystem is the Chagga coffee-banana complex in Kilimanjaro, but agro-ecosystems based on tree crops have developed in the central highlands (Uluguru) and in the southern highlands (Mporoto, Kipengere, and Rungwe mountains). River valleys; disappointingly, there appears to be little current data about the valleys. The common land uses are agricultural with little livestock (tsetse fly area), and high proportion of field/home-garden trees, primarily fruits.

There is a definite link between the environment and land use system. Agropastoralism is the primary land use system in the upland plateau areas. The tie between ecozone and the subsistence system, specifically the level of reliance of livestock, is related to the amount of rainfall. In the drier areas there is more emphasis on the livestock component of the agropastoral system. Given the lack of certainty of rains it is not surprising that herd rather than the field is given higher priority in resource management decision-making. Studies have shown that livestock provide the safety net: they can be sold during an agriculturally bad year to purchase food, provide milk and drought power, and they also serve as a source of prestige and bride price (Warner, 1993).

Similarity in land use is what also links highlands. Although the specific crops may vary, throughout the highlands a land use system is found based on high population densities (at least four times greater than the national average of 20 per km²), on small fields, reliance on permanent fields (with some crop rotation), and marketing (or attempts to do so) of cash crops.

1.1.3 The rural sector:

The Arusha declaration of 1967 was the beginning of a radical change in rural Tanzania. The goal was a complete transformation of the rural areas. Although specific policies and interventions have shifted over time, there is still a basic dedication to rural equality and provision of social infrastructure.

There have been four sets of policies which have been emphasized and promoted in roughly this order of priority: Villagization, Communalization, Social infrastructure and Agricultural output. The policies are interrelated, and a sequential change in emphasis has not resulted in a total rejection of the previous interventions. Rather there has been an evaluation of policy as existing policy

was viewed as inadequate or objectives changed. The cornerstone of all four policies has been the "Ujamaa" village. "Ujamaa" (Tanzania's brand of socialism) was an attempt to make an ideological abstraction real: the village would be an organization of peasants who would raise their living standards "by hard and disciplined communal work" (Collier et.al, 1986). The first Ujamaa villages were voluntarily formed during the 1960s, but few of these survived by 1970. The government then began to encourage villagization by "rewarding" the formation of villages by preferential allocation of social services.

Where the initial villages were begun by peasants dedicated to socialistic principles, this phase included villages in which members were interested in receiving services, but lacked an interest in, and dedication to, communal production and distribution. There was also a subtle shift in policy from that of encouraging villagers to work collectively to improve their standard of living to the burden, and the initiative, of such improvements being assumed by the government. This shift in policy reflected the government decision to take a more "interventionist" approach in rural development. The original Ujamaa villages which had survived were disbanded and the peasant organizations were brought under central control (Collier, et.al., 1986).

The villages were given formal organizational structure for political and labour management (elected chairman and council). Communalization was seen as less of a priority than the process of villagization and social infrastructure. However, the government realized that it could not afford to provide inducements to the entire rural population. When inducements were scaled down, villagization slowed. In 1973, the government abandoned its strategy of voluntary inducement (which it could not provide) and a strategy of forced villagization was adopted. In 1974, the villagization policy was forced and by 1975 the majority of the rural population was resident in villages. Most of these were not communally organized ujamaa villages; in order to be so the village was required to satisfy stringent criteria of communal activity and by 1988 not one Tanzanian village met the criteria (Warner, 1993). The purpose of the village during this period was to have a geographical consolidation of the population so that services, land reform, and marketing could be more effective.

Given time constraint, site selection for these villages was not given adequate supervision nor was the natural resource base or the environmental impact of such village resettlement considered (Mlay, 1986). Village sites were chosen because of nearness to roads and the existence of sufficient land for 250 or more families. The criterion of number of families (250 was the official minimum although smaller villages did occur) was not based on environmental or agricultural conditions, but on the number of children needed to maintain a primary school. The purpose of the village was: to provide a population large enough for social services; to act as an

agent of land reform (i.e to allocate land among private cultivators); to be the primary unit for marketing chain (as a collection point); and to be the potential unit for communal production, although this was by this period given low priority.

By 1975, the highest priority was to increase agricultural production. Farmers were encouraged and in some cases coerced, to plant a minimum of one hectare of food crops and one hectare of cash crops. Agricultural production remained in forefront of government objectives. The social infrastructure has deteriorated from its peak because of the lack of funds, and villagization has remained at the same level for the last decade. Communalization rhetoric reappeared in the early 1980s but never gained momentum since agricultural production continued to be the primary objective of government policy. The decline in interest, beyond the ideological boundaries in communal production is probably the result of the very low returns per hectare of the village communal fields. The study conducted in 1980, showed that the communal field absorbs approximately 20 % of village labour and 8 % of village land, yet, it produces less than 2 % of agricultural output (Collier, et.al. 1986).

The poor financial situation of the country, with per capita income falling and with increasing dependency on donors and food imports, has intensified the government's drive for higher agricultural production, and relegated the objective of communal production to the past. The restructuring of the economy is now in progress. The government is withdrawing from its role as a collection and marketing agent for agricultural products, and the producer is being forced through lack of alternatives to assume control of marketing. The tacit objective of social and economic equality is being replaced by somewhat reluctant acceptance that to increase agricultural production on a national level will entail the creation of an entrepreneurial elite. This is in opposition to the former policy which perceived the commercialization of the Tanzanian agriculture as benefiting primarily a minority of prosperous farmers, thereby generating inequality. To prevent this, post Arusha policies "turned the terms of trade against the farmers", reduced market networks, regulated landholding, introduced communal production, and provided basic social services (Collier, et.al. 1986). All but the last of these reduced agricultural production and incomes, while a fairly high degree of rural inequality has persisted.

1.1.4 Forest sector:

Forest resources

Forests and woodland are assumed to occupy about 44 million hectares or 50 % of Tanzania mainland area. This estimate may be too high because of the unrecorded area lost due to deforestation.

The total forested area is distributed by type as follows (MNRT, 1989):

Type of forest:	(1000 ha)
-Forests (other than mangrove)	1,400
-Mangrove forests	80
-Woodlands	42,891
Use of forest land:	
-Net productive area	34,626
-Unproductive area	9,745
Legal status:	
-Forest reserves	13,024
-National parks	2,000
-Public forest land	29,347

Forests and woodlands include some 150,000 ha. of plantation forests (within reserves about 80,000 ha.), representing only about 0.3 % of total forest area. Most forest reserves have been gazetted for production and for protection purposes. Though there are no reliable data on the rate of deforestation, it has been estimated to be in a range of 300,000 - 400,000 ha. per year (MNRT, 1989). The main reasons for deforestation are clearing for agriculture, overgrazing, charcoal burning, woodfuel harvesting, bush fires for various reasons and harvesting for industrial wood.

Forestry's contribution to the national development

The direct contribution of forestry and forestry industries, to Gross Domestic Product (GDP) in 1987 was Tshs 1.7 billion according to the national accounts "1 USD = 200 Tshs" (MNRT, 1989). Primary production accounted for about 45 % of the total and the rest originated from commercial wood manufacturing. The apparent contribution of forestry sector has represented 1 to 2 % of GDP. This contribution does not reflect the true economic importance of the forestry sector in Tanzania as much of the output remains unrecorded and goes to subsistence consumption meeting the basic needs of the rural populations (e.g fuelwood, fodder, fruits and medicines). Part of the forest produce is commercialized in urban and rural centers is traded informally to evade taxes and fees, and many forest products and services (e.g soil erosion control and watershed management) are difficult to estimate in monetary terms, although they are vital for the ecological balance of the country and thus have a great positive effect on the agricultural productivity.

The forestry sector has several backward and forward linkages in the Tanzania economy. Inputs are bought from other sectors (chemicals, transport services and energy) and forestry outputs are utilized as production inputs in other sectors (building and construction, furniture and joinery industry, packaging and printing). No up to date information is available to estimate these

indirect impacts of the sector. But based on the information from other developing countries with comparable economic structure to Tanzania, it can be assumed that the value of indirect contribution to the national economy of the forestry sector is roughly equal to the direct contribution (MNRT, 1989).

As trees and forests are important in maintaining and improving soil fertility and conserving water resources, the most significant indirect impact of the sector is felt in agricultural and livestock production. While the systematic study of the contributions of trees to agriculture is relatively new field of agroforestry research, the use of trees in farming systems is as old as agriculture itself. Indeed, many agricultural technologies evolved from the practices of forest dwellers who depended on trees and other forest plants for most of their needs. The relatively limited but solid information that has become available during the past two decades or so, reveals that the contributions of trees to farming systems and farmer's welfare are widespread, varied and significant (Gregersen, et. al., 1989). Trees contribute to farming systems and farmer welfare in the following ways: Trees can help to improve the productivity of farmland by fixing nitrogen, providing green manure and reducing wind erosion and soil moisture loss when trees are used in shelterbelts or windbreaks. Trees planted along contours and in other critical areas can act as an effective barriers to the surface flow of water, and thus increase rainfall infiltration and reduce soil erosion and loss of soil nutrients. Also, trees provide wood that can replace dung and crop residues as fuel for cooking and heating, so the dung and residues can go back into the soil and help crop and pasture productivity. The diversion of animal dung and farm residues to fuel thus becomes the equivalent of burning "food to cook food". Arnold & Jongma (1978) estimated that each ton of animal dung burnt may mean a loss of production of 50 kg. of food grains or more. Baidya (1975) noted that the practice of burning animal dung and crop residues, by helpless rural poor, is damaging the existing life support systems.

Trees can also contribute to livestock production. In Tanzania, farm trees as well as forest trees provide fodder for livestock. They also provide shade for animals and can serve as living fences to keep livestock from crops. Moreover, trees and forests play an important role in food security. For many foresters the issue of food security may seem to be a concern which goes far beyond the domain of their profession. And yet, in many rural areas forests and trees provide critical support to food security. Although it is clearly wrong to suggest that forestry can replace agriculture as a food production system to any significant extent (FAO, 1990a). In Tanzania, wild trees are a source of snack food for the Masai herd boys and girls, although these are eaten only occasionally and do not represent an important dietary component (Arhem, 1985). However, in times of drought and food stress, wild foods become an important component of the diet of many rural people. In Turkana, Kenya wild foods constitute only 3 % of wet season diets, but 9 %

of dry season diets (Arhem, 1985). Therefore, forests and trees do have an important role to play in food security. It is a role that has been ignored in the past, and is currently being eroded as forests are cleared and the remaining farm trees come under increasing pressure. Forests and trees have the potential for providing a range of benefits - augmenting food production, increasing the sustainability of food supplies, and improving access to food for landless and poor people by providing subsistence products, income and employment (FAO, 1990a).

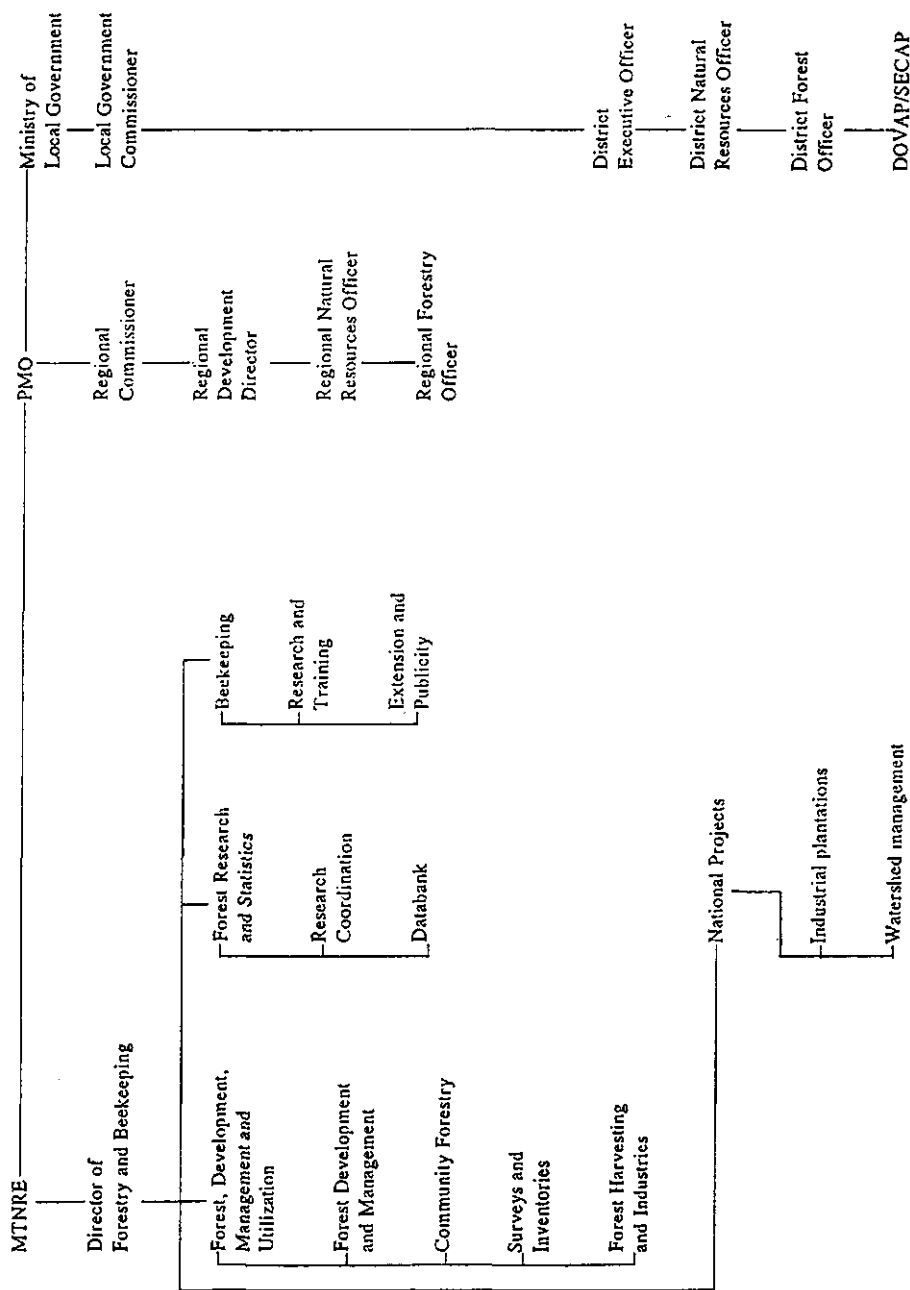
Forest management

Four official areas of forest management can be distinguished in Tanzania: Community forestry; which is implemented essentially by district governments under the guidance of the community forestry unit (CFU) of the Division of Forestry and Beekeeping (FBD); Industrial plantations; whose full management responsibility lies with FBD; Catchment forests; in which management responsibility is shared between FBD and the district governments, depending on the ownership of the forests; and Forest industries; under the management of the Tanzania Wood Industries Corporation (TWICO) - a parastatal organization under the Ministry of Tourism, Natural Resources and Environment (MTNRE). TWICO through its subsidiaries, owns 12 sawmills, several mobile sawmills and three panel plants. The saw milling industry is mostly based on indigenous hardwoods. The recovery rates in those sawmills are low and the product quality is poor. Valuable hardwood logs are therefore partly wasted. The markets have a great preference for few well-known and popular indigenous species, which has led to their overexploitation e.g. *Pterocarpus angolensis*, *Chlorophora excelsa* and *Ocotea usambarensis*.

Administratively the forest sector in Tanzania is embedded in three main, almost "parallel" organizations. These include: FBD; under the ministry of Tourism, Natural Resources and Environment (MTNRE); the regional organization is under the Prime Minister Office (PMO); while the district organization falls under the Ministry of Local governments (Fig. 2). The projects studied i.e. Dodoma Village Afforestation Project (DOVAP) and Soil Erosion Control and Agroforestry Project (SECAP) fall under the Ministry of Local governments; with District Executive Officer as an executing agency. Village extension workers under DOVAP and SECAP are seconded from the District Forest office. But professional foresters (Supervisors) are seconded from the Division of Forestry and Beekeeping.

The state is the major forest owner and therefore, the role of the national administration is decisive in the formulation of the forest policy. However, sectoral administration is fragmented and therefore it is difficult to ensure that the policy is properly implemented. There is some unnecessary duplication of efforts and

Figure 2. Public Forest Administration.



at times conflicts of interest. The decentralization which was carried out in 1972, was supposed to have brought decision-making close to the people. However, lack of control has led to a situation whereby the forest staff do not operate according to professional ethics (MNRT, 1989).

Community forestry development in Tanzania

With the exception of cash crops, trees were absent from much of the land use planning during the 1960s and into 1970s. Villages were encouraged to clear as much forests and woodland as possible, so that the land can be put into production. The government lauded the villages which had cleared the largest areas as being at the fore front of production, they were seen as "good" villages and were awarded. Therefore with villagization, deforestation did occur around the settlements, and the pressure on local forest resources increased. During the same period, there was a programme for village afforestation for fuelwood.

As already explained in section 1.1.3 above, the Arusha Declaration of 1967 marked a major change in political direction followed by Tanzania since her independence in 1961. It placed an emphasis on socialism and communal self help. The village Afforestation Programme, was designed in the spirit of the declaration and was intended to play a major part in the country's afforestation efforts. In 1970s, attention was on the issue of rural energy supplies. The Forestry and Beekeeping Division, estimated that the annual consumption of fuelwood in rural areas was 2 cubic meters per head. Using this basis, calculations showed that the total consumption of fuelwood was greatly in excess of the estimated wood production of the country. This led to an increasing emphasis on village woodlots as a means of meeting future fuelwood shortages. The main promotional method was to supply villages with seedlings which were produced and delivered by the Forestry and Beekeeping Division.

Political pressure was often placed on village leadership to ensure that land was set aside for the woodlots. Sometimes the planting was done by the Forestry and Beekeeping Division, at other times by the villagers. The total annual planting needed to meet projected fuelwood demands was calculated to be about 400.000 hectares per year. The rate of planting, however, never remotely approached this, and towards the end of the 1970s it was still well below 10.000 hectares per year; and even this is an optimistic figure as it was based on the number of seedlings distributed and assumed a high survival rate.

Several reasons for the limited impact of the programme at this stage have been suggested. One was that village or community forestry as it is now known, was the responsibility of the Forest management section of the Forest and Beekeeping Division. This

section was completely lacking experience in extension work and saw its task as simply telling farmers how to establish forest plantations. An extension film of that time, for example, explains that woodlot should be planted with "conventional" forestry tree species such as *Pinus patula* and *Cupressus lusitanica* at the 2.5 meters spacing. By early 1980s the Forestry and Beekeeping Division was convinced that a change in direction was required (Mnzava, 1983). A separate Community forestry unit was set up to develop new promotional methods. It produced a number of publications for the extension foresters in which a more participatory approach was emphasized; (although it was more rhetoric). Although there were villages, however, where woodlots were established and managed satisfactorily, the overall rate of tree planting did not show any significant improvement.

A number of studies were carried out to establish the reasons for the relative lack of impact of the programme (see for example, Skutsch, 1985; Kajembe, 1988). These revealed a number of fundamental flaws in the analysis on which the programme was based. One of the major premises had been that Tanzania farmers were facing a fuelwood crisis which had to be solved by tree planting. In fact, the farmers placed a very low priority on producing fuelwood and were generally much more interested in planting trees for construction wood, poles, fruit or other non-fuel purposes. Moreover, it was found that the figure of 2 cubic meters per head per year, seriously exaggerated fuelwood consumption in many areas. A FAO study for example, found that consumption varied between 0.5 and 1.5 meters per head per year, in a series of 15 villages (FAO, 1984).

Distribution of seedlings from the large central nurseries in which they were produced was, found to be a serious problem. In fact, given the lack of resources at disposal of the Forestry and Beekeeping Division, it was clearly impossible to distribute such nursery production to thousands of villages in the country. The degree of collaboration with the villagers was also found to be insufficient in many cases. Foresters were under considerable pressure to produce tangible results, and at times, simply used the Division's labour, tractors, fencing and other materials to establish large plantations/woodlots, some up to 50 - 80 hectares, which were then termed "demonstration woodlots". There was little or no villager participation in these and their demonstration effect was probably negligible. At times, there was even conflict with villagers wanting to harvest the produce from the woodlots and foresters claiming they belong to the Division of Forestry and Beekeeping.

Perhaps the most important realization was that communal approach was profoundly unpopular among the majority of farmers. People turned out to be distrustful of village leadership in many ways. There were instances where village chairmen were said to have sold the produce of woodlots and kept the money or used the wood to

improve their own dwellings. In many cases, there was uncertainty about what to do with the woodlot once it had been established and how to allocate responsibility within the village for managing it (Skutsch, 1985). The failure of the communal woodlot policy is now extremely obvious. Unattended woodlots in front of the village offices are a common sight, livestock roam freely through them because there is no one to keep them away.

It is now clear that the policy of promoting village woodlots as a basis of a national afforestation strategy has not been successful. Tree planting by individual farmers is now becoming the core of the Tanzania's community forestry programme. Under this new policy, rural people are encouraged to plant trees wherever they wish. If they want to create a village woodlot, they will receive help in doing so, they will be equally helped if they want to plant trees on their own land. The production of seedlings is also being decentralized from large Forest and Beekeeping Division's nurseries to village and school nurseries. Tools, plastic pots and technical advice are provided by the Division whenever there is local interest in setting up a nursery. Experience, however, shows that given a real interest from villagers, communal woodlots can be successfully established and therefore there should be a provision for them in the national programme. But, tree planting by individual farmers for a variety of purposes, and rarely with fuelwood as the main motive is generally likely to be more productive.

1.2 The problem statement

In the last two decades, efforts to helping small farmers to grow and manage trees in Tanzania had little positive impact because of the failure to incorporate people's participation into the process. Most projects were based on the assumption that farmers would participate in managing forest resources by the application of orthodox forestry techniques. indigenous forest management systems were neglected. Local knowledge and skills can be effective means to increase the extension agent's sensitivity to local needs, and stimulate meaningful dialogue between all actors in community forestry development process. It should be noted that participation should not refer to farmers only, but to all actors in the community forestry development process. Farmers participate in managing the forest resources, extension agents participate in stimulating the process on the basis of being sensitive to farmers' needs and constraints while forestry scientists participate by developing appropriate technologies.

The concept of indigenous forest management systems as used in this study refers to series of practices based on consensus use-rights and agreed rules carried out by local people aiming at the sustained availability of products and services from the trees and forests for today and for future generations. These practices are

generated by internal initiatives within the local community itself (Fisher, 1989). It is important to differentiate between "indigenous" and "traditional" systems of forest management, although many researchers and writers do not make this distinction. According to Fisher (1989), "Traditional" implies antiquity; "Indigenous" does not. Webster's Third New International Dictionary (1981), gives the following definitions: "Traditional" - based on an order, code or practice accepted from the past. "Indigenous" - originating or developing or produced naturally in a particular land, region or environment. Therefore, something traditional is not necessarily indigenous. Indigenous people in the context of this study refer to original or native inhabitants of a certain area who identify themselves as such. They have their own language and culture as well as their own history. In this study the words indigenous people, local people, peasants, villagers and farmers are being used interchangeably.

On the other hand, professional forest management systems in this study refer to activities carried out by specifically trained people, referred to in this study as professional foresters. These professionals are employed either by the state or other public organizations with specific forest management objectives, be they commercial wood production or nature conservation. Decisions taken by these professionals are often primarily based on national and long term interests or commercial intentions. In local communities, decisions on forest management may be taken either by private persons or communal groups. These decisions are taken on the basis of daily household needs, and they are often directed at a subsistence needs but sometimes commercialization can be a powerful force. In this study the words "Professional forest management systems" and "externally sponsored forest management systems" are being used interchangeably. Moreover, the words "professionals" and "scientists" are also used interchangeably.

The distinction made in this study between "professional " and "indigenous " forest management systems is of analytical nature. In reality, many forest management systems have elements of both internal initiatives and external sponsorship. The crucial point is the location of initiative for setting up an organization or for institutionalizing a set of rules or practices (Fisher, 1989). In this study these points of location were pragmatically identified by the researcher on the basis of his background on professional forestry. Similarly it should be emphasized that the distinction made does not imply any value judgement on the efficiency or effectiveness of these management systems. Indeed as will be elaborated latter, indigenous forest management systems may as well be adapted to local ecological conditions and people's needs as professional forest management systems and may even be valued higher than general non-site specific professional forest management systems.

Programmes attempting to intensify tree growing and conservation through people's participation should try to understand indigenous ecological knowledge and practices (Gerden & Mtallo, 1990). Whereas modern science tries to control nature, indigenous societies adapt to it. This gives them an intimate knowledge of and understanding of their own environment. Richards (1985) argues that shifting cultivation is a major educational resource which gives many West African farmers a subtle sense of ecological dynamics. Local people are capable not only of devising viable solutions to local problems based on their understanding of local situations but also of conducting relatively sophisticated field experiments in response to local constraints and opportunities (Chambers, et. al, 1989). Rhoades and Bebbington (1988) identify three kinds of farmer experiments: curiosity experiments; problem solving experiments; and adaptation experiments. They give an example of a Peruvian farmer who simply out of curiosity did an experiment to test whether apical dominance would affect the number and size of potato tubers; the results may some day be useful but that was not the motivation. The propensity to experiment to solve problems, they argue, may be more pronounced in areas of diversified agriculture and poor extension services. As regards to adaptation experiments, two kinds are recognized: testing an unknown technology in a known environment; and testing a known technology in a new environment. Studying experiments as undertaken by rural people give understanding of their "sense making" activities (Brouwers, 1993). Scientists tend to regard an experiment as an inquiry during which all the parameters are highly controlled except the variables under study. Farmers' "practice" differs from the scientists' way of experimenting in the sense that it has to be included in daily circumstances. Farming experimentation is integrated in the whole farming activity. It has to provide direct comparison with adjacent fields and the previous method or technique. Richards (1988) concludes that in recent literature the experimenting, innovative, adaptive peasant farmer is now accepted as the norm not the exception. His own pioneering work has made a substantial contribution to this change of attitude. He has given numerous examples from West Africa, including innovations in labour organization, rice variety selection from rouged materials, integration of tree-crop and rice cultivation, and intercropping in swamps (Richards, 1985).

However, beside all the available evidence most professional foresters in Tanzania are still skeptical about farmers' knowledge and experimentation, partly because farmers seldom record their accomplishments in writings, rarely write papers on their discoveries and do not attach their names and patents to their inventions. As a result, in most cases the history of forestry development is written without reference to the main innovators who are the farmers. However, it is an open fact that many activities we now associate with innovative rural development, such as "agroforestry" to ensure a continuous supply of fuelwood and food, have in fact been practiced by some indigenous groups for many

generations (Wiersum, 1988). For example, for the Chagga people of Tanzania, agroforestry is simply a term for something they have been doing for centuries without any external help. The Chagga live on the southern slopes of Mount Kilimanjaro, where they have developed an extremely refined system of agroforestry (Fernandes, et al 1984; O'Kitingati, et. al, 1984)). An intimate knowledge of their forest environment has led them to apply the best ecological principles in home-gardens admired by agronomists and foresters across the world. When they settled in the area several hundred years ago, the Chagga cut just enough trees to be able to plant their own bananas under the forest cover. Now they grow 15 kinds of bananas, beneath which come coffee bushes and then below potatoes, onions and tomatoes. The trees provide shade for crops, animal fodder and mulch for the soil, as well as medicine, fruits, nuts, timber for construction and fuelwood. The sale of coffee gives the Chagga a cash income.

Whereas formal agroforestry science is based on the systematic placement of trees relative to crops and pastures, local people are often more concerned about the fit of the whole agroforestry system, and trees in particular into the land scape (Chambers, et. al., 1989). In many cases farmers have longer experience and knowledge of "agroforestry" practices than most scientists. Although it is now accepted that indigenous agroforestry systems are a valuable starting point for agroforestry development, it is less accepted that also in respect to more general forest management a similar argument can be made. Indeed, the distinction between agroforestry and forestry can be considered as being significant to the professional foresters. But, for local people these two forms of resource use blend into each other and do not hold specific significance.

Notwithstanding the importance of taking indigenous forest management systems as a basis for community forestry development, analysis of indigenous forest management systems has barely started in Tanzania (see for example, Alriksson & Ohlsson, 1990; Gerden & Mtallo, 1990). Much of the literature is anecdotal or depends on secondary sources. Although increasing number of people accept that there are or used to be, many effective indigenous forest management systems in Tanzania, none offers an original account. It is important to note that in community forestry development, it pays to take into account indigenous forest management systems in both planning and implementation stages. Indigenous forest management systems have practical validity in themselves, without having to "scientise" them by forcing them into technical framework used by forest scientists. Instead, they should be entry points for future scientific work in community forestry development. Science should attempt to enter the farmers' world of concepts and representations, in order to establish a sound base for partnership with indigenous knowledge. Partnership between science and indigenous knowledge presents a big challenge to conventional positivism science, given the dynamic and strategic nature of

farmers' knowledge and practices. But science must come to terms with its dynamism because this is what farmers' reality is all about. Modern scholarship challenges conventional views of indigenous knowledge. It is not a question of "tradition" refined by a long process of trial and error and handed down from generation to generation, but of active innovation and invention by local people in the recent past (Richards, 1985). Indigenous knowledge, like scientific knowledge should, therefore, be regarded in the first instance as something which become possible as a result of creating order out of disorder, and not simply as a response to practical human needs such as sustenance and health (Howes and Chambers, 1979). The thirst for objective knowledge is one of the most neglected aspects of the thought of the people we call "primitive". Even if it is rarely directed towards facts of the same level as those with which modern science is concerned it implies comparable intellectual application and methods of observation. In both cases the universe is an object of thought, at least as much as it is a means of satisfying needs (Howes, 1979). Indigenous knowledge is thus not a static pool of knowledge waiting to be mined, but includes the indigenous capability to add to and use that stock. It also has a capacity to incorporate and adapt innovations from outside its own system. However, it is also equally important not to romanticize the indigenous knowledge systems. We need to readdress the balance but not to end up in the opposite extreme.

The increasing call for taking into account indigenous forest management systems is not a "sterile collector's mania" for bits and pieces of local lore, but a genuine attempt to see what role indigenous forest management systems can play in community forestry development process. Richards (1979) warns that "a sentimental belief in 'traditional values' and a gut feeling that the Local people know best without knowing why, and under what circumstances, will be equally unhelpful and damaging to the prospects of development in the long run. A combination of professional and indigenous forest management systems or "technology sharing" between the two may prove to be an effective development approach. Richards (1975), expressed it quite well when he said "... an idea borrowed from the people, developed by the scientist and returned to the people again is much more likely to be adopted than something totally alien to the culture". A combination of professional and indigenous forest management systems can draw on the strength of both. Indigenous decision-making is flexible and fluid (both in time and space), because it depends on changing circumstances, but it lacks planning powers (FAO, 1990b). Professional planning has fixed goals, objectives and techniques, but needs periodical feedback mechanisms to provide it with flexibility. Local people are source of such feedback.

But again not all indigenous forest management systems remain intact. There are those that are still successful in use, but often very locally; those that are still in use but no longer meet the

increased pressure of changing land use and socio-economic changes; and relatively recently abandoned because of various reasons (Stigter, 1987). Indigenous forest management systems should be revived or modified and the optimum mix between professional and indigenous forest management systems needs to be worked out in the field because their viability depend on socio-economic conditions (Howes, 1980). Viability in this context, is meant to include both the degree of survival and the appropriateness to the present day constraints and development needs. In combining indigenous and professional management systems, several advantages can emerge. The development worker concerned with forest resource management, gains an additional constituency and the local people gain the official recognition of their ecologically sound land use systems.

The goal of this study is twofold first is to demonstrate empirically the gap between indigenous and professional forest management systems. Second to suggest ways of bridging the gap.

1.3 Structure of the thesis

In Chapter 2, existing trends of deforestation in the tropics are presented with the reasons underlying them and the need for a change. The chapter singles out Community forestry as a potential solution to the dwindling tropical forest resources. It argues persuasively that in order for community forestry to be successful, people's participation is necessary. The chapter draws attention to indigenous management systems as a necessary ingredient for the success of community forestry programmes. It concludes with discussion on the concept of interface between indigenous forest management systems and externally sponsored interventions.

In Chapter 3, Research objectives and methods used are given. The study employed a multi-method approach. The approach facilitated the collection of both quantitative and qualitative types of data and information. Even though each of these research methods (i.e Participant observation; Formal surveys; Tree inventories, Social interface, Detachment and Reflections and Documented material) were applied individually, they were developed and used in an integrated fashion, and the resultant data were analyzed both individually and collectively.

Chapter 4, contains a description of the study areas. The study was conducted in two districts namely: Dodoma urban and Lushoto. These districts are climatically very different. While Dodoma urban is in semi-arid climatic zone Lushoto is in the highlands. To a large extent the two districts can be regarded as a representative sample for most areas where community forestry activities are carried out in Tanzania.

Chapter 5, discusses indigenous forest management systems in rather detail and whenever appropriate attention is drawn to the basic

differences between indigenous and professional forest management systems. The chapter demonstrates the existence of a gap between internally regenerated initiatives and externally sponsored interventions.

Chapter 6, is more or less an extension of Chapter 5 in the sense that it explores further the dilemma underlying externally sponsored interventions. It argues that rhetorically, the goal of externally sponsored interventions is to achieve people's participation. But during the implementation process what is actually taking place is social interface between internally regenerated initiatives and externally sponsored interventions. The chapter exposes the fact that village extension workers who are normally identified as part of the bureaucracy are in the actual sense away from the very bureaucracy. They cannot simply be separated from local processes and on-going social constructions. Thus, their work styles and career patterns are part of the local processes. Hence, village extension workers represent the on-going social processes rather than the projects. The chapter also exposes the fact that, farmers tend to "internalize" external interventions through influencing village extension workers to re-adjust interventions practices in accordance with farmer's programmes of action. Therefore, village extension workers and farmers modify and re-order project interventions in on order to develop their own working principles in the process of project implementation.

Chapter 7, is the core of this thesis, as it tries to "deliver" by suggesting a model which can bridge the gap between local people initiatives and externally sponsored interventions. The "Middle ground model" is based on actor perspective. It is the actors (professionals, village extension workers and farmers) who can bridge the gap. The model calls for a change of attitude in the part of professional foresters. Senior officers need to learn from subordinates and subordinates from their rural clients. Furthermore, farmers need to change their outlook and their submissive behaviour.

Chapter 8, reflects on the limitations encountered in carrying out this study. It also reflects on more general theoretical aspects underlying the study.

Chapter 9, contains conclusions and recommendations. Contrary to the prevailing assumptions and paradigms in forestry profession in Tanzania, local people are active managers of tree and forest resources. They do not simply use, but also actively manipulate their tree and forest resources to sustain an adequate level of production in the long run. However, if we are to incorporate these time tested local initiatives in "our" projects we have to participate in "their" projects. The chapter recommends two bold policy measures aimed at creating an effective forest management system capability in community forestry in Tanzania: First, creation of two Forest divisions; division of forest protection and

division of afforestation. The former to deal with environmental protection while the latter to deal with extension. Second, transferring some of the forest management functions to the local people. The people's participation component of community forestry equation can only come to fruition when local-level controls are restored. Besides the structural changes, the chapter calls for acculturation of foresters. Acculturation is the process of social and cultural change, set in motion through contact with another society or culture. The chapter ends by giving a warning that, the road ahead, like the trail behind for community forestry development in Tanzania, promises to be rocky and fraught with pitfalls. Policy evolution, and to a certain degree policy revolution., must be pursued with one eye on the types of policy reforms that are solely needed and the other on the political realities at hand. Somehow the political will to support these reforms must be tapped.

CHAPTER 2 THEORETICAL ORIENTATION

2.1 Deforestation: an impending reality in the tropics

2.1.1 Existing trends

Scientific evidence suggests that the world's forest area has declined by one-fifth, from about 5 to 4 billion hectares, from pre-agricultural times to the present. Temperate closed forests have suffered the greatest losses (32 to 35 %), followed by subtropical woody savannas and deciduous forests (24 to 25 %), and tropical climax forests (15 to 20 %). Over the entire period, tropical evergreen rainforests have suffered the smallest attrition, 4 to 6 %, because until recently they were inaccessible and barely populated (Mathews, 1983). Forests and woods still cover two fifths of the earth's land surface, three and half times the area devoted to agricultural crops, and account for about 60 % of the biomass productivity of terrestrial ecosystems (Olson, 1975). Just over half of the remaining forests are in the tropics (Repetto, 1988).

Since World War II, deforestation has shifted to the tropics. In the richer temperate zones, rural out-migration and rising agricultural yields have allowed abandoned farms to revert to forests. Extrapolation of the existing trends shows that the tropical forests, will be destroyed by the turn of the century if present rates of destruction continues (Postel & Heise, 1988). Although this destruction is taking place in the less developed world, its effects are unlikely to be confined to these countries. Tropical forests contribute genetic materials that plant breeders can use to confer disease and pest resistance upon coffee, cocoa, bananas, pineapples, maize, rice and many other crops (Repetto, 1988). They contribute entirely new foods such as mangosteen and winged bean. Pyrethrin, rotenoid and other insecticides have evolved in tropical plants in self-defence, while insect predators and parasites found in tropical forests control at least 250 different agricultural pests (Myers, 1984). Tropical plants underlie one-quarter of all prescription drugs sold in the United States (U.S Congress, Office of Technology Assessment, 1987). Alkaloids such as quinine, reserpine (used in drugs to control hypertension) and vincristine (vital in treating childhood leukaemia and hodgkin's disease); plant steroids such as diosgenin, which comes from Mexican yams and used in oral contraceptives, are some of the pharmaceutical products from the tropical plants.

In the tropical countries current forest uses represent only a very minor fraction of the potential benefits. The sacrifice of these current potential benefits as the tropics are deforested and endemic species and indigenous knowledge of them, are lost is generally omitted from economic analyses of forest management options (Repetto, 1988). It therefore, needs no emphasis to note that the likely loss of genetic and biological diversity mean a

general loss to every one in the world (Bitanyi, 1990). The loss of tropical forests also raises the specter of widespread climatic change through the disturbance of the earth's carbon dioxide balance (Barnes, 1978), something that would be likely to affect both the poor and the rich alike.

Nevertheless, the main losers in the process of tropical deforestation will be the people of the deforested areas themselves. Deforestation carries many penalties for local populations, for example loss of soil due to erosion, and the destruction of water balance resulting in alternating downstream flooding and desiccation (Brunig, 1977). Moreover, forests often make a vital contributions to local economies, providing the main source of energy. In Tanzania for example, woodfuel make over 91 % of the whole energy consumed (Kaale & Munisi, 1984), and forests provide materials for building, as well as valuable plants for food and for local industries. There may be increased health risks due to modification of forests and loss of areas of cultural or religious significance to local populations (Gerden & Mtallo, 1990).

2.1.2 Why is all this happening?

The conventional answer is simple: "overpopulation". More people put more pressure on already scarce land leading to clearance of the remaining forests. The hungry world need food not forests, and the hungry peasant cannot afford to think about tomorrow (World Commission on Environment and Development, 1987). It would be a rash person indeed who would dismiss the threat which existing and potential unchecked population growth poses to the world's remaining tropical forests. Yet, detailed examination of the world's major areas of tropical forests destruction reveals that population growth itself is not usually the main reason for the existing high rate of destruction of these forests.

The main causes appear to be complex social ones, rather than simple biological ones. The pervasive overpopulation explanation, although superficially plausible and widely taken advantage of, does not withstand detailed examination of most cases of contemporary tropical forest destruction. It is important to caution, to avoid misunderstanding that to reject the current focus on overpopulation as a cause of tropical forests destruction is not to discount population as a serious problem. Population growth is one factor in tropical forests destruction, but contrary to the contemporary heavy or exclusive concentration on this factor, often relatively minor one, and its emphasis occurs at the expense of the recognition of other major more controllable social reasons for the worldwide tragedy of the tropical forest destruction. The argument then, is that the simple population growth picture has in the case of tropical forests resource destruction been used as a scape goat, to obscure the real factors which usually lie elsewhere. In

particular, the proponents of the simple biological population explanation have tended to ignore the overall social context of development in which tropical forest destruction occurs. The environment movement is increasingly realizing that many of the problems initially seen as largely biological in character are in fact often social, or have major social dimensions (The World Commission on Environment and Development, 1987).

Proponents of the population thesis rarely present any data for this assumption or consider an alternative explanation for the phenomena of environmental destruction they so rightly deplore (Global 2000, 1980). The main case for the population thesis appears to be based on methodological fallacy. It is observed that agricultural expansion is the major factor in tropical forest destruction (ETC-Foundation, 1987), and it is concluded, sometimes incorrectly, that expansion of agricultural lands must be due to population growth. But very often expansion of subsistence agriculture is not the main factor, but rather the cause lies in various kinds of corporate or business-based development. Even where land clearance for subsistence agriculture is the major factor, it may not be due simply to population growth. Usually other factors are at work, for even when there is sufficient agricultural land to provide to everyone, the poor may not be able to obtain access to it (World Commission on Environment and Development, 1987).

Initial suspicion of population thesis should be raised by the fact that tropical forests are increasingly threatened even in areas where there is no serious population pressure on the forest. There is evidence that much of the west and central Africa and Amazonian region supported higher populations in the sixteenth century than they do today and without the same level of forest destruction (Bunker, 1983). To understand why tropical forests are disappearing at such an alarming rate, why third world governments are allowing even promoting the destruction of forests their own people often need desperately, we must look at the socio-economic forces at work. In part the problem arises from the capacity of the international markets to create and supply needs which are entirely out of balance with the continued ability to supply them in ecologically sound ways (World Commission on Environment and Development, 1987). Historically, "market forces" are known to have stripped many areas of the world. But, we must also ask why such forces are allowed to prevail over the welfare of the people in the regions concerned, and to understand this, it is necessary to look at social and economic factors within the tropical areas themselves. The social and economic factors at work appear to be complex, and diverse - shifting cultivation, logging, settlement schemes, land clearance by agribusiness etc (Sajise, 1991). But all these apparently separate factors spring from a particular kind of socio-economic situation and development model in the less developed world - one which in some cases may have roots in the colonial past, but in all cases has intensified in application in

the last two decades, those which have seen the main onslaught on the tropical forests.

In countries where development opportunities for the majority have lagged behind, often landless, rural people have moved into the forested areas in search of arable land. In Ghana for example, a nation of about 11 million people, over nine million hectares had come under shifting cultivation by 1980; 40 % of the total land area and eight times the area of the remaining productive forest (Repetto, 1988). Rules of land tenure in many tropical countries that confer title to forest lands on parties who "improve" it by clearing forest for some other use also invite deforestation. For example, in Lushoto district, Tanzania a forest area was given to landless farmers in the early 1960s and by 1980s the area was so eroded to be of any economic value. Much of the deforestation also stems directly from government policies in third world countries towards forest exploitation, and towards industries that compete for the use of forest resources. Such policies emphasize the timber harvest at the expense of other potential benefits and forego potential long-term benefits for lesser transitory gains. Potential benefits from forest exploitation are dissipated in wasteful harvesting and processing, or allowed to flow unnecessarily to stockholders of timber companies. Government policies also result in greater conversion of forest lands to agricultural and other uses than is economically warranted, with loss in benefits from land. Despite official endorsements of conservation goals, government policies contribute significantly to rapid deforestation now under way in the tropics (Repetto, 1988).

Therefore, the prevalent development model has operated in several ways to place heavy and increasing pressure on the tropical forests, to the great detriment of the bulk of present and future inhabitants of these areas. In this model, emphasis is primarily on private capital accumulation and elite - creating, export-oriented development (of the kind requiring no widespread social development), and on rapidly turning any available natural resources, such as forests, into exportable commodities for foreign exchange, for capital accumulation and for a type of development which enriches the governing elite, maintains it to power (via arms spending) and provides an appropriate westernized lifestyle. The production of most of the best lands is oriented to cash crops for export, rather than to providing for basic needs for local people, especially poor people, and these are highly concentrated patterns of land ownership, excluding many from agricultural production and forcing them to become "marginal people" who have to clear new often unsuitable land for subsistence agriculture (World Commission on Environment and Development, 1987). There is also pressure for clearance of forests for resettlement, often as a means of avoiding the redistribution of the existing land. Many projects affecting the forests, have been heavily promoted by international economic and technocratic agencies such as FAO and World Bank, who although acknowledging that due to unregulated and unsupervised cutting such

projects are usually a disaster for the forests, continue to see them as the key to western style development and economic take off (Das, 1977).

2.1.3 The need for change

Once the exclusive focus on apparently uncontrollable population growth as a source of the problem is abandoned, it can be seen that there is nothing inevitable or unstoppable about what is happening to the tropical forests. A necessary condition for the strategy which stood chance of saving the forests is that which should be able to affect an immediate improvement in the lot of people of the relevant areas largely within the limits set by the existing agricultural land. The only strategy which seems to satisfy this condition involves major changes in the social structure. Alternative social strategies which would go along way towards taking the pressure off the forests would include: (a) The intensification of the existing agricultural land, to be achieved primarily through the redistribution of existing cleared land and by provision of appropriate assistance to farmers rather than by energy and capital intensive green revolution style of farming recommended by some people. The green revolution, as has now been shown extensively for the third world often increases poverty, inequality and exclusion from the production process for part of the population and continues to create pressure on the forests both through such marginalisation and through pressure to sell off the forests as a source of development capital, thus creating vicious circle; (b) An alternative development model stressing rural and self reliance and widespread participation of the rural population and directly improving life style. This model is labour rather than capital intensive and should allocate resources primarily according to need rather than according to market forces; (c) While both national governments and international agencies have overestimated their own capabilities for forest management, they have underestimated the value of indigenous management practices and local governance over forest resources (Repetto, 1988). Local communities depend on forests for many commodities and services, not just timber, have been more sensitive to their protective functions and the wide variety of goods available from them in sustainable harvest. Moreover, when national governments have overruled traditional-use rights to forests, local communities and individual households have been unable, and less willing, to prevent destructive encroachment or over-exploitation. Therefore, restoring or awarding such rights to local groups would induce them to attend to the possibilities of sustainable long term production from the forests.

It is important to underscore here that without major social changes in these sorts of directions the strategy advocated by the World Commission on Environment and Development (1987), attempting to save the tropical forests through development via the so called

"New economic order" is likely to make the position of the forests worse than better. The "closer economic ties" between developed and less developed nations envisaged in the new economic order would involve tailoring the economies of the less developed countries even more closer to the demands of the commodity markets of the affluent rather than the needs of the local people. This means more rather than less clearance of forests for beef, lumber and pulp and paper (Global 2000, 1980).

2.2 Community forestry: a potential solution to the dwindling tropical forest resources

When at the end of the 19th and the beginning of the 20th century, the earliest tropical forest management strategies were enunciated, there was little concern on the importance of forest products and services for the local populations. These strategies were primarily concerned with exploitation of the forests for the products needed by the colonial powers and revenue generation, and with the protection of the forest in upland watershed (Wiersum, 1989a). These early forestry management strategies were based on the following assumptions:

- (i) Forests can play many and diverse roles in producing raw materials and providing environmental services. These various roles have to be carefully balanced in multipurpose forest management systems.
- (ii) Forests do not only exert their positive influence locally, but may also influence conditions in some distant regions (e.g watershed influences). Thus forest management should incorporate regional interests.
- (iii) The production cycles in forestry normally take many years, and thus long-term sustained forest production and protection can best be assured by the government organizations.

Consequently, as major objectives of forest management were identified there was also the need to look after the national interests and rights of future generations. In addition also the forest related needs of the local populations were supposed to be met to a reasonable extent, but these needs were mostly considered subordinate to the national interests.

The consequence of these basic assumptions underlying the early forestry efforts in tropical countries was that it became almost commonly accepted that proper forest management was best assured through the creation of legally gazetted forest reserves, which were to be managed by "professional" forest services. The main aim of forest management should be "to scientifically conserve and prudently exploit" forest resources through the application of "multiple-purpose, sustained yield" forest management practices

which addresses the often conflicting demands, for industrial timber production and maintenance of essential protection forests. The land-use practices of local people were in most cases considered to be detrimental to this aim (Wiersum, 1989a). As a result, forest services often assumed a territorial role, and access for local people to the forest reserves was restricted by various regulations.

However, during the second half of the 1970s it became increasingly recognized that the classical and often still colonial approach (Dargavel et. al. 1985), in effect does not contribute much towards rural development (Westoby, 1978). It became increasingly rapid acknowledged that if forestry was to contribute significantly to rural development, a change in approach was needed (FAO, 1978; World Bank, 1978; Douglas, 1983). Several factors contributed to the reappraisal of the relevance of forestry to rural development. Some of these factors were related to changes in thinking about the very concept of rural development, while others were more directly related to the observed changes in tropical forest land-uses (Wiersum, 1989a).

With regards to the concept of rural development, there was a gradual shift during the past two decades, from the emphasis on economic growth, to the need for proper distribution of this growth and the need for fulfillment of basic human needs, and the need for active participation of rural people in their own development process. These changes in thinking have had several repercussions on the ideas about the role of forestry in rural development. First, as a result of the evolvement of the basic needs development strategy, it became recognized that wood products such as fuelwood for cooking and heating, and timber for house construction are essential for human survival. In addition, the importance of fuelwood in many tropical countries became widely recognized as a result of the world-wide concern about the "energy crisis" (Eckholm, 1976). Secondly, growing interest in the provision of basic needs for rural people also increased awareness of the necessity of improving the traditional forms of land-use, especially on marginal lands. The result of "green revolution" on good agricultural lands could not be replicated on less productive lands with constraints such as periodic droughts, steep slopes or low fertility (Wiersum, 1989a). People occupying these lands are often not able to buy commercial inputs, as they lack financial resources. Under these conditions the development of low-external-input agriculture may offer a scope for improving the agricultural production. Trees can play an important role in such agricultural systems by providing both essential products (wood, fruits etc) and assisting in proper management of soil and microclimate (Wiersum, 1988). Thirdly, gradually it also became apparent that the supposed contribution of forestry to economic development through the creation of employment and income in forest plantations and wood-working industries often does not materialize (Westoby, 1978). The supposedly forward and backward linkages on such enterprises are

mostly much smaller than originally anticipated. Too often, local people hardly profit from such enterprises and if realized, profits are normally siphoned off by urban elites and foreign investors.

At the same time when these changes in thinking about the best approach to rural development were taking place, there was also rapidly growing concern about the unprecedented rate of uncontrolled deforestation in many tropical countries as elucidated in section 2.1 above. This process of loss of forest resources not only negatively affects the livelihood of many rural people, but it also brings about many undesirable environmental effects (Postel and Heise, 1988). Although classical forest management strategies had been based on the principle of sustainable forest use (Van Maaren, 1990), these strategies had not been able to control the process of deforestation (Wiersum, 1989a). It was also recognized that many social changes are taking place which result in previously isolated forest areas being more and more incorporated into the national economy. Not only the increase in population, but also growing demands for commercial forest products and land for commercial crop production, and opening up of forests as a result of the need for a national infrastructure, all resulted in increased pressure on forest resources (plumwood & Routley, 1982; Repetto, 1988). The acknowledgement of the inability of classical approaches in forest management to adjust to these pressures implied a need to reappraise these strategies and to develop new ones.

The change in perceptions about the nature of rural development and the role of forest management to counter undesirable deforestation developed more or less simultaneously. During the last two decades, as a result of these developments, a re-evaluation of the relation of forestry to rural development took place and various assumptions on forest policy and management were challenged and criticized. For instance the assumption that forest management should be based on central policy and planning within an authoritative and hierarchical forest service which has important territorial and policing functions, was reappraised. A need was identified to complement the strategy of forestry development based on national interest and industrial growth with new strategies focusing on basic needs, equity and popular participation (Wiersum, 1989a). A dualistic forest economy should be created in which emphasis on developing modern forest industries with their related industrial wood production plantations is matched with efforts to develop a forestry sector directed to the needs of local people (FAO, 1978; World Bank, 1978; Wiersum, 1984a). While the management of forest resources in the first sector is normally carried out by professional foresters, in the latter sector the tree resources are managed by local people, and foresters assume a new role as extension and development agents (Kajembe, 1988).

Concern over these overlapping issues led community forestry being identified as an area that needed to be given priority attention.

As a result a series of studies and meetings in the 1970s, most notably the 8th world forestry congress in 1978, which was devoted to the theme "*Forests for the people*", served to give impetus to this re-orientation and to mobilize a major re-orientation towards this dimension of forestry at both national and international levels (FAO, 1978).

A distinguishing feature of community forestry projects and programmes in the past two decades has been an attempt to build them on active involvement and participation of the community with external involvement being of supportive rather than management in nature. However, though this concept of community forestry took roots quite quickly, putting it into practice has taken much longer, due largely to the initial shortage of relevant experience and methodologies. The design of projects in the late 1970s and early 1980s was understandably strongly influenced by the new community forestry programmes that had taken shape. The communal framework of several of the more striking of these, such as the village woodlot programme in Korea, thus gave rise to a preference for common property resource management solutions in project design. As experience accumulated showing much better participation by individuals than groups there was a tendency to abandon group approaches (Swedforest Consulting AB, 1986). However, more recently, a clearer understanding has been emerging that both are appropriate on occasion (Arnold, 1987; Arnold & Campbell, 1988; Arnold & Stewart, 1989). Also, that management of remaining indigenous wood stocks may be more effective solution than trying to establish a new planted tree resource. Many early projects were also strongly influenced by the concerns with fuelwood shortages which had done so much to stimulate interest in community forestry. They were therefore usually designed with fuelwood production as the main and often the sole objective (Hoskins, 1990), on the assumption that removal or alleviation of the problems associated with shortages - less cooked food, increased labour for women and children, diversion of crop residues and animal dung to fuel use etc. would be sufficient benefit to stimulate participation in community forestry programmes.

This, however, now appears to be in doubt. While to outside observers, the problems created by deteriorating fuelwood supplies appeared to provide incentive enough for those involved to do something about them, severe though these problems were, they have seldom stimulated local remedial action. People seldom isolate their problems this way. A fuelwood shortage is only one of the several or many problems they face (Kajembe, 1988). Moreover, fuel is seldom the only product they get from trees, and often not the most important. There is also a growing understanding that production and use of tree products at the village level, in fact, is often embedded in complex resource use and social systems (Arnold, 1987), within which most of the factors that affect our ability to intervene with forestry solutions are non-forestry in nature. They are primarily human factors, connected with the ways

in which people organize their land and other resources (Arnold, 1983).

The learning process we have been engaged in is similarly making it clearer that the umbrella term "community forestry" in practice covers a range of different situations, aims and strategies. The objectives set for projects to support community forestry have varied considerably. Some have pursued tree management within a framework of broader, and often ambitious environmental and social goals. Others have been intended to encourage production of tree products to meet subsistence or market demands, or to contribute to income and employment generation. Moreover, this learning process has shown that central to the success of the programmes and projects supporting community forestry is the need to involve the beneficiaries from the very beginning. So far like most rural development programmes, particularly in Tanzania, community forestry programmes had only limited success in achieving effective people's participation (Ndossi, 1990).

2.3 People's participation: an essential ingredient in community forestry development

The preference for more participatory approaches to forestry development has certainly manifested itself during the past decade. It came on the heels of growing realization that individual responsibility and people's action are far superior - both for economic growth and human development - to anything that may be designed by commissars or bureaucrats, even if they masquerade as guardian angels (Umali, 1983).

As a result, several nations, particularly the so called "developing" and "less developed", started reorienting and/or recasting their forest policies and programmes. The bottom-line for such changes is that forestry agencies and the general public can and should become full partners in forestry development and conservation. Stated in other words, the formerly simple task of forestry has now taken on a new and gigantic dimension owing to changing patterns in society, technology and environment (Magno, 1985). As such, forestry has become more a social or people's business (Castro, 1984) and is now fast shedding its feathers as a purely physical activity.

The road, however, is not and has never been easy to such metamorphosis (Magno, 1985). Those who are familiar with efforts of some countries to "wrench" forestry's traditional stress on technical concerns and corporate profit, and return attention to issues of social equity, poverty and popular participation (Umali, 1983), would readily admit that such efforts did involve and are still encountering tremendous technical, institutional and political problems. Needless to say, the new role and posture that forestry has taken would eventually entail bigger and more

insurmountable difficulties on the part of governments. Corresponding changes thus should be simultaneously made in the ways foresters and forestry agencies carry things in relation to people, particularly the rural poor who compose the bulk of the population of many nations and who are purportedly the target of participatory forestry programmes.

At present, concern with participation in forestry is popular, and one can hardly be against the concept broadly conceived. However participation is often endorsed unambiguously on normative grounds even if the empirical basis is not clear. There is danger that with growing faddishness and a lot of lip service, participation could become drained of substance and its relevance to development programmes disputable (Cohen & Uphoff, 1980). Indeed, there is even little consensus on what constitutes participation, despite of a lot of work which has so far been done on this subject. Nevertheless, there have been continuing efforts and studies attempting to bring an understanding on this concept. As a result a multitude of definitions have been proposed by various authors trying to bring clarity to the concept. FAO (1982), defined participation as a process by which rural people are able to identify their needs, share in decision-making, implementation and evaluation of the participatory action. Uphoff et. al., (1979), defined participation as active, collectively organized and continuous effort by the people themselves in setting goals, pooling resources together and taking action which aim at improving their living condition. The United Nations Economic and Social Council Resolution Number 1929, indicated that participation requires the voluntary and democratic involvement of people in: contributing to the development effort; sharing equitably in benefits derived therefrom; decision-making in respect to setting goals; formulating policies; planning and implementation of economic and social development programmes (Midgley, et. al., 1986). White (1982), defined participation as the involvement of all those affected in decision-making about what should be done and how; sharing of benefits of the programme and evaluation. Dusseldorp (1981) related participation to notions such as equity, power and distribution politics, self-fulfillment, authority, legitimacy and representation.

2.3.1 Dimensions of participation

Different disciplines have different connotations of the concept of participation and thus tend to give emphasis to different dimensions. However, most authors tend to base participation largely on three dimensions: *What kind of participation is under consideration; who participates in it; and how participation occurs* (Hoskins, 1983; Cohen & Uphoff, 1977; Uphoff, et. al., 1979; White, 1982; Wolfe, 1982; Oakley & Marsden, 1984; Mayfield, 1985). Some authors divide the "what" dimension further into three domains: *Participation in decision-making; participation in implementation;*

and participation in benefit sharing (Cohen & Uphoff, 1977; Hoskins, 1983). Some authors even add a fourth domain namely "Participation in evaluation" (White, 1982; Mayfield, 1985; Uphoff, et. al., 1979).

The "What" dimension

In the decision-making process, the beneficiaries should be allowed to participate in defining the situation; choosing the preferred alternatives; determining how to implement the decision once it is made and evaluating the consequences of the action taken (Mayfield, 1985). Corollary to this is the fact that decision-making should be thought as a process rather than a single act (Ndossi, 1990). People should be involved in making initial decisions about the needs and priorities, whether to undertake a project, and if yes, what should be done. They should also be involved in making on-going decisions about the needs, and priorities and whether or not to continue with the project and lastly people should be involved in making operational decisions, this involves the formation of organizations to further the achievements of the participatory projects (Cohen & Uphoff, 1977). As Hoskins (1983), pointed out, beneficiaries' interests which are in most cases very specific with respect to socio-economic and ecological environment can be brought to attention of project designers and planners only if the beneficiaries are involved in the decision-making process. Lack of involving the beneficiaries in decision-making and formulation of objectives amounts to assuming that they don't know what they want; an assumption which is evidently inaccurate, and mainly leads to programme or project failure (Noronha & Spears, 1985).

Similarly it is now widely acknowledged that the success of any programme/project can only be brought by the people themselves, and that massive deployment of capital cannot do it (Ndossi, 1990). This does not mean however, that capital is not needed for development, but it simply implies that people should feel committed to improving their welfare through their own efforts and should produce the goods and services they need according to their priorities (Machooka, 1984). Experience gained so far has shown that most projects implemented by those who will benefit from them provide a certain guarantee that the work will be done and that the future operations and maintenance will be taken care of (Bugnicourt, 1982). When projects are implemented by outsiders, with all the resources provided, all planning, organization and implementation processes completed while the local populace watches it happen, it is no wonder that the projects are not sustained (Mayfield, 1985). The expected maintenance is not carried out and the local leaders do not emerge to take charge after the outsiders have gone. As Midgley et. al. (1986) indicated, people's participation is said to occur when programmes/projects which are desired and utilized by the people are effectively sustained by them after the external support has been phased out. According to

Cohen & Uphoff, (1977), participation in implementation can take one of the following forms: contribution of resources either to create infrastructure or build up asset, including knowledge. Basically what is important to know is who contributes various kinds of inputs needed and how the contributions are made as well as how administration and coordination are organized. The involvement of local people in the administration and coordination can occur in various ways, the most common of which are as project employees, or as members of project related committees or in specific roles. One possibility of increasing local participation is to recruit local people as project staff (Ndossi, 1990).

People's participation is generally motivated by benefits in material and psycho-social terms which the individual households or community derives from the programme/project (Chandrasekharan, 1985). The success of any rural development programme is directly correlated with the efficient with which it can ensure the delivery of benefits to various segments of rural population (Sen & Das, 1987). World Bank sector paper on rural development published in 1975, went this far : "Rural development is a strategy designed to improve the economic and social life of a specific group of people - the rural poor. It involves extending the benefits of livelihood in rural areas" (FAO, 1984). Unfortunately it is often the case that planners of common property management schemes such as village woodlots do not consider how the benefits of the scheme will be distributed among individual participants in relation to for instance individual labour input (Lawry, 1988). Actually more important than who physically produce the product is the issue of who needs; and who will benefit from, and who will control the use of the product (Hoskins, 1979). Experience has shown that there is always a possibility for some few individuals to capture the benefits of the participatory action. Hunter (1981), showed that some of the programmes are designed in such a way that only the powerful people who have more access and more influence with the source of supply can take part, thus leaving the poorest in more worse situation or that the content of the programme may be such that the poor dare not take the risk of adoption.

Participation in evaluation involves the feedback in information from the participants. It is important means of detecting unforeseen outcomes which have adverse effects and impacts on the rural population, and checking the validity of the project activities and objectives (FAO, 1985). In short it is intended to answer questions of project relevance, efficiency, effectiveness and impact (Desmond, 1983; Stephens, 1988; FAO, 1985; Rugh, 1986 & Bugnicourt, 1982). The importance of evaluation has been emphasized by a number of writers. Mayfield (1985) and Stephens (1988) indicated that in building up a social or economic structure in which people are helped to take charge of their lives, there is no substitute for honest feedback on the process. While emphasizing on this, Rugh (1986), commented that "unless the results of the last years objectives are measured and analyzed how can subsequent

objectives be realistically set? Participatory evaluation serves dual purposes: as management tool which enables people to improve the efficiency and effectiveness; also as an educational process in which participants increase awareness and understanding of the various factors affecting them, thus increasing the control over the development process (FAO, 1985; Hoskins, 1979; Desmond, 1983; Stephens, 1988). Evaluation is an effective means of increasing self reliance. Principally it should be carried out by the decision makers inter alia the beneficiaries who should not only initiate the call for evaluation, but also play a major role in implementing it. It is important that they are involved in defining what, how and when to evaluate; and that they be instrumental in the process itself (Rugh, 1986). In practice however, it seems this is not the case as too often the beneficiaries are left out of the picture, and seen only as "objects" in a project run by outsiders who make all the management decisions. Moreover, seldom are the local people approached with the results of the evaluation for comment.

The "Who" dimension

As regards to the "Who" dimension of participation, Cohen & Uphoff (1980) and Dusseldorp (1981), gave the following categories: Members of the local communities - these include local residents and local leaders or different interest groups; Government personnel - divided into those residing in the community and non-residents; and Foreigners - residents and non-residents in the community. Local residents and leaders, as the designation suggests, are persons having local "roots" whereas the remaining ones are in varying degrees "outsiders".

Local leaders are distinguished from the government personnel essentially by their having some long-range commitments to the local area and generally to its residents, though this does not mean they necessarily act in altruistic ways. The category typically includes local notables from long-established families, large landholders, voluntary association leaders, major traders and merchants, local professionals like teachers, priests and so forth. Government personnel are people assigned to the area for short or long periods by the government. Even if they may originate from the area, they are persons whose career prospects rest in the hands of bureaucratic superiors and their futures are significantly bound up with what happens in the area. Foreign personnel, who are normally identified by their nationalities, may or may not be important in rural development project's operations. They may include personnel working with the project, missionaries and others whose involvement might be very marginal.

The "how" dimension

Knowing "Who" participates in what way provides the basic

information needed in participation process, but to make some qualitative judgement and comparison, a third dimension of "how" is necessary. The "how" dimension adds something qualitative to the analysis of participation (Cohen & Uphoff, 1980). Attention to the "how" dimension generates insights into such questions as to why participation takes place, continues or declines, and why it has the particular patterns. The amount, distribution and trends of participation can be assessed basically by looking at the "what" and "who" dimensions. But one would like to know exactly the ways in which participation is occurring, such as: whether the initiative for participation comes mostly from above or below or whether the inducements for participation are more voluntary or coercive. It might be relevant to analyze and compare over time; the structure and the channels of participation whether it occurs on an individual or collective basis, with formal or informal organization (Cohen & Uphoff, 1980), and whether it is direct participation or indirect representation. Furthermore, consideration should also be given to the duration and scope of participation, whether it is once-and-for-all, intermittent or continuous, and whether it extends over a broad or narrow range of activities. Finally, it will usually be useful to consider empowerment; how much capacity people have to obtain the results which they intend to obtain from their involvement in decision-making and implementation.

2.3.2 Present state of participation in community forestry in Tanzania

Despite of insistence on people's participation in community forestry development in Tanzania there is evidence that the performance is not encouraging, an authentic participation is far from reality (Ndossi, 1990). Contemporary thinking associates this state of affair amongst others with the fact that not enough critical attention has been given to one important "what factor" i.e participation in providing knowledge. Programme designers and planners did not so far consider indigenous knowledge as a starting point for enlisting genuine participation from the local populations. Understandably foresters in the tropics have directed their attention to a single set of technologies for solving the problems of deforestation: Nurseries, exotic species and woodlots. The main reason they have so focused is because the origins of community forestry are still found in "classical forestry" (Wiersum, 1984b). The other reason is that with the current international interest in the poor man's energy crisis running high, projects with physical inputs of the kind that nurseries require, find sponsors easily; more complicated or locally specified projects are much more difficult to "sell" to donors.

Other technologies are however, available; and a place to start looking first for these is in the farmers' own fields and villages. There are countless examples that farmers have developed locally,

specific forest and tree management systems as responses to loss of woody biomass. These systems can be observed, adapted, developed and considered for further propagation by agencies wishing to influence tree growing and management by local people.

2.4 Indigenous management systems: a neglected ingredient in community forestry development

2.4.1 The turning point

Although indigenous knowledge and management systems have been the subject of academic concern ever since anthropologists started their work in tropical countries, it is only recently that their role in natural resource management has been acknowledged (Richards, 1980; Padoch & Vayda, 1983; FAO, 1990b; Barrow, 1991). The isolation of many local people has meant the preservation of indigenous ways of life in close harmony with natural environment. Their very survival has depended on their ecological awareness and adaption. Much (but not necessarily all) of indigenous knowledge is based on an accurate, detailed and thoughtful observations collected and passed over many generations (Chambers, et. al., 1989). Farmers are well-informed decision makers, who combine information and techniques to maximize production and minimize risks (Brokensha & Riley, 1980a).

Local communities in the tropics are repositories of vast accumulations of indigenous knowledge and experience. The disappearance of this knowledge is a loss for the whole human race. It is terrible irony that as formal development reaches more deeply into the rural areas, it tends to destroy the only cultures that have proved able to thrive in these environments (World Commission on Environment and Development, 1987). Ellis et. al., (1984) for example, found no evidence of deforestation or other environmental misuse in South Turkana in Kenya, in the recent past, because the people of the area have adapted their life styles to the dynamics of the ecosystems by raising stock which take advantage of the existing woody forage, by maintaining mobile and dispersed exploitation patterns and conservation and selective use of trees. Much can be learned from the local people which may prove useful for community forestry development efforts. Modern technologies usually come in bits and pieces, and in order to fit them effectively into and build upon the local systems, we need to have a through understanding of indigenous knowledge and management practices (Brokensha & Riley, 1980a). Indeed, there is a wealth of useful information stored in indigenous knowledge systems, e.g. in respect to utilization of local plant species (including trees), ecological requirements of different plant species and possibilities for stimulating their production. Much of this knowledge is reflected in indigenous management practices by which local people are actively protecting and even cultivating useful plant species.

In the following sections, the nature and importance of indigenous knowledge of plant species and of indigenous forest/tree management systems is being reviewed in rather detail. First, the major streams of indigenous knowledge systems are elaborated. Then, a description is given of the main features of indigenous forest/tree management systems. Such systems are characterized by a set of management practices to protect and stimulate plant growth. A second set of characteristics involves the organization of such systems: who has access to forest lands and trees; who decides on which management practices are to be carried out and how is the proper execution of those practices controlled.

2.4.2 Indigenous knowledge

What is indigenous knowledge?

In the discussion of indigenous knowledge in the literature there are two major streams, what one might refer to as "ethnoscience" and "indigenous technical knowledge" (ITK). Ethnoscience is a branch of linguistic anthropology and has been defined as "the set of concepts, propositions and theories unique to each particular group of culture in the world" (Meehan, 1980). According to this definition, modern science is also included. The focus of ethnoscience is how people understand and interpret environmental phenomena. In the case of agriculture, it seeks to model farmers' knowledge of meaning of important cultural symbols in their farming systems. The tools which have been developed include taxonomies, plans or scripts, goals and decision models (Gladwin et. al., 1984). ITK is of interest to a broader range of disciplines and is more concerned with the relationship between indigenous knowledge and science and how they can most usefully cooperate in the generation and exploitation of technology to the benefit of rural populations. It stresses experimentation and the generation of knowledge as an on-going process. Of course, the two streams are closely inter-twined; they have been brought together in Brokensha, et. al. (1980).

Indigenous knowledge of plants

The knowledge of plants is perhaps the most refined aspect among the local people in the tropics. The simplest classification of plants corresponds to the specific epithet level in the Linnaean classification system (FAO, 1990b). The same plant may be classified and named according to different criteria resulting in several names for the same plant. For example, among the Sui Dorobo, hunter/gatherers of northern Kenya, the same plant is called differently depending on the attributes that one wishes to emphasize, such as "medicinal" "toxicity" etc (Ichikawa, 1987). In addition, the plants that have common characteristics have another generic name on top of their specific one (Ichikawa, op.cit.). The

Dogon of Mali, for example name plants according to their therapeutic value for human diseases (Dieterlen, 1952; cited in Carrington, 1983). The Mbeere of Kenya, have utilitarian categories for plants, such as shade, perfume and bedding (Brokensha & Riley, 1980b).

Local people's knowledge and classification of plants is usually more pragmatic and immediately utilitarian than the formal scientist's. For example, in Sudan, all plants that are not useful or good forage are given the names of less respected animals e.g rat, ass etc (FAO, 1990b). However, it is also quite likely that some plants are named not for their utilitarian value, but because they are considered as beautiful, unusual or prominent. The local people also have an intimate knowledge of the characteristics and values of different plants. For example, their value in stimulating milk and meat production in livestock, ability to indicate agricultural potential of the land, and their prominent characteristics (such as prolific fruiterers, fast rate of growth etc). For example, the Pokot and Turkana of Kenya, recognize the seasonal availability of different plants and their role in stimulating greater milk and meat yield (Barrow, 1988). The Wandali of Mbozi district, Tanzania, use plants to indicate the agricultural potential of the land (Knight, 1974). Among the Samburu of Kenya, blessings refer to trees with their well-known characteristics. For example, to bear as many children as "*Enparuei*" tree; to live as long as "*Nkusuman*" tree; to be as sweet as "*Seiye*" tree and to have peace as the "*Lokorosio*" tree (Spencer, 1965). Some plant species may be considered good by some groups, but bad by others. Therefore, the value of a plant is a relative one that varies with environment, time and cultural background (FAO, 1990b).

In addition to classification of individual plant species, local knowledge may also be reflected in indigenous classification systems for vegetation communities. Vegetation communities are usually classified according to broad divisions, with which subdivisions are made. The classification and nomenclature of vegetation types and communities is usually defined by a combination of integrated factors, such as dominant species, the soil type and shape of the landscape. For example, the Masai of Tanzania and Kenya, differentiate between pastures and the "wilderness" - the former used for grazing while the latter for hunting - and divide pastures into lowland (wet season) and highland (dry season) areas (Galaty, 1981). The Wandali of Tanzania, have several broad vegetation types, but in the same type have different names according to the density of vegetation (Knight, 1974). The Wodaabe of Niger, categorize plant communities according to the type of soil they grow on and in which they are best suited (Maliki, 1984). Similarly, knowledge of the evolution of plant community can be very high among the local people especially since it is based on long term accumulated observations (Chambers, 1983). For example, the Wandali of Tanzania, can

describe the progress of plant succession in fallow fields (Knight, 1974).

The process of environmental degradation is another ecological feature that is known in detail by the local people in the tropics. The cause of degradation may be overgrazing or other factors. However, "degradation" may mean different things to different people. For example, among the Masai, who are pastoralist it may be taken to refer to the loss of forage rather than loss of soil potential. The later, notion is likely to be perceived by farmers like the Sambaa. Local people are often accused of not knowing much about ecological dynamics of their environment; and thus causing environmental problems. However, the reason in most cases is due to the fact that researchers have neglected to study the efforts these people put to maintain their environment. Local people in the tropics, may fail to maintain the environment in a sound way due to forces beyond their control, not because they do not know the dynamics involved.

To a great extent, indigenous knowledge of plants is accurate and sometimes similar to formal science (FAO, 1990b). But may be the advantage that indigenous knowledge has over formal science is the ecological particularism. For example, local people may identify more tree species and varieties than scientists (FAO, 1990b), perhaps because they have had more time to search and find all the plants in their areas. Those who have examined ITK in depth have inevitably been impressed in the sphere of ethno-botanical knowledge by the range of different species which individuals can identify, the degree of precision with which species are differentiated, and the high level of consistency found between different members of the same group (Kamondo, 1993). According to Howes (1980) a Ko bushman informant was able to identify by name 206 out of 221 varieties collected, and could draw finer distinction between different types of plants than the professional taxonomist for whom she was working. In most cases, indigenous knowledge has much to gain from formal science, but also vice versa (Chambers, et.al 1989).

However, an important fact which has emerged recently is that one cannot assume that all indigenous knowledge is known and shared equally by everyone. For example, among the Mbeere of Kenya, older women know annual herbs best, herd boys know wild edible fruits best, and honey collectors know most about the phenology of plants (Brokensha & Riley, 1980a). Even within a group, an individual may stand out because of "keen powers of observations, prodigious memory, curiosity and intellect". Variation in knowledge is due to age and sex differences, aptitude, economic and social class (Warren & Meehan, 1980); older people usually know relatively more than the young ones. Variation due to individual skills can be substantial, and may be due to different level of informal experimentation (Howes, 1980). Sexual and social differences are usually due to division of labour. Women may know more about wild

cereals, while men may know more about the best wood for house-poles.

This diversity in level of knowledge suggests that it is not enough just to talk to a small group of informants or a group of leaders (Brokensha & Riley, 1980b). Moreover, one cannot just assume that the information will be given freely, whether to researchers or to other villagers (Johnson, 1980), this is essentially true for the "specialists" who may either stand in the way of exchanging information or may provide a basis for collaboration between the local and external knowledge systems depending on what the local social-political context is, and how they are approached (Warren & Meehan, 1980).

2.4.3 Indigenous forest management practices

The term "indigenous forest management practices" as used in this study, refers to the myriad, small and large decisions taken on daily basis by the local people in their generation, protection and use of tree resources. It goes beyond descriptive knowledge, to what local man does with his store of accumulated knowledge - not just what he uses tree resources for, but also how. We are interested for example, in his practices of harvesting forest resources and how this affects the long term sustainability of the resources. By manipulating his tree resources - such as by pollarding, pruning etc. - and by respecting (or not) both formal social controls and common sense rules on harvesting of herbs, shrubs and trees and other forest resources, the local man is showing his knowledge and skills of forest resource management (FAO, 1990b).

Scientific knowledge of what trees and shrubs are used for among indigenous groups in the tropics is much greater than the understanding of when, how, and to what degree they are harvested, regenerated or protected. Conventional knowledge has it that indigenous people either carelessly or deliberately destroy trees and shrubs, but some and relatively recent studies ascribe to the contrary (Padoch & Vayda, 1983). Woody species are used by local people for browse, fuelwood, constructing houses, kraals and fencing (Alriksson & Ohlsson, 1990), and other uses, such as food, medicine, shade etc. In some cases, utilization of the resources has been shown to be destructive to the plants, but there are many other instances of existence of formal and informal rules for protecting the plants against abuse. The few studies that have recorded harvesting techniques; show that, with a few exceptions, most groups tend to harvest in such a way that as to avoid destroying the plants which are most useful to them (FAO, 1990b). However, it may occur that sustainable harvesting techniques are poorly applied e.g by cutting half way through the branch, then pulling down, which results in bark being pulled off and reduces chances of bud regeneration from the affected area (FAO, 1990b).

Deliberate or careless misuse of trees and shrubs seem to occur more frequently when one is outside one's own territory.

Local people are not necessarily destructive of their resources as it is usually believed. In many cases they manage and use the vegetation, and in particular the woody species on a sustainable basis. Valuable species are rarely cut down, rather selective pollarding is practiced. Dry and dead timber are used for fuel. Only the useless bush trees are cut. Instances where formal and informal rules exist to enhance the productivity or protection of trees and shrubs against abusive browsing have been recorded among the Pokot and Turkana of Kenya. The Pokot and Turkana are selective in how they coppice trees. Rarely will they deliberately cut valuable tree down, and only less useful bushes will be cut back in order to make fences and to reduce bush encroachment on the range (Barrow, 1988). The importance of trees is strongly stressed culturally. People are named after trees; trees play a vital and integral role in many initiation ceremonies such as birth, marriage and various feasts (Barrow, 1988). All this helps to preserve an interest in sustaining tree resources, for trees which have important cultural associations cannot be cut down without serious consequences.

The regeneration of trees and shrubs either through seed germination or cuttings among the local populations is rarely discussed by research studies. Where they have been recorded, regeneration techniques can either be passive protection of seedlings or active germination and/or propagation. Some local groups, such as the Turkana of Kenya, do not seem to see a connection between tree planting and tree use, and do not traditionally plant trees, nor even protect seedlings (Barrow, 1988); (although it is not clear whether this conclusion is due to interview technique or not). The practice of frequent movement of camps among pastoralist often results in higher tree germination on the camp sites since the seeds scarified by passage through the digestive system of livestock, and taking advantage of high organic fertilizer on sites, seem to germinate better (FAO, 1990b). Once mature, these trees are often protected by the next camp who use it for shade and for building their huts and this may explain the situation observed by Barrow (1988). Many groups especially agropastoralists are known to protect spontaneously germinated seedlings in their fields, for example, the protection of *Faidherbia albida* among many West Africans (FAO, 1990b), and protection of *Melia volkensii* by Mbeere of Kenya (Bronkensha & Riley, 1980a). However, such passive regeneration techniques are often the first to disappear once a shortage of tree resources begins.

Experience has shown that many agricultural groups have a clear knowledge of regeneration requirements of different tree species and know how to regenerate them if need be (Bronkensha Riley, 1980a; FAO, 1990b). But in the case of pastoralists, records of

actual tree and shrub regeneration through seeds have not been found. However, for both groups regeneration by cuttings or transplanting naturally germinated seedlings, have been recorded. The former has been recorded among the Gabra and Boran of northern Kenya. They build live fences, with a 50 % survival rate, by putting wet dung in the hole where a tree or shrub cutting is placed (Legesse, 1984). The latter has been recorded among the Lozi of Zimbabwe who mark the graves of their chiefs and other royal people (sacred groves), with trees collected and transplanted from the surrounding bushland (Gluckman, 1951).

The protection of trees and shrubs in particular, rather than all natural resources in the area, seem to take two forms among the local populations in the tropics; prohibition and restriction on the use of some highly valued individual species, and the protection of all trees and shrubs in sacred groves (Gerden & Mtallo, 1990). In West Africa, over 40 tree species were preserved on a farmland in densities less than 40 trees per hectare, by both agropastoralists and farmers. Three species which dominate the list are: Baobab (*Adansonia digitata*); *Parkia biglobosa* and *Faidherbia albida* (Wiersum, 1985). In East Africa, the Gabra and Boran ritually protect trees in sacred groves and shrines and prohibit cutting of valuable mature tree species, such as *Acacia tortilis* (Legesse, 1984). The Turkana of Kenya, protect important trees, such as *Acacia tortilis*, *Hyphaena coriaca*, *Cordia sinensis*, *Ziziphus mauritiana*, *Dobera glabra* and *Faidherbia albida* (Barrow, 1988). The trees, shrubs and herbs in sacred groves are normally protected from being harvested, but the Kikuyu of Kenya allow cuttings to be made from the sacred trees to propagate other sacred trees (Bronkensha & Castro, 1988).

Having discussed all this, the question which needs to be asked is: Is conservation a goal of local people in the tropics? If by conservation we mean the Western environmentalist's view of protecting tree resources from any use so that the climax stage can be reached, then probably no! But, if we mean protection and reservation for future productive use, then probably yes. Poor people in the tropics have no use for the climax stage of plant succession, which has often less productivity than lower stages of succession. They are more concerned with maintaining the productivity of forest area at a level high enough to meet their needs. It should also be noted that sustaining the long term productivity of a forest area is not the only goal of local people. They also continually balancing several goals: reducing risks of food deficiencies, efficiently using the labour available to meet socio-cultural needs etc. Sometimes the long term needs of the forests are even subordinated to immediate and pressing needs (The World Commission on Environment and Development, 1987).

Obviously, indigenous forest management practices as they have been discussed above reflect indigenous knowledge. But, the practices are also influenced by other factors such as access to resources,

various types of rules and regulations etc. Likewise, not all indigenous knowledge is necessarily being reflected in indigenous practices. This study was geared towards obtaining information on practices (which can be observed) and not on knowledge per se.

2.4.4 Organization of indigenous management systems

The indigenous management practices used in managing tree/forest resources as described in section 2.4.3, are enclosed within a socio-political-economic framework and organizational structures. This section puts those management practices into their wider context by describing the organizational structures that define property rights and means for enforcing the rules and regulations on tree/forest resources enshrined within the tropical societies.

Tenure system

The term tenure which was derived from Latin "*Tenere*" (to hold), has been defined by Riddell (1988) as a "bundle of rights" that people hold to a parcel of land, a tree of a forest reserve (see also Bruce, 1989). When we speak of "rights" we are referring to human interactions, to social relations between individuals and groups vis-vis property. In other words, we move beyond the readily observable into the realm of values and norms. The degree to which different forest resource management practices are utilized depends to a large extent on the degree to which tenure rights are organized and exercised. The tenure of trees has been the subject of many studies in recent years (Bruce et. al., 1985; Noronha & Spears, 1985; Fortmann & Bruce, 1988; Gregersen, et. al., 1989; Subedi, et. al., 1990). These studies have helped to create an awareness on the importance of ownership in tree/forest resource management. "Tenure" can be defined as either the full and exclusive ownership of resource or the right to use without owning it (usufruct), or something between the two. Ownership includes the right to use the resource and the right to determine the extent and nature of use by others. Resources can be individually or communally owned. Communal tenure, implies that the enjoyment of rights is not exclusive to one individual, but is shared collectively by the community (Clouston, 1953).

There is a difference between "dejure" and "defacto" rights. As succinctly discussed by James and Fimbo, (1976), with reference to Tanzania, "land is more than just property, and land tenure rules form a part of the whole complex of culture. The central idea of land tenure is one of controls not titles". Land ownership is indeed a multireferential word. Rights and powers are never absolute and their existence in most cases is limited by a number of restrictions and subject to controls. Some limitations and controls rest on custom and conventions and are based on group protection, others rest on legislation and aim at realizing certain

individual or community needs. Taken tenure rules to be a result of existing social relations, they are always in a state of dynamic change. As social relations change, so do the interpretations of existing tenure rules, and new rules are created (Riddell, 1988).

In Tanzania all the land is officially held by state and a person's rights to land are dependent on the use they make of it. As land is not a commercial commodity, theoretically, no private sales can be transacted. In practice, however, land is inherited, exchanged, purchased, sold and leased. The country does not have one detailed, comprehensive and authoritative land policy. Instead there are a number of authoritative Presidential or Ministerial circulars and orders of varying dates. The tenure situation encompasses several historical periods i.e the German (1920 -1922) and the British (1922 - 1961) colonial eras and the Post-independence (1961 - 1967) and the Post-Arusha declaration (1967 - Todate) periods, which all in their own way have left their mark on the tenure structure of the country. The lack of comprehensive policy, however, makes the interpretation of tenure rules complicated and unclear even to a professional. The indirect rule policy effected during the British colonial period prevented changes from taking place uniformly within the traditional sector of land tenure and land use. In contrast, the integration of the court system in the post-independence period has been an important agent in effecting change in a unified manner.

The aim of this study is not to try to sort out this intricate legal complex, but rather to see how law is implemented and interpreted in the local context. What characterizes land tenure in Tanzania is the existence of two parallel, simultaneously tenure systems namely customary (use) rights and statutory (ownership) rights. Because different authorities have allocated land, different policies appear to have been implemented. The official laws apply mainly to the communal fields and block farms, while the traditional tenure rights are still valid for most individually held land which, however, is gradually being transformed into a market system.

In principle, all land in Tanzania is being held in common in the sense that nobody could be completely denied access to land. That would be synonymous with depriving a person of his or her way of making a living. In pre-colonial times there was no formal authority in charge of land allocation because land was plenty. When people found a suitable place for residence, they began to cultivate the land according to their needs and labour capacity. The family had usufruct rights to piece of land as long as they lived there and kept the land under cultivation. Tenure rights were based on the principle of occupancy and membership in a community.

During the colonial period, persons holding the administrative posts of chiefs and sub-chiefs became responsible for allocating land to those who asked for their assistance. This mainly concerned

immigrants or people with no established relations to families in the community they settled in. The colonial chiefs were usually recruited from lineages endowed with special ritual powers and they often became powerful people in the community they headed. With the support of colonial administration, the administrative chiefs consolidated their economic and political power far beyond their traditional role. It appears that land allocation to indigenous small holders was not a big issue in practice and did not fall within the routine work of the chiefs. The chiefs, however, were called upon to mediate and settle disputes concerning land tenure conflicts, which could be quite common in some areas (Winter, 1968).

With regard to tenure it is important also to revisit the Tanzanian villagization policy. The villagization (Operation vijiji) of the countryside of Tanzania which began in the mid 1970s was an ambitious project for reorganizing settlements in rural areas. The Village Act of 1975 is the major policy document formulating the official policy towards land tenure. People were moved into village centers and allocated new land within the village as a territorial unit; some moved only their homesteads and kept their former holdings, others had to give up their houses as well as their fields and grazing areas. It is important to note that the allocation of land made at the inception of villagization and afterwards was based upon witnessed verbal agreements. As time went by, and as people came and went, certain problems arose regarding the terms of agreement. The allocation made during villagization sometimes depended upon whether the person was present and could defend his or a her interests.

For many people in Tanzania, villagization was a traumatic period. People resisted changes in various ways, but for the majority of them there was very little they could do, so they complied with the decree. Villagization or "Operation" as people commonly call it, appears to have been unpopular with a large number of people in Tanzania. Their reasons are rational: Clustered settlements are inappropriate especially for agropastoralists. Not only do grazing resources deplete easily in densely populated areas, but diseases spread quickly among the herds, jeopardizing the whole livestock keeping enterprise. For such obvious reasons, villagization has been particularly resented by agropastoralists like the Gogo. From their point of view "sedentary settlement is simply irrational".

The re-organization of people into villages was thought to be a way of securing equal rights to land. The egalitarian rule of land distribution, however, applies only to the minimum allocation of land, the plot on which the homestead is built and gardening and subsistence farming is done, and not to total land distribution. During the last few years there has been political liberalization in Tanzania and farmers perceive that villagization has now come to an end. Consequently, people have begun to move out of the village centers back to their former dwelling places or to other favoured

places, which is, in principle, illegal. People moving back however, may find their land cultivated by other people. A couple of years ago a number of villages experienced a surge of people reclaiming their former lands on the basis of customary rights or pre-operation tenure. To stop things from getting out of hand, the government passed an act (Act no. 88 of 1987), giving legal precedence to statutory law as implemented during the villagization period and latter by village councils. The overall trend in the country seems to be towards a "progressive extinction of customary land law".

Generally speaking, land rights allocated during the operation or latter by the village councils appear to have greater legal validity than customary rights. The tenure situation, however, is still fluid in the sense that many principles are applied simultaneously and are creating ample opportunities for the manipulation of land holding rights by those who have the ability and resources to do so. People tend to employ various strategies of securing tenure rights. Among the prominent ones and of particular interest to this study, is the planting of trees and perennial crops. In Tanzania as already pointed out, in principle land cannot be owned, purchased or sold. Nevertheless, land does have market value and everybody is aware of that and acts accordingly. People get around the law in various ways. Instead of formally selling the land as such, people sell and purchase what is on the land: trees; houses etc. What is so obvious to many people in Tanzania is that planting trees on the land gives it not only legal exchange value, but also a better price.

One of the more enduring myths of our time has been that of "tragedy of the commons" first pronounced by Hardin (1968). In its simplest form, it states that when a resource is communally owned, each individual has no incentive to reduce and restrict his use of it, thus leading inevitably to abuse of the resource. This concept was falsely attributed to communal property ownership when it really refers to "open access" (i.e. where there are no communal social controls over the resource) (Ciriacy-Wintrup & Bishop, 1975; Runge, 1986). In most traditional systems all lands were claimed either privately or communally. The concept of "vacant" or unclaimed land has been introduced by colonial governments, and applied especially to forest lands, since maps of these areas were often based on surveys done only in one season missing for example the pastoralist who were transhumance (Noronha & Lenthem, 1983). Some areas did appear to be vacant, in so far as there were no sustained claims to them, but often were considered to be in the sphere of influence of certain tribes, or were the object of expansion and warfare between neighbouring tribes (FAO, 1990b).

People who have been exposed only to forms of Western property law often assume that trees are always part and parcel of the land on which they grow (Fortmann & Bruce, 1988). But, like minerals and water, trees can be a form of property separable from the land on

which they are located. Failure to recognize the relationships between property rights in trees and property rights in land has led to bad policies, failed projects and even led to projects with unanticipated consequences. A number of observers have commented that the nationalization of trees by various governments has led to the destruction of trees by farmers who don't want the government's property on their land (Fortmann and Bruce, 1988; Subedi, et. al., 1990). Trouble can also arise when the government exercises its statutory claim to land that also claimed under local custom. Hoskins (1980) describes a West African case in which project personnel, under the impression that it was "worthless bush" and belonged to no one, bulldozed the communal forest for plantation site. The local people returned the favour by burning the project plantation of fast-growing exotics to the ground.

There are few recorded cases of tree tenure at the household level. For example among the Turkana of Kenya, certain fruit and browse trees on the "ere" (or household land) are exclusive to the household and passed down to sons (Barrow, 1988; Storas, 1987). The Suei-Dorobo of Kenya, also recognize individual, exclusive, ownership of valuable trees in the bushland (Spencer, 1965). In some cases ownership of trees in the bush may be *de facto*, not *de jure*. Ownership and actual use of a resource are not necessarily synonymous. Whether the resource owned by a social unit will be used by its members depends on several factors. In the first place, although in the local societies in the tropics, traditionally the land belongs to the tribe or clan (FAO, 1990b), a member's rights to its resources, for example trees, may be based on continual exercise of those rights. If any area is abandoned then it reverts to the communal property of the social unit and can in principle be used by any other member. Most people prefer to remain on the land they have come to know best, thus tend to continuously occupy, and manage its resources as if they privately owned them. Second, an area may belong to the tribe or clan, but in any given year, only a small portion of the members will actually use it, because of distance, availability of alternative resources, changing needs etc. Therefore, the actual pressure on the resources is lower than would be expected. For example, among the Masai, each family's *de facto*, usufruct rights are maintained with long term use of the same area, thus people manage the land as if they own it. In addition, their rights are assured only if they participate effectively in age-set structures (Jacobs, 1980). Similar observations have been made among the Kikuyu of Kenya, the Kikuyu have to maintain their rights, especially to exclusive cattle posts, by showing continual use, such as actual grazing, frequent visits and renewal of boundary markers (Middleton & Kershaw, 1972).

As has been elucidated above, regulated access to and ownership of resources thus exists in the tropics, and is recognized by neighbours, but in the absence of legal titles, it has to be continuously exercised and defended against intruders or usurpers. The degree of control over the resources depends on various

factors. One is the value of the resource and the easiness with which it is obtained. Second, rights are more strongly exercised and defended where the resources are more frequently utilized. This is especially evident in the recognition of the "home" territory around settlements.

Means of enforcing rules

Most of the local societies in the tropics do not have an internal "police force" which raises the question of how the rules and regulations are maintained and enforced. In this respect, it should be noted that some of the rules on natural resources, like trees and forests are so fundamental, that they appear to be taken for granted as inviolable and are widely respected by all the people (Kajembe, 1993). These fundamental rules are "first come first serve" rights of historical precedence, and rights of continual occupancy (FAO, 1990b). These rules can be collectively described as a "fairness ethic", and do not require formal enforcement since they are embodied in moral culture of all the people (Storas, 1987). Their violation when it does occur, is generally resolved by social controls.

More complicated rules, however, may require some form of informal or formal law enforcement procedure. Informal procedures are part of the social fabric of the local societies in the tropics, where the kinship system and the rules and obligations set up by the culture provide the stabilizing force. "... rights must be respected, duties performed, the sentiments binding the members upheld, or else the social order would be so insecure that the material needs of existence could no longer be met (FAO, 1990b). The power of local "traditions", is so strong such that no one would even dream of breaking the rules (Draz, 1978). Social ostracism is a powerful tool used by the local societies to keep their members in line, and this includes social rebuke, shame or different degrees of social isolation. Local societies in the tropics also use praise and social rewards to reinforce positive actions. The belief in curses can be a powerful tool for ensuring adherence to rules. In addition, rules of reciprocal obligations are daily enforcers of regulations. According to one account, the traditional African society is not so much afraid of being poor as of being ashamed (Benot, 1979; cited in FAO, 1990b). For example, the Masai regularly use social rebuke and avoidance of the individual and his household who fails to adhere to good resource management practices (Jacobs, 1980). The Kikuyu loosely enforce the customary restrictions on the use of woodlands through neighbourhood consensus and anger of the local residents (Bronkensha & Castro, 1988). Among the Samburu of Kenya, the belief in curses is very strong and is used to sanction decisions, punishments and other forms of enforcement of rules (Spencer, 1965). "Reciprocal altruism" i.e. do good to someone knowing that you can ask a favour in return, also is another way of enforcing

customary rules.

However, once the social order and the moral culture are destroyed, these social enforcement rules lose most if not all of their power. Also, although rules and regulations exist in society, they are rarely explicit, and need to be interpreted to fit each situation. Except for serious disputes which would end up in front of traditional judges and courts, most rules are interpreted on daily basis by people concerned, with the intention of establishing consensus among the parties. For example, among the Sukuma of northern Tanzania, there are general rules limiting access to certain pastures (O'kitingati & Kajembe, 1991), but there is a constant argument about where and when to apply these limitations, and who should apply them. In most cases they use verbal persuasion, involving elaborate rhetorical arguments, in order to influence communal agreement. But not all groups in the tropics maintain such flexibility in the application of rules. Some such as the Art Ben Yacoub of Morocco, rigorously enforce the decisions laid down by the councils and chiefs (Artz, et. al., 1986).

Another form of law enforcement procedure is the traditional relationship between the people and their leaders. In most cases, the political hierarchy is accountable and answerable to the people. In other words, in certain cases the people may abandon an oppressive, inefficient chief who does not perform well, is weak in enforcing rules, and does not respect his share of social obligations. The political power of the leader and his ability to enforce rules, thus lies in the balance that he can achieve between power/authority and responsibility/obligations (Southwold, 1964; Hjort & Ostberg, 1978). Therefore, the social structure defines the source of power needed for enforcing rules.

Likewise, the means of enforcing rules and regulations vary among different groups. Some have local "police force" such as the "Sungusungu" or traditional guards in Sukumaland, Tanzania (O'kitingati & Kajembe, 1991), or even official supervisors who monitor the activities of their people or that of outsiders. But, most local societies in the tropics, rely on the observations of each individual member to report transgression and trespass. Some societies impose fees and penalties for transgression of rules. But in rare cases, when all else fail, one can use confrontation, fights, and in case of inter-tribal disputes, warfare. For example, the Turkana of Kenya, use physical fights and confrontation as ultimate means of enforcing rules. These fights may end at elder's court under the tree, but whatever is decided there, may only be valid until the next confrontation where a new court may decide differently (Storas, 1987). Similarly, the Masai are prepared to defend with force their tribal or intra-tribal boundaries if necessary (Jacobs, 1980).

In discussing indigenous knowledge, management practices and management organization in that order, I tried to, identify the

basic features of indigenous management systems. Through their observations and intimate knowledge of their physical environment, local people in the tropics have devised techniques for managing (harvesting, improving, protecting, regeneration, etc) forest resources. Rules and regulations enshrined within the "traditions" of these societies ensure the smooth functioning of the systems by coordinating the activities of each member. The rules primarily concerned with forest resources include tenure, harvesting controls and protection.

Both socio-political expedience, and ecological exigencies define the particular form of techniques and rules practiced by each society. The objectives are mainly to ensure their survival and sustain the productivity of their natural system in the long term. Many of their activities have evolved and adapted so that they simultaneously result, in long term, in sustained production at least as long as no significant changes occurs in either use intensity (through population growth or commercialization) or changes in external institutions (e.g. new government rules and regulation).

The organization as described here and the means of enforcing rules show that the social structure defines the power base on which rules are enforced. As it has been noted in this review, the viability of the organization rests on a system of mutual aid, information network, power lines that reinforce, reward and punishment, and cooperation to eliminate competition (Jacobs, 1980). It also defines the way resource management practices and rules react to external forces, and how the society adapts to new technologies and management strategies proposed by development workers. Thus this simply implies that indigenous management systems are dynamic rather than static as they are usually referred to by some people.

2.4.5 Dynamics of indigenous forest management systems

In adapting to changes in their environments, local people in the tropics not only vary the products that they use from the forest, but also the practices they employ, the amount of labour they expend, as well as other social factors. The sources of the change that affect them are not invariably "outside" pressures or influences alone but also changes engendered by the local people's own subsistence activities (Boserup, 1965). It is undoubtedly true that many important changes have resulted from the impact of outside forces, and that, increasingly, the independent decision-making of the local people have been undermined. It is, I believe, theoretically unsatisfactory however, to base one's analysis entirely on the notion of external determinism. All forms of external intervention necessarily enter the existing life-worlds of individuals and groups affected and thus pass through certain social and cultural filters (Long, 1984). In this way, external

factors are both mediated and transformed by internal structures (Comaroff, 1982; Ranger, 1978). It is therefore important to adopt a more dynamic approach to the understanding of indigenous management systems, which recognizes the interplay and mutual determination of external and internal factors and relationships. Such an approach emphasizes the importance of taking full account of "human agency" (Giddens, 1979; Dawe, 1979 & Abrahams, 1982). This means recognizing that individuals, whether they are peasants, landlords or bureaucrats, attempt to come to grips with the changing world around them and that they do this both cognitively on the basis of existing cultural categories and ideologies and organizationally in the way they interact with other individuals and groups (Long, 1984).

We must therefore, find a place for an actor-oriented analysis of indigenous forest management systems if we are to avoid the determinism of orthodox theories of classical forest management. That is, we must look closely at ways in which different individuals or social groups deal with changing circumstances. Not even forest-dwelling hunter-gathers are completely equilibrated resource users as they are commonly believed to be. Some observers have argued that the environmental impact of small non-agricultural groups has been greatly underestimated, and that foraging activities have led to considerable change and selection of some forest species (Harris, 1978; Rambo, 1979). Local people in the tropics have no doubt driven several tree species to extinction and have influenced the numbers and range of many. Having caused change, they have more or less successfully varied their activities in response to it.

Available historical and comparative studies of indigenous tropical populations discredit the widely prevailing view that total social disorganization and breakdown of forest resource management systems in the face of overpowering modern economic and political forces are the only changes that local people have experienced over the last few generations. Street (1969), in an article arguing against the prevailing "assumptions" of technological stagnation among the tropical populations, cites several examples to illustrate this point. Among the populations he mentions are the Wakara of Lake Victoria in Tanzania who, when faced with land shortage, abandoned their land extensive methods and turned to more intensive farming including the use of manure. These observed variations in resource use, the Wakara showed both propensity and ability to make use of available lands as well as an ability to use resources more sparingly and conservatively when altered circumstances made a change in behaviour desirable.

Other studies have confirmed that flexibility and change are not only known or atypical of tropical societies but that the direction of change in resource use among such groups is also variable (Padoch & Vayda, 1983). It needs no emphasis therefore to say that, in general, increased pressure of whatever nature may lead a

society to temporarily intensify the management of its resources, a relaxation of that pressure may result in rapid disintensification (Bronson, 1972). Such pressure may take several forms: Change in ecological conditions (e.g. soil degradation, drought or other forms of environmental decline); changes in technology; changes in economic conditions (e.g. development of new markets and increased commercialization); changes in socio-political conditions (e.g. changes in tenure arrangements including gradual privatization of land, greater involvement of government in rural development etc.). In such adaptive strategies farmers tend to take a micro-economic orientation. They normally adjust the use of their household resources in a way which they perceive as resulting in their best possible welfare. Such changes may involve moving into or out of , or intensifying or improving certain resource-use systems (Wiersum, 1989c).

In some places the pressure on forest resources has been building up abruptly and almost imperceptibly and as a result deforestation is evident. But where pressure to remove trees has been subtle, and cutting has occurred little by little, people had time to evolve and adapt certain management systems in order to offset the effects of such pressures. Thus signs of tree scarcity might have been present for decades, but adaptive strategies such as the protection of valued trees, the encouragement of volunteer seedlings and selective thinning have prevented acute manifestations of deforestation from developing (Wiersum, 1989c). In certain cases in recent years such indigenous management strategies have been overwhelmed as changes multiplied which made it more difficult to protect trees. In other cases, people have abandoned tree management and conservation practices simply because they are no longer consistent with their perception of rural development (Shrire, 1980)

But again in other cases, the changed rural conditions resulted in intensification of forest/tree management. Some of the processes that in some cases have contributed to the abandonment of forest/tree management, in other cases resulted in intensified management. Thus processes such as the trend towards land privatization, a growing desire by rural inhabitants to increase productivity and to raise their income level; the active response to commercialization may result both in deforestation and forest degradation or adapted forest management strategies. Consequently, the possible effects of such changes must be analyzed for concrete conditions. It should be remembered that indigenous forest management systems are often site-specific because of their adjustment to the specific local environmental and socio-economic conditions.

The question of differentiation and variation within a given society is central to the understanding of indigenous forest management systems. Even if the population is relatively homogenous in terms of access to the means of production and standard of

living, there will always be important differences of demographic and ecological kind, between households in a village and between villages, districts or even regions. Although lip-service is frequently paid to this fact in general theories, the full theoretical significance of differentiation and variation is usually missed. Recognizing heterogeneity entails dealing with adaptive responses of particular social units (e.g. households) to apparently similar sets of circumstances. This requires identification of specific livelihood strategies and explaining their social basis (Long, 1984).

2.4.6 Relevance of indigenous management systems in community forestry development

Interventions to stimulate forest management by local people should in most cases reflect the fact that such interventions are needed because the traditional and indigenous practices could no longer cope with the rapidly changing rural conditions. However, this does not mean that those local practices are no longer relevant. In many cases it may be advisable to integrate indigenous forest management systems with new interventions rather than to introduce radically new forest management systems (Wiersum, 1989c). A basic principle for introducing interventions to rural societies is that, they should be based on an understanding of the existing systems, as well as on an understanding of what makes interventions necessary in the first place.

Often there may be good possibilities for strengthening existing forest management systems rather than introducing new ones. In many cases, professional foresters have failed to take the advantage of the wealth of indigenous knowledge about tree growing. At the other hand, it cannot be doubted that a number of complex, multiple and interrelated issues have created situations where rural people have difficulties in continuing to maintain the traditional forest management systems or to develop adaptive strategies fast enough to keep up with the present rate of rural change that has been caused by loss of forest resources in many tropical countries. But, it may be that only little encouragement need to be given by professional foresters in order to adjust and develop more adaptive strategies. Again in some cases, it may be necessary to introduce radically new management systems. A clear-cut recipe cannot be given under what conditions it is necessary or possible to strengthen indigenous forest management systems, to supplement them with new ones or to introduce totally new forest management systems. The choice between these options will depend on many factors, of which the most important are: Local stadium of development (e.g. subsistence or commercial oriented); reasons for the need to intervene; intensity of the problems in relation to tree management and land-use; and the extent and nature of the existing traditional or adaptive practices and likelihood that more complex management practices can effectively complement them (UNESCO, 1978).

2.5 Interface between indigenous forest management systems and project interventions

As pointed out in section 2.4.5 above, all forms of external interventions necessarily enter the existing life-worlds of individuals and groups affected and thus pass through certain social and cultural filters. In the same analogy, project interventions are both mediated and transformed by the existing indigenous knowledge and management practices of the area. Therefore, in order to understand how local people participate or not participate in people-oriented projects, the analysis of interface is necessary. This section reviews first the nature of people-oriented projects as an entry point to the analysis of interface. Also the concept of intervention as being underlined by multiple realities is reviewed.

2.5.1 The dilemma of people-oriented projects

When one looks at the planned rural development interventions in Tanzania, the results are far from impressive. What are the main reasons why planned development is not successful and can even have disastrous results? According to Van Dusseldorp (1990), the whole successful planned development, in the sense that outcomes predicted have been realized within the timespan indicated and with the means allocated, is only possible when the following four pre-requisites are fulfilled:

- (i) Firstly, there must be a general agreement among all actors involved on the consistency of the objectives;
- (ii) Secondly, there is knowledge of the functioning of all relevant processes and their interrelationships, as well as the ways in which they can be manipulated;
- (iii) Thirdly, there is the power and means needed to manipulate these processes; and
- (iv) Finally, there is a political will to use the power and the means available.

These pre-requisites are not external conditions outside the reach of planned development. An important task of planned development can be to contribute to the realization of these pre-requisites, among others by improving via evaluation our insights into the processes which determine our future. When it comes to planning and implementation of projects that are based on well known, often physical processes (like building of houses or bridges), these pre-requisites are in most cases realized. But when it comes to people-oriented projects, these pre-requisites will never be completely fulfilled. It was thought that by introducing participatory approaches in planned development, the problems encountered in

people-oriented projects could be solved (Garcia-Zamor, 1985; Cernea, 1985). But there are limits to participation as has been indicated by Gittel (1980) and by Van Dusseldorp and Frerks (1985). The general experience is that people-oriented projects like community forestry projects, very seldom follow the course that was indicated in the plans. This means that it will never be possible for individuals or governments to create via planned development, exactly the future they had in mind. But should this lead to a conclusion that we have to return to "muddling through" approach and that government efforts at least in the field of planned development should be stopped? The answer is obviously no! It is the nature of individuals and organizations they have created to change their environments in an effort to realize their objectives. So, planned development, however imperfect it may be, and however, disastrous its outcomes sometimes are, will remain with us at least for the foreseeable future.

In most of the planning literature (Rondinelli, 1977; Goodman & Love, 1980; Baum, 1982); projects have been mainly described, analyzed and prescribed as administrative instruments used by governments, and in the case of developing countries like Tanzania, often under pressure from donors, in order to legitimize the allocation of scarce resources for specific actions. Projects as instruments of governments to steer ahead development have been criticized as being of a blueprint nature, top-down (Van den Hoek, 1992) and fragmenting development efforts. But, above all, that they have not delivered the promised results, or when this was the case, their outcome was not sustainable (Chambers, 1983; Morris & Gow, 1985; Long & Van der Ploeg, 1989). A considerable part of this criticism was and is still correct. However, it indicates mainly that projects were often poorly prepared and on many occasions miserably implemented. It did not present arguments that the project approach as such was inherently wrong.

Projects are necessary because in this form it is possible to bring forward arguments for future action to be undertaken, to make action patterns manageable, and to decide on priorities. According to Cernea (1985), "the debate on the merits and demerits of projects has not, however, produced many effective alternatives. Therefore, as long as the project approach is routinely being used in planning, it is valid and necessary to identify and address the sociological variables embedded in rural development projects". I intend to agree also with the conclusion of Honadle and Rosengard (1983), when they warned not to throw the baby away with the bath water because "the development projects concept is not just a fad, stylistic intrusion on human scene. Rather, it is a profound concept that imposes specificity on social endeavors".

Development projects can be analyzed as arenas for negotiations, as it was done by Bierschenk (1988), or as arenas of struggle (Crehan & Von Oppen, 1988). This perspective can give us an interesting insight into why community forestry projects seldom realize the

objectives mentioned in the official documents. This however, does not mean that they are only losers. It only means that the benefits did not go to people for whom they were officially meant. When this view is adopted then it becomes necessary to have a look into the behaviour of the actors involved. My paradigm is that every individual is involved in a preparation and implementation of a great number of planned interventions through which he/she tries to realize his/her objectives with the least possible actors. What these objectives are, and what the actor sees as actors, is to a considerable extent determined by the norms and values of the culture or subculture in which he/she lives. Costs and benefits can be of economic, social, psychological and physical nature. However, each individual develops his/her own operating norms. In the view of Giddens (1979), an individual is in permanent dialogue with his/her values and norms trying to improve his/her position in the existing social structure. Each individual is permanently assessing his/her environment. This assessment includes his/her estimate of his/her position in the social, economic and physical environment. The next step is that he/she links this assessment with his/her objectives. When there is a difference between objectives and the perceived situation the actor has a problem. The following step is to make an assessment of resources the actor commands (this includes an estimate of his/her power versus the power of others) and to see whether it is possible, via a specific intervention, to change his/her environment in such a way that it is more in conformity with one or more of his/her objectives. When, in the stage of conceptual linking of objectives and resources, it is possible to find an acceptable alternative for intervention, then the actor can start actually using these resources for specific intervention.

It should be realized that planned development through projects, will be a phenomenon that will be with us at least for a foreseeable future, because it is part of the human nature to try, through purposeful action, to change the environment in order to realize one's objectives. The main reasons are that human beings and the organizations they have created, in the developed as well as in the developing world, are neither capable of grasping completely the complexity of their environment, nor do they have managerial capacities to implement holistic and comprehensive programmes of action. These have to be broken into manageable action programmes (i.e. projects).

Planning will never be a perfect instrument, making it impossible for mankind to control completely its destination, because the essential pre-requisites, at least when it comes to people-oriented projects, can never be fully realized. This does not mean that no efforts should be undertaken to improve the planned development process and the instruments for planning. Social sciences can play an important role in this improvement. Projectized planned development will remain for ever an imperfect instrument. However, it is indispensable for the development of a society. We can only

make the best of it. If this is the case then it is worthwhile to look into details the concept of intervention as being underlined by multiple realities.

2.5.2 Intervention as a multiple reality

Actor-oriented analysis views intervention as a "multiple reality" made up of differing cultural perceptions and social interests, and constituted by the on-going social and political struggles that take place between the social actors involved. Focusing upon intervention practices allows one to take into account the emergent forms of interaction, practical strategies, types of discourse and cultural categories present in a specific contexts (Plumbo, 1987).

The dominant theoretical paradigms of planned intervention in the 1960s and 1970s espoused a rather mechanical model of the relationship between policy, implementation and outcomes. A tendency in many studies (which still lingers on in certain policy discourses), was to conceptualize the process essentially as linear in nature, implying some kind of step-by-step progression from policy formulation to outcomes, after which one could make an ex-post evaluation to establish how far the original objectives had been achieved. In synthesis one might say that intervention is both perceived and legitimated as a continuous production of "discontinuities". If development is supposed to come about through intervention and restructuring of existing social forms, then development implies discontinuity, not continuity with the past. The situation chosen for intervention is deemed inadequate or needing change; thus indigenous bodies of knowledge, organization forms and resources are implicitly (sometimes quite explicitly) delegitimized; and consequently external inputs are assessed as necessary and indispensable. It in this way that the normative framework and technical instruments of planned development are validated by interventionists. This suggests that intervention should not be seen solely or perhaps even primarily as consisting of material and organizational inputs, but rather as involving a kind of "trade images" which seeks to redefine the nature of state-peasant relations (Siriwardena, 1989) through the promotion of certain normative standards of what development is and entails.

The claim that intervention is a key to agrarian development is not only false but also, if we consider the possible consequences of such a claim is part of the problem of development itself. Most dominant theories state that development is to be "induced" (Hayami, & Ruttan, 1985); that is external interventions are considered necessary in order to trigger off the development process. And, although probably no one would maintain that outside the domain of intervention no development whatsoever takes place, it is nonetheless a widely shared opinion that "substantial" or "adequate" development depends critically upon intervention, in other words on the introduction of "packages" consisting of various

mixtures of expertise, capital, technology and effective modes of organization. The logical converse of this, of course, is that outside this realm of the "cargo cult" is "ignorance", "incapacity", "poor resources", "backward" forms of technology and "powerlessness".

Even a brief acquaintance with the literature on agrarian history, economics and sociology, however, would show conclusively that the bulk of evidence runs counter to this dichotomized view. Agrarian development is not limited to intervention practices (Long & Van der Ploeg, 1989). It is potentially everywhere and, when it does not manifest itself as a relatively autonomous, diversified and dynamic process, this is probably because it has become impeded or obstructed in some way; and one of the mechanisms by which this occurs (here we enter the real problem) is through intervention itself. Thus behind the claim that intervention is a trigger or driving force of development, is a fact that intervention practices more often than not aim to control the pattern of local economic and political development. Intervention in most cases aims to bring the dynamic indigenous practices and organizations into line with the interests and perspectives of public authorities, and to produce the image of the state as being key to development (Lane, 1992). This intent to increase outside control may affect the effectiveness of and the meaning accorded to local development activities. Much historical evidence in fact demonstrates that a reduction in control by the central authorities leads frequently to a sudden revitalization of local development initiatives (Samaniego, 1978, Lane, 1992).

Heterogeneity is indeed a structural feature of rural development. This heterogeneity does not emerge as something casual, but rather as an outcome of development being designed and realized from "below" and within the local setting (Van der Ploeg, 1986). Bodies of indigenous knowledge, which result in the detailed and socially-mediated translation of local resources, constraints and conditions into action, are central in this production and reproduction of heterogeneity. Yet, because of its internal dynamics, externally-planned intervention aimed at central control of development, cannot take into account this detailed knowledge and mastery of the local situation; hence the tendency towards standardization and the consequent problem that externally-initiated models often do not concur adequately with the situation, thus producing "underdevelopment" rather than "development". "The newest is not always the best".

Therefore the study of intervention should begin with an assessment of the complete pattern of development tendencies and counter-tendencies. This raises the question of the complex interaction between specific interventions on one hand, and the multitude of developmental patterns, strategies and actors, on the other hand. Depending upon the circumstances, specific actors may be constrained or spurred on by particular interventions; others may

find their interests and strategies impeded or completely blocked. That is to say, we need to identify the specific patterns of interaction and accommodation that take place between the different actors (individually and collectively) and to analyze ways in which their particular histories, memories and time-space conceptions shape outcomes. In more technical terms, this implies that evaluation studies should be replaced by new types of impact studies. Whereas evaluation studies address themselves to the "fictitious" question of whether or not original goals have been reached, the latter would take seriously into account the dynamics of intervention as a set of social practices arising out of the interlocking of actors' strategies and intentionalities. Impact studies would also look at the consequences of intervention on other more "autonomous" modes of development (Long, 1984).

An actor-oriented approach, allows for the recognition of institutional incorporation (or bureaucratization) as a basic trend in contemporary community forestry history. From an actor perspective, institutionalization only become real in its consequences when introduced and translated by specific actors (including here not only farmers but also others such as professionals and politicians). This implies that these "basic" trends do not eliminate power within the local situation, nor do they eliminate an active role for the farmers involved. What they do result in is a shift in the basis of power relations, and also a shift in various definitions of farmers' roles. At the same time, increasing institutionalization often result in the emergence of new structural discontinuities and hence in the creation of new points of leverage and space for manoeuvre which may become crucial in the interaction with various intervening agencies.

Intervention practices often do result in abrupt and massive increases in institutionalization, and commodatization, and these processes are often seen as the vehicle of development. However, even if they are essential features of intervention practices, one cannot deduce from this that local actors are simply "expropriated" and reduced to something called "powerlessness". Although tendencies towards such forms of expropriation might be strong, we will find within the same area certain counter-tendencies where new points of leverage and new power relations emerge. Thus, rather than eliminate social and normative struggles, it is likely that intervention practices will radicalize them, introducing new discontinuities and heightened confrontations between differing interests and values.

In summary therefore, actor perspective in this study aimed to bring out the significance of building into the analysis some account of human agency. This entails, both the idea of individuals or groups developing social capabilities, and emergent organizational forms that both enable and constrain action. Hence the execution of community forestry policy becomes an active process (often with unforeseen outcomes), involving both

cooperation and struggle among the various actors involved. It takes place within specific historical and institutional contexts which are themselves continuously being shaped and transformed by actions of constituent groups and individuals.

It is important therefore, to go beyond the notion of participation which assumes an intervening parties acting on behalf of the "state" or some other "superior authority". Individual personnel and the development agencies differentially interpret and act upon the policies they are required to implement, and their behaviour is influenced not only by their administrative experiences but also by their experiences in other domains (e.g. family, the political arena, in interaction with fellow professionals etc.). Applying this theoretical perspective to community forestry problems leads one to a fuller appreciation of the complexities of intervention practices and processes. It emphasizes the theoretical importance of considering differential responses and outcomes to intervention, and thus exposes the limitations of highly generalized development models. It criticizes planning models that assume a simple linear or cyclical process of policy formulation, implementation and outcomes, and points to the need to examine how interventions are transformed during the process of implementation. It points out that interventions are affected among other things by social interests, ideologies and administrative styles of the bureaucratic elite. In addition, it points out the value of undertaking interface analysis between project interventions and the more "autonomous" processes of change taking place at the local level or what some people call "off-stage processes". This approach can be used not only to understand, but also to transform the practice of intervention in community forestry programmes.

2.5.3 Social interface: An inevitable consequence of planned intervention

The concept of social interface

The general notion of interface conjures up an image of two surfaces coming into contact. In this study the concept of interface is being used to refer to a critical point of interaction or linkage between indigenous management systems and project interventions. The concept implies some kind of face-to-face encounter between individuals or units representing different interests and backed by different resources (Long, 1989). The interacting parties will often be differentiated in terms of power. Studies of social interfaces should aim at bringing out the dynamic and emergent characters of the interactions taking place and show how the goals, perceptions, interests and relationships of various parties may be reshaped as a result of their interaction. However, they should also explore how these interactions are affected by, and in turn themselves influence actors, institutions and resource-fields that lie beyond the interface situation itself (Long, 1989).

The tendency in most community forestry projects in Tanzania, is to conceptualize the relationship between project objectives, the means of implementation and outcomes as essentially linear in nature, implying a kind of step-by-step deterministic process whereby projects are formulated, implemented and certain results follow. Clearly as lamented by Long(1989), this separation is gross simplification of a much more complicated set of processes which involves the continuous reinterpretation and transformation of policy, both at the formulation and at the frontline by those responsible for its implementation. Furthermore, "outcomes" often result from factors which cannot be directly correlated to the project interventions.

Interface as a means of acquiring social meanings

Development interface situations are critical points at which not only policy is applied but at which it is "transformed" through acquiring social meanings that were not set out in the original policy statements. As any enlightened planner or rural development worker knows through experience, it is impossible to separate policy, implementation and outcomes into water-tight compartments. There is a considerable seepage between them and therefore a mixing of elements such that it is often difficult to say where one stops and the other begins. One solution to this dilemma seems is to concentrate one's research efforts on implementation process so that one reaches a fuller understanding of the structural dynamics and "degree of freedom" or "room of manoeuvre" associated with particular interface situation (Long, 1984).

A sounder analysis of the processes by which "target" populations respond to project interventions is necessary. Such analysis as it was done in this study, should aim at exploring how different types of households, groups and communities develop strategies for dealing with new circumstances they face due to introduction of new development initiatives. Such an approach necessarily entails contextualizing the new types of choices generated by specific interventions within the framework of the livelihood and organizational problems faced by the local people. In order to undertake such analysis one needs to document the differential responses of particular local people to community forestry interventions. This calls for undertaking a set of comparative study aimed at explaining why different people or groups react differently to apparently similar circumstances, as well as providing a detailed chronological analysis of the relations that evolve between the local people and the implementing agency. In most studies the latter is often neglected, with the assumption that the key explanatory factors are endogenous to the situation, rather than an outcome of how the intervention process has evolved in relation to specific social units. The issue of differential responses, therefore, requires a much more careful mapping out of how implementing agencies and their personnel interact and present

themselves to local people and vice versa.

It is important to resolve the serious theoretical gap in the analysis of social change in community forestry and rural development in general that results from the tendency to formulate problems either from the point of view of how local people react to project interventions without really analyzing the nature of wider encapsulating system, or from the point of view of how external forces determine local patterns of change without taking into account how the actions of local people themselves may shape the process. One way of breaking this theoretical deadlock is to carry out analysis which focus more on the interface situation that develop between local people and professionals during the implementation phase of the project. While the study of interface necessarily involves giving attention to interfactional processes and adopting an "actor-oriented" approach to understanding of social phenomena (Long, 1977 and Long, 1984), this should not, however, blind the researcher to the effects of important larger-scale structural processes (such as national forest policies, national-level power structures etc). Rather that interface studies should reveal concretely the nature of state-peasant relations in particular localities, and thus indirectly facilitate a fuller understanding of the character and significance of specific state formations.

Interface analysis emphasizes the ways in which actors' previous experiences and biographies shape their interaction with each other, leading to differing social constructions of the project. Yet, despite of these differences, the actors are nonetheless able to develop "bridges" between their life-worlds, even when these life-worlds represent major discontinuities within a particular social order. Hence processes of accommodation are not simply defined by the existence of differential relations of power and resources of authority in the society at large, but by the inherent capacity of actors to process knowledge and learn from experience, which are the hallmarks of human agency (Long, 1989). In the end, it appears that it is those who cope best with this process of defining specific interface situations and utilizing their resources to full, who come to control the organization and meaning which particular intervention take at the local level.

There is no need to emphasize the fact that the concept of "social interface" can serve as a focal point for analyzing the nature of peoples' participation in community forestry development. Such an approach would analyze participation as both an interfactional and accommodational process, linking technical and social aspects. It is therefore important that a more dynamic perception of management processes evolve and that professional foresters make explicit the social dimensions of their projects and also should aim at revealing the social meanings of the implementation process. However, a warning is necessary that one must be careful not to deposit a dualistic notion of "external" versus "internal" forces

when analyzing social interface situations.

Interface as a metaphor for depicting areas of structural discontinuity inherent in community forestry projects

The study of interface involves social actors with conflicting or divergent interests and values. In community forestry, these interfaces often occur where government or other bodies intervene in order to implement forestry related projects. The interest in interface, however, goes beyond the simple wish to document the type of struggles, negotiations and accommodations that take place between intervening agents and local actors. The concept functions as a metaphor for depicting areas of structural discontinuity inherent in community forestry and in social life generally. In other words, it sensitizes us to the importance of exploring how discrepancies of social interest, cultural interpretation, knowledge and power are mediated and perpetuated or interpreted at critical points of linkage or confrontation. Such discrepancies arise in all kinds of social context. For example, in village they may entail struggles between peasant and non-peasant interests and life-worlds; in bureaucracy, the intersection of political groupings, differing ideologies or authority levels; or in broader arena, they may involve the interplay of different "worlds of knowledge", such as those of the farmer, extension worker and scientist.

Within limits of existing information, uncertainty and other constraints (e.g. physical, normative and politico-economic), local actors are "knowledgeable" and "capable" (Chambers, et. al., 1989). They attempt to solve problems, learn how to intervene in the flow of social events around them, and monitor continuously their own actions, observing how others react to their behaviour and taking note of various contingent circumstances. Giddens (1984), points out that "agency refers not to the intentions people have in doing things" - social life is full of different kinds of unintended consequences with varying ramifications - "but to their capability of doing those things in the first place". Action depends upon the capability of the individual to "make difference" to pre-existing state of affairs. As a matter of fact, all actors exercise some kind of "power" even those in highly subordinated positions. As Giddens (1984) puts it "all forms of dependence offer some resources whereby those who are subordinated can influence the activities of their superiors". And in this way they actively engage in the construction of their own social worlds, although as Marx (1962), cautions us, the circumstances they encounter are not merely of their own choosing.

Considering the relation between social actor and structure, Giddens (1987) argues persuasively that the constitution of social structures, which have both a constraining and enabling effect on social behaviour, cannot be comprehended without allowing for human

agency. He writes: "In following the routines of my day-to-day life, I help to reproduce social institutions that I played no part in bringing into being. They are more than merely the environment of my actions since they enter constitutively into what I do as an agent. Similarly, my actions constitute and reconstitute the institutional conditions of actions of others, just as their actions do to mine. My activities are thus embedded within, are constitutive elements of, structured properties of institutions stretching well beyond myself in time and space" (Giddens, 1987:11). This embeddedness of action within institutional structures and processes does not of course imply that behavioural choice is replaced by unchanging daily routine and repertoire. Indeed, actor-oriented analysis assumes that actors are capable (even when their social space is severely restricted) on formulating decisions, acting upon them, and innovating or experimenting. Thus, although one may criticize the premises of decision-making and transactional models, social action undeniably entails the notion of choice, however limited, between different courses of action as well as some way of judging the appropriateness or otherwise of these. Indeed, as Giddens (1987) points out "it is necessary feature of action that, at any point in time, the agent could have acted otherwise: either positively in terms of attempted intervention or negatively in terms of forbearance".

Hindness (1986) takes the argument one step further by pointing out that the reaching of decisions entails the explicit or implicit use of "discursive means" in the formulation of objectives and presenting arguments for the decisions taken. These discursive means or types of discourse vary and are not simply inherent feature of actors themselves: they form part of the differentiated stock of knowledge and resources available to actors of different types. Since social life is never so unitary as to build upon one single type of discourse, it follows that, no matter how restricted their choices are, social actors always face some alternative ways of formulating their objectives and deploying specific modes of action.

It is important here to point out that the acknowledgement of alternative discourses used or available to social actors challenges, on one hand, the notion that rationality is an intrinsic property of the individual actor, and on the other, that it is simply reflects the actor's structural location in society. All societies contain within them a repertoire of different life styles, cultural forms and rationalities which members utilize in search for order and meaning (Long, 1989), and which they themselves play (wittingly or unwittingly) a part in affirming or transforming. Hence, the strategies and cultural constructions employed by local actors do not arise out of the blue, but drawn from a stock of available discourses (verbal and non-verbal) that are to some degree shared with other individuals, contemporaries and even predecessors. It is at this point the individual is

transmitted metaphorically into a social actor, thus signifying that "actor" (like the person in a play) is social construction rather than simply a synonym for individual person or human being.

One needs also to distinguish between two different kinds of social construction associated with this concept of social actor: first, that which is culturally endogenous, in that it is based upon the characteristics of the culture in which particular individuals and social groups are embedded; and second, that which arises from the researcher's or analyst's own categories and theoretical dispositions (also of course essentially cultural in that they are usually associated with a particular "school of thought" or "community of scholars"). The social construction of actors touches crucially upon the issue of agency. Although we might think that we know perfectly well what we mean by "knowledge" and "capability" - the two principal elements of agency identified by Giddens (1984) - these notions must be translated culturally if they are to be fully meaningful. One should not, therefore, presume (even if there is considerable evidence of increasing commodatization and westernization) the existence of a "universal" interpretation of agency across all societies. Cultural expressions of agency vary and reflect different philosophies regarding the capacity of individual to influence actions and outcomes.

Why interface analysis in community forestry development?

Basically there are three reasons for analyzing interfaces in community forestry development: They can help us develop a more adequate analysis of policy transformation processes; they can enable us understand more fully the differential responses by local groups (including both "target" and "non-target" populations), to planned interventions; and they may assist us in forging a theoretical middle ground between the so called "micro" and "macro" theories of agrarian change by showing how the interactions between "intervening" parties and "local" actors shape the outcomes of particular intervention policies, often with repercussions on the patterns of change at the national level.

Interface, given the way it has been defined in this study is married to an actor-oriented perspective. Interfaces typically occur at points where different, and often conflicting, "life-worlds" or social fields interact. Although the word "interface" tend to convey the image of some kind of two-sided articulation or confrontation (Long, 1984), interface situations are generally much more complex and multiple in nature, containing within them many different interests, relationships and modes of rationality and power. In summary the following are the key dimensions of interface analysis:

- (i) It focusses upon the linkage that develop between the interacting individuals or parties concerned rather than

simply on their individual strategies. Continued interaction, of course, encourages the development of boundaries and shared expectations that regulate the interaction of the actors so that over time, the interface between for example professionals and local people in a project persists in an organized way, with rules, expectations and sanctions. The establishment of such normative "middle ground" for interacting and negotiating with outsiders can, of course, be endogenously or exogenously generated. The latter usually involving intervention by some public authority that aims to set "the rules of the game".

- (ii) It draws attention to the forces making for conflict or incompatibility between the individuals or parties concerned. Although interface interactions presupposes some degree of common interest, they are also likely to generate conflict arising from contradictory interests and objectives or due to differential power. Negotiations at the interface are sometimes carried out by individuals who represent particular groups or organizations. The social positions of such representatives inevitably creates ambivalence, since the individuals concerned must respond to the demands of their own groups as well as to the expectations of those with whom they must negotiate. This of course, as Gluckman (1968) originally emphasized, is the dilemma of the village headman, workshop foreman or the student representative in university departmental boards. Yet, those who become skilled in their job, manage whenever possible, to exploit such ambiguities, may turn them to their own personal or political advantage. Therefore, in analyzing the dynamics of contradictions and ambiguities in interface situations, one should not assume that because a particular person "represents" a specific group or institution, or belongs to a particular social category, then he or she necessarily acts on the interests or on behalf of the others.
- (iii) It highlights differences in world view or cultural interpretations between the individuals or parties concerned. In fact interfaces often provide the means by which individuals or groups come to define their own cultural or ideological positions in opposition or contrast to those whom they see as espousing or typifying other views. For example, assumptions and views on community forestry expressed by extension workers and farmers often do not coincide. And the same is true for individuals working in different capacities within a single government agency or for those who work in different agencies of the same overall bureaucracy. Extensionists, credit officers and the like, may all work for one ministry, but they seldom agree on the problems and priorities of development. Such differences are not merely individual idiosyncrasies but reflect differences in patterns of socialization and professionalization that often result in

miscommunication or the clash of rationalities (Chambers, 1983). And the process is further complicated by the coexistence of several different cultural models adhered to by persons of different age, sex or status within a given population or administrative organization. This means that interface encounters involve an explicit or implicit contest over the dominance and legitimacy of particular cultural paradigms. Development intervention itself representing an attempt to promote or impose particular normative notions concerned planned change. At the same time, it is important to recognize that commitment to given normative or ideological frames or references, and to a certain types of discourse or rhetoric, are situational. They do not remain constant across all social contexts for the actors involved. An actor-oriented approach therefore, must try to identify the conditions under which particular definitions of "reality" are upheld and to analyze the interplay of cultural and ideological opposition. It should also map out the ways in which "bridging" or "distancing" actions and ideologies make it possible for certain types of interface to reproduce or transform themselves.

- (iv) It stresses the need to look at the interface situations diachronically. Interfaces change their characters over time due to, among other things, changing internal and external relationships, perceptions, resources and social investments. Diachronic processes are short-term in that changes in the constitution of interface have immediate effects on actors, but also longer-term in that interface encounters develop their own ground rules and styles of interaction and organization which over time can generate cumulative effects, leading to the restructuring of the interface itself or to the creation of new ones.
- (v) Interface analysis should not focus exclusively on the detailed study of patterns of social interaction that take place between the actors directly involved in interface situations. It should also provide the means of identifying those groups, individuals and social categories excluded from a particular interface negotiations, thus highlighting the existence of systematic forms of non-participation characteristic of marginalized groups such as poor people, certain ethnic groups or categories of women. On the other hand, the question of non-participation should not be interpreted to imply that non-participants have no influence on the constitution and outcome of interface encounters. On the contrary, they can, as "backstagers" actors, have a decisive influences on the strategies and scenarios.
- (vi) It contributes to the understanding of processes by which planned interventions enter the life-worlds of the individuals and groups affected and come to form part of the resources and

constraints of social strategies they develop. Thus so called "external" factors become "internalized" and come to mean quite different things to different interest groups or to different individual actors, whether they are "implementors" "clients" or "bystanders". In this way interface analysis help to deconstruct the concept of planned intervention, so that it is seen for what it is - namely, an on-going socially-constructed and negotiated process, not simply the execution of an already-specified plan of action with expected outcomes. It also shows that policy implementation is not simply a top-down process, as is usually implied, since initiatives may come as much from "below" as from "above". It stresses that it is important to focus upon intervention practices as shaped by the interactions among the various participants, rather than simply on intervention models, by which is meant the ideal-typical constructions that planners, implementors or their clients have about the process.

- (vii) Interface analysis allows one to focus on the emergent forms of interaction, procedures, practical strategies, types of discourse and cultural categories present in specific contexts. It also enables one to take full account of the "multiple realities" of development projects (by which it means the different meanings and interpretations of means and ends attributed by different actors), as well as the struggles that arise out of these differential perceptions and expectations. From this point of view, then, planned intervention is an on-going transformational process that is constantly re-shaped by its own internal organizational and political dynamics and by the specific conditions it encounters or itself creates, including the responses and strategies of local people who may struggle to define and defend their own social spaces, cultural boundaries and positions within the wider power fields.
- (viii) On yet another level, interface analysis can contribute to the general discussion of the state-peasant relations. Interface studies can reveal concretely the nature of state-peasant relations in particular localities or regions. They also help to identify how much political space exist for local initiatives aimed at changing the pattern of resource distribution or improving the benefits received by local groups, and in this way they facilitate an understanding of the character and significance of specific types of state structure, policy and intervention. It also highlights the process of incorporation, manipulation and subversion of power practiced by the relatively "powerless" in their struggle to defend and promote their own interests.

CHAPTER 3 RESEARCH OBJECTIVES AND METHODOLOGY

3.1 Research objectives and conceptual framework

3.1.1 Overview

From the problem statement in chapter 1, it is clear that most of the externally sponsored interventions were based on orthodox forestry techniques. Indigenous knowledge and skills were neglected. No attention was given to the idea that local people are capable of developing viable solutions to local problems based on their understanding of local situations. Partnership between science and indigenous knowledge presents a challenge to conventional positivism science, given the dynamic and strategic nature of farmers' knowledge and practices. But science must come to terms with its dynamism because this is what farmers' reality is all about. Indigenous knowledge, like scientific knowledge should be regarded as something which become possible as a result of creating order out of disorder. Even if indigenous knowledge is rarely directed towards facts of the same level as those with which modern science is concerned, it implies comparable intellectual application and methods of observations. Thus combination of scientific and indigenous knowledge or "technology sharing" may prove to be an affective development approach.

However, notwithstanding the available evidence, chapter 2, showed that community forestry planners so far did not consider indigenous knowledge and practices as a starting point for enlisting genuine participation of the local populations. Understandably, foresters in the tropics have directed their attention to externally sponsored technologies for solving the problems of deforestation. The main reason they have so focused is because the origins of community forestry are still found in "classical forestry".

It was on this background that three objectives were formulated to readdress the situation (Section 3.1.2). The first objective is geared towards demonstrating empirically the existence of a gap between internally regenerated initiatives and externally sponsored interventions. Second objective, is geared towards identifying and analyzing different interfaces of knowledge and everyday practices which actors participating in community forestry-oriented projects drew upon to re-organize and shape the project interventions at the local level. The last objective is geared towards devising the way of bridging the gap between internally regenerated initiatives and externally sponsored interventions. These objectives which are rather global were operationalized into research questions (Section 3.1.4).

Taking these research objectives as a point of departure, a conceptual framework which puts indigenous and professional forest management systems in an integrated perspective was developed (Fig. 3). Without theoretical framework to bind the facts together,

knowledge would be fragmented into collection of discrete segments of unconnected statements. With the help of theoretical framework, the "facts" in this study were made far more meaningful and enabled the researcher to construct more and more inclusive generalizations. Research performed without the guidance of a theoretical framework is usually sterile for the reason that the researcher does not know quite well what data to collect and when he/she has them, he/she cannot put them to use.

3.1.2 Research objectives

This study attempted to:

- (i) Demonstrate empirically the existence of a gap between indigenous and professional forest/tree management systems;
- (ii) Analyze how project interventions generated confrontations, as well as degrees of collaboration and participation;
- (iii) Develop a model which can bridge the gap between internally regenerated initiatives and externally sponsored interventions.

3.1.3 Conceptual framework

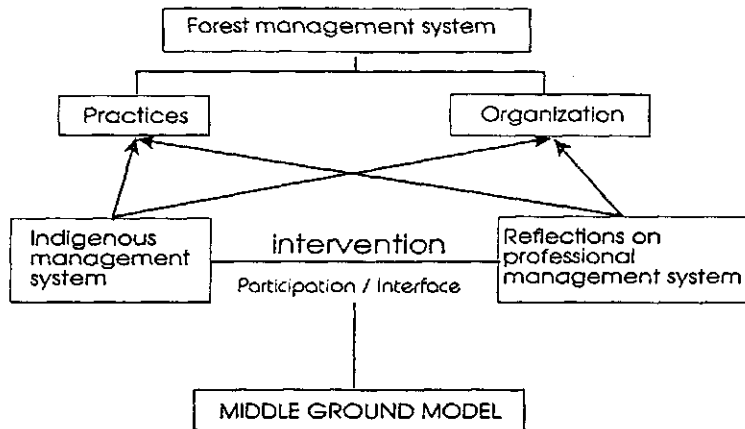
As already mentioned in 3.1.1; conceptual framework which puts indigenous and professional forest/tree management systems in an integrated perspective was developed as shown in fig. 3.

In this study, forest management system is defined as an act of making and carrying out decisions, or plans for the proper maintenance and utilization of forest resources (Duerr et. al, 1979). Decisions or plans are made by managers on behalf of the society. The term "manager" is used here loosely to refer to both professional forester and local man. In deliberated decision-making, the problem (question) is specified; alternative solutions (series of means and ends) are forecasted; and the series of great value to the management unit is chosen. In this process, means, ends and values are all determined together or by successive approximations. They are mutually determined. No single means or end has inherent value, or significance, to the management unit. Its value arises in context (i.e in whole series of which it is apart). In practice, many decisions are made not by deliberation but by reference to rules (i.e cultural tenets or intuitive feelings). All decisions are reached at least partly by non-deliberated means.

For analytical purposes, forest management systems in this study are divided into indigenous and professional. The two types of

management systems represents two ends of a continuum. In reality, many systems have elements of both internal initiatives and external sponsorship. The crucial point is the location of the initiative for setting up an organization or for institutionalizing a set of rules or practices (Fisher, 1989). In this study these points of location were pragmatically identified by the researcher on the basis of his background in professional forestry.

Fig. 3 Conceptual framework



3.1.4 Research questions

- (i) What are the existing indigenous forest/tree management practices in the study areas?
- (ii) What does indigenous forest management organization entail in terms of decision-making and control?
- (iii) What are the management practices of forestry development projects studied?
- (iv) What does professional forest management organization as exemplified by the forestry development projects under the study entail in terms of decision-making and control structure?
- (v) What are the everyday practices and interactions of key actors in the projects studied?
- (vi) How can the gap between internally regenerated initiatives and externally sponsored intervention be bridged?

3.2 Methodology

3.2.1 Research phases

The research was carried out under two phases. Phase one, which was conducted in January - May, 1991 was confined to two villages namely Mkonze in Dodoma urban district and Kibaoni-Longoi in Lushoto district. This phase was geared towards getting an overview on key issues in respect to indigenous and professional forest management systems, as well as collecting data on issues related to people's participation in the study projects. In phase two, which was carried out from April, 1992 - April, 1993, a more detailed study was conducted in which two more villages namely Zuzu in Dodoma urban district and Kwemashai in Lushoto district were added. The villages in both phases were purposively selected. A village is a social unit of at least 250 families who live in, exploit and possess a common geographical area. The majority of villages in Tanzania have 400 - 500 families, or even more.

Phase one of the study, concentrated at the household level. But phase two targeted at both household and supra-household levels. The survival strategy of the farmer is not restricted to his/her household, but also to supra-household, or common property level. When this study was started, it was assumed that the concept of participation could serve dual purposes both as a means and an end. In other words it was thought that it could serve as a methodological tool as well as an objective of the study. Paradoxically, results of phase one indicated that the concept of participation was inadequate as methodological tool for analyzing community forestry development problems and change in the study areas, because it is based on rigid and deterministic dimensions (i.e what, who and how). For that matter, a more flexible approach became indispensable. Social interface was identified as an alternative methodological tool. However, participation remained an end of the study.

3.2.2 Units of analysis and type of data collected

A unit of analysis is a unit from which information is obtained. It is a unit whose characteristics we describe (de Vaus, 1986). In Tanzania, community forestry activities take place at two levels: Household and supra-household. These levels served as basic units of analysis for this study. A household in this study is defined as a group of people who eat from a common pot. They usually share dwelling houses and may cultivate the same land. They recognize the authority of one person, the pot head or household head who is the ultimate decision-maker for the household (Poate & Daplyn, 1988). The definition hinges on four features: consumption of food, dwellings, cultivation of land and acceptance of a common authority. Supra-household level may include either an interest group or a community. An interest group can be defined as a group

of people with more or less common goal and are relatively homogenous in terms of resource endowment. A community on the other hand can be defined as a group of people living in a particular area or a group of individuals or body of people with some common characteristics. Communities are characterized by being relatively heterogenous.

In every village the village register was used as a sampling frame. In phase one, twenty five households were randomly selected in each village (i.e Mkonze and Kibaoni-Longoi) by using a table of random numbers, making a sample of fifty households. In phase two, fifty households were again randomly selected in each of the new villages (i.e Zuzu and Kwemashai), while only twenty five households were selected from phase one villages. Therefore, in total the study had a sample size of two hundred households.

Data collected at the household level were essentially on management practices and organization as well as on some aspects of participation/interface situations. At the interest group and community levels data collected were mostly on indigenous organization and some aspects of controlled utilization. Besides data collected at these basic units of analysis, data were also collected at both project and national levels. At the project level, data collected were basically on some aspects of management systems and participation/interface situations. At the national level (Division of Forestry and Beekeeping), data collected were essentially on policy issues.

An advantage of using these different units of analysis was that it was possible to cross check and verify information from various sources. As de Vaus (1986) commented "Where a number of units of analysis can be used in one study, one can be more confident in the general thrust of the results".

3.2.3 Description of research methods

A multi-method research approach was used. This approach facilitated the collection of both quantitative and qualitative types of data and information. In this way I tried to overcome many of the problems endemic to social research. This approach also led to the understanding of indigenous management systems surrounding trees/forests and interface situations more easily. Even though each of these research methods were applied individually, they were developed and used in an integrated fashion, and the resultant data were analyzed both individually and collectively.

Participant observation

Participant observation as the name implies, is distinguished by the fact that the observer himself/herself forms a part of the situation he/she is studying. In this study participant observation involved observation of the community, group, and household activities. It provided the context within which all other methods were applied, and it functioned as the initial medium for learning about social and physical environment interrelationships. Within the context of unstructured observation, a blend of activities occurred: discussions were held with residents; questions were asked about specific aspects of village life; time was spent listening to farmers talk among themselves; and the researcher and his assistants participated in some activities of farm life. The method was also used to study village extension workers.

The process of participant observation was primarily used to tie together the more discrete elements of data gathered by other methods. Thus, an iterative process between participant observation and the other research methods evolved. The other methods allowed aspects of life in the study areas to be isolated and studied out of context of the community life. Participant observation permitted these elements to be examined within the context of the social system. At times, this resulted in a more complete understanding of both the individual elements and the whole. In other situations, new questions about life in the study areas emerged.

The surveys

Six interviewers, four men and two women (two men and one woman were undergraduate forestry students at Sokoine University of Agriculture) were hired to carry out the formal surveys. The interviewers were first introduced to the purpose of the study and the survey instruments. They were also trained in interview techniques, primarily through practice sessions where they interviewed each other in a role-playing situations. This training also provided an opportunity for the interviewers to comment on the survey language and initiate changes in the survey forms.

The survey forms were designed in such a way that they contained questions in the following order: Classification; factual and opinion (Appendix 1). With regard to classification questions, interviewers were advised to explain the purpose of such questions in simple language to the informants. Classification questions were on aspects such as age, education, marital status etc. These types of questions were essential for relating given views or facts on the subject matter of the survey to the kind of people who have been interviewed. In short, classification questions were asked chiefly to provide information by which the main groups of respondents could be distinguished in the analysis.

The majority of questions asked in this study were concerned with facts. In saying this, the word "fact" is being used here in a wide sense. For instance, the question "how many livestock units do you own?" is factual question, although the answers given could be a mixture of fact, wishful thinking, vague, or even a desire to give the answer the interviewer is believed to be looking for. Thus the adjective "factual" refers to the type of information the question seeks, not to the accuracy of the answer. So to describe a question as "factual" does not imply that the answers given are necessarily accurate.

Interviewers were cautioned that they should be sensitive when administering opinion questions because answers to opinion questions are more sensitive to changes in wording, emphasis, sequence and so on than are those to factual questions. Opinion questions are many sided, and questions asked in different ways tend to generate different aspects of the opinion. To overcome this problem, the interview contained several repeated, but differently phrased questions as a means of checking the validity of the answers. Also answers were counter-checked with the actual field observations.

The researcher visited the interviewers during the actual execution of the work after every two weeks to see if the work was continuing as planned. The visits were also used to solve some of the field problems encountered.

Tree inventories

Tree inventories were carried out in the agricultural lands owned by heads of the households which participated in the surveys. In these inventories the farmer was the teacher, and he/she identified trees present in his/her land (both exotic and indigenous) along with their uses and how they are regenerated and tended. The farmers were especially very elaborative in the ways they regenerate some indigenous tree species to the astonishment of the researcher. Farmers in most cases named the trees in their local languages, and the names were later translated into latin with the help of the check list developed by Westman (1988) for Trees and shrubs in Dodoma district which gives both Gogo and latin names for a number of species. For Lushoto district, a check list developed by Johansson and Msangi (1988) was used, which gives names for a number of tree species both in Sambaa language and in latin. For those species which couldn't be directly translated, specimens were taken to the Silvicultural Research Station, Lushoto or to Sokoine University of Agriculture for identification by Botanists.

Social interface approach

Participation was inadequate as methodological tool in this study because it is essentially based on "Etic approach"; i.e "the problem" is described in the language of the researcher (what, who and how). On the other hand Social interface approach is based on "Emic approach". The Emic approach is concerned with interpreting the situations as they are presented by the respondent. For further elaboration on these approaches i.e etic and emic, the reader is referred to Harris (1968). Through the use of social interface approach it was possible to understand the social meanings of the transformations that were taking place that were not set out in the original project goals. Similarly, through this method I was able to explore how different types of households and groups of farmers develop strategies (by using their indigenous knowledge) for dealing with new circumstances they face due to introduction of new development interventions. Also through interface approach, I came to understand at least the relationships between implementing agencies and local actors. These relationships refer to the ways in which different actors interpret and confront new situations in an attempt to create space for organizing their own livelihood strategies.

The aim of using interface approach in this study was to bring out the dynamic and emergent characteristics of the interactions taking place and show how the goals, perceptions, interests and relationships of professionals and local people were being reshaped as a result of their interactions. Interface approach served as a focal point of understanding the nature of people's participation in forestry development projects as both interactional and accommodative process. In this way it was possible to get in grip with the social meaning of the implementing process. Social interface as it was used in this study didn't focus exclusively on the patterns of social interaction that took place between the actors directly involved in the interface situations. It also provided the means of identifying those individuals and social categories excluded from project activities thus highlighting the existence of systematic forms of non-participation characteristics of marginalized groups. As such, the question of non-participation should not be interpreted to imply that non-participants have no influence on the constitution and outcomes of the interface encounters, on the contrary, they can, as "backstagers" actors, have a decisive influence on the project interventions.

Detachment and Reflections

When this study was planned, it was thought that data on professional forest management system would basically be collected by interviewing village extension workers who were assumed to represent the projects and hence the professional foresters' point of view. Paradoxically, in the process of carrying out the study,

it was realized that in actual sense village extension workers were the "middle actors"; they are between project officials (supervisors and researchers) and the farmers. In short they were found not to be the representative sample of the professional foresters.

As a result, the researcher himself being a professional forester had to apply a detachment method along with some informal discussions with some project supervisors and researchers. Detachment as a method in social research requires the researcher not to let his/her emotions intrude. Thomlinson (1965) argues that "if we want to understand what makes our social world, we must study human behaviour with the same "detachment" as does the chemist regarding a reaction in a test tube". Forestry as a profession is always normative. It is based upon the fact that its members carry in their heads, as part of the professional ethic, the notion that they ought or ought not to do certain things. To question the sentiments lying behind a profession is controversy. A person who tries in his/her own thinking to escape his/her moralistic system in order to study it objectively is quickly branded as an agnostic, cynic, traitor, or worse. Instead of getting professional support for his/her work, he/she must count on blames. Therefore, detachment as a method to solicit data on professional forest management systems in this study was carried out with this fact in mind.

Essentially the researcher tried to question some of the theories he learned in his professional training. But also when discussing with his fellow professional foresters he tried to act as an outsider so as to get their point of view.

Documentary material

A number of published and unpublished documents were consulted both at the projects studied, Sokoine University of Agriculture, and at the Forestry and Beekeeping Division, Ministry of Tourism, Natural Resources and Environment, Dar es salaam. Such pre-existing data were both qualitative and quantitative. The data from documented material served dual purposes: first, they saved considerable time and expense and secondly they acted as check points for the primary data collected from the field. No need to emphasize that studies which involves social change like this one, dictates the use of factual material covering a lengthy time span, and for that matter historical documents must be consulted.

2.2.4 Data analysis

Basically three methods were used to analyze the data: Statistical analysis of quantitative data and content and structural-functional analysis of qualitative information.

Statistical analysis of quantitative data

Quantitative data were analyzed by using the Statistical package for social sciences (SPSS). The first stage involved preparation of the variables so that they were in a form suitable for addressing the research questions and the methods of analysis used. Coding was part of this task and opportunity was taken sometimes to change the order of categories, or even collapsing some categories.

The second step was to explore the data for distribution of responses, central tendency and dispersion. For every question I wanted to know the range of distribution of replies given, the existence of any concentration or central tendency in those replies, and the shape of distribution or extent to which replies were clustered around the central point. In other words the task was to classify, summarize and explain.

Most of the analysis described above falls under the domain of descriptive statistics. However, in this study an attempt was also made to cover the second domain; inferential statistics. The function of inferential statistics was to provide an idea about whether the patterns described in the samples were likely to apply in the population from which the samples were drawn (de Vaus, 1986). In this regard, multiple regression equations were developed to show the relationships between socio-economic factors and tree growing and retention efforts. "Effort" is defined in this study as a "conscious exertion of physical or mental power or a serious attempt used either to plant or retain a tree in the farm". The effort is indicated by the actual number of trees planted or retained.

The general model used was:

$$Y_i = b_0 + b_1x_1 + b_2x_2 + b_kx_k + e_i$$

N = Sample size

Y_i = The i^{th} observed value of the dependent variable

x_1 to x_k are independent variables

b_0 = Intercept

b_1 to b_k are independent variable coefficients

e_i = Random disturbance error

$i = 1, 2, \dots, N$

Specifically, the hypotheses tested were:

$H_0: b = 0$; against

$H_1: b \neq 0$

A two tailed t-test at 0.05 level of significance was chosen; i.e H_0 : was rejected only where $P < 0.05$. In postulating relationships among dependent and independent variables in this study, linearity was assumed. Of course, this assumption is not always correct. However, its adoption at least as a starting point, might be justified on several grounds: first, numerous relationships have been found empirically to be linear; second, the linear

specification is generally the most parsimonious; third, the theory is often so weak that we are not at all sure how the non-linear specification would be (Lewis-Beck, 1983).

Similarly, in developing regression equations, research questions dictates whether one emphasizes prediction or explanation. Regression equations developed in this study emphasizes explanation rather than prediction. Also multiple regression was preferred to simple regression due to the fact that, first, it almost inevitably offers a fuller explanation of the dependent variables, since very few phenomena are products of single cause. Second, the effects of a particular independent variable is made more certain for the possibility of distorting influences from other independent variables is removed.

The regression coefficients tells us how much impact one variable has on the other. The precise interpretation is that for a change of one unit of x , y increases by b amount (or decreases if b is a negative number). However, to assess the goodness of fit of the multiple regression equations developed, the coefficients of determination were employed (i.e. R^2). Coefficient of determination tells us how strong the relationship is. Coefficient of determination, acts as an index of assessing how much reliance we should place on our regression estimates (de Vaus, 1986). If R^2 is high we can have considerable confidence in the regression estimates.

In this study both non-standardized and standardized equations using **partial regression coefficients (b)** and **beta weights (b*)** respectively were developed. Normally when making predictions the non-standardized equations are used. Standardized figures are used more when trying to assess the relative impact of each independent variable. Standardized partial regression coefficients (beta weights) can be compared with one another and work out which variable has the greatest impact. Standardized partial coefficients are the ones used to explain different phenomena in this study (chapter 5 and 6).

The importance of multiple regression analysis lies not in its statistical sophistication but in its value in testing complex theoretical models. Its potential is realized when it is preceded by careful, theoretical reasoning. The sophistication of a technique is no substitute for theoretical sophistication. The value of multiple regression analysis in this study is that, it enabled the researcher to take the notion of multiple causation of phenomena under the study seriously and escape Durkheim's idea that each effect has only one cause (de Vaus, 1986).

Content and structural-functional analysis of qualitative information

Content analysis was used to analyze in detail the components of verbal discussions held with professional foresters, village extension workers and farmers in an objective and systematic manner. In this way the recorded dialogue with the respondents was broken down into the smallest meaningful units of information or themes and tendencies. This helped the researcher in ascertaining values and attitudes of the respondents.

Structural-functional analysis sought to explain social facts by the way in which they were related to each other within the social system and by the manner in which they related to the physical surroundings. Structural-functional analysis as applied in this study helped to understand the presence and the persistence of many social problems. This type of analysis enabled the researcher to distinguish between manifest and latent functions. Manifest functions are those consequences which are "intended and recognized by the actors in the system"; Latent functions are "those which are neither intended nor recognized" (Thomlinson, 1965). For example, a manifest function of a village extension worker is to advise the farmers; a latent function is to act as a "broker" between the farmers and the project officials.

3.3 Summary

Generally, this chapter pointed out the need to demonstrate empirically the existence of a gap between local people initiatives and externally sponsored interventions. The chapter, points to the fact that the gap can only be bridged if different actor categories are identified and carefully studied. The chapter underscores the need for theoretical framework to guide the research. Without a theoretical framework to bind the facts together, knowledge would be fragmented into a collection of discrete and meaningless data. The chapter emphasizes the need for carrying both quantitative and qualitative types of analysis so as to escape the trap of treating people as numbers and to forget that each unit represents a living, feeling person.

CHAPTER 4 DESCRIPTION OF THE STUDY AREAS

4.1 Justification as to the choice of the study areas

The following four factors were instrumental in selecting the study areas:

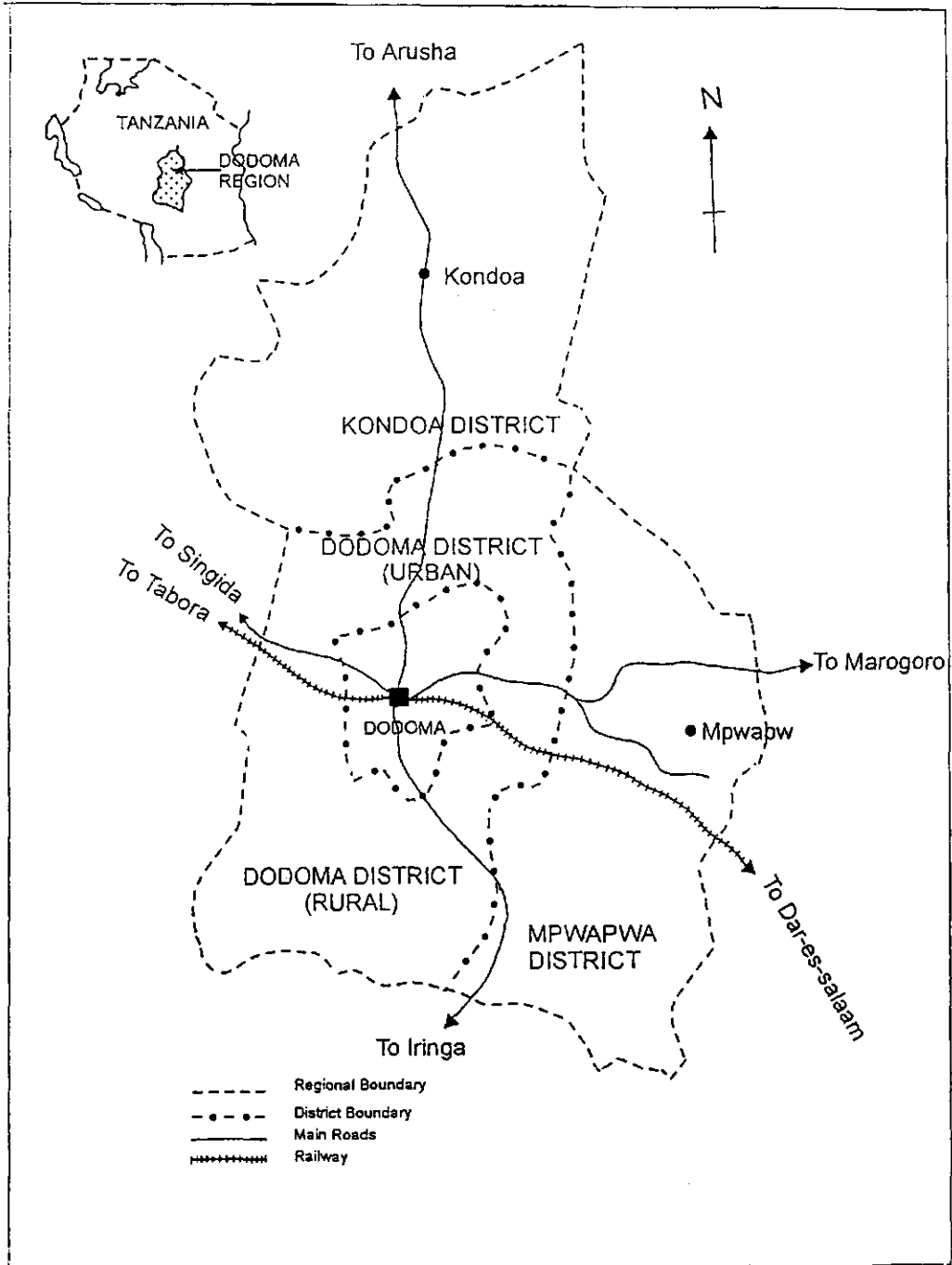
- (i) The two districts were drawn from two distinct climatic zones of Tanzania. Dodoma urban district has semi-arid type of climate while Lushoto district has a highland type of climate. Therefore the two districts represents to a great extent most of the areas where community forestry activities are carried out in Tanzania.
- (ii) Dodoma urban district has been relatively more affected by the villagization programme than Lushoto. Operation Dodoma, as a process of nucleation, began in 1971, two years before villagization became a national programme. The two districts therefore were expected to show implicitly how the villagization programme might have influenced forest resource use and management.
- (iii) The two districts have projects which deal with aspects of community forestry i.e Dodoma Village Afforestation Project (DOVAP) and Soil Erosion Control and Agroforestry Project (SECAP) for Dodoma urban and Lushoto districts respectively. These projects offered very useful case studies.
- (iv) Lastly, though not least, the researcher was familiar with both districts, a factor which facilitated the fieldwork.

4.2 Dodoma urban district

4.2.1 Geographic and socio-economic description

Dodoma urban district is one of the four administrative districts of Dodoma region, other districts are Dodoma rural, Kondoa and Mpwapwa (Fig. 4). The district covers an area of 2576 km². Besides Dodoma town, the district also includes 32 villages surrounding the town. Dodoma urban district has a population of approximately 117,000 people. The rural population is dominated by the Gogo, but many people from outside the district have also moved in, especially in villages near Dodoma town. The Gogo are Bantu-language group of mixed ethnic origin who moved into "Ugogo" (Central part of Dodoma region) during the 18th century (Christiansson, 1981). The Gogo live in what may be called a "marginal" agro-ecological environment. This is manifested by erratic and unevenly distributed rainfall, periodic droughts, floods and famines. These environmental factors have distinct consequences upon residence, spatial mobility and social relationships in general.

FIG. 4 LOCATION OF DODOMA URBAN DISTRICT



The Gogo are sedentary but to a certain extent are also mobile who subsist upon sorghum and millet grain crops, but who also have considerable numbers of livestock. Several aspects of their culture, especially kinship relations, are bound up with the possession and exchange of livestock, particularly cattle. Livestock is the most important form of heritable property, land is not. Livestock are never regarded as a consumption goods but can be exchanged for agricultural products within the local economic system. The cattle produce protein in the form of milk and meat. Under famine conditions Gogo also practice bloodletting. Milk production amounts to 1-2 litre per cow per day during rainy season but drops to a very small amount during the dry season.

An important factor with ecological as well as socio-economic implications is the "cattle trusteeship system". This means that the stock owner gives temporary disposition of one or more animals to a stock trustee. Thus, of the total number of animals in the herd, only a part is the property of the homestead owner. Some advantages of this system are: a network of social and economic relations, involving individuals and kin groups, is created and maintained; if fatal droughts or diseases hit a particular area, part of the capital of the cattle in that area will be saved through the trustee system; and the system helps to relieve certain areas from excessive grazing pressure. During the wet season the cattle are usually grazed near the homesteads. When the streams and ponds dry-up during the dry season the "heroes" move great distances looking for water and grazing. Nowadays, many dry-season grazing areas are being transformed into semi-permanent agriculture. It is not uncommon that stock are now kept near settlement areas until the grass is completely exhausted. This factor among others is one that may be used to explain trends in environmental degradation in Dodoma.

Although agriculture is an (unreliable) basis of subsistence, usufructuary rights in land are not inherited (Gerden et. al, 1988). The localization of descent groups does not occur on the basis of rights to a certain piece of land. Furthermore, for the mobile Gogo, rights in grazing and water are free for everybody. Nobody "owns" any of the scarce water resources. Gogo cultivate several varieties of sorghum and bulrush millet. Different grains are known by the Gogo to be suited to distinct soil types, and also to be resistant in varying degrees to crop pests. The soils are classified by the vegetation on them and the colour and texture of the soil itself.

The Gogo nowadays live in villages. However, until the beginning of the 1970s the Gogo, like the majority of the rural population in Tanzania, were living in dispersed homesteads. Each homestead consisted of one or more production units (households). The homestead group had well defined internal organization. Beyond this grouping, the Gogo seem to lack any broad traditional political cohesion. The Gogo themselves point at the multiple origins of

their clans to explain this fact (Gerden et. al, 1988). The only organizational structure beyond the homestead groups are the tiny ritual areas - chiefdoms - with geographical boundaries within which certain clans have ritual authority. Traditionally, the head of the chiefdom, the "Mtemi" leads the seasonal ritual of rain-making and fertility within the area. He had the power to prevent certain resources from being used for certain periods. However, he can do so only for reasons of religious nature.

Several studies have concluded that the Gogo living patterns were a good adaptation to the prevailing marginal conditions (rainfall ranges from 450 - 700 mm) (Christiansson, 1981; Gerden et.al, 1988). During the first half of the 19th century a certain balance is said to have existed and degradation of land was probably never serious. However, many reports show that famines still frequently occurred, particularly in years of drought and locust invasions (Gerden et. al, 1988). When the "balance" was disturbed by the external influences, the Gogo society started using marginal lands with the resultant land degradation.

The historical events that prevented the free movements of the Gogo and reduced the available grazing areas and hence land degradation are four:

1. The caravan trade

The caravan trade with its enormous food requirements increased the pressure on the land. Between 1860 - 1885 about 400,000 - 500,000 people per year passed through Ugogo along the caravan routes (Gerden et. al, 1988). Opportunities to buy ivory and slaves brought travellers beyond the coastal hinterland. The heavy food and firewood requirements of thousands of travellers led to a clearance of new areas of woodland and cultivation of marginal lands without any conservation measures. In such semi-arid type of climate the result was soil erosion. In the mid 19th century, the Ugogo was said to be covered by a mosaic of deciduous thicket, open grass areas and small cultivated clearings surrounding scattered settlements. Large areas were also covered by dry woodland of miombo type. Burton (1860; in Garden et al, 1988), writes about "the jungle and forests of Ugogo." With the expansion of the caravan trade the woodlands disappeared completely within large tracts. Scarcity of firewood forced both the local population and the caravans to use grass and cow dung as a substitute. With the dwindling of the woodland was so do the water. The total rainfall did not decrease, but due to land degradation, rainfall became less effective than it used to be. Regeneration of woodland on fallow fields was prevented by short fallow cycles and by the high demand for firewood and charcoal. The extensive utilization of the land for cultivation means less areas available for grazing. Furthermore, there was competition of the pasture areas between local herds and sizable herds brought along by some of the caravans. During the late 1880s the food situation was reported to become worse. *"the main reason for this must have been a successive*

lowering of the production potential including acceleration of soil erosion caused by deforestation and overexploitation of the agricultural land" (Christiansson, 1981). Around 1910 Ugogo definitely lost its role as an important producer of agricultural products to become an area that imported large quantities of food in the form of famine relief (Garden et. al, 1988).

2. The colonial period

Both during the German and British colonial time, a number of development projects were formulated for the Ugogo area. most of these were geared at making the Gogo more "agricultural", making the population sedentary and creating villages. This - as has been pointed out above - inhibited freedom of movement, social structures and the value system of the Gogo. In fact, it threatened what was the Gogo way of survival under harsh conditions. It should be noted that "still Dodoma is climatically the most unsuitable area for arable agriculture in the whole of Tanzania". Anti-erosion programmes carried out in Ugogo during colonial time included - apart from destocking - contour ridging of cultivated land, contour banking of uncultivated land, gully control, reforestation and resettlement. Rigby (1969), writes about the colonial agricultural programmes in the following way "...It took several years of crop failure, before policy came around to accepting pastoralism as a basis for development in this area. The solution eventually reached is really a modification of traditional Gogo economic practice, obviously the best suited to conditions in their country. The idea that modern techniques, machinery and money are all that is needed to transform desert of dry steppe into a Garden of Eden dies hard".

3. The railway

The central railway line was built in 1896 and railway engines needed fuelwood (especially from large trees). Over the years this was to have a profoundly adverse effect on the ecology of Dodoma, and already in 1917 there were reports of Greek and Indian firewood contractors denuding the trees of the country (Capital Development Authority, 1975). The last factor, was villagization. This is probably the main event in Ugogo since independence. "Operation Dodoma" started on large scale in 1971. By September, 1973 the whole population in Dodoma district (Dodoma district here refer to both urban and rural) had been moved into 142 villages. Most of the villages were concentrated on the central belt (about the third of the district). Before the movement, this area had a much higher population density than the rest of the district. Thus, about 90 % of the population of the district was concentrated in one-third of the total area. This changed the man-land ratio unfavourably. The new, concentrated, permanent way of living has meant that the areas close to the village settlements are endangered by overcultivation and overgrazing as well as deforestation. With the present agricultural techniques, the concentration of the population in the central belt makes it difficult to maintain the existing production capacity. The new villages had on the average 400 households, some with more than 1000 households. It was difficult to find enough

areas of agriculturally suitable lands adjacent to the new village sites.

The Gogo were attracted to move to the new villages by one important promise by the government: "clean water would be provided to all". The implementation of this promise has met difficulties. Ugogo is devoid of permanent surface water, except a few reservoirs. The ground water resources are sparse, and in most cases of low quality (saline). The independent Tanzanian peasant society was characterized by small scattered farming units. Simple hand tools were used and the production was mainly consumed by the production unit (the household). This economy seldom gave any surplus. Villagization was launched to increase production (through mechanization) and facilitate division of social services (water, schools, dispensaries, etc). This study was not intended to assess if villagization policy has achieved or not the said objectives in Ugogo. I confine myself to the conclusion that the concentrated settlements have further strained the natural resource base and the traditional semi-pastoralist living patterns of the Gogo. One observer (Rigby, 1977 in Gerden et.al, 1988), who has studied the Gogo society in depth, expressed his view in the following way: "From the Gogo point of view, villagization was an ecological, economic and social impossibility, as well as a disaster"; and this may still prove to be the case.

4.2.2 Dodoma Village Afforestation Project (DOVAP)

Dodoma Village Afforestation Project (DOVAP), started in 1987, under the Labour Intensive Public Works Programme (LIPWP) of the Prime Minister's Office (PMO), and implemented by the Forestry Department of the Dodoma Municipal Council. The long term objectives include among others, the release of the present perceived fuelwood scarcity in the villages; awareness raising among villagers; rural employment generation and soil erosion control. Establishment of 714 ha of village woodlot in pilot villages namely: Mkonze, Zuzu, Matumbulu and Ntyuka; protection of the natural vegetation and training of the local staff were the components of the project activities in the original set up. According to the project document, during the implementation of phase one, 90 % of the labour was supposed to be paid by the project while 10 % would be provided on self-help basis by the villagers.

However, based on the project experience and consultancy reports, a more participatory approach was adopted. This approach was said to be based on a step-wise development methodology which includes three steps:

- (i) Setting organizational structure at the village level:
Initially both formal and informal discussions are held with the villagers to introduce the project. Information about the

ecological situation and land use practices are collected through organized discussions and observations. The village government is then asked to establish village committee on tree planting and land-use management. The committee in turn selects in cooperation with the project, a villager who can serve as an extension agent. The extension agent is supposed to represent the project and coordinate the activities at the village level.

(ii) Selection of target groups

Secondly, the project selects specific target groups among the villagers. These target groups are identified and selected to develop with special guidance from the project, agroforestry systems specifically geared towards the local situation. Also the project identifies 8-10 contact farmers in each village.

(iii) Evaluation of the target group's activities

In the third step, the activities of the target groups are evaluated by the project staff, target group members and members of the village committee on tree planting and land-use management. Based on the results of the evaluation, a plan of action is made to implement the findings among other members.

The project was evaluated in 1990, and a second phase was recommended and approved (1991 - 1994); and as a result, another four villages namely: Kikombo, Chololo, Gawaye and Mbabala B have been added to the list.

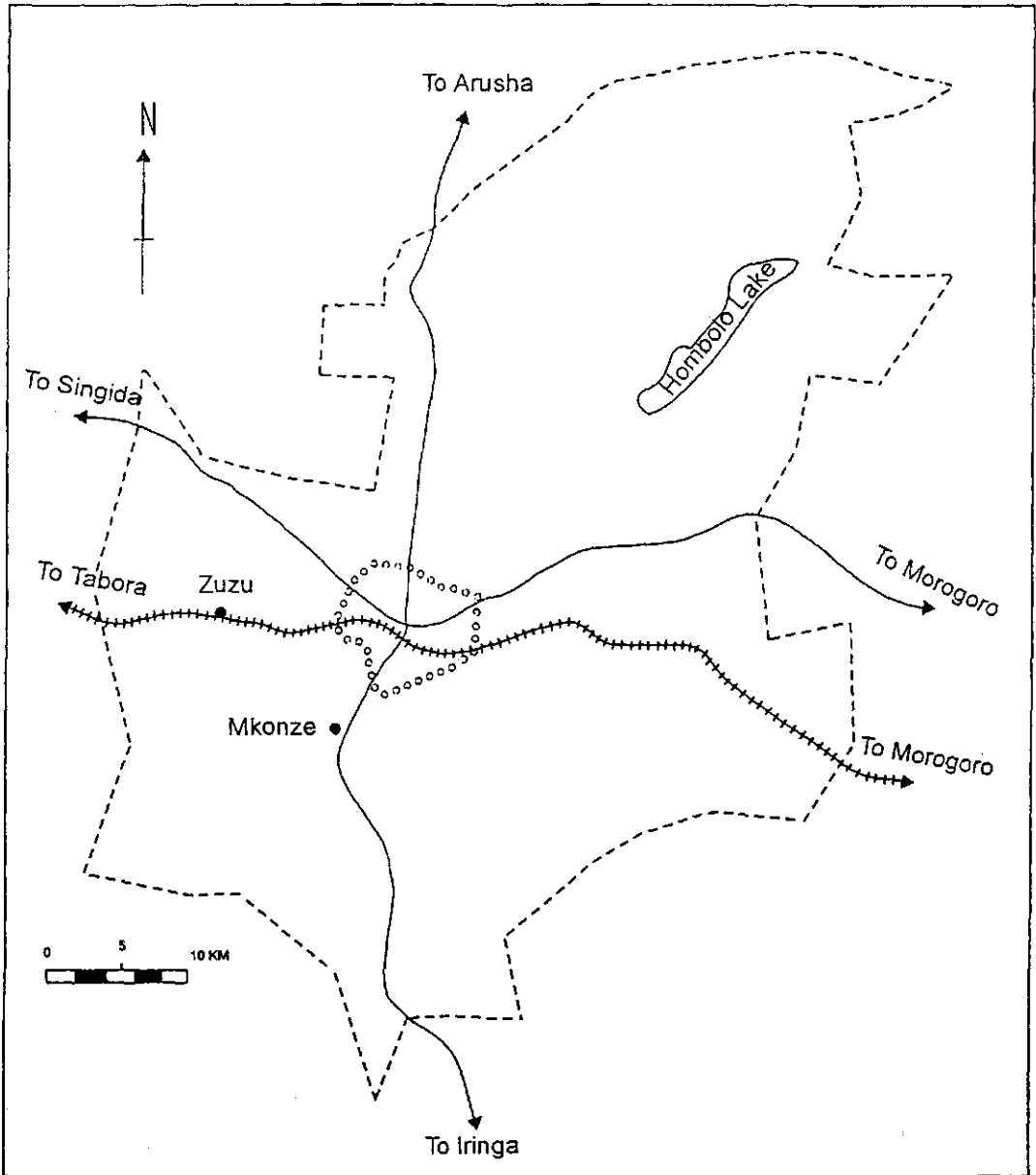
4.2.3 The study villages

The study in Dodoma urban district was conducted in two villages namely Mkonze and Zuzu (Fig. 5). These two villages were among the first villages under project.

(a) Mkonze village

Mkonze village is located at about 20 km south of Dodoma town. It is connected by a permanent road going to Iringa. The village is a traditional one, but its size increased considerably in 1972, as a result of villagization policy, whereby other surrounding villages were required to move to Mkonze. The size of the village is estimated to be 3300 ha, with a population of 2587 people (Fieldwork, 1991). Among the population, 1480 are working people with the rest being either young, old or disabled. The village has about 600 households with an average of 6 members per household. The livestock population is estimated to be about 1315 livestock units. The soils are mainly sandy loams with a central band of alluvial sands and sand clays. Vegetation is open grassland and open woodland. The main economic activity is arable farming. The main food crops grown are: millet, maize, groundnut, peas and cassava. Others are rice and sweet potatoes. Tomatoes and

FIG.5 DODOMA URBAN DISTRICT : STUDY VILLAGES



DODOMA MUNICIPAL COUNCIL BOUNDARY

----- Municipal Boundary

oooooo Dodoma Urban Area

sunflower are grown as cash crops. In terms of social facilities the village has a primary school and soon is going to get a health center.

(b) Zuzu village

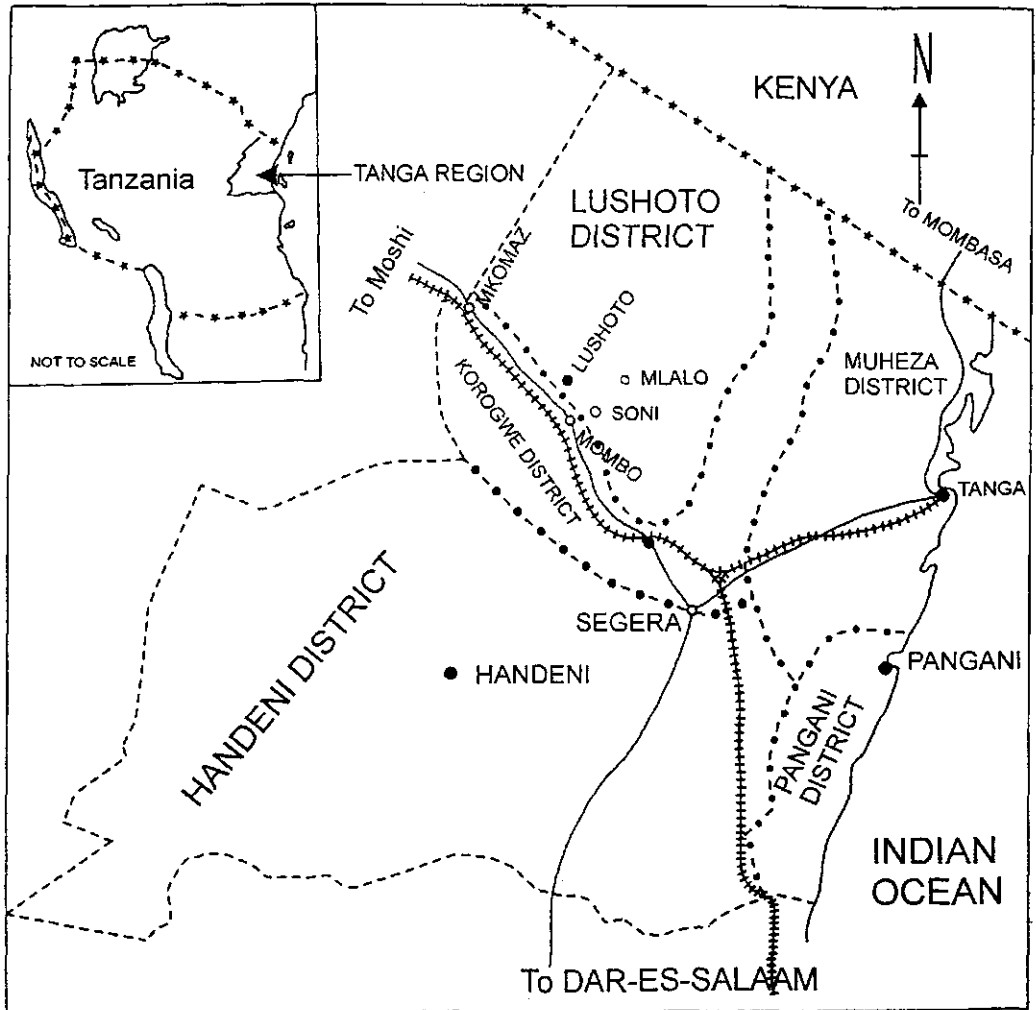
Zuzu village is located at about 14 km west of Dodoma town. It is connected to the town by a central railway line and a permanent road going to Singida. The history of Zuzu village goes back to 1930s, when a few people started to settle in the area. By 1957 there were about eight families apart from railway line staff members. As a result of the villagization policy, in 1972 people from other villages migrated to Zuzu. At the time being, the village has a population of about 2948 people (Fieldwork, 1992), with 1587 being working people. The rest are either young, old or disabled. The village has about 500 households, with an average of 6 members per household. The livestock population is estimated to be 2270 livestock units. Soils are mainly sandy loams and sandy clays. The vegetation is open grassland and open woodland. The main economic activity just like Mkonze, is arable farming with millet, maize, groundnut, peas, cassava and sweet potatoes as the main food crops. While simsim and sunflower are grown as cash crops. In terms of social facilities, the village has a primary school.

4.3 Lushoto district

4.3.1 Geographic and socio-economic description

Lushoto is one of the six districts of Tanga region, other districts are: Korogwe, Handeni, Pangani, Muheza and Tanga (Fig. 6). The district covers an area of 2500 km². Lushoto district is in the western block the Usambara mountains. Together with their lower slopes, the mountains occupy about 90 % of the total land area of the district (Mwihomeke, 1987). The Lwengera valley separates these mountains from their counterparts to the east, which are essentially low lying (< 1200 msl). The Western Usambaras are the main block. They consists of an uplifted block of highly folded, metamorphosed volcanic rocks. They rise from the surrounding plains at approximately 600 m altitude and has an irregular eastward sloping upper plateau surface at about 1300 to 1900 m, the maximum altitude is 2300 m. The population of 280,962 people is dominated by the Sambia who make up approximately 80 % of the population. This group has been living in the area since the eighteenth century. Around 1900, the population was small, probably around 15,000 people or 7 to 8 persons/km² (Lundgren, 1980). They practiced farming techniques which were generally considered to be "progressive" (Buchwald 1896 in Lundgren, 1980). In addition to shifting cultivation, also fallow irrigation was practiced.

Fig. 6 LOCATION OF LUSHOTO DISTRICT



- * - * - International Boundary
- - - - - Regional Boundary
- Main Road
- + + + + + Railways
- . . . - District Boundary

At the end of the 1890s the first official development endeavours were started by the German colonial government. These consisted of the introduction of European agricultural crops, like potatoes and vegetables as well as cash crop, coffee. In the 20th century, indigenous farming experienced a process of involution rather than evolution and a slow process of pauperization apparently occurred (Wiersum, et. al, 1985). In this period, the population started to grow rapidly due to the cessation of tribal warfare under the colonial government and the introduction of "modern" medicine. In the plains of the district, the population density is lower than in the mountains. The population of Lushoto district grows at the rate of 2.8 (Lundgren, 1980). An active outmigration takes place in the district, essentially by men; and as a result the sex ratio is 0.87 (Wiersum, et. al, 1985). Per household there are on average 7 persons consisting of man with one or more wives and children. Normally labour division occurs with men being responsible for land clearing, tillage and harvesting cash crops. Women are in charge of household fuelwood collection - which takes about 17 % of the 64 hours working week (Fleuret & Fleuret, 1978), the harvest of food crops and local marketing. The labour for sowing and weeding is commonly shared by both sexes. On average, a family can provide yearly 625 persondays of labour input for productive purposes. (Wiersum, et al, 1985).

Lushoto district receives rainfall on bimodal pattern, with short rains in October - December and long rains in March - June. The short rains accounts for only 25 % of the total annual rainfall, and are less reliable than the long rains (Darnhofer, 1983). They are however, the most important for growing seasonal and annual crops like maize and beans adapted to the temperature greater than 20 °C, because such temperatures are prevalent in the Western Usambaras from October - March. The heaviest period of long rains occur in April when the Intertropical Convergence Zone (ITCZ) is located between 3 °S, and 3 °N (Mwihomeke, 1987). Rainfall varies with orographic effects in the Western Usambaras. At higher altitudes there is higher rainfall. Lushoto (1560 m) receives 1050 mm of mean annual rainfall, while Mombo (800 m) receives 611 mm. High rainfall occurs in areas located to the east and southeast which are the first to receive moisture-laden south-easterly trade winds from the Indian ocean. These winds become drier as they approach and pass over the western areas.

The natural forest vegetation of the West Usambaras consists of three main types: Lowland forests below 750 meters above sea level; the intermediate evergreen forest (submontane evergreen forest) from 750 - 1400 meters altitude and the highland evergreen forest above 1400 meters above sea level. The intermediate evergreen forest is the most luxuriant forest type of the area with many endemic species. In the mountain area of 1973 km² this forest vegetation is presently mainly restricted to the 340 km² of forest reserves. Part of these reserves, have been transformed into industrial forest plantations. Of the remaining 1633 km² about 160

km² of land is badly eroded; consequently only about 1473 km² of land is available for subsistence and commercial farming plus grazing and for settlement.

The dominant crop production system in Lushoto district is smallholder rainfed cultivation of maize, beans, vegetable crops and temperate fruits (plums, apples, pears and apricots). Other important crops are: Sweet potatoes, cassava, bananas, sugarcane, white potato, taro and yams. Coffee is also grown on smallholder plots. Tea is grown mostly in commercial plantations although smallholder farmers are encouraged to grow it. There is high potential for the introduction of other agricultural crops like wheat, sorghum and finger millet; because ecological conditions are rather conducive to these crops (Mwihomeke, 1987). Maize and common bean are major food crops grown. The yield of maize, however, is far below the average level possible for the low input rainfed cropping systems in the tropics (Landon, 1984). The inherently low and declining soil fertility, poor crop and soil management practices, the continued use of poor crop varieties and environmental hazards particularly the frequent droughts and occasional damage on the crops by strong wind, insect pests and diseases are considered to contribute to the poor performance (Mwihomeke, 1987). The burning of debris and the intensive soil cultivation during site preparation and weeding in maize and beans fields are blamed for soil erosion and the increasing rate of decline of soil fertility (Mwihomeke, 1987).

Cassava, sugarcane and fruit trees are interspread on farms where annual crops like maize and beans are grown. Sugarcane and fruit trees are important cash crops in the district. In addition they are useful for soil erosion control on steep slopes if they are properly planted. Cassava is an important reserve food crop in Lushoto district because of its drought hardiness, yields well on soils with poor fertility and high acidity unfavourable for other crops. Sweet potato is cultivated in more or less the same field conditions as cassava. It is planted on fallow croplands or on sites with poor soil fertility and unsuitable for high nutrient - demanding crops such as maize. Mounds and contour ridges are the most common methods for cultivating sweet potato in the district. White potato and taro are mainly grown in the valleys where soil moisture conditions are conducive for the growth of these crops. These crops together with vegetable crops receive better management than the major food crops, maize and beans. Modern farming practices using mineral and cow manure fertilizers, terraces and irrigation are applied to these crops, partly because these crops are raised in small manageable plots and because these crops provide high profits to farmers.

The shade tolerant bananas and coffee are grown with interspersed trees. Areas bearing these crops account for only 3 % (Mwihomeke, 1987). Yields are comparatively lower than on the slopes of Mounts Kilimanjaro and Meru. This is attributed to low soil fertility in

the West Usambaras, but also less effective management practices are likely to contribute to the contrast (Mwihomeke, 1987). With increasing shortage of land shade tolerant crops like banana and coffee are likely to gain importance in the district.

Livestock production in the district has declined sharply following the increasing excision of grazing land for crop production. High animal stocking is indicated for the 1930s (Wiersum, et. al, 1985), but recently it has estimated that the average household owns 4 livestock units. Shortage of livestock has led to critical shortages of animal protein derived from meat and milk, and unavailability of manure needed for improving soil fertility in croplands. To readdress this situation, livestock improvement in the district is emphasized alongside crop production and tree planting (TIRDEP/SECAP, 1988). Particular attention is paid to improving both the quantity and quality of fodder, stall construction and providing farmers with improved breeds of cattle and goats for dairy and meat production.

4.3.2 Soil Erosion Control and Agroforestry Project (SECAP)

In 1964, the German Max Planck Institute established a nutritional research unit in Lushoto, which was engaged in nutritional surveys. Based on their findings, the Institute stimulated the start of an experimental development programme in the area, which was sponsored by the Tanzania government and the German Kubel Foundation. Due to its institutional background, much attention was given to the provision of health and nutritional services, but also other activities were included in the programme like agricultural extension. Due the fact that the programme was developed from a medical background, it did not start from an integrated vision on the development potential of the area, but rather several non-medical activities were gradually developed once their importance was recognized (Heynen, 1974).

In 1974, the Kubel Foundation, which had sponsored the project known as Lushoto Integrated Development Project (LIDEP), decided to have an independent evaluation of the agricultural activities. In this study of Egger and Glaeser (1975, in Wiersum, et. al, 1985) a critical evaluation was made on the modern, high-input technology utilized in the project in relation to the traditional cultivation techniques. The main arguments in that report can be summarized as follows:

1. The high-input agricultural practices

The high-input agricultural practices are based on the methods from industrial countries which often are not suited to the developing countries. Such practices tend to create an increased dependence on the market situation, both in terms of obtaining the necessary inputs as well as for selling the produce. This form of agriculture replaces labour by capital, which often is not sensible in heavily

populated areas which lack capital.

2. Neglected indigenous cultivation techniques

The positive aspects of indigenous cultivation techniques are often neglected in development projects. The present indigenous cultivation techniques must not be considered as a continuation of the original methods of shifting cultivation at the time when the conditions have changed to semi-permanent cultivation with subsequent low yields and site deterioration. Rather, they should be considered as a continuous improvement or adaptation of the old methods of shifting cultivation with adaptations to the necessities of a semi-permanent cultivation without the use of external help. These methods are based on sound ecological principles like mixed cultures, providing many different types of products, which spread the risk for pests and diseases, maintenance of a humus layer by an almost permanent soil cover of weeds and by mulching, and the use of robust and resistant varieties. Useful adaptations to local conditions are also displayed by the use of relative suitability of different plots and rainy seasons for cultivation and spreading of risk by differential rotations of maize and cassava. Some farmers are still trying to develop these indigenous systems with continuity and it should be endeavoured to assist these developments.

Although Egger and Glaeser (1975, in: Wiersum, et. al, 1985), agree that the vegetable growing was initially emphasized in LIDEP as a means of improving the diet of the population, as the subsistence farmers could not afford buying vegetables, they recommended change in the strategy of the project in which more attention was to be given to ecological farming methods based on development of valuable indigenous methods. Under the prevalent conditions of limited land and capital resources special attention should be given to supplementing subsistence farming than replacing it.

As a result of the study, in 1975 a pilot trial started within LIDEP based on the recommendations. The trial showed the following characteristics (Glaeser, 1977): Presence of shade trees in the fields; presence of horizontal strips of deep-rooting guatemala grass to protect against erosion and provide fodder; mixed cultivation to take advantage of different maturation periods, heights of plants and demand for fertilizers; crop rotation; mulching and composting; and reduced weeding.

The LIDEP was handed over to the Tanzania government in 1976. In 1978, a new German assisted project started in the West Usambaras within the framework of the GTZ- supported Tanga Integrated Rural Development Programme (TIRDEP). The project known as Soil Erosion Control and Agroforestry (SECAP), began its fieldwork in 1981. SECAP, has as overall objectives to improve both economic and ecological conditions of Western Usambaras.

Since factors causing land degradation are interlinked, SECAP tries

to promote an integrated approach, comprising three sectors namely: Agriculture; Livestock and Forestry. Measures from all the three sectors are supposed to be integrated in such a way that they not only stop land degradation but also support each other to meet the basic needs of the farmers and increase their income. At the same time, the project attempts to increase the planning and organization capabilities of the villagers to make them more self-reliant and independent from external support (TIRDEP/SECAP, 1988). Therefore, the project is active at two levels; individual farmers are advised and assisted in the application of soil erosion control measures as well as ways of specialized and intensified production. On community level, villagers are assisted in the establishment of village tree nurseries, bull-centers and large-scale afforestation/land rehabilitation.

SECAP's extension system consists of a number of methods and is said to be directed both towards individual farmers and the whole community. The following methods are said to be used by SECAP: general campaign meetings before every rainy season; micro contour line improvement campaigns in each rainy season; farmers' field days; seminars for village leaders and primary school teachers. In addition to these mass and group methods, individual methods are also carried out.

The villages under the project are categorized as shown in table 1: By applying the categorization and assuming that each village stays for one year in category II and three to four years in category III and IV, it is expected that all 126 registered villages in Lushoto district will be covered by the year 2000. By then, all the villages are supposed to be able to practice soil erosion control measures and sustainable land-use under low extension inputs, which can be maintained without donor support. At the moment there is rethinking within the project to change to catchment approach, whereby the project would concentrate its activities in one selected catchment area at a time. But so far, the project operates under the categorization approach above.

4.2.3 The study villages

The study in Lushoto district was carried out in two villages namely Kibaoni-Longoi and Kwemashai (Fig. 7). The two villages were among the first villages under the project.

(a) Kibaoni-Longoi village

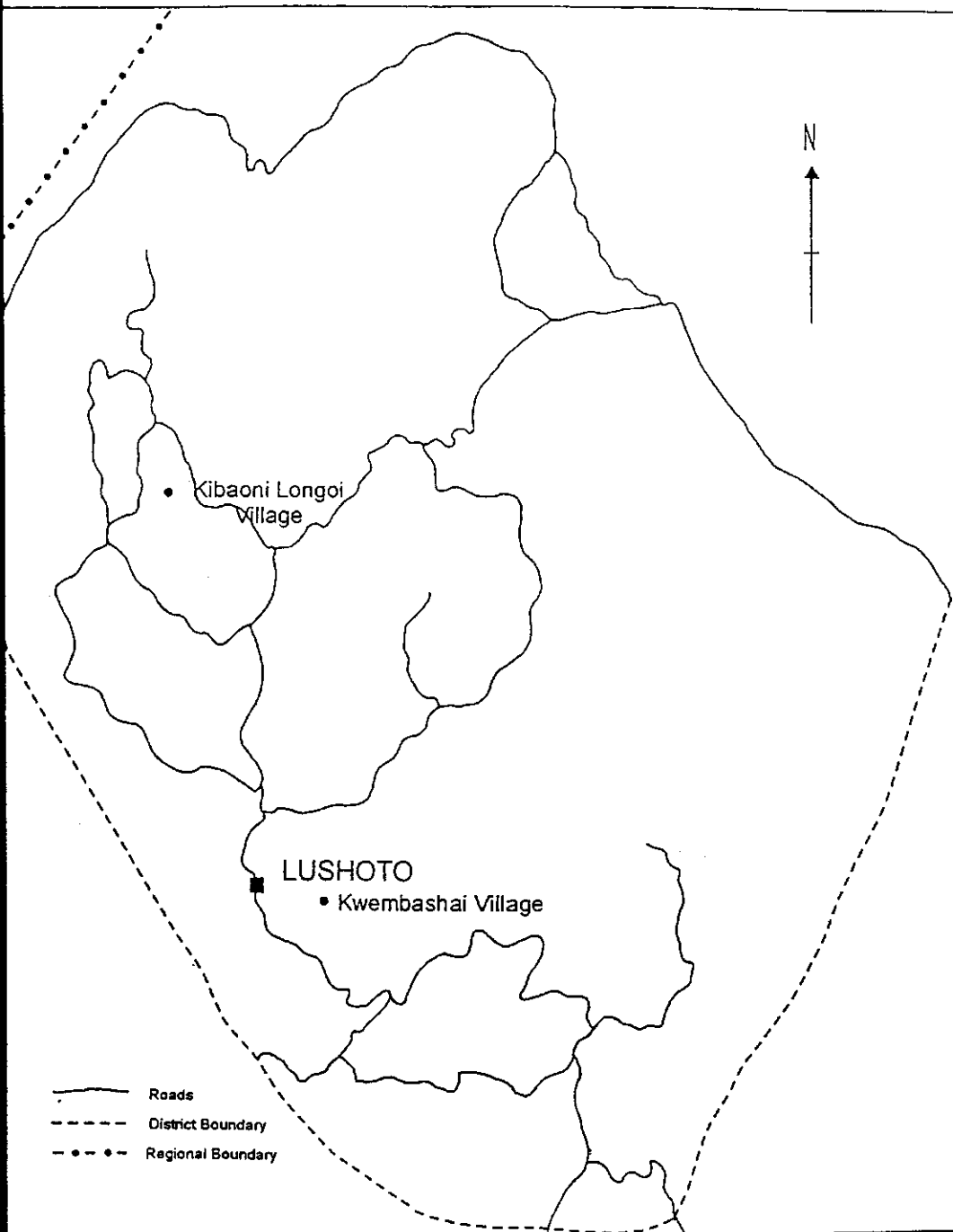
Kibaoni-Longoi is located at about 30 km north-west of Lushoto township. The village is connected to Lushoto township by an all-weather road. Kibaoni-Longoi has an area of about 795 ha with a population of about 2200 people (Fieldwork, 1991), with 1450 being working people. The rest are either young, old or disabled.

Table 1: Village categories Lushoto district

Category	Approach	Measure	Extension service
I	No extension	None	None
II	Forestry	Village nursery campaigns; Establishing committees; Training nursery attendants	Divisional Forest officer
III	Low extension	Forestry; Zero grazing; Bull plots; Fodder grass nurseries; Micro-contour lines; campaigns	Divisional Forest Officer + Zonal Extension Worker
IV	High extension	Forestry; Zero grazing; Crop production; Farmers' excursions; Campaigns	Divisional Forest Officer + Zonal Extension Worker + Village Extension Worker
V	Post Secap (minimum extension)	Monitoring	Divisional Forest officer + Zonal Extension Worker

The village has 707 households with an average of 8 members per household. The livestock population is estimated to be 1200 livestock units. Climatologically, Kibaoni-Longoi is located in the so called "dry-cold zone" of the three agro-ecological zones of Lushoto district. Other zones are "humid-warm" and "dry-warm". This zone is characterized by having annual rainfall ranging from 500-800 mm, with an average daily temperatures of around 16 °C; a four month dry period and slight frosts, which occur during the dry periods in the valley bottoms. Especially during the dry season frequent mist improves the water balance of the area. Temperate fruits (pears, apples, plums and peaches), vegetables and Irish potatoes are the most important cash crops. Cultivated

FIG. 7 LUSHOTO DISTRICT STUDY VILLAGES



subsistence crops are mainly maize and beans, with less cassava and little banana. The valley bottoms, which served as communal grazing areas before, are used nowadays mainly for irrigated vegetable and Irish potato cropping. Soil erosion is rather severe in Kibaoni-Longoi village as no destocking has been carried out while previous grazing areas are turned over to cash-crop production.

One of the most interesting feature of Kibaoni-Longoi village is that irrigation efforts go back for more than 40 years and consist of temporary intakes constructed with local materials e.g rocks and timber. These efforts are currently being supported by the Traditional Irrigation Project (TIP), which is being funded by the Dutch government. Traditionally, irrigation areas in this village are organized at water-users level. TIP therefore tries to work within this traditional organizational framework. In terms of social facilities the village has a primary school.

(b) Kwemashai village

Kwemashai village is located at about 10 km east of Lushoto town. The village is accessible by all-weather road. The village has an area of about 540 ha with a population of about 1800 people (fieldwork, 1992). Out this population about 1050 people are working. The rest are either young, old or disabled. The village has 600 households with an average of 6 members per household. Livestock population is estimated to be about 850 livestock units.

Climatologically Kwemashai village is located in the "humid-warm zone". The zone is characterized by having annual rainfall between 800 - 1700 mm and average daily temperatures of about 18 °C. In this village coffee and vegetables are the leading cash crops. Sugarcane is a cash crop for local wine production. Small stands of *Acacia mearnsii* are quite common and the sale of the bark to the tanning acid extraction factory in Lushoto is of some importance for cash income. Maize, bananas, beans and to a lesser extent cassava are the dominant food crops of Kwemashai village. Traditional agroforestry systems dominated by the intercropping of coffee plants, bananas and *Albizia schimperiana* are evident in the village. For *Acacia mearnsii* woodlots, which due to the species characteristic of high water consumption and acid leaf litter, suppression of nearly all regrowth of herbs and shrubs was evident. These stands are therefore, very susceptible to soil erosion. In terms of Social facilities the village has a Primary school.

CHAPTER 5 FOREST MANAGEMENT SYSTEMS

The chapter discusses indigenous tree/forest management systems. For clarity forest/tree management systems are discussed under two levels: household and supra-household. At the household level the chapter discusses management practices and household organization. The practices include: the way farmers arranged the trees in their farms; the balance between indigenous and exotic tree species in the farms; regeneration and tending techniques. The chapter also discusses uses of trees and forests. The household organization is singled out as a major determining factor for the functioning management system at a household level. It organizes labour, decision-making process, distribution of authority, property rights and obligations among members. Management systems at a supra-household level consists mainly sets of organized use-rights. They are concerned mostly with regulating who has the right to access to particular forest/tree resources and excluding others. Whenever appropriate, attention is drawn to the basic differences between indigenous and professional forest management systems.

5.1 Management practices on private lands

5.5.1 Configuration of trees in the farms

The spatial arrangements of trees varied considerably in different farms visited. In Dodoma urban district, the largest tree cover and most complex spatial arrangements were observed in home-gardens, lesser tree cover and simpler arrangements were observed on farms situated away from homesteads. For Lushoto district, the largest tree cover and most complex spatial arrangements were observed on farmlands which were relatively near to homesteads. Zonal arrangements like single rows and wider strips of trees were most common around homesteads in home-gardens in Dodoma urban district and in woodlots in Lushoto. Planted exotic tree species dominated in zonal arrangements while indigenous tree species often grew naturally among the crops. Within the constraints imposed by what will grow in particular niches in the farms, farmers were remarkably consistent in the choices they made about where to put particular categories of tree species. The general trend in Dodoma Urban district was a shift from the field to the compound. Once retained indigenous field tree species begin to be used up, farmers tend to cluster most of the trees they decide to plant around the compound, presumably to keep an eye on them. For Lushoto district, the most striking pattern was the exodus of trees over time from the cropland mixtures into the field boundaries.

A breakdown of trees on the farms by apparent wealth of households in Dodoma urban district showed a tendency for the poor to plant more trees in the compound and less in the field than their wealthier counterparts. In general the study showed that the relatively well-to-do farmers tend to plant more trees than the

poor. Table 2 and 3 shows a negative correlation between the number of planted exotic and indigenous trees and social position of the farmer in both Dodoma Urban and Lushoto districts. Generally speaking, this indicates that fewer trees are being planted as the social position one occupies is lower. The lowest social positions included mostly women especially those who are either widowed or divorced. In Dodoma urban district the number of women falling under this category was considerably high, representing about 18 % of the sampled population while in Lushoto it was rather modest representing only 5 % of the sampled population.

Table 2: Relationship between household tree growing efforts and socio-economic factors in Dodoma Urban district (n = 100)

X_i	Y_1 ($R^2 = 0.65$)	Y_2 ($R^2 = 0.30$)	Y_3 ($R^2 = 0.42$)
	b*	b*	b*
Social position	-0.137 (ns)	-0.101(ns)	0.771(*)
Land size	-0.067(ns)	-0.120(ns)	0.696(*)
Land parcels	0.277(*)	0.218(*)	-0.066(ns)
Labour	-0.135(ns)	0.047(ns)	0.198(ns)
Ethnicity	-0.086(ns)	-0.023(ns)	-0.103(ns)
Livestock	-0.100(ns)	-0.021(ns)	0.038(ns)
Religion	-0.120(ns)	0.025(ns)	0.050(ns)
Gender	-0.030(ns)	-0.061(ns)	0.032(ns)
Marital status	0.023(ns)	0.084(ns)	0.011(ns)
Age	0.590(*)	0.011(ns)	-0.045(ns)
Education	0.376(*)	0.145(ns)	-0.039(ns)
Extension services	0.343(*)	0.020(ns)	-0.068(ns)

Key: Y_1 = Planted exotic trees; Y_2 = Planted indigenous trees; Y_3 = Retained indigenous trees; R^2 = Coefficient of determination; X_i = All independent variables refer to household; * = Indicates significance at 0.05 level and ns = Indicates non-significance; b* = Beta weight.

Table 3: Relationship between household tree growing efforts and socio-economic factors in Lushoto district (n = 100)

X_i	Y_1 ($R^2=0.75$)	Y_2 ($R^2=0.63$)	Y_3 ($R^2=0.41$)
	b*	b*	b*
Social position	-0.004 (ns)	-0.043 (ns)	-0.059 (ns)
Land size	0.593 (*)	0.167 (*)	0.047 (ns)
Land parcels	-0.174 (ns)	-0.113 (ns)	0.173 (*)
Labour	0.040 (ns)	-0.032 (ns)	0.092 (*)
Ethnicity	0.432 (*)	-0.108 (ns)	-0.038 (ns)
Livestock	-0.053 (ns)	0.025 (ns)	0.0970 (*)
Religion	0.072 (*)	-0.127 (ns)	-0.077 (ns)
Gender	0.035 (ns)	0.185 (*)	0.026 (ns)
Marital status	-0.183 (ns)	-0.109 (ns)	-0.116 (ns)
Age	-0.346 (ns)	0.976 (*)	-0.317 (ns)
Education	0.090 (*)	0.182 (*)	0.051 (ns)
Extension services	-0.117 (ns)	-0.037 (ns)	0.090 (*)

Key as in table 2

The fact that the wealthier farmers planted more trees than the poor is probably related to their having more land at their disposal. The study showed that the number of trees planted (both exotic and indigenous), was significantly correlated with land size in Lushoto district (Table 3); while in Dodoma, the correlation was negative (Table 2). These results to a certain extent confirm the fact that there is land scarcity in Lushoto and hence those with relatively more land tend to plant more trees. On the other hand, the study showed that the number of trees planted (both exotic and indigenous) in Dodoma Urban district was significantly correlated with the number of land parcels (Table 2). In Lushoto the correlation was negative (Table 3). One plausible explanation of these results is that in arid conditions like that of Dodoma, tree planting tend to be "niche" dependent rather than just land size. The higher the number of land parcels the higher the number of niches because in most cases these parcels were located in different places and hence have different tree-growing potentials.

5.1.2 Reasons for tree planting

The study found that farmers gave three logically different kinds of reasons for their tree planting efforts. A simple and evident underlying reason was that farmers had noticed an increasing scarcity of wild trees, while they still dependent on tree products and services (Table 4, 5, 6, 7, 8 and 9). A large number of utilitarian reasons constituted the second level of explanation. Asked why the farmer planted trees, he/she simply listed what he/she expected to harvest or gain from the trees. The third category concerned what I would call triggering factors. The triggering factors were the most difficult to get at, but also the most interesting from the practical point of view. These factors were best understood as answers to questions like "What made you go and plant those first trees?"; "From where did you get the idea or impetus?". Of the many utilitarian reasons, a few were ranked far more important than others. To obtain own building material was mentioned as a high priority by most people interviewed.

The third reason, to use planted trees to demarcate land, was also important especially in Lushoto district where conflicts of land tenure are common. All other reasons were frequently mentioned but they did not all seem to be as important as these three. Fuelwood was always mentioned as a reason for planting trees, but the farmers normally referred to off-cuts and pruning from trees when they said they harvested for fuelwood. The reason for planting trees along farm boundaries was that tree ownership in practice substituted for land ownership. The trees guarded the land from intruders and they could be assessed as private property which is a useful criterion in conflicts and land transactions. It should be noted that it is the investment of labour which creates ownership. In this respect it is interesting to see that labour is positively correlated with the number of planted indigenous trees in Dodoma (Table 2); while in Lushoto labour is positively correlated with the number of planted exotic trees (Table 3). These results runs contrary to the long-held belief that the Gogo are traditionally non-tree-planters. This belief it seems is based on the fact that professional foresters are only interested on exotic trees and those people who invest labour on indigenous tree planting are labelled as non-tree-planters. Planters of valuable indigenous tree species or exotic tree species strengthen their rights to land on which trees are planted.

The triggering factors point out something which is very interesting for extension strategies. They show what had convinced the first generation of tree planters to start planting trees. It should be noted that it normally takes quite some time to instil tree-planting behaviour. People need to see casually planted trees grow, mature and yield profit before they take the initiative to invest money and time in tree planting. The study showed that local people tree planting initiatives in the study areas were out of phase with the conventional recommended extension packages.

Table 4: Planted exotic tree species in Lushoto district (n = 100)

No	Species	Uses	HH %
1.	<i>Acacia mearnsii</i>	Fu, In, Sh, Po	75.0
2.	<i>Acrocarpus fraxinifolius</i>	Tb, Fu	15.0
3.	<i>Cajanus cajan</i>	Fd	34.0
4.	<i>Carica papaya</i>	Fr	20.0
5.	<i>Casuarina montana</i>	Tb, Sh, Fu, Fe	42.0
6.	<i>Citrus lemon</i>	Fr	15.0
7.	<i>Cupressus lusitanica</i>	Tb	44.0
8.	<i>Erybotria japonica</i>	Fr	23.0
9.	<i>Eucalyptus saligna</i>	Po, Fu	50.0
10.	<i>Grevillea robusta</i>	Tb, Sh, Fu, Fe,	92.0
11.	<i>Jacaranda mimosifolia</i>	Tb, Sh, Fu, Fe	38.0
12.	<i>Lucaena leucocephala</i>	Fe, Fu, Fo	37.0
13.	<i>Mangifera indica</i>	Fr	8.0
14.	<i>Persia americana</i>	Fr	43.0
15.	<i>Prunus persica</i>	Fr	70.0
16.	<i>Psidium guajava</i>	Fr	14.0

Key: Fr=Fruits; Nu=Nut; Fu=Fuel; Me=Medicine; Tb=Timber; Sh=Shade; Po=Pole; Be=Beehive; Om=Ornamental; Wb=Windbreak; Fo=Fodder; Fe=Fertility; Hg=Hedge; Wa=Walking stick; Ut=Utensil; Rp=Repellant; Fn=Fencing; Fb=Fibre/rope; Le=Edible leaves; Se=Edible seeds; Ha=Handles; Re= Edible resin; La=Latex; Fd=Food; De=Dermacation; To=Tools; Dy=Dye; Dr=Drug; In=Income; Ri=Ritual observance; Co=Water conservation; Fm=Fermentation; Pe=Pesticide; and HH % = Household percentage.

Many farmers such as those in Lushoto district had started with agroforestry practices at the time when they were recommended to cut down trees. At present SECAP is recommending intercropping especially with exotic tree species at farm boundaries.

Table 5: Planted indigenous tree species in Lushoto district (n = 100)

No.	Species	Uses	HH %
1.	<i>Albizia schimperiana</i>	Fe, Sh, Fu, Co	84.0
2.	<i>Anona cherimola</i>	Fe	9.0
3.	<i>Catha edulis</i>	To, Fu, Fo, Dr, Sh, ME, Fe	34.0
4.	<i>Cussonia arborea</i>	Fe, Fu, Me, Sh	20.0
5.	<i>Commiphora zimmermannii</i>	Me, Fu, Fr	11.0
6.	<i>Croton microstachys</i>	Sh	6.0
7.	<i>Dracaena usambarensis</i>	Fu, De	32.0
8.	<i>Ehretia symosa</i>	Fu, Ha, Fr	13.0
9.	<i>Erythrina abyssinica</i>	Fe, Fu, Me	56.0
10.	<i>Fagaropsis angolensis</i>	Tb, Fu, Me, Sh,	40.0
11.	<i>Ficus thonningii</i>	Sh, Me, Ri, Co, Fu, Fe	17.0
12.	<i>Ficus vallis-choudae</i>	Co, Fe, Sh, Fu	6.0
13.	<i>Juniperus procera</i>	Po, Tb, Fu	45.0
14.	<i>Justicia angleriana</i>	Hg	39.0
15.	<i>Maesa lanceolata</i>	To, Be, Me, Sh, Fe, Fe, Co	38.0
16.	<i>Markamia hildebrandtiaca</i>	Fu	4.0
17.	<i>Ocotea usambarensis</i>	Tb	8.0
18.	<i>Olea capensis</i>	Tb, Po, Fm	14.0
19.	<i>Podocarpus usambarensis</i>	Tb, Sh	18.0
20.	<i>Raulvofia inebrians</i>	Me, Sh	6.0
21.	<i>Ricinus communis</i>	Me	8.0
22.	<i>Solanecio angulatus</i>	De, Fe	21.0
23.	<i>Tetradenia riparia</i>	De, Me, Fr	27.0
24.	<i>Trichocladus ellipticus</i>	Po, Fu, Sh	5.0
25.	<i>Vangueria infausta</i>	Fr, T, Sh	10.0
26.	<i>Venonia sabuligera</i>	Me, Sh, Fe	10.0
27.	<i>Zanthoxylus usambarensis</i>	Sh, Me, Fr	16.0

Key as in table 4

Observations in the field revealed that farmers did not object to intercrop but most of species being recommended by projects studied, such as *Melea azadarach* and *Cedrela odorata* for Dodoma urban district and *Cupressus lusitanica*, *Grevillea robusta* and *Eucalyptus saligna* for Lushoto were not compatible with the crops being grown by the farmers. This observation is supported by the fact that farmers still carry intercropping with a number of indigenous tree species: *Faidherbia albida* being the most common in Dodoma urban district; 92 % of the sampled population have retained this species in their farms (Table 9) and *Albizia schimperiana* in Lushoto; 86 % of the sampled population have retained this tree species in their farms (Table 6). The official explanation given by the professional foresters on the lack of motivation for farmers to intercrop exotic tree species with their crops was that farmers especially in Lushoto are facing land shortage so they cannot afford to put part of their land under trees.

Table 6: Retained indigenous tree species in Lushoto district
(n = 100)

No	Species	Uses	HH %
1.	<i>Acrocarpus</i> sp	Tb, Fu	10.0
2.	<i>Albizia schimperiana</i>	Fe, Sh, Fu, Co	86.0
3.	<i>Annona cherimola</i>	Fr	23.0
4.	<i>Asparagus setacens</i>	Fu, Sh	10.0
5.	<i>Bersama abyssinica</i>	Fu, Po, To	20.0
6.	<i>Cassipourea malosama</i>	Sh, Fu	20.0
7.	<i>Catha edulis</i>	To, Fu, Fo, Dr, Sh, Me, Fe	48.0
8.	<i>Cettis africana</i>	To, Fu, Be	10.0
9.	<i>Commiphora zimmermanii</i>	Fr, Me, Fe	41.0
10.	<i>Croton syvaticus</i>	Fo, Sh, Fu, Me	18.0
11.	<i>Cussonea arborea</i>	Fe, Sh, Fu, Me	36.0
12.	<i>Cussonea spicata</i>	Fe, Sh	10.0
13.	<i>Dracaena usambarensis</i>	De, Fu	13.0
14.	<i>Ehretia symosa</i>	Fu, Ha, Fr	30.0
15.	<i>Entandrophragma excelsum</i>	Tb, Fu, Fe	8.0
16.	<i>Erythrina abyssinica</i>	Me, Fe, Fu, De	68.0
17.	<i>Ueclea dirinorum</i>	Fu, Me, Sh, To	28.0
18.	<i>Fagaropsis angolensis</i>	Tb, Fu, Me, Sh	26.0
19.	<i>Ficus thonningii</i>	Sh, Me, Ri, Co, Fe, FE, Fu	19.0
20.	<i>Ficus vallis choudae</i>	Fe, Sh, Fu, Co	37.0
21.	<i>Juniperus procera</i>	Po, Tb, Fu	72.0
22.	<i>Maesa lanceolata</i>	To, Be, Me, Sh, Fe, Co	45.0
23.	<i>Manikara discolor</i>	To, Po, Fu	13.0
24.	<i>Markamia lutea</i>	Fe, Fu	12.0
25.	<i>Nuxia congesta</i>	Fu, To, Sh	50.0
26.	<i>Olea capensis</i>	Tb, Po, Sh	43.0
27.	<i>Parinari excelsa</i>	Me	9.0
28.	<i>Pleroxylom obliquum</i>	Pe, Me, Fe	23.0
29.	<i>Podocarpus usambarensis</i>	Tb, Sh	40.0
30.	<i>Rapanea usambarensis</i>	Po, Fu, To	9.0
31.	<i>Raulvofia inebrians</i>	Me, Co	26.0
32.	<i>Raulvofia caffra</i>	Fu, Fe, Fu, Co	21.0
33.	<i>Rhus natalensis</i>	Me, Fm, Fr	21.0
34.	<i>Ricinus cumunis</i>	Me	29.0
35.	<i>Teclea simplicifolia</i>	Po	5.0
36.	<i>Trichocladus ellipticus</i>	Po, Fu, Sh	17.0
37.	<i>Trimeria grandifolia</i>	Me, Fu, Fr, To, Sh	47.0
38.	<i>Vangueria infausta</i>	Fr, To, Sh	28.0
39.	<i>Vernonia sabuligera</i>	Fe, Me, Sh	7.0
40.	<i>Warburgia ugandensis</i>	Me	5.0
41.	<i>Zanthoxylus usambarensis</i>	Sh, Me, Fu	5.0

Key as in table 4.

Table 7: Planted exotic tree species in Dodoma urban district
(n = 100)

No	Species	Uses	HH %
1	<i>Anacardium occidentale</i>	Fr, Nu	26.0
2.	<i>Azadarachta indica</i>	Fu, Me, Tb, Sh	47.0
3.	<i>Carica papaya</i>	Fr	60.0
4.	<i>Cedrela odorata</i>	Tb	20.0
5.	<i>Citrus lemon</i>	Fr	15.0
6.	<i>Delonix regia</i>	Sh, Be, Om, Fu	45.0
7.	<i>Eucalyptus teriticonis</i>	Fu, Po, Wb	56.0
8.	<i>Jacaranda mimosifolia</i>	Om, Fu	24.0
9.	<i>Lucaena leucocephala</i>	Fu, Fo, Fe, Sh	42.0
10.	<i>Mangifera indica</i>	Fr	75.0
11.	<i>Melea azadarach</i>	Po, Tb, Fu, Sh	28.0
12.	<i>Pithecolobium dulce</i>	Hg, Fu, Sh	20.0
13.	<i>Psidium guajava</i>	Fr	76.0
14.	<i>Schinus molle</i>	Fu, Sh	19.0
15.	<i>Senna siamea</i>	Fu, Po, Sh	68.0
16.	<i>Syzigium cumini</i>	Fr, Sh	74.0
17.	<i>Tamarindus indica</i>	Fr	72.0

Key as table 4

This explanation however, is clearly not supported by the observation that farmers retain or even plant indigenous tree species in their fields. The advice and knowledge imparted by forestry extension services in Tanzania, seem to have been insignificant. But the tree seedlings they have distributed in the seventies and early eighties have been crucial for exposing thousands of farmers to seeing planted exotic trees grow and thus made exotic tree growing conceivable to them. Analyzing the events together with the farmers, I realized how first the ideas and then practices in respect to tree growing had changed.

Seemingly very insignificant event involving one farmer who almost by accident happened to plant a single tree for beauty of its flowers or for shade, ten or twenty years latter has triggered off very rapid and important changes making a number of farmers also plant trees. This shows that if a technology is suitable to a particular farming system and coincides with the farmers priorities, it can spread extremely fast even without the help of the extension services. Extension services do have a role to play. But in some cases, extension workers have more to learn from than teach farmers.

Table 8: Planted indigenous tree species in Dodoma urban district (n = 1000)

No	Species	Uses	HH %
1.	<i>Acacia tortilis</i>	Fn, Fu, Sh, Ri, Fo	48.0
2.	<i>Calyptrrothea taitensis</i>	Sh	60.0
3.	<i>Combretum spicatum</i>	Fu, Sh	30.0
4.	<i>Commiphora africana</i>	Po, Fn, Ha, Be, Me	10.0
5.	<i>Commiphora mollis</i>	Sh, Fu, Hg, Be, To	60.0
6.	<i>Commiphora ugogoensis</i>	Sh, Be, Po, Fu, La	70.0
7.	<i>Euphorbia tirucalli</i>	Fn, Hg, Wb, La, Rp, Me	87.0
8.	<i>Ficus vallis-choudae</i>	Fb, Fu, Sh, Fr, Be, To	35.0
9.	<i>Grevia plactyclada</i>	Be	5.0
10.	<i>Manihot glaziovii</i>	Le, Sh, Le, De	94.0
11.	<i>Sapondus saponaria</i>	Sh	12.0

Key as table 4

But in most cases they are not learning. No one is taught at college/university to listen to farmers or attempt to understand their priorities or problems or to explore their potential. To change this set up, we should start by changing extension workers education so that they learn much more about how to interact with farmers and about farmers' priorities. This would help them understand that the priorities they reflect, which are in most cases government/project priorities are not necessarily consonant with the priorities of the farm family.

Table 9: Retained indigenous tree species in Dodoma urban district (n = 100)

No.	Species	Uses	HH %
1.	<i>Acacia tortilis</i>	Fn, Fu, Sh, Ri, Fo	65.0
2.	<i>Adansonia digitata</i>	Be, Fr, Sh, Fb, Le, Ut, Fo, Rp, Me	78.0
3.	<i>Albizia harveyi</i>	Po, Ha, Re, Me	13.0
4.	<i>Boscia grandiflora</i>	Fr, Sh	10.0
5.	<i>Calyptrothea taitensis</i>	Sh	26.0
6.	<i>Combretum spicatum</i>	Fu, Sh	34.0
7.	<i>Commiphora africana</i>	Po, Fn, Ha, Be, Me	29.0
8.	<i>Commiphora ugogoensis</i>	Sh, Be, Po, Fu, La	42.0
9.	<i>Cordia gharaf</i>	Fu, Ha, Wa, Fr, Me	56.0
10.	<i>Delonix regia</i>	Po, Ha, Ut	13.0
11.	<i>Dicrostachys cinerea</i>	Sh	26.0
12.	<i>Erythrina abyssinica</i>	Fe	8.0
13.	<i>Faidherbia albida</i>	Sh, Fo, Fe, Fu, Me	92.0
14.	<i>Lannea stuhlmanii</i>	Fu, Fb, Me, Dy	11.0
15.	<i>Sapium bussei</i>	Sh, Rp	13.0
16.	<i>Terminalia seria</i>	Sh, Fu	23.0
17.	<i>Virtex iringensis</i>	Fr, Po, Fo, Fu, Me	37.0
18.	<i>Xeroderris stulmanii</i>	Sh, Be, Fu, Re, To, Me	83.0

Key as table 4

Kajembe (1988) commenting on this aspect said "It is high time forest extension services in Tanzania are oriented to support and strengthen participatory management effort, and extension workers should be trained to listen and adapt to, and collaborate with the target groups and show respect for local customs, attitudes and beliefs. Involving target groups in designing, implementation and evaluation of tree planting is important for widespread adoption and longevity of innovations. Since technologies and practices imposed from outside may lead to suspicion and even active sabotage

from the target groups; utilization of traditional innovation channels should be considered."

5.1.3 Balance between indigenous and exotic species

During the fieldwork, trees seen in the farms were recorded whether the farmer had either planted the tree or had made a deliberate decision not to fell it when clearing the land. In the course of interviewing farmers, it became clear that their classification of trees did not fit neatly with the professional one. While professional foresters contrast "indigenous" with "exotic" species, farmers contrast "local" (Kienyeji) with "new" (Kigeni) species. To them, trees brought into the areas (i.e Dodoma and Lushoto) even from other parts of Tanzania, could be "new" and familiar exotic species such as *Mangifera indica* and *Carica papaya* be regarded as "local". It would be perverse to set out "non-local" indigenous species as exotic species here. But, the distinction between "naturalized" and "new" exotic species could be an important one, since foresters are predominantly concerned with introducing farmers to the latter. Tree species which can be classified as "naturalized" exotics in this study includes: *Azadarachta indica*, *Carica papaya*, *Mangifera indica*, *Psidium guajava* and *Citrus Lemon* for Dodoma; and *Acacia mearnsii* for Lushoto.

It was interesting to note that in Lushoto district where the number of indigenous tree species planted/retained was high, the diversity of exotic tree species planted was low (Table 4, 5, and 6); as compared to relatively high diversity of exotic tree species planted in Dodoma urban district compared to indigenous tree species Planted/retained (Table 7, 8 and 9). In Lushoto about 48 indigenous tree species were retained/planted compared to 16 exotic tree species; a ratio of 3:1; whereas, in Dodoma there were about 24 indigenous tree species retained/planted compared to 17 exotic tree species, roughly a ratio of 1:1. It can be speculated that farmers in Dodoma need to plant much more exotic species so as to meet their needs which are not currently met by indigenous trees. The opposite seem to hold for Lushoto.

5.1.4 Regeneration and tending techniques

Regeneration

The interviews and observations showed that farmers in the study areas used two basic techniques for regenerating trees i.e direct sowing and vegetative propagation. Most of the fruit trees in the study areas were found to be propagated through seeds. For example is common to put *Citrus lemon* or other *Citrus* spp directly into the ground on the growing site. *Carica papaya*, *Psidium guajava* and *Mangifera indica* were also commonly propagated through direct sowing.

Vegetative propagation of woody perennials on farms in Dodoma Urban district was done exclusively by cuttings. The study showed that 70 % of the sampled population planted indigenous trees by using cuttings. Discussions held with DOVAP officials indicated that they have realized the fact that farmers are experts when it comes to propagating indigenous tree species through cuttings. The project tried to emulate the farmers by propagating some indigenous tree species by cuttings, but failed. The study showed that this failure resulted from the fact that professionals did not ask the farmers how they do it; instead they based the regeneration on their own "professional" knowledge. Farmers usually plant their cuttings just before the start of the rains, and when the rains commences the cuttings normally have started to give roots and the rains helps them to establish. The project planted their cuttings during the rain season and almost all of them rot. It is difficult for the expert to acknowledge that farmers often understand their situation better than he/she does, and to accept that he/she has anything to learn from rural people (Chambers, 1983). It seems now the project has realized this weakness and has at least started to consult the farmers through its newly created research section.

It is important however, to caution the project researchers that this seemingly good intention can fail to bear its expected positive results if the wrong section of the target group is consulted. It was rather interesting to see that indigenous tree planting in this study was positively correlated with the age variable in both Dodoma Urban and Lushoto districts (Table 2 and 3). This indicates that indigenous tree planting is a practice which was acquired through a long period of apprentice and observation. Therefore it needs no emphasis to say that consulting the old generation can be promising rather than trying to consult the young generation - "our generation".

In Lushoto district, the study showed that most of the vegetative propagation of woody perennials on farms was done through wildings and suckers. 83 % of the sampled population used either wildings, suckers or both. As the results indicates, traditionally the Gogo of Dodoma and the Sambaa of Lushoto use different planting material to propagate indigenous tree species. This to some extent can explain the relatively low rate of exotic tree planting in Dodoma, with a mean of 29 trees as compared to a mean of 140 trees in Lushoto. One can see that the type of planting stock advocated by professional foresters (i.e potted seedlings) was more or less resembled traditional planting stock of the Sambaa (i.e wildings and suckers), but were quite different from that of the Gogo (i.e cuttings). It is therefore not surprising to see that exotic tree planting is negatively correlated with ethnicity in Dodoma (Table 2) but significantly correlated in Lushoto (Table 3). Forestry extension messages in Tanzania are territorial as if all the people are the same. But as this study has demonstrated people of different cultural backgrounds are likely to differ in the way they propagate trees. It is therefore high time extension messages are

geared towards meeting this diversity.

Discussions with SECAP officials and even with researchers at the Silvicultural Research Station, Lushoto indicated a general agreement that farmers in Lushoto prefer to do intercropping with indigenous tree species such *Albizia schimperiana* and *Erythrina abyssinica*. But both project officials and researchers admitted that the tendency so far was to supply the farmers with the famous exotic tree species such as *Grevillea robusta*. This indicates how professional foresters still depend on their orthodox knowledge based on exotic trees. In short one can say that the type of tree species advocated by professional foresters does not reflect farmers' needs. This once again, explains the tendency for the farmers to plant exotic tree species in the boundaries.

From the conventional standpoint, the ideal situation would be the one in which forest extension workers act as a link between researchers and farmers, questioning farmers on how and why they do things the way they do and feeding these data back to project officials (supervisors and researchers) to make their theorizing more rooted in reality. The officials in turn, could use the extension workers to disseminate, and popularize improvements at the grassroots level: "two-way traffic on a single street". But as demonstrated by this study, it seems this has barely been done if at all. To really reach farmers, we need extension workers who think in interdisciplinary, holistic terms and can understand what is happening in the farm-household system, along with researchers who share a common perspective. They should both respect farmers' knowledge and farmers' criteria. It does not matter what the government/project write in their plans. In order to attain those objectives they have to come up with a set of packages that make sense to farmers. Admittedly, average-forest extension worker can't influence all the factors affecting the farmers, but he/she should be aware of them. Extension workers and project officials should be aware not only that farmers are making decisions under the influence of different set of priorities but that they also have to contend with tremendous uncertainty. To come up with a fixed package of technology is not only arrogance it is ignorance. As it has been observed in this study, the same technical package is often maintained year in, year out, and yet the ratio of output to input swings widely.

Unfortunately, it seems the projects studied tend to focus on the transfer mechanism of "professional" knowledge. They are concerned only with the efficiency of propagating the message rather than whether the message makes any sense to farmers. Professional foresters are in my opinion simply not used to observe the major factors determining why farmers do what they do. Nor are they used to listen to farmers or talk with farmers. Unless this changes, the usefulness of community forestry will remain questionable. Although there seemed to be a lot of rhetoric concerning people's participation in the study projects, this will remain to be a lip

service unless foresters are prepared to leave their professional camp and cooperate in farmers' projects. As Umans (1993) lamented "there seems to exist in many cases a gulf between internally regenerated initiatives and externally sponsored interventions.

Protection of seedlings and trees

Successful establishment of seedlings can be endangered by termites and browsing livestock. Termites are serious threat to newly planted seedlings. The problem was more pronounced in Dodoma urban district than in Lushoto. The damages could often result in total destruction of the seedlings. There are two principal ways to prevent the problem. Termite resistant or less susceptible species may be chosen or steps may be taken to prevent termites from consuming the seedlings. Generally, farmers said exotic tree species were more susceptible than indigenous tree species. In Dodoma, among the exotic tree species which were found to be more susceptible to termite attack includes: *Psidium guajava*, *Carica papaya*, *Mangifera indica*, *Syzgium cumini* and *Citrus lemon*. Those found to be less susceptible includes: *Senna siamea*, *Lucaena leucocephala*, *Azadarachta indica*, *Delonix regia*, *Tamarindus indica*, *Melea azadarach* and *Pithecolobium dulce*. In Lushoto district among the exotic tree species *Grevillea robusta* was said to be more susceptible.

During the interviews, farmers pointed out that termite attacks could be prevented by mixing ashes into the soil or spreading ashes around trees. On the contrary, professional foresters seem to advocate pesticides such as Aldrin. It is possible that Aldrin can be more effective than ashes; however, the question is how many farmers can afford to buy that? It is therefore logical for the projects to look into the possibility of improving the indigenous protection methods which are low cost and in most cases affordable. Generally speaking however, termite resistance does not seem to be a major factor in farmers' species choice. Fast growing species like *Grevillea robusta* were most planted in Lushoto (Table 4), although they are vulnerable to termite attacks.

Seedlings are also threatened by livestock especially in Dodoma. Most of the farms visited had no special barriers to prevent trampling or browsing of seedlings. Some farmers have tried to protect young seedlings by constructing rings of thorny *Acacia tortilis* branches around the plants. The barriers were simple and could be more efficient if improved. This kind of single-tree protection is probably the best low cost alternative available to most farmers. Uncontrolled grazing was a common reason that farmers gave for not planting trees in farms in Dodoma, unlike in Lushoto where stall feeding of livestock have taken ground; although extensive grazing is still the norm. It was also pointed out by farmers in Dodoma that it was difficult to protect young seedlings from livestock during post-harvesting grazing by other people's

animals. Generally, the study indicated a negative correlation between the number of livestock units owned by a household and the number of planted exotic trees in both Dodoma and Lushoto districts (Table 2 and 3). It can then be postulated that farmers with many livestock units are reluctant to plant trees because their livestock do graze within their farms. It is important therefore, for the projects to treat this group as a special one and try to encourage them to plant fodder trees by supplying them with fodder tree species rather than the general purpose tree species. The tendency currently was to supply the same tree species to everybody as if all farmers are the same.

When farmers were asked if it would be possible to fence their whole land, some said yes. But, they cautioned that fencing would be done by using thorny branches of *Acacia tortilis* which they said increase fire risks. They considered other fencing methods to be complicated and rather expensive. However, since post-harvest grazing is such an important part of livestock management of the Gogo, great emphasis has to be given to finding alternatives. Introduction of certain agroforestry practices like growing of fodder trees as already mentioned above can be one part of the solution. However, it is important to note that the problem of post-harvest grazing can probably not be solved by any single measure. A combination of innovative management practices together with different kinds of social sanctions could most likely be successful. An albeit somewhat extreme, example of such approach is demonstrated by Hifadhi Ardhi Dodoma Project (HADO) (Kerkhof, 1990), whereby innovative agroforestry practices together with social sanctions are used to limit post-harvest grazing.

In connection with seedling and tree protection, fire hazards also needs attention. Burning on agricultural and pasture land is common especially in Dodoma. It is said to be done to get rid of weeds, plant diseases, insects and snakes and stimulate new growth of grass for grazing. Fire is a very important management tool (Sollart, 1986; Wormald, 1984). But as a matter of fact there has been and may be there is still conflict between professional foresters and local people concerning this tool. Unfortunately, this study did not do justice to its importance, and probably it is necessary that at a latter stage there is a need for more work on indigenous knowledge of management by fire. Fire is plainly both a cleanser and enricher of land and potential danger to savanna woodland. It is an essential part of agriculture as well. Observations in this study revealed that the Gogo farmer of Dodoma has had a sophisticated understanding of the effects of fire on tree and grass species he needs both for his livestock and for bush fallow cultivation. The negative tone expressed by professional foresters about Gogo fire mismanagement practices was in my opinion based on misconception and the usual negative professional prejudices depicting the rural people as "primitive" or "traditional". But as a matter of fact, the knowledge base of the people is an important asset to be supported and legitimized.

Pruning, Pollarding and Coppicing

Farmers were found to use different techniques for tending and controlled harvesting of trees. Branches were normally removed from the trees both to adjust their shapes and to obtain firewood or material for other purposes. Although discussion with professional foresters in the projects studied indicated that pruning was normally used to release nutrients for crop production, none of the interviewed farmers saw pruning as a way of releasing nutrients. Neither were fruit trees pruned to improve productivity as claimed by professionals. Coffee in Lushoto was the only species that was said to be pruned regularly to improve productivity.

Farmers preferably prune their trees at the end of the dry period. They said scars heal better when humidity is low. When the rains return, the trees develop new shoots and branches. This practice is however, not adhered to. Several farmers pruned their trees during the first part of the dry period. Pruning is done with a varying degree of intensity. Some farmers pruned their trees very high up along the trunk and others did prune more restrictively. Pruning was found to be done in a number of different species both indigenous and exotic. *Grevillea robusta* in Lushoto and *Senna siamea* in Dodoma seemed to receive the highest intensity in terms of pruning.

Pollarding was another widespread management practice used by farmers especially in Lushoto mostly in exotic tree species like *Grevillea robusta* and *Persia americana*. Pollarding is a harvesting technique where both branches and the top are cut-back. One argument for pollarding mentioned by some farmers was that it allows them to control the height of their trees. Similarly, coppicing seemed to be a prevalent management technique in the study areas. Coppicing is the deliberate use of tree species ability to produce new shoots from the stumps when the tree has been felled. The technique was often used when cutting indigenous tree species such as *Albizia schimperiana* and *Catha edulis* but also on exotic species like *Eucalyptus*.

5.1.5 Uses

Results of the field study, showed a lot of scientifically proven benefits from trees. Most of the arguments given during the interviews in this study for integrating trees on farm and pasture lands are also given in the literature written about agroforestry. Both productive and protective functions were mentioned by farmers as important reasons for tree planting or retention (Table 4, 5, 6, 7, 8 and 9). However, the importance of protective functions seemed to vary according to the prevailing environmental conditions of each farm. For example, farmers whose land was level did not mention trees as a means of controlling soil erosion since this was

not perceived as a problem in their farms. The varying conditions of different areas were also reflected in the type of arguments used. In Lushoto district for example, where the slope often reaches 20 % or sometimes even more, trees were commonly planted along the contours to lower the effects of soil erosion, although research has shown that the effects of this practice are limited (Diederichsen and Sianga, 1992). In Dodoma, where the wind was said to be a serious problem, the importance of trees as windbreaks was more emphasized.

Table 10: Traditionally protected tree species in Dodoma urban district

No.	Species	Sanction
1.	<i>Acacia tortilis</i>	sacrifice a goat or a bull
2.	<i>Adansonia digitata</i>	Sacrifice a goat or a bull
3.	<i>Calyptrothea taitensis</i>	Sacrifice of a bull or a goat
4.	<i>Combretum spicatum</i>	Sacrifice of a bull
5.	<i>Commiphora mollis</i>	Sacrifice of a bull or a goat
6.	<i>Cordia gharaf</i>	Sacrifice of a bull or a goat
7.	<i>Faidherbia albida</i>	Sacrifice of a bull or a black sheep
8.	<i>Ficus vallis choudae</i>	Sacrifice a goat or a bull
9.	<i>Lannea stuhlmanii</i>	Sacrifice of a bull or a goat
10.	<i>Vitex iringensis</i>	Sacrifice of a bull ; goat or a black sheep
11.	<i>Xeroderris stuhlmanii</i>	Sacrifice of a bull or a black sheep

It was also very interesting to hear the way farmers mention about the importance of trees in traditional ritual observances and beliefs. In Dodoma urban district tree species said to be important for ritual observances includes: *Acacia tortilis*, *adansonia*

digitata, *Faidherbia albida*, *Ficus vallis choudae*, *Xeroderris stuhlmanii*, *Vitex iringensis*, *Combretum spicatum*, *Commiphora mollis*, *Cordia gharaf*, *Calyptrothea taitensis* and *Lannea stuhlmanii* (Table 10).

In Lushoto district, only one tree species was mentioned as being used for ritual observances i.e *Ficus thonningii*. The study showed that a relatively larger number of individual tree species are used for ritual purposes in Dodoma than in Lushoto (a ratio of 11:1). One can speculate that this tendency is due to the fact that Sambiaa people in Lushoto still have groves of forests which can be used for that purpose; the phenomenon seemed to be lacking in Dodoma. Ritual forests or sacred groves in Lushoto acquired their importance from the fact that ancestors' graves are clustered in them, and socially important species are clustered there as grave markers. It is customary for the Sambiaa people to put such clusters of graves on hilltops or ridges, hence the trees may have an incidental conservation effect as well.

Ritual uses of trees and forests tend in most cases to be disregarded in classical forest literature, but indigenous knowledge accompanying these functions if studied carefully by professional foresters can be valuable to the success of tree/forest conservation (Kajembe and Mwaseba, 1993). So far, the practices behind sacred tree and forest groves have hardly been studied and described with the objective of investigating how they fit with professional forest management systems in Tanzania. a number of different categories of "traditional" forest reserves, ranging in size from a hectare to several hundred hectares includes : forest groves; meeting places for male elders; cemetery grounds; private forests for traditional healers; forests believed to create rain and forests for teaching young women/men.

With regard to protective function of forests it is interesting to note the presence of spring forests. The protection of spring forests is justified in Lushoto district by a fascinating mixture of ecological and religious rationale. Nobody is allowed to cut the trees around the water spring. Today, most villagers in Lushoto are either Christians or Moslems but they often continue to respect the protected spring forests. This study showed that religion was positively correlated with both the number of indigenous trees planted and retained by the farmer in Dodoma urban district (Table 2); while for Lushoto significant correlation was observed between religion and the number of all trees present in the farm (Beta weight = 0.0550). These results strengthen the argument that people in Dodoma are connected ritually to particular individual indigenous trees while in Lushoto are connected ritually to forest groves. For the Sambiaa of Lushoto, it is a fact beyond dispute that forested catchments make springs yield water longer into the dry season. Therefore it is tempting to try to interpret the prevalent traditional beliefs along ecological lines.

The concept of forest for both Gogo of Dodoma and Sambia of Lushoto is connected to traditional medicine. It is rather interesting to note that most of the indigenous tree species mentioned in this study have something to do with provision of medicine (Table 5, 6, 8 and 9). This characteristic is found in a few exotic tree species being advocated by the projects such as *Azadarachta indica*, believed to cure over 40 different diseases, and *Eucalyptus spp.* Somehow the concept is also connected to water and fertility in a very general meaning. The regenerative and healing powers of nature, which are associated with water, do not thrive in the domesticated sphere, and traditionally one goes to the wild to sacrifice for rain as well as for curing people who are ill.

There is a certain degree of mysticism, fear and maybe awe when one hears of the practices of traditional healing methods. Ethnomedicine is the subject of traditional healing. It is of great importance in traditional and modern changing Tanzanian society. Most interesting, however, is the connection between ethnomedicine and the culture of people. People of different cultures and social positions turn to different types of treatments when faced with illness or misfortune. Cultural background therefore has an important influence on the aspects of people's lives including their beliefs, behaviour, perceptions and attitudes to illness and pain. Each culture has its own unique language of expressing distress and pain. Others value stoicism, restraint and playing down of their symptoms. Everyday objects such as charms, amulets, horns, fly-whisks, calabashes, powder and herbs are used either directly as medicine or indirectly in a symbolic manner. The symbols often become the language and media of diagnosis and treatment. This study revealed that in villages under the study, the practice of ethnomedicine influences the social position of a person. The traditional healer and the traditional birth attendant are all respected. They play important roles within the community because they are channels through which the involvement of supernatural forces enter daily existence.

Tanzanians have a rich cultural heritage and the role of a traditional healer has been important, but sadly not given recognition it deserves. In the West, the traditional healing practices such as homeopathy and osteopathy and spiritual faith healing are all registered and recognized. It should be noted that the role of the traditional healer (Mganga) is completely different from that of the Witch doctor (Mchawi). The traditional healer identifies, treats or remedies people who have been harmed by witchcraft or supernatural forces. The few contacted traditional healers showed that they have vast knowledge of medicinal plants, their immediate environment and community. The skills of the traditional medical practice are acquired primarily through a long period of apprenticeship and observation. Most of the knowledge is passed from one generation to another. The power of trees and herbs cannot be denied.

5.2 Household social organization

The social organization of the household is a major determining factor for a functioning management system. Households organize labour and are the focus of the decision-making process, distribution of authority, property rights and obligations among members and the control of the production and income. Basic knowledge of the social organization of the small-farm household is fundamental for accurately targeting community forestry interventions at the household level and rural development in general.

The organization of labour within the household is an important factor determining its production activities. The labour power of the individual household in fact, often limit the size of land and field. It was observed in this study that there was a specialization in agricultural tasks by sex. In both Dodoma and Lushoto, women deal mainly with food crops whilst men deal essentially with cash crops. This division of labour cannot be ignored when trying to introduce technological changes for example through tree planting. The first question that should be asked is, who are the farmers? This may seem ridiculous, but experience in Tanzania shows that the significant role women play in agriculture is repeatedly ignored (Kajembe and Mwaseba, 1993). Studies conducted in Tanzania showed that women provide 60 % of all the required farm labour (Rwambali, 1992). Women farmers prepare the land, plant, weed, harvest, process and market agricultural produce. Therefore, women have primary responsibilities for meeting the subsistence needs of their families. The success or failure of agricultural development projects therefore, depends on the use of appropriate technologies by those involved in agricultural production i.e the women. However, in general, women's contribution, and so their relevance to agricultural production, may go unnoticed or may even be undervalued by the extension programme planners as they tend to be overshadowed by traditional values (Ibrahim, 1991). Sachs and Caye (1989) commenting on the orientation of extension services to men as agriculturists stated that *"Agricultural extension in its inception and early development was viewed largely as a masculine enterprise. Little, if any effort was made to interest the female members of the household. Women were assumed to be directing their efforts into channels better adapted to their talents. Farm business and its resultant profit or loss was considered to be outside the scope of women's concern"*. According to Sachs and Caye (1989), in Zambia, improved techniques in plant breeding materials are provided almost exclusively to men farmers. Generally speaking, women farmers quite often with limited access to resources are by-passed by the extension services.

Agriculture is defined here in its broadest sense to include crops and trees. All too frequently, males are assumed to be the farmers and are targeted in most rural development projects like community forestry, despite the fact that women are actually the farm

managers. The disturbing question which arises is "to what degree is this male bias in extension undermining tree planting efforts in the study projects and Tanzania in general?. In Lushoto district for example, male farmers work mostly in valley bottoms where they plant vegetable for income-generation while women work in the slopes where they plant food crops for the family. It is on those slopes where trees are planted. It follows then that tree planting falls under the jurisdiction of the woman. Paradoxically, the study showed that trees planted in Lushoto district (both exotic and indigenous) are positively correlated with the gender of the head of the household (Table 3). Since most of the households are headed by men these results shows that planted trees are correlated to maleness.

Just as women are often the invisible farmers, children's labour in agriculture also often goes unrecognized, although time-allocation studies carried elsewhere have shown that it is substantial in many rural societies (Merrill, 1979; Nag et, al, 1978). Children's presence in schools under the Universal Primary Education Programme in Tanzania has reduced the farm family's total labour supply and forced other members to assume responsibility for tasks traditionally delegated to children or to neglect them completely. Women are frequently the ones who assume the extra burden.

The study also showed that the man who is in most cases the head of the household is the decision-maker on land-use issues (Table 11). The head controls accessibility to trees on his land. He makes rules for his wife and neighbours who are both categories of inside-outsiders, as to the tree species that may be cut. He makes rules for the thickness of branches that can be cut, for the volume that may be cut, or indeed, whether any cutting should be allowed at all. In Lushoto district for example, neighbours may collect firewood from one another's land in dry season, but only wives may collect from their husbands' fields in the wet season, and only the head himself can cut larger branches, no matter what the season.

Table 11. Land-use decision-making (n = 200)

Responsible	Dodoma urban %	Lushoto %
Man	73.0	70.0
Woman	23.0	16.0
Man and Woman	4.0	14.0
Total	100.0	100.0

In Tanzania all the land is officially held by the state and a person's rights to land are dependent on the use they make of it.

As land is not a commercial commodity, theoretically, no private sales can be transacted. In practice, however, land is inherited, exchanged, purchased, sold and leased (Table 12). Both the Gogo and the Sambaa have patrilineal kinship structure, which means that property and descent are inherited in father's line. Inheritance and residence priorities favour sons, not daughters. If the father dies untimely, the eldest son assumes responsibility for the family i.e. he divides property to sons, arranges the daughters' marriages etc. Within the traditional system of Gogo and Sambaa women do not normally inherit land or livestock from their parents. The argument is that women marry and thus move to their husbands' locality. As married wives and mothers, however, women exercise quite extensive rights to crops and livestock property.

Table 12. Land acquisition methods (n = 200)

Method	Dodoma urban %	Lushoto %
Inheritance	49.0	70.0
Purchasing	4.0	24.0
Borrowing	11.0	6.0
Given by the Village govt	36.0	0.0
Total	100.0	100.0

James and Fimbo (1973) argue that the spread of Islam promoted female inheritance rights, as did modern legislation after independence. Traditionally, the father advises his son where to build his home and plough his field. Administrative chiefs were not usually involved in these kinds of transactions unless specific controversies arose and needed to be resolved. Rather the person moving into already settled areas ask permission from his neighbours to build his homestead. They in turn advise the newcomer (often a relative or acquaintance of the people living there) on a suitable settlement site. Title-deeds were never given, but people felt that land belonged to them and so it did as long as they wanted to use it.

In the study villages in Dodoma, land allocation is based upon a principle of a minimum of 1 or 2 hectares per household. The household in this context is defined as a woman and her children; if a man has two wives he is given twice the minimum by the village government (Table 12), three times the minimum if he has three wives etc. Single women (widows or divorcees) with children are normally given their own parcels of land; any woman who is considered the breadwinner of the family and has the ability to

cultivate is allocated her share of land. In principle, then the official tenure law appears to be more advantageous for women than the customary law. Field experience, however, suggests that the local application of this law is actually biased against women. For instance, land cultivated by a married woman is always registered in her husband's name. The village chairmen consulted admitted that they allocate land to women only upon exception. They used the same argument that has been raised before, that women marry and move.

All people interviewed were well-informed about the benefits of tree planting. A wild tree that grows on a cultivated field has very much the same status as a planted tree as long as one continues to till the land. The fact that a person has cleared the area, cultivated the land, but left certain trees, means that those trees should be counted as part of his field. The owner of such trees, however, cannot demand compensation for their loss in case of land transfers in the same way as he would claim for the planted trees. Trees are inherited as property, usually passed on from father to son. They are symbol of continuity and maleness among the Gogo and Sambaa. Tree tenure in the study areas is closely interrelated to land tenure and is, in the final analysis subordinate to the latter. Planting trees is a way of cultivating or working a field and thus acquiring holding rights to land, but cultivation, whether of trees or other plants requires labour and effort. Unless one is sure to harvest the field, one may be reluctant to invest that energy. Trees, in contrast, to agricultural crops take long time to grow. Thus for people to reap the benefits of the labour invested they need to have some stability and continuity in tenure.

In the perspective of tenure security, tree-planting is a double-edged sword. It seems to favour those who have the means (i.e. land and labour) to plant trees in large numbers. I argue that the importance of trees in securing tenure rights is highly conditional. Although both projects under the study (i.e. DOVAP and SECAP) ideologically address themselves to the poor farmers as a basic target group, the wealthier farmers actually have the structural and economic resources to utilize the project services. As tree tenure in the study areas is so closely interconnected with land tenure, there are few ways the projects could have predicted and avoided these unfortunate developments. One method of checking this trend is to direct tree-planting efforts and extension services more to collective entities, for example to schools, village woodlots etc.

The projects have definitely supported collective efforts but well-intentioned professionals, in their eagerness to get the individual farmers to plant trees in order to enhance his or her living standard and economic sustainability have tended to overlook some important aspects of the real situation in which the target groups lives. As noted in this study and by other researchers for example, Johansson, (1989); planted trees are circumscribed by property

rights, and as property, they lay definite claims on the soil in which they grow. Because trees, can take on this quality of property, encouraging tree-planting activities is far from political neutrality. I believe that the area of concern of projects like DOVAP and SECAP should be in the commons rather than in individual holdings. Such an approach would not necessarily discourage the individual farmer from planting trees, but would perhaps minimize some risks inherent in hastening a process that undermines the sustainability of poor farmers' activities.

On the issue of obligations, it was observed that members of the farming households in the study areas are bound together by complex system of obligations. This system is important factor for organizing production and consumption within the household. It structures the hierarchy of goals operative in the household. It determines the number of cook-pots and who shares them; the degree to which resources, assets and factors of production are pooled among the members; and disposal of the household's products and income. It also seem to influence decision-making process and the long-term viability of the household. For example, it was observed in both Lushoto and Dodoma that labour demands and children's autonomy usually revolves in a rather complex manner. If there is a need for labour in production, the parental household strives to retain the labour services of the adult children, while the adult children struggle to assemble sufficient resources to marry and establish an autonomous households. The strength of household therefore depends on finding a balance between these two conflicting goals. In this respect marital status was found to be positively correlated with the number of planted trees (both exotic and indigenous) and retained indigenous trees in Dodoma urban district (Table 2); but surprisingly it was negatively correlated in Lushoto (Table 3).

These rather opposite results can partially be explained by the fact that labour is a constraint in Dodoma during the farming season, so marriage besides making a young man become independent also adds labour to the newly created household. The opposite seems to be true in the case of Lushoto where land rather than labour is a constraint. The results from Lushoto agrees with Chayanov's rule which states that *"In a community of domestic producing groups, the greater the relative working capacity of the household the less its members work"* (Sahlins, 1972), when land rather than labour is a limiting factor.

It needs no emphasis therefore to say that the system of obligations can influence the technology transfer. Technology which threatens the balance of obligations within the household may not be adopted or may not be feasible when household resources are not pooled. Another manifestation is that if the head of the household has to pay for wives' or sons' labour because it falls outside of the traditional labour obligations, than the new technology may be rejected because it is not economical. Yet, thinking in terms of

pooled household labour, development planners may have calculated the returns to technology as profitable. A further implication is that if the system of obligations is ignored, community forestry development or rural development in general can increase inequity between men and women. Carloni, (1983) commenting on this point said "...Modernization in agriculture has tended to concentrate lands, assets, and cash earning opportunities in male hands at the expense of women, thereby making it difficult for them to fulfill their traditional household obligations".

5.3 Management systems at the supra-household level

Forest management systems at the communal level in this study (i.e. Protective spring and ritual forests) (Table 13), were found to be rather passive. Management systems at this level consisted mainly sets of recognized use-rights. They are concerned mostly with regulating who, has the right to access to particular forest/tree resources and excluding others. In other words they are more protection-oriented rather than use-oriented. In short their intention was not to achieve biological goals, such as forest regeneration. In such cases, limiting the number of people who take the product from the forest may reduce overall demand and will have biological consequences, but this is an accidental outcome. In this study, the Sambaa of Lushoto were found to have elaborate traditional forest management systems. One finds that, although their reasoning is different from scientific thought, the consequences are frequently the same. It is traditionally forbidden for example to clear forests on hilltops and along water courses as these clusters of trees are thought to attract water. Traditional forest reserves are accordingly often found high up on the hill slopes or along water courses.

Both the Gogo and the Sambaa have sacred tree species that are strictly prohibited to cut or destroy (Table 10). Nobody is allowed to fell these trees or even cut branches without first having sacrificed an animal. In Lushoto as discussed elsewhere, only one sacred tree species (*Ficus thonningii*) was mentioned by farmers but a number of ritual forests were identified in this study. Ritual forests, act both as a "Church" (altar) and meeting place. Nobody is allowed to take away trees or branches from such forests. To the people these forest groves are animated with power and may, if managed and treated properly, they bring well-being to the people and livestock. Conversely if not handled with care and respect, the forest, potentially wild and dangerous may inflict misfortune and disaster. By conducting their rituals and ceremonies in the forest, people domesticate it and transform the inauspicious and "wild" into human, cultured world. By using the products of the forest and by approaching it through their rituals, both the Sambaa and the Gogo men and women extend their culture into the "empty" forest lands, filling it with social and religious significance.

The main difference between forest management systems at the communal level and forest management systems at the household level is that at the household level forest management systems have a biological goal in addition to recognized use-rights. The concern at the household level is not only with limiting the people who are allowed access to tree/forest products, but also limiting products taken, and the frequency or amount that can be removed. Such systems have biological goal (i.e survival or regeneration of the trees), which is a deliberate goal of those with use-rights. However, saying that the management systems at the household level have a biological goal does not imply that these are sophisticated yield-maximizing systems of forest management. The emphasis is usually on restraining the use of specific type of use, rather than optimizing production. Thus while they are not self-regulating equilibrium systems, they are not solely concerned with use-rights like those at the communal level. Therefore, the statement by Arnold and Campbell (1988:428), that "*indigenous forest management systems are primarily concerned with rights of ownership, protection and distribution of benefits*" seem to be based on communal level analysis only and therefore is misleading when one takes household level management systems into consideration. Although both indigenous forest management systems at the household and communal level have use-rights as a minimum concern, indigenous management systems at the household level are also concerned with the biological goal. The attempts to achieve the goal may be imperfect but this should not obscure the purpose of the systems.

Both village woodlots under village governments/projects and production forest under the central government have biological goals. These goals are supposed to be achieved through the application of professional forest management practices. In both cases trees are raised through polythene tubes. However, this study did not dwell too much on state production forests simply because farmers are not involved in managing them and if at all involved they are involved as wage-labourers; and worse still if they are getting any benefits they get them through stealing. They are trespassers on their own land. For that case the emphasis was put on village woodlots which ideally are supposed to be managed by the people (all study villages had woodlots of about 5 ha). This study showed that 82 % of the sampled population in Dodoma urban district and 89 % in Lushoto district had some knowledge about the presence of village woodlots in their villages.

As the study showed, forest management systems at the supra-household level consists mainly sets of use-rights. It needs no emphasis therefore to say that the existence of a group of people with recognized use-rights is an essential feature of these systems. Indigenous use-rights exists outside the national legal system in the study areas and probably also in most parts of the country. Use-rights are claims to rights to use specified resources regarded as legitimate by people in the same area.

In many cases, secondary or residual rights are also recognized for people outside the primary user group. The secondary rights may involve restricted access to products available to primary users or restricted time frame for collection of the products. The rationale for the recognition of use-rights may vary. In some cases, rights are inherited by members of a particular clan or lineage. In Dodoma, every case of indigenous use-right to common forest resource observed appeared to be based on residence rather than on membership to kin group. In Lushoto, the use-right to ritual forests was based on membership to a kin group (Table 13).

Table 13. Identified tree/forest management systems

District	Type	Organization
Dodoma urban	<ul style="list-style-type: none"> -Home-gardens -Scattered trees in the farms -Protected woodlands in the hills -Forest reserves -Household woodlots -Village woodlots -Fallow shrublands 	<ul style="list-style-type: none"> -Households -Households -Project/ Village govt. -Local govt. -Households -Village govt. -Open access
Lushoto	<ul style="list-style-type: none"> -Scattered trees in the farms -Household woodlots -Village woodlots -Spring forests -Village catchment forests -Ritual forests -Production forests 	<ul style="list-style-type: none"> -Households -Households -Village govt. -User-groups -Project/ Village govt. -Clans -Central govt.

5.4 Summary

This chapter showed that management and utilization of tree/forest resources in the study areas takes place at two levels of social organization i.e. at household and at supra-household. At the household level the farming system is managed by the family members. However, although private land is owned and controlled by one farm family, different people outside the household may have access to the farm resources. The chapter also showed that there is mismatch between internally regenerated initiatives and externally sponsored interventions. Farmers seem to prefer the use of low-cost indigenous methods to protect seedlings and trees rather than the relatively expensive methods recommended by the projects. Farmers also use different techniques for tending and controlled harvesting of trees (Table 14).

Table 14: Indigenous versus professional management practices

Indigenous	Professional
Retention of indigenous species	Planting exotic species
Boundary planting of exotic species	Planting exotic tree species within the farms
Planting stock: cuttings, wildings and suckers	Potted seedlings
Seedling/tree protection: low cost methods	Seedling/tree protection: high cost methods
Pruning to adjust tree shape and to get firewood or material for other purposes	Pruning to get knot free timber and to control the release of nutrients
Pollarding to control height of the trees	Pollarding to get bigger logs
Coppicing as regeneration and controlled utilization technique	Coppicing as a regeneration technique

Furthermore, the chapter underscores the fact that the survival strategy of a farm family is not restricted to its household level but, also to supra-household level. In order to gain better access or control to forest/tree resources people may organize themselves in local organizations, with their own rules for local community control. Management at supra-household (communal management), only succeed when all users can be identified and when clear rules and decision-making arrangements can be put into practice.

CHAPTER 6 THE DILEMMA OF EXTERNALLY SPONSORED INTERVENTIONS

This chapter discusses people's participation and social interface perspectives as two major outcomes of externally sponsored interventions. In this study people's participation is regarded as one of the goals of project interventions but paradoxically, during the implementation process social interface becomes an inevitable consequences. The chapter examines the relationship between actors' actions and project implementation and outcomes. The chapter underscores the fact that community forestry development must be understood in terms of actors' actions. Behind this lay the notion that we should not underestimate actors' choices and responsibilities nor should we assume that externally sponsored institutions are the only carriers affecting the organization of a project.

6.1 People's participation perspective

The analysis of survey data and information collected in phase one indicated that local people acted only as implementers of plans formulated by projects after consulting with village government leaders. Local people are rarely involved in decision-making, benefit sharing or in evaluation. As Long and Van Ploeg (1989) commented *"Their participation in our projects is undoubtedly inspired by the belief that participation will help to reduce infrastructural costs and organizational burdens"*. It follows then that, the participation concept in the projects studied was used in the sense that the rural poor participate in the professionals' projects, and not the other way round; that is participation in their *"livelihood projects"*. To a certain extent villagers had the opportunity to voice their opinions in village meetings. However, frequently villagers only reacted through spokesmen; women rarely spoke out during such meetings. Consequently vital information about people's attitudes and objections could easily be lost.

Both DOVAP and SECAP sponsored new institutions as a way of ensuring people's participation in tree/forest management activities by setting up tree planting committees and went no further. Although committees exists in some indigenous forest management systems, they are not an essential feature (Fisher, 1989). Indigenous institutions in the study areas seem to bear little resemblance to western model of committees being advocated by the studied projects (Table 15 & 16). These externally sponsored institutions are based on subgroup of the population with a delegated decision-making powers. In Dodoma and Lushoto and probably in most parts of Tanzania, decision-making often takes place at different levels. For example in Dodoma it can take place at the co-operative work group, neighbourhood *"Matumbi"*, ritual, and rain committee level. While in Lushoto it can take place at co-operative work, ritual, rain committee, irrigation dam groups or at councils of elders level.

Table 15. Indigenous and externally sponsored institutions in Dodoma Urban district

Indigenous	Externally sponsored
Co-operative work groups	Village councils
Neighbourhoods "Matumbi"	Tree planting committee
Ritual groups	Ten-house cells
Rain-making committee	Council of church elders

Table 16. Indigenous and externally sponsored institutions in Lushoto district

Indigenous	Externally sponsored
Co-operative work groups	Village councils
Ritual groups	Tree planting committees
Rain-making committees	Ten-house cells
Irrigation dams groups	
Council of elders	

The tree planting committees are subordinated to the village administrations. Field research in both Dodoma and Lushoto revealed two kinds of factions competing for village administrations control. Elite groups which normally cooperate with higher level state apparatuses including project officials, in establishing externally sponsored institutional structures (such as tree planting committees) and traditionalists, who sought to reconstruct the village administrations as entities performing predominantly ritual functions and tactful non-compliance to insulate households from demands of the state (projects being party to the state of course).

It seemed many decisions in the study villages are actually being taken outside of the formally recognized "loci" for decision-making, and some of the most important decisions are made by loosely-bounded groups of individuals or factions. It is competition for power which establishes the concept of a faction. A faction is not a legitimate agent within an administrative structure. It may be a locus for decision-making and practice but the rules, if there are any, which govern it are not prescribed by

institutional structure in which it operates. Its criteria of membership and decision-making are necessarily informal. The traditionalist faction, was mostly fully organized. Its primary concern was ritual, but also retained the outward form of the state apparatus. The predominant characteristic of the traditionalists' political practice, is a tactful non-compliance with orders of the village government leaders. The end result of which was the insulation of some households from the demands of the state (the village government is an extension of the state). "Traditional" in one sense refers to what actually existed at some earlier and distant time, while in another sense it refers to modes of "behaviour" or "institutions" which are regarded as such. Members of the traditionalists faction certainly regarded many of their institutions as traditional, that is as things which the people have always been doing. The other faction was composed of elite villagers, teachers and other salaried employees of the state, who work and reside in the villages.

Unlike the village secretaries, who are appointed from above; the village chairmen always see that the retention of their rather authoritative offices depended upon maintaining electoral support among the villagers. Their participation in for example rain-making rituals, asserts their particular claim to the offices. The decision-making practices of the rain committees seem to be analogous to those of formally recognized bodies in the villages, so that the traditionalists had succeeded in organizing a parallel unofficial village administrations. Their jurisdiction, however, are exclusively ritual. Discussions with some villagers in the study villages in Dodoma indicated that they would prefer to see the activities of rain-making committees being integrated with those of the village councils. One leading traditionalist at Mkonze village explained "if we were able to join the rain-making committee with the planning committee and education committee, that would be sufficient; we could get development".

This complex interaction between administrative office and ritual leadership has characterized Dodoma since the first colonial administration was established (Rigby, 1967). The emergence of Christianity (Christians make about 79 % of the sampled population - even if few are devoted) as a new element in the interaction between administrative office and ritual leadership occurred in 1960s, and by the 1970s Christians had become a major new force in local politics. The literacy of Christians was cited by Rigby (1967) as one reason why they took control of administrative offices established just after independence. This remained a factor in the 1970s although the advent of Universal Primary Education Programme has weakened the monopoly of the church in the area. In addition to literacy, Christians also had a knowledge of bureaucratic practice. The Church Missionary Society (CMS), from the Bishop of the Diocese downwards is a highly bureaucratic organization in which administrative protocols are carefully observed. At the village level the church has its own

administrative structure. A council of church elders is supposed to represent the interests of the church within the village (Table 15). As an administrative structure, it gave Christians a knowledge of bureaucratic practice and provided a model for the way such structures should operate. Therefore, if traditionalists are trying to reconstitute the village administrations as traditional ritual institutions, Christians are trying to establish them as secular institutions operated on formal administrative principles. These factions explains in my opinion to a certain extent the limited participation in projects' activities observed in the projects studied.

Besides establishing tree planting committees in the study villages, the projects are also involved in planting trees on pieces of land which seem to change their tenurial status. The first problem of this practice is posed by taking communal land and replacing it with a village woodlot, namely the problem of creating "new social institutions". This presents the projects with a problem far tougher than most others they face. As some observers have said (e.g Murray, 1987), it is a challenge that has to be avoided whenever possible. There are countless examples of social institutions for the common property management of natural resources that have evolved traditionally and that work well; there are very few examples of institutions created by development planners for the same purpose which have been successful (Dove, 1991). Kajembe (1993) commenting on this aspect said "the management of communal natural resources require a strong social organization capable of enforcing incentive and control. Management of these resources by government bodies has not always been effective as they are not able to generate similar patterns of social organizations."

The second problem is that in creating new social institutions, something crucial tends to be left out, namely the need for sanctions against behaviour that maximizes the short-term benefits of the individuals to the detriment of the long-term good of the group. In my opinion this has been left out in the projects studied because project planners did not realize that it was an element in the pre-project situation. Prior to SECAP interventions for example, the poor would have been able to benefit from the village catchment forests, regardless of their actual jural status. A variety of social institutions (Table 16) would have served to prevent the wealthier and more influential villagers from using those forests completely for their own benefits. Under these circumstances, the influential I think, welcome the project drive to create village catchment forests as a way of circumventing the traditional institutions.

Participation in the study project seem to be conceived as a "package deal" which involves a discrete set of interventions that take place within a defined step-by-step programme of implementation; delivering inputs and services to already

identified beneficiaries. Project officials therefore are supposed to institutionalize power by way of rules and procedures governing the system of resource distribution. Intervention models, based upon package delivery systems and the technocratic approach to development, like the ones used by SECAP and DOVAP, frequently become strategic weapons for attempting to assert control over the farming households. This type of development intervention also seeks to influence rural people to go beyond what are seen as their limited capacities, and to acquire new organizational skills and technical know-how. In so doing, attempts are made to convince farmers that, without access to outside institutions and resources, they cannot solve their own problems or improve their living conditions. Community forestry development, in the projects studied, generally implies the restructuring of existing social arrangements (refer to the discussion on the establishment of tree planting committees), to conform to externally-sponsored institutional structures, and the introduction of new meanings in farming practices and within farmers' own "livelihood projects". The paternal attitude of project officials has led to the situation in which local people tend to develop a syndrome of submissive behaviour. Local people are not involved at any stage in planning and evaluation, and are only used as implementers. Therefore, development of people's participation as advocated by the projects remains rhetoric.

6.2 Social interface perspective

Due to misconceptions of the reality of intervention practices and the inadequacy of participation as an analytical tool for the analysis of implementation in the projects studied, a more flexible approach became indispensable as amply explained in section 3.2.3.4 of this thesis. Social interface approach, as Long (1989) argues, is not only a methodological device for studying the confrontation between different life-worlds, but is also a means of understanding the social meanings of the implementation process. through social interface approach, it was possible to deconstruct project interventions to the level of actors actions. Rather than assuming project action, as a functional and predictable policy system, this approach permitted me to appreciate the human dimension and significance of externally sponsored interventions in the restructuring process of community forestry development. In the following sections we will see how project policy and interventions were constituted, organized and implemented in the context bureaucratic culture (Arce, 1993). This was one way into the analysis, but I also needed to observe and analyze actors' social backgrounds and situated social actions, in order to get a firmer grip on actors' practices that shaped the outcome of the projects studied. It was through these observations and analyses of everyday life of policy actors, that the contributions of this actor-oriented approach could be demonstrated.

6.2.1 Complexities of implementing project interventions

A major problem of intervention practices as observed in this study emerges out of the contradiction between the official assumption of uniformity in household farming and the diversity that actually exists in the process of implementation. Similarly, uniform procedures of project implementation are based upon the project officials' assumption that the social behaviour of the village leaders is uniform in nature and shaped by one type of discourse. This study has shown that this assumption is baseless (see discussions in section 6.1). Behaviour of village leaders is not uniform; we have seen for example how complex interactions between administrative office and ritual leadership as a characteristic of the study areas.

Similarly, the formal communication system or policy discourse used by the project has its inherent rigidities and limitations, since it is governed by a set of procedures which the local officials (village extension workers) cannot apply when confronted with a more relevant and highly diverse local strategies and types of discourse used by farmers in accordance with their own indigenous knowledge. In this respect for example, we see that the official policy of the projects is to encourage exotic tree planting, but surprisingly this study showed a positive correlation between extension visits and the number of indigenous tree species planted in Dodoma urban district (Table 2); similarly a significant correlation was observed between extension visits and the number of retained indigenous tree species in Lushoto district (Table 3).

These results suggests to a certain extent that village extension workers have their own strategies of communicating with the farmers. Therefore one can argue that the multiplicity of interests and behaviour of village extension workers are shaped by the diversity and complexity of the practical problems and needs of the farmers they face. They are forced or compelled to formulate alternative objectives and actions as a means of coping with the situations. From the perspective of project officials, diversity has a different meaning. They explain it principally as a management problem, and if, the latter is considered real, then one needs to determine how this diversity is externally determined and reproduced by the actions and ideologies of the intervening parties. Explanation of the problem situations in the study projects, therefore depends on how project officials understand and evaluate those problems, and set about devising "solutions" for them. This is important because intervention practices are based upon officials' ways of conceptualizing the problems of the small holder farming and of categorizing farmers and their production problems. Discussions with project officials in both DOVAP and SECAP revealed that they often categorize farmers in terms of "Progressive" versus "Backward"; "Efficient" versus "Inefficient"; "Adaptable" versus "Unadaptable"; "Educated" versus

"Uneducated". The study for example, showed that education was significantly correlated with the number of planted exotic trees in both Dodoma urban and Lushoto districts (Table 2 and 3).

These results to my opinion reflects the bias of the projects towards the "educated". Kajembe (1988) argued that *"It is the comparatively better educated and well to do farmers who generally absorb the bulk of the government inputs"*. Project officials use this categorization to explain the problems of small-holder farming which they see as their job to solve. That means officials consider their role as indispensable to making farmers "progressive". According to them "failures" cannot be avoided but can be corrected with proper management or "corrective actions". For corrective measures, more and more officials, facilities and externally sponsored institutions are needed. This seem to constitute the central management principle of the projects studied.

In summary then, the discussion above reveals two fundamental dimensions: First, the clash between project development model, which is based on the rationale and underlying concepts concerning the delivery and distribution of project resources, and the strategies and interpretations of the local officials who are responsible for the implementation of the strategy; and secondly, the power and influence which individual farmers and groups of farmers exert over the kinds of intervention strategies devised by the projects in their day to day struggles. These dimensions will be elaborated latter in this thesis.

6.2.2 Strategies of village extension workers

This section examines the strategies, attitudes and behaviour of village extension workers in the study projects. In this discussion the terms village extension workers and field officers are used interchangeably. By structuring the discussion this way I am attempting to depict the reality of the social life of village extension workers. In the first part of this section, I explain how the procedures, rules, tasks and responsibilities of the local field officers are laid down. In the second part, I analyze the practical problems of implementation, I show how the work and effectiveness of the field officers are affected by the external constraints of the institutions to which they belong and by the internal struggles of the farming communities with which they interact. Thirdly I discuss the difficulties being faced by the local field officers during the implementation of the interventions that fall in line with the exigencies of the top-down authority structure of the projects. Finally the behaviour patterns of the local field officers are analyzed in order to understand their role in the construction of ongoing social process.

The critical points of linkage within and entree to the local arena

In section 6.2.1 I dealt with farm households in general and outlined the myriad of socioeconomic complexities that contribute to, what the project officials call "Management problems". It should be emphasized that farm households exhibit a heterogenous pattern of development generating different patterns of response and change. In order to understand the dynamic and emergent characteristics of these different processes, my analysis addressed itself to the critical points of linkage within and entree to the local arena. These critical points are likely to meet with at the community, group and household levels, since it is at these levels, that community forestry development takes place in Tanzania. In other words it is at these levels that farmers and intervening parties meet and negotiate and interact in effort to realize their own goals. In so doing, they contribute to the crisis of intervening organization (Siriwardema, 1989).

The implementation of planned interventions depends very much upon the reliability and accountability of the local field officers. However, their effectiveness and work discipline cannot be guaranteed by top-down management strategies based on rules, procedures and reporting to superiors; since control from above is possible only under a reliable and accurate information flow from below. As I will elaborate latter, this information flow is controlled, manipulated and distorted by the local field officers in pursuit of their own goals. This obstructs domination from above. The control and administration of a considerable large number of local field officers and their activities in the study projects is largely based on general circulars in the form of written instructions. These instructions are formulated on the assumption that all village extension workers carry out equal tasks, face similar problems and respond in a common way. However, the fact is that, problems are different in different villages. A top-down management system cannot address itself to such diversity. And it is the weakness of the centralized management system of both SECAP and DOVAP that creates space for local officials to work out their own local solutions.

A related point is that local officials, the bottom layer of the project structure, are far away from the authorities in Dodoma and Lushoto towns. Their links are maintained through a communication system based upon follow-up reports, monthly returns and the keeping of field records. But these local officials do live with the farmers, and therefore, regular face-to-face interaction with the farmers is unavoidable. As one village extension worker explained in Kibaoni-Longoi village: *"With regards to our day to day problems, farmers who are waiting in front of us are much more important than the orders we receive from the head office"*. Because of this practical situation, the projects need to separate the internal and external dimensions of their intervention

practices. The internal dimension is a more dynamic process which involves day-to-day actors. The external dimension involves dealing with high-ranking officials.

Tasks and responsibilities of village extension workers

Within the project bureaucratic structure, it is the village extension worker at the local level, who play a central role in transforming project policies during the implementation process. The most important aspect of an effective village extension worker is the type of social relations that he (almost never she) builds with the farmers. His ability to establish smooth working relations is judged by the farmers' willingness to accept different project interventions. Also the village extension worker is supposed to be "the closest friend and supporter of the farmers". This means an extension worker should be able to explain to the farmers what is expected of them in the programmes at hand and what the benefits will be and persuade them to participate accordingly. In a detailed study on the interface between bureaucrats and rural people in Western Mexico, Arce (1993) positions the extension worker as *"a manipulator of circumstances, rather than a controller of standardized agricultural services"*. Also as Lekkan dit Deprez and Wiersum (1993) argues *"the identification of the forest agent as operating at the interface of the national context and local level interests implies that these persons are operating in a dualistic social environment: the meeting point of local village environment and government institutions"*. This is a very different interpretation from seeing the village extension worker merely as the link between the project and the local population. He is the primary target when farmers question the legitimacy of certain project interventions. From the point of view of the rational, knowledgeable farmers, the village extension worker is not the "real bridge" to the village, but merely the lowest echelon of the project. As Lekkan dit Deprez and Wiersum (1993) commented in the case of the Sahel *"He, the field agent, is not seen as someone who listens to the needs and priorities of the people, but as, essentially, the implementer of commands from the top, with any possible room for manoeuvre and discretion in implementation being normally used for his personal domain"*. Consequently, the behaviour of the village extension worker could be characterized as a strategy to arm oneself against uncertainty, manifesting itself in a variety of coping patterns.

After being given a work task and monthly salary, it is assumed that village extension worker will perform his tasks as expected. However, this process does not happen in practice because: The extension worker may be committed to conceiving and organizing his field activities according to the demands and problems of the local people and yet, at the same time, also has to perform duties within the existing administrative structure and as a matter of

fact he is expected to further the interests of the project (external institution). Thus he faces difficulties in dealing with the wide-ranging and flexible problems and demands of the local people within the rigid project framework in which he is expected to function. The relationships between various social groups in the village and extension worker do not follow a uniform pattern. Under prevailing resource constraints in Tanzania, local-level extension workers cannot maintain a sufficient social status to attract the affluent group of farmers; and some are compelled, or choose to develop an alliance with the better-off farmers as a strategy for personal gains.

External factors influencing the role and attitude of the village extension workers

The village extension worker's performance is influenced by three basic factors: The attitudes and expectations of his superiors; his own domestic pressures; and local people's demands. One should not assume therefore, that within the project management hierarchy, village extension workers play a passive role, carrying out only the instructions of their superiors. Village extension workers are important intermediary actors between farmers and the project authority and organize their activities to suit different situations, and changing circumstances.

Theoretically, both SECAP and DOVAP authorities at Lushoto and Dodoma head offices have both the necessary political and statutory powers to reward performance in support of the stated project objectives and take punitive action against those who obstruct the achievements. But, in practice, these powers remain ineffective due to difficulties in making correct assessments of what is actually happening at the local level. As Lekanne dit Deprez and Wiersum (1993) argued *"the organizational structure and institutional culture create, ignorance at the level of the higher echelons; the management does not know what is really happening at the grass roots"*. In this sense they are self-deceiving organizations. Indeed, sometimes, the reporting system is regarded by the village extension workers as unsuitable, which then leads to a weakening of vertical links and relationships. In certain cases, a Divisional Extension Officer who supervises a number of village extension workers can show to his subordinates a considerable degree of, what they might consider, irrational and arbitrary application of power. This has a demoralizing effect on village extension workers, making them either fearful of taking initiatives or become frustrated. Thus resistance comes not only from the farmers but also from the bottom layer of the project structure itself. As one village extension worker in Dodoma commented *"It is a matter of preparing the field environment (up-to-date field notebooks; required statistics and progress reports; and some hand-picked farmers to provide information) in order to relate positively towards the supervisory actions of the*

Divisional Extension Officer or subject matter specialist from the head office. It can be a highly exaggerated interpretation of the reality; or it can even be a wrong opinion. Yet, whatever it may be, I must be very careful in my response to these enquiries".

The village extension worker who is supposed to conceive and organize tree planting activities of his particular village is constantly subject to pressure from his superiors. Under this push-pull set-up the extension workers in the study villages tend to be very agile in the performance of their duties. Therefore, village extension workers who may be initially dedicated and loyal are reluctantly compelled to take evasive action to avoid undue blames from their immediate superiors. Therefore, it can be argued that, the projects' attempts at incorporating the local people into planned interventions often works against themselves since their local extension workers are not sufficiently motivated and sensitized. It is misleading therefore, to speak of the "logic of transformation" not only because all conditions are unable to be transformed, but also because of the alterations that are being made by intermediary agents who develop strategies for keeping superiors away from realities of farmer behaviour.

The fact is that the system has never worked as it was conceived. There are breakdowns along the line and local extension workers have to face the consequences. However, as observed in this study, they have found the way to survive. Paradoxically, most forms of dependence on external institutions introduced in Tanzania provide some access to transactional processes with farmers. This enables local officials to influence to some degree the activities of the farmers, and in some cases to assist the poor farmers to reduce or eliminate such dependencies. It is in this respect that careful studies are required to determine the strategies developed by the actors of the bottom layer of most community forestry development projects in Tanzania.

An important internal factor that contributes to the effectiveness of extension worker is his own domestic commitments. The socio-economic condition of the village extension worker, particularly his low salary, leads to financial pressures from the domestic front due to his responsibility towards his kinfolk who are usually dependent on his earnings. As observed in this study, most of the village extension workers come from lower income groups with large families and the financial strain is evident in the performance of their duties. Therefore, their economic and social status itself is an obstacle to the development of the relationships within the project bureaucracy and with certain categories of farmers. During discussions with village extension workers, I came to appreciate their perceptions and explanations on what they call "their internal world". Indeed, they had their own opinions on almost everything about the projects. Village extension workers are aware that for their own survival they should avoid the temptation of breaking their links with the

farmers. One extension worker at Zuzu village had this to say "Our living environment is surrounded by farm families, their human and social struggles for survival, as well as by unavoidable moral bonds. This is our internal world in which our involvement may even become counter-productive depending on the particular local situations we are confronted with. We have to maintain good relationships with the progressive farmers. Sometimes we help them within our limitations. We do so mainly for our own survival. For example, we have to use these progressive farmers as "show pieces" when visitors come to visit us".

Observations in the field showed that even when the village extension worker visits the project head-quarters his self-effacing behaviour follows a set pattern: He remains silent at meetings and tries to avoid communication so that he can keep his "internal world" more or less independent from the links with the external agents. In his responses to his superior's questions, he tries to create confusion about the actual situation at the grassroots level, so that the actual situation remains unknown.

The discussion above, illustrates how the planned intervention strategies in the study projects are continuously being modified or altered at the level of implementation. Three implications may be noted from the above account of the strategies adopted by the local level extension workers: The bottom layer of the project structure, which consists the village extension workers and villagers, does not function in the same way as its top layer of project supervisors. Theoretically, the project structure had been designed to maintain "a top-down" dependency on external institutions. But, in reality the top management of both SECAP and DOVAP depends heavily on the local actors; and although policies and models of the projects were formulated in Lushoto and Dodoma towns, they are severely affected by organizational constraints at the level of implementation. It needs no emphasis therefore, to say that although general procedures and models of community forestry in Tanzania may be a product of foreign and local experts' knowledge, but when these models and policies are handed over to the village extension workers, the latter usually make their own modifications and alterations depending on the nature of the specific problems they face.

Therefore, it is not "expert knowledge" of community forestry development models that actually works at the local level but the village extension worker's own knowledge and experience which emerge out of micro-level economic, social and political factors. The day to day struggle of the village extension workers with their own problems is dominated by the pragmatic motive, that is their everyday life is essentially oriented towards solving practical problems. Although village level extension workers are normally identified as monthly wage-earning development bureaucrats, they cannot simply be separated from local processes and on-going social constructions. With their rural background

(all of them in the projects studied were from rural families) and life experience, they are closer to reality of social life in the villages. Thus their work styles and career patterns become part of the local processes where local actors (villagers and extension workers) attempt to give social meaning to ordinary events and situations. Hence, village extension workers represent the on-going social processes rather than the projects. Since they are compelled to get involved in local social interactions, they cannot simply escape from the social justifications of the communicative order.

It is also equally important to analyze how the farmers attempt to manage this complex organizational set up imposed by SECAP and DOVAP on them. The next section, therefore discusses farmer behaviour, resistance and struggles which takes place in response to planned project interventions.

6.2.3 Farmer reaction, resistance and strategies

Farmers in both SECAP and DOVAP are heavily supervised by a number of extension workers with strategic intentions aimed at changing their "traditional" farming practices towards "modern" ones. Farmers have limited possibilities for making their own decisions. Yet, although there is very limited room for manoeuvre, these farmers do resist, negotiate and struggle in a variety of ways. For example, as already discussed in this thesis, farmers tend to leave indigenous tree species such as *Albizia schimperiana* scattered within their farms and confine the famous project species like *Grevillea robusta* to farm boundaries simply because they know they are not compatible with their crops. As a matter of fact, farmers tend to learn the behaviour of the intervening parties, identify their weaknesses and generate their own "battle grounds" for confrontation with them. In so doing, they reshape the so-called controlled programme of planned intervention. This reshaping process generates "common ground" upon which to press their demands.

In some cases farmers can "internalize" external interventions through influencing officials to readjust intervention practices in accordance with farmers' programmes of action. This situation was clearly seen in DOVAP where the project officials have realized that farmers prefer and plant indigenous tree species and consequently the project has started to readjust its strategies accordingly. So in the actual fact farmers struggle to demarcate their "domains" and identify the value and meaning of their encounters under diversified patterns of household farming.

It should be noted that although village extension workers play a subordinate role among their superiors, they tend to maintain some authority among the local farmers as liaison officers. Experience from the study revealed that when farmers are not

satisfied with the work of the village extension worker, they cannot protest to the project officials because they see no point doing that. Instead farmers tend to depend on farmer-farmer relationships and social networks which are based on indigenous knowledge and practices. Farmers use social networks and shared stocks of knowledge for reshaping and for internalizing many components of the external interventions. Since in most cases village extension workers have neither answers nor solutions to most of the farmers' problems, they are forced to "participate in farmers' projects" and this may explain the observed positive correlation between the number of planted indigenous tree species and extension visits in Dodoma urban district as well as the positive correlation observed in Lushoto district between the number of retained indigenous tree species and extension visits (Table 2 and 3). These results show how actors at the local level (i.e. farmers and extension workers), modify and re-order project interventions in order to develop their own working principles in the process of project implementation.

6.3 Summary

In this chapter we have seen that village extension workers are the front-line cadre of the projects at local level. Their administrative involvement with contrasting and often conflicting sets of cultural, social and economic interests generate a body of knowledge based upon their personal experiences made up of the "social dust of the field" (Arce, 1993). As we have seen in this chapter, these experiences usually lead front-line "project representatives" to develop their own views while devising strategies on how to implement community forestry interventions at the local level.

Farmers also construct their own "livelihood projects" which cannot be specified in advance. They are able to reject some interventions, while accepting others. Through this, they improve their skills of negotiating. The extent to which they accept project interventions involves a complex interface between indigenous knowledge and the characteristics of the new rural context proposed by the projects. Farmers cannot be represented as passive subjects of project interventions. Therefore projects cannot avoid coming into contact with resistances, negotiations and capabilities of the rural people. Active participation of local people in their struggle for survival and their significant contribution to the shaping of "local reality" involve the entanglements of bureaucrats and rural people (Arce, 1993)

In this study community forestry, became the contested means of rural development. The way community forestry interventions were internalized and translated into actors' life-worlds generated anxiety, discussions, and reflections; where community forestry implied a social construction of actors. Therefore, community

forestry came to be conceived in this study as a "social field" made up of a series of related actors' actions and experiences.

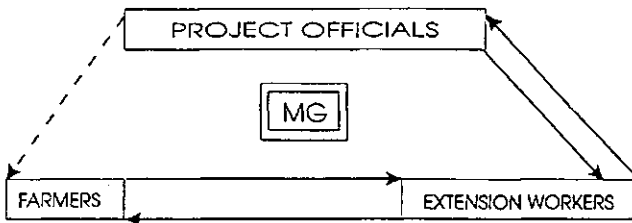
A central argument of this study is that "project interventions cannot be seen as a set of patterned interrelationships between entities, institutions or tendencies totally devoid of actors' presence and actions. Instead project interventions should be perceived as a process that is part and parcel of the action of the actors." One important implication of this perspective is that it allows us to recognize diversity as a material condition of community forestry development process in Tanzania.

CHAPTER 7 THE MIDDLE GROUND MODEL

7.1 Overview

The central aim of this study was to analyze the differences and similarities between indigenous and professional forest management systems and suggest a way of integrating the two. Analysis carried out indicated clearly that in most cases there appears to be a gulf between internally regenerated initiatives and externally-sponsored interventions. In order to bridge this seemingly ever increasing gap a "Middle Ground Model" (MGM) is proposed (Fig. 8)

Fig. 8 The Middle Ground (MGM)



Key:

MG = Middle ground

— = Two-way communication between project officials-extension workers-farmers

---- = Contact between project officials and farmers

Figure 8: The Middle Ground Model (MGM)

The model is based on the premise that it is necessary to deconstruct actors' actions in relation to their life-worlds. Actors' actions are embodied within ideological and culturally-specific meanings of authority, and are part of the social construction of power. The model takes actors' practices and feelings as a central dimension of community forestry development.

7.2 The concept of a model

A model is a simplified representation of something that has to be described, explained or understood. Its purpose is to generate answers to questions or problems (Van Maaren, 1990). Models have three connotations. They may represent states, objects or events in much the same sense in which an architect constructs a small-scale model of a building. They may imply a degree of perfection or idealization, e.g. a model student, or they may demonstrate how something works. Generally models are less complicated than reality and hence may lead more directly to generalizations.

Social models like the one proposed in this study, are based on selected "sets of statements" about the reality in a given situation. Hardly ever do models attempt to encompass all possible variables. A complete explanation of human behaviour would probably demand hundreds if not thousands of different independent variables.

7.3 The key actors

The study showed that there are three key actors in community forestry development: farmers (including local leaders); village extension workers, and project officials or supervisors. This "triangle" of relationships constitute the social arena marking out the actual locale of community forestry development in Tanzania or what I call "the middle ground". The middle ground refers to the totality of social processes and fields within which different groups of actors attempt to establish "common ground" for their negotiations over resources and development alternatives. My intention was to open windows into these social realities and to observe how the strategic actions and interactions of the various "participants" shaped the outcome of the planned project interventions. This is a highly complex zone of intervention practices where actors meet each other, test out their practical concepts, evolve interdependencies for survival, and develop various types of relationships based upon these encounters. As I explored in this thesis, what actually happens in the "middle ground" cannot simply be analyzed within the framework of "participation" which is idealized as the unimpeded two-way flow of information from the intervening party to the local people (two-actor model). In reality there are often confrontations involving bargaining and negotiations between three groups of social actors: farmers, village extension workers and project officials.

Such face-to-face engagements constitute, "the battle ground" of community forestry development in Tanzania. There are also struggles that may be depicted as "underground" actions where the so-called "powerless" groups develop alternative forms of power for realizing their own goals (refer for example to the discussion on traditionalists). These relatively invisible processes, which frequently go unnoticed in community forestry development studies, often constitute the beginnings of peasants' empowerment. In the same way, various strategies used by the village extension workers for realizing their hidden agendas, which may be regarded as "unofficial" also contribute to these complex processes by the participants. The biggest weapon used by farmers in these confrontations and negotiations is their "indigenous knowledge".

The "Middle ground model (which may also be referred to as a "three-actor" model) emphasizes the need to understand these key actors. In the case of farmers, it is important first to find out

if there are any active tree/forest management practices and organizations and if there are active practices and organizations trying to build upon them. If Those practices and organizations are found to be inadequate then, trying to intervene. However, if intervention is to be carried out it should be done in the following sequence: first, there is a need to learn about the clientele; it is important that interventionists have a set of conceptual tools to enable them better to comprehend the situation of small farm families and the possible socio-economic and institutional constraints they may face in an attempt to introduce trees in their farming systems. The second step is to recognize that there is a basic picture of the small farmers that ought to be assembled for problem definition, design and implementation phases of the programme. Attention must be given, besides socio-economic and institutional aspects, to technical as well as to environmental factors also. The third step should be the full integration of the farmers into the decision-making process. Farmers should be involved in problem definition, the design of possible solutions and evaluation of the proposed technological solutions. Full "participation" of the small farmers in the process not only enhances the design of appropriate technologies, but also enables farmers to sustain changes after official support ends. But this participation must be based on a realistic understanding that the "middle ground" is a contested domain, and that participation involves negotiation and compromise.

7.3.1 Re-orienting the village extension workers

As the study showed, village extension workers are the front-line cadre of the projects at the local level. They are the ones who are supposed to conceive and organize tree planting activities at the village level. They are constantly subject to pressure from their superiors. Under this push-pull set-up, village extension workers tend to be very submissive. It is on this premise that middle ground model calls for changes. Changes in value systems and the hierarchies project officials "impose" on extension workers; establishing relationships of respect and trust between project officials and village extension workers; giving more decision-making responsibilities to extension workers; promoting experience sharing, reflection and confidence-building among the village extension workers; helping the village extension workers to identify problems and define new approaches; and supporting them and applauding their efforts in this complex, contested terrain.

These changes will enable village extension workers to take initiatives; to change their attitudes and develop commitment to community forestry development; and to participate in community forestry development by developing relationships with villagers and subsequently institutionalizing their new roles and working styles. According to this model the village extension workers need

to be seen as "active and creative, as agents in their own rights, not simply as respondents of stimuli".

7.3.2 Bureaucratic re-orientation

The major challenge for the proposed "middle ground model" is the need for the bureaucratic re-orientation, including a change from authoritarian to participatory styles and a shift in responsiveness from orders from above to demands from below (Chambers, 1983). The working environment in which field staff find themselves must also be conducive to their role. It will be difficult for the village extension workers to adopt service-oriented role when the value system they work within encourages them otherwise. Change in value system of community forestry projects and Forestry and Beekeeping Department in general needs to come from the higher levels first - the senior officials and the senior project advisers. Furthermore, the present hierarchical working styles of community forestry projects and Forestry and Beekeeping Department at large is not suitable for sustaining participatory forestry. An example of one area in which change is needed is in village extension meetings. These at present often in the style Chambers (1983) describes: "...In meetings subordinates are upbraided, cajoled and given orders. They are asked to report of targets achieved, not for problems encountered. Poor performance of deviant initiatives are rewarded by punishment of posting to remote areas. Promotion comes, if at all, through compliance. Real problems of implementation are repressed; appearance of achievements applauded. Senior officers do not learn from their subordinates and subordinates do not learn from their rural clients." A more appropriate style of working would be stimulative and supportive rather than directive and punitive. Another change that is needed in community forestry if extension workers' commitment is to be sustained is that "good work should be recognized". The problem of extension workers' inadequate enumeration needs to be considered. The extension workers' low salaries leads to the financial pressures from the domestic front due to their responsibilities towards their kinfolks who are usually dependent on their earnings. Most of the extension workers in this study come from lower income groups with relatively large families and the financial strain is evident in the performance of their duties.

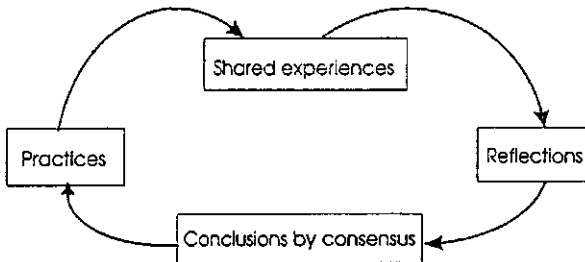
7.4 Operationalization of the middle ground model

7.4.1 Running participatory workshops

Operationalization of middle ground model calls for the following strategies : first running "participatory workshops" for village extension workers (front-line actors). These have also been referred to as re-orientation and start-up workshops (Gronow and

Shrestha, 1988). In these workshops there is no teacher/pupil relationships, rather it is accepted that everyone has something to contribute to the learning process. The objective is to encourage extension workers learn from their own experiences. If the extension workers are to be active in the field then they have to be allowed to be active in the classroom situations. The major goal of these workshops is to begin the process of re-orienting village extension workers towards their new roles; that of "facilitators" of community forestry development and subsequently to help them develop their own approaches, strategies, and work programmes to meet their goals. Fig. 9 depicts how these workshops might be conducted.

Fig. 9 Sequences for a participatory workshop



The "experiences" shared are that of the extension workers. It is accepted that learning is not something which can be "injected" into the extension workers; it has to emerge from their own experiences to be useful, real and practical (Wzorec, 1986). The workshop facilitator and participating project officials also have to make effort to listen to and understand the perspectives of extension workers. Extension workers will come with a wealth of experiences, insights, problems and ideas. In addition the workshop methodology itself will provide new experiences. Since agreement by group consensus is usually the key factor in community forestry development in Tanzania, the workshops should be designed to show the extension workers how consensus can be reached - by actually experiencing it. In this way the workshops will have relevance to what extension workers would do in the villages.

"Reflections" will enable the village extension workers to re-evaluate their attitudes, values and roles. Suggested topics on which they should be invited to reflect critically are: reasons for forest destruction; the villagers' ability to manage forests; the villagers' role in community forestry development; and the use of extension materials. Reflection should be encouraged by the facilitator by posing problems, challenging, inconsistencies and using the socratic method of questioning (i.e by which the respondent comes to his/her own realization). Invariably in open but challenging climate of the workshops prevalent attitudes give

way to more honest ones. The village extension workers should be made slowly to accept the villagers' ability to take the leading role in community forestry development. They should be encouraged to draw "conclusions" from their own analyses. Coming to conclusion is important to produce a sense of consensus, commitment to change and increasing self-confidence. It also helps people feel they are learning. They should be encouraged to commit themselves to putting their conclusions into "practice" both during the workshops by role playing, in field trips and back at their work through work plans.

7.4.2 The role of the workshop facilitator

In order these workshops to be successful the role of the facilitator is very central. A facilitator must have "faith in people", must not impose, must try to "create awareness and help extension workers analyze their situations." Throughout the workshop the facilitator should provide a role model for the extension workers' subsequent work in the villages of stimulating not directing. To help ensure the success of the workshops the facilitator must also be responsible for: first, encouraging the breakdown of hierarchical structures by helping every one to take initiatives: officers and village extension workers equally. Second, encouraging those taking part to be active and expressive. The facilitator has to create and maintain a non-threatening learning climate; to validate the participants' experiences i.e help them to believe that their experiences are valuable. This again has parallels with the role extension workers will play in the community. This climate can be created by: keeping each person involved and active by having small group work; ensuring involvement of everyone in decision-making so that each participant feels committed to carrying it out; giving and receiving feedback; and dealing with conflicts constructively, so that no one feels that he/she has been excluded; and thirdly, sustaining self-motivation throughout the workshops.

Focus for the workshops should be on "those taking part rather than on particular subject matter". As far as possible participants should be involved in identifying the workshop objectives and topics. Because the extension workers themselves help to identify their learning needs and sets goals, the content is usually highly relevant. Once the workshop is over, the re-orientation process should continue in the field. The extension workers interviewed in this study have repeatedly said that working in the villages presents difficulties with regard to credibility, confidence and political pressure. Their relation to some influential villagers and low official status make them feel insecure. Without a "role model" the field staff will initially find it difficult to develop the skills needed to initiate and maintain dialogue with the villagers. Without help it is difficult to develop strategies. The type of moral and practical support

provided at the workshop has to be provided in the field until the extension workers' role re-orientation is completely instituted (both in the villages and at the project level). The need for intensive field support to extension workers should be short-term, until skills develop and until the villagers have faith in the extension workers. If this field support is not forthcoming the re-orientation process goes no further than the end of the workshop.

7.4.3 Village extension workers to be employed by the local farmers' organizations

For outside agencies (who often have legalized them), local organizations form important "entrances" to the local level. Their interventions are often canalized via them (Heijdra, 1989). For farmers, local organizations offer access to wider institutional and economic systems. Thus it is at the level of local organizations that critical points of intersection or linkage between different social systems or levels of social order are likely to be found. Local organizations (such as users' associations, rural cooperatives etc.) constitute social arenas where farmers and outside agencies can meet and attempt to realize their collective and individual goals.

Like intervention itself, local organizations are best described in terms of ongoing processes of interaction and negotiation between representatives of different social orders (e.g. outside agents, peasant leaders and local members) and it is these vivid interactional processes which shape the actual function and meaning of such organizations. Hence they have a dynamic and emergent character. They are not machine-type organizational structures but continuously changing outcomes of ongoing organizing and structuring processes. Because of this dynamic and emergent character inherent in most local organizations, it is logical to suggest that in the long run possibilities should be explored whereby village extensions workers are directly employed by these local organizations. Village extension workers who will be employed directly by the local organizations will not simply allocate services and benefits to farmers in a "mechanical" fashion (as is the case at the moment). But, will be active contributors to the production of decisions using their own discretion and will evolve their own *modus operandi*.

7.4.4 Empowering the farmers

The proposed "Middle Ground Model" will remain ineffective if farmers do not change their outlook and their behaviour of being submissive. In order to build farmers' confidence different extension methods should be used. Regular users' assemblies and users' committee meetings (not village meetings as is the case

now), if properly conducted in a participatory way, can inculcate the necessary environment for "People's participation". Richards (1985) argues that successful rural development depends on inventive self-reliance, enabling farmers to make changes themselves. Rural people's knowledge might be a catalyst, if recognized as a legitimate source for empowerment (Brouwers, 1993). The present research indicates that farmers in both Dodoma urban and Lushoto districts have a rich body of knowledge related to tree growing which seems a logical catalyst for development practitioners who seek to join the farmers in their efforts to define their situation and decide on actions.

7.5 Summary

The "middle ground model" indicates that the role of the village extension worker is important in linking two different contexts of knowledge: that of the rural people and that of the externally sponsored institution. The everyday existence of the village extension worker in these two contexts forces him to separate these two worlds into providing guarantees of a better future for farmers, and also ensuring achievement of project targets. In order to perform well in this "creative" role, village extension workers will have to be freed from the chains of bureaucratic authority and empowered through the means (e.g. workshops aimed to boost "learning" skills) just advocated. Also an important prerequisite for the proper functioning of the different actor categories is the existence of well-adjusted forest policy. (This point is elaborated further in chapter 9).

CHAPTER 8 REFLECTIONS

The chapter reflects on some of specific limitations of the present study, but also provides an opportunity to reflect on general theoretical issues invoked by the foregoing discussion.

8.1 Study limitations

Study areas

This study was carried out only in two districts, which although they are agro-ecologically quite distinct, and hence reflect to a large extent the variations likely to be found in Tanzania, it cannot be claimed that these two districts represent all agro-ecological settings likely to be found in the country. Therefore, the results from this study should be treated as preliminary and more comparative study need to be done.

Information on indigenous practices rather than on knowledge

The study concentrated on getting information on indigenous management practices rather than on knowledge. Obviously, indigenous forest management practices reflect indigenous knowledge. But these practices are also influenced by other factors, such as access to tree/forest resources, a number of culture-sound rules and regulations. It follows that not all indigenous knowledge is reflected in indigenous practices. Therefore, it is likely that there remains much more information to be unlocked by further study.

The problem of recall data

Failure of memory is particularly painful, but hard to avoid, where baseline data are missing and comparisons over time are possible only through memory. In this study, for example, I wanted to find out how the farmers perceived current tree/forest resources as compared to the time when they were young. I had to rely on their memories. Obviously such information cannot be hundred percent reliable, but if no records exists it may be the only way to get an idea of changes over time.

Specification errors

When deciding on the variables to be included in multiple regression analysis there is always a possibility of committing specification error by excluding relevant variables.

Farmers' conditioned responses

A number of studies have been conducted in both Dodoma urban and Lushoto districts on various aspects of agriculture and natural resource management. The main criticism of most research conducted in rural Tanzania is that farmers have been extensively investigated but not adequately studied; as a result it is now difficult to use questionnaire or direct interviewing methods to collect information since farmers have grown accustomed to offering "conditioned" responses. In Dodoma, for example, farmers tend to give answers to suit the researchers' in the hope that they might get some assistance in return. Their responses are generally governed by immediate needs. Interviewers, therefore, tend to gain insight only into an artificial situation created by the farmers and in this way they are diverted from real issues. In order, at least, to reduce this problem this study employed a multi-method approach.

The problem of the "Terms of reference"

Officials in the study projects tend to request for "Terms of reference" in order to limit research only to what they specify and agree upon. Project officials do not seem to feel the need for research knowledge. As a result researchers find it difficult to rely confidently upon official information, since it has often proved to be misleading. It should be stressed that information obtained from official sources has to be interpreted with care for various reasons. Such information is subject to political censorship and always tend to hide problems. Statistical data normally given are highly susceptible to manipulation because the motivation for supplying correct data is generally low.

Fire as a management tool

Burning on agricultural and pasture land is common, especially in Dodoma. It is said to be done to get rid of weeds, plant diseases, insects and snakes and stimulate new growth of grass for grazing. Besides all these seemingly convincing benefits, this study did not do justice to its importance, and probably it is necessary that at a latter stage some work should be done on the indigenous knowledge of management by fire.

Conceptual framework

When this study was planned it was thought that data on professional management systems would be collected by interviewing village extension workers who were assumed to represent the official view point. But during the execution of the study it became clear that such an assumption was wrong. In reality village

extension workers are "the middle actors" between project officials - who are in my opinion the ones who can be labelled as "professionals". As a result, the study had to be modified by adopting a "detachment and reflection" methodology as a tool of getting information on professional forest management systems. The researcher reflected on theories he learned in his professional training. This method was supplemented by some ad hoc discussions with some project officials and researchers.

Inadequacy of participation as analytical tool

When the study was planned, the participation concept was expected to serve dual roles; as a study objective and as methodological tool. However, after carrying out phase one of the study, it became clear that participation was inadequate as an analytical tool. As a result social interface approach was adopted as an methodological tool. However, an interest in participation remained one of the corner-stones of the study.

8.2 Theoretical aspects

8.2.1 "Hard" versus "Soft" forest management systems

In the past forest management science has devoted itself almost exclusively to the concerns of only one kind of "manager": Professional; conducting the affairs of private and public enterprises (Checkland & Scholes, 1990). The manager is situated outside the forest management system, and seeks to "engineer" the system in such away that systemic-externally defined objectives of the system are met. The forest management system is defined as practices and organization of these practices. The objective of the system, and management of it are beyond the system boundaries. These "hard" systems are criticized, and a "Soft" human based system is suggested in community forestry development. Human beings are characterized by their readiness to attribute meaning to what they observe and experience. They cannot abide meaninglessness (Umans, 1993). Human beings can take purposeful action in response to their experience of the world. By purposeful it means deliberate, decided, willed action, whether by an individual or by a group (Checkland & Scholes, 1990). The purposeful action derived from intentions is also based on knowledge. Thus a circle is made: purposeful action in relation to our perceived situation creates new experience of the world of affairs, which yields experience-based knowledge, which again leads to purposeful action. Each time round the cycle the world experienced is somewhat different place, and hence the cycle embodies fundamentally the possibility of learning. Within this learning system, the manager is internalized. The forest-society complex is not seen as a "hard" forest management system (Wiersum, 1992), but rather as "soft" human activity system.

8.2.2 Classical forestry versus community forestry

Substantial differences exist between classical forestry and community forestry or social forestry, both with regard to management as well as to research and development models. Most of these differences arise from the differences in control of the forest/tree resources. In classical forestry, professional foresters have direct control (under a legal mandate) over the forest resources. This enables a concentration of the attention in decision-making on technical manipulation of these resources. The objective of these manipulations are derived from the perception of the expectations of the societal environment, expectations that are communicated in fairly clear manner through the political and economic (market/price) system (Van Maren, 1986); and usually leading to management objectives such as the production of raw material (especially wood) for industrial processing and/or protection of the natural environment.

The research development models of classical forestry have evolved in close contact with the development of practical forest management. The concentration of attention in classical forest management on manipulation of the forest resources and/or protection of these, is reflected in forest research and development that is predominantly biologically, technically and business economics oriented (Veer, 1984). In community forestry, professional foresters have no direct control over the forest/tree resources. Those resources are controlled by a "local manager" with completely different motives, objectives, skills and knowledge and this manager is usually operating under entirely different institutional and technical conditions, as compared to the classical forest manager. Derived from this difference in nature of the manager, the forest/tree resources will often differ considerably from the classically managed closed forest e.g. trees may neither be nor become the biologically or economically dominant form of vegetation. Moreover, the objectives for which the trees are managed may also be entirely different from those in classical forestry.

The decision-making in community forestry cannot be defined in terms of a natural system but must be defined in terms of man-nature system or "soft" system. As a result, interventions in community forestry cannot be directly applied to the natural system but they must be mediated through the "local manager". The consequences of this change in object for decision-making and research and development in community forestry are pervasive. It follows that the local man has to be involved in the decision-making process in one way or the other. As a result people's participation becomes a pre-requisite in community forestry development.

For research and development models, the change in object implies that besides the usual technical criteria of productivity and

sustainability, a third criterion becomes essential i.e. adoptability (Veer, 1984). And in order to increase the chances of adoptability of technical interventions, the local man's physical and social environment must be taken into account. The local man-oriented research should concentrate on analyzing the local man's management strategies, his societal environment and his perception of the natural environment and especially the interrelationships between these. Based on this analysis problems and potentials can be identified, as well as operational constraints and possibilities. These could then be specified in problem definition for technical research and development.

From the foregoing discussion, it is evident that development and implementation of decision-making and research models not only require an adaptation of the professional classical forester's knowledge and skills, but first and foremost a drastic change in professional attitude towards a "local manager". Van Maaren (1986) commenting on this aspect said *"In many developing countries, there is a pre-occupation with traditional values of forest management objectives, which focus on the production of wood for industries, or on conservation. These values are usually at variance with those of the rural people who depend on forest for food and shelter. This bias is usually reflected in the staffing structure and budgets of forestry administrations. The bias is also reflected in the traditional training of foresters who find themselves well-equipped to deal with trees but ill-prepared to deal with people"*. No longer are rural people to be viewed in their capacity as potential forest encroachers that have to be kept out with the force of law, but they are now to be seen as partners in solving common problems. It is assumed that this change in attitude can be best brought in Tanzania through the participation of professional foresters in community forestry research and development.

8.2.3 Intervention as interaction

Intervention when perceived as interaction serves as eye-opener (Long & Van Ploeg, 1989). But most foresters have not been trained to seek knowledge through direct interaction with "layman". They are trained to go first to books, then directly to nature for their answers. An interaction approach implies people-centered, development-oriented approach, rather than a forest-centered, production-oriented one (Gilmour et.al, 1989; Korten & Klauss, 1984). It sees development activities as innovations rather than interventions (Messerschmidt, 1990). An innovation is any thought, behaviour, or a thing that is new because it is qualitatively different from existing forms. Van den Ban and Hawkins, (1988) defined "innovation" as an idea, method or object which is regarded as new by an individual but which is not always the result of recent research.

Innovations are founded upon pre-existing or indigenous forms. In

contrast to intervention, innovation implies a process intrinsic to the local situation, involves local knowledge and perspective, blends outside technologies and resources with local ones, proceeds through a process of dialogue and understanding, recognizes and builds upon local custom and need, and demands that we take the time and use all available opportunities to listen to and learn from what local people know, have to show us, can teach us; then follows up by engaging, encouraging, enabling and empowering them to participate in dialogue and throughout the effort to effect beneficial change (Messerschmidt, 1990). To be able to cooperate in developing successful innovations, it is imperative to understand the process of social change and "the process by which interventions enter the life-worlds of the individuals and groups affected and thus come to form part of the resources and constraints of the social strategies they develop" (Long & Van Ploeg, 1989).

8.2.4 The assumption of a "vacuum" unwarranted

Very often a lack of insights results in the unwarranted assumption of a vacuum in indigenous forest management systems. Many communal forest management systems are perceived by outsiders as open-access regimes or many fallow forest areas are perceived by outsiders as belonging to nobody. This study for instance, identified open-access cases, but also identified communal forest management systems.

Instead of assuming a "vacuum" of whatever nature, the burden of proof should be reversed in order to investigate and verify each vacuum in "our" knowledge. This argument, however, is not intended to deny the possibility of existence of vacuums. They do occur, however, experience shows that the vacuum is often wrongly identified (on "their" side not on "ours"), which is used as a pretext to intervene and results in mismatched initiatives. But it is an open fact that intervention itself, through the project approach, contributes to the image of a "vacuum". Projects assume on one hand an "inside" with material or organizational content, or a "package", to be delivered, and on the other hand an "outside", filled with "ignorance", "incapacity", "poor resources", "backward" forms of technology, "powerlessness" and "inadequate" indigenous knowledge (Long & Van der Ploeg, 1989).

8.2.5 Dichotomies in community forestry development in Tanzania

The projects studied (SECAP and DOVAP), consists of a separate world of development professionals involved in formulating planned intervention programmes, built upon assumptions about the universal features of small-scale farmers and their generally passive participation in community forestry development. Officials of SECAP and DOVAP have their own language, specialized terminologies,

interpretations, meanings and interests concerning the notion of "the project" and its development. In contrast, the middle ground of intervention practice is made up of its own distinctive sets of social relations and social encounters, through which actors process their knowledge, images and understandings, and pursue their own practical ends. Based on this background, the following dichotomies can be reflected.

Dichotomy between project image of the people's participation and the middle ground model of participation

The attitudes and strategies of project officials representing SECAP and DOVAP are such that their own discourse and technical expertise contribute to the creation of their own world (the project), which involves realizing their own goals and hidden agendas. Project officials hardly ever study the social and cultural foundations of the "middle ground model" from the point of view of the client population and its ability to adjust itself to planned intervention. It seems, the projects use "participation" ideals which assume that all farm families will be willing to participate in their programmes in accordance with a "rational" model of participation. Such concepts however, belong to the international vernacular of development professionals, which are used to create images of how farmers should or could behave, and to justify channelling of funds from international donor agencies.

In response to such planned interventions, farmers develop their own models of participation. This involves the internalization of planned intervention through various struggles, manipulations and building of vertical and horizontal relations that take place in the "middle ground". A central problem voiced in community forestry development in Tanzania has always been lack of farmer participation. Most board room discussions, evaluation and training programmes give major attention to farmer participation in community forestry programmes. However, official support to promote participation is often manipulated by village extension workers who, on one hand, try to show compliance with official policy, whilst, on the other hand, acknowledging farmers' notions of participation.

Dichotomy between project language and the language of the middle ground

Such "irregularities, or what are sometimes called "failures", provide the legitimate for the continuance of community forestry development projects in Tanzania. Failures must be corrected through carrying out "evaluation" studies and proposing "improved" interventions. This, in turn, means more and more projects, at a cost of thousands and thousands of dollars. As long as donor agents are willing to provide funds, evaluation reports will continue to

point to the need for "evaluation studies" for new or modified policies.

The specialized technocratic discourse used by the projects, in which top-down instructions and procedures are communicated contains no reference to the actual behaviour of the local actors (i.e extension workers and farmers). These instructions, which may appear legitimate within the project bureaucratic setting, lose their social meaning in the middle ground. In comparison, the types of discourse that emerge from below, through the everyday struggles of farmers and the village extension workers for solving practical problems, are much more dynamic. And such discourses, in fact, become viable alternatives to formal communication system. Hence, the process of change cannot simply be explained as an outcome of intervention practices initiated by the state or by other powerful outsiders, since these interventions are reshaped in the middle ground and accorded social meaning by local actors in accordance with their own specific local interests and circumstances.

Dichotomy between the simplicity of the project model and the complexity of the middle ground model

The middle ground of the development intervention reflects various patterns of change at the village level. These can only be understood by analyzing in detail the behaviour of actors involved. In chapter 6, it was shown how farmers influences village extension workers and gradually incorporate them into their life-worlds. Village extension workers, as the basic intervening agent at the local level, are unable, using formal methods of communication to deal effectively with the actions of the farmers. As a result, they always tend to modify formal communication channels and to ignore regulations, if they want to have impact at all at the local level. As one farmer in Lushoto put it "Officials cannot ever practice what they preach". This disillusionment with external agencies and their representatives, however, was not only characteristic of farmers but also infected those extension workers who finally face the local problems of the intervention.

Dichotomy between theoretical models and practical models

Structuralist models tend to view the process of social life from an external point of view (Siriwardema, 1989), which in the context of this study has meant looking at community forestry development from the point of view of the "official project", or at least from the perspective of structural determinants and linear change. In contrast to this, an actor approach requires understanding problems and processes from the "inside" and in terms of their emergent forms. For that matter, the researcher must make his entry point those situations and arenas where intervention processes impinge upon and enter the life-worlds of the key social actors. This study

argues that, despite the existence of various external linkages and interests and power of intervening parties, when these enter the "middle ground" (local arena), they are compelled to confront and accommodate to the specificities of the local conditions. In so doing, intervening actors have to solve their practical problems from inside.

Within this complex set of problems involving development models and development practice, the identification and explanation of community forestry development process is, I believe, only possible if research addresses itself to, what I have called, "the middle ground" of community forestry development. This, I insist, requires giving serious attention to the perceptions, aspirations and strategies of those social actors involved. A better understanding and conceptualization of these issues depends also upon the development of appropriate research methodologies, and not upon the application of "outdated" frameworks which contain within them interventionist assumptions. The complex social interactions and human behaviour implicit in community forestry development cannot be reduced to some universal logic of development. Thus the researcher must open up the problems for analysis through a detailed understanding of the problematic of the middle ground, where the action takes place. Only by doing that, can he or she open the window on social reality and, at the same time, close the door on interventionist thinking and analysis.

CHAPTER 9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

Indigenous forest management systems are a fluid and dynamic package of elements that change and adapt to new circumstances. Several basic questions have been dealt within the preceding chapters. Did indigenous forest management systems work in the past? This is amply shown by this study. Have indigenous forest management survived and are they still viable? They have been abandoned in quite few cases but as revealed by this study many continue to be viable. Is it important to incorporate indigenous management systems in community forestry development in Tanzania? Yes - and this study tried to show how to do that.

This chapter brings out some of the salient issues that have led to the above conclusions. Contrary to prevailing assumptions and paradigms in forestry profession in Tanzania, local people are active managers of tree and forest resources. They do not simply use, but also actively manipulate their tree and forest resources to sustain an adequate level of production in the long run. Indigenous practices and organizations seem to have been adapted both to ecological necessities as well as to socio-economic needs of the people. The primary objective of the local people is not necessarily conservation (*sensu* absolute preservation), but sustaining the long term productivity of their tree/forest resources while fulfilling their social and biological needs. In terms of degree of complexity, indigenous forest management systems are on the continuum stretching from "very simple" to "highly complex" (where elaborate social controls are devised to coordinate the behaviour of individual members).

But generalities can only go so far. There is a great amount of heterogeneity both inter and intra-groups as amply revealed by this study. Differences between Sambia of Lushoto and Gogo of Dodoma were obvious but also differences were clearly noted even within these groups. Individuals vary in how they manage tree and forest resources and respect social controls, because of their differing skills, experience, needs and personalities. Management systems also vary depending on the tree/forest resources and the time they are used. Valuable trees/forest resources tend to be more strictly managed than low quality or inaccessible tree/forest resources.

For sometime now local people in Tanzania have seen tremendous changes in their social and physical environment. Most of these are due to internal and external factors which were initiated in the colonial era and have continued to this day. For example, during the colonial era, policies that actively favoured crop cultivation, especially for large scale commercial agriculture, led to, crop expansion into communal forest lands and hence exacerbated the problem of deforestation. Also, there have been deliberate attempts to destroy traditional attitudes and behaviour concerning

tree/forest management. All these factors in totality resulted in a gradual dismantling of the traditional political authority, which weakened the social cohesion necessary for maintaining traditional control over the use of trees and forests. The process of social and political disintegration continued during the post independence era when "ujamaa" villages were established and as urban and commercial influences made inroads into the rural economy. The net effect was the weakening of the power of the traditional leaders to enforce forest control mechanisms.

As regards to incorporation of indigenous management systems in community forestry development in Tanzania the study proposed "the middle ground" or "three-actor" model. This model is based on the fact that it is the actors who can decide to incorporate indigenous management systems in community forestry development process or not as the case may be. The model calls for a sense of reversal on the part of the professionals; professionals need to participate in farmers "projects". As clearly shown by this study, indigenous management systems are not static but are at most stable and often flexible, adaptive and dynamic. "Change is inevitable and most local people are not opposed to it; what they resent is the kind of change that is being foisted upon them" (Aiken & Leigh, 1992).

If we are to incorporate their initiatives in "our" projects we have to participate in "their" projects. This means first acknowledging the right-to-live-in. Ownership, in the sense of western use of the term, is often of little importance as compared to customary stewardship. Even more important, is the need to re-evaluate the project-approach. The term "project" should not refer to the conventional use of the term (i.e development project with project staff), but rather it should refer to more abstract and perhaps philosophical use of the term if we are to genuinely incorporate indigenous management systems in community forestry development in Tanzania.

9.2 Policy recommendations

9.2.1 Current situation

The rigid paramilitary orientation of forest service in Tanzania, with its restrictive and punitive approach has been a major factor in the breakdown of some traditional forest resource management systems. Local communities have become divorced from the management of forest resources. Generally speaking, there is no motivation for the villagers to preserve growing trees in the public lands under the existing policy and legislative framework. Kajembe (1988), argued that "Laws are directives for implementing policy and guidelines for resolving conflicts. Rural development and forest policy therefore need to be codified by law. However, to be effective the law must accurately reflect these policies and also be enforceable. Existing legislation affecting the use of forests

in Tanzania, often falls down on both of these counts".

The Tanzania forest law still reflects earlier policies directed primarily towards conservation (sensu absolute preservation). Forest law has not so far been conceived as a positive agent of forest development, but merely as a means of preventing the misuse of forests, and has been developed chiefly in terms of litigation (FAO, 1969). The consequences of this emphasis on deterrent and punitive aspects of forest law is that law becomes an obstacle to forest development. It needs no emphasis to say that a favourable forest policy environment has to emerge if "People's participation" is to pass from rhetoric to reality. The burning question is how?

The Tanzania government and forest services recognize the inherent deficiencies of the approach that emphasizes repressive police functions. This recognition, with encouragement from forestry sector donors, has been incorporated in the Tanzania Forestry Action Plan (TFAP). Recommendations were formulated to underscore the pressing need for better training and research as well as certain policy reforms. Among the priority areas indicated for policy revision were: the transition from repression to extension as a major role of forest extension workers; the revision of forest legislation including the definition of forest domain; the necessity of involving local population in forest resource management; the need to integrate forestry interventions with agricultural and livestock; and importance of greater flexibility in the application of forest regulations to reflect the diverse eco-climatic zones.

Since the landmark document was published back in 1989, some - but, in the opinion of many, not enough progress has been evident. In terms of community forestry, the pivotal reform concerned the role of transition of extension workers in the field. There is much rhetoric suggesting that extension workers are being re-oriented towards assuming a participatory extension role. However, given the animosity developed in the past, relationships between foresters and the local people, and the strong vested interests promoted by fining system, this transition will be very slow unless more draconian policy reform measures are undertaken. Even with the most qualified, motivated and well-intentioned extension workers, the nature of dual roles - providing both repressive and extension functions is often conflicting and impossible to fulfill.

Owing to the low level of national funding, the forest service is dependent upon donor financial assistance for most of its programmes and projects development. Thus donors have a potentially greater leverage in policy dialogue and reform. For that to occur, a unified donor position regarding the major reform issues would be required (at present, and by no means by accident, the major donor agencies - SIDA, FAO, ILO, and DGIS - are each working in separate region). This geographical dispersal renders difficult the important issue of donor coordination. While informal interchange

between donors improves information sharing, formal links have not been forged either by the government or by the donor agencies themselves.

9.2.2 Strategies ahead

What then, are the options to be pursued to create a more conducive forest policy environment in Tanzania? And how can these suggested options be implemented in the face of certain vested interests and the desire to maintain the status quo? There are certainly no clear-cut solutions. One scenario would involve the development and experimentation of rather bold policy measures aimed at creating an effective forest extension capability. Among the potential options to be considered and tested are:

(i) Creation of two forest divisions

The formal separation of the police and extension can be the only short-term solution to the "duality" problem. It is envisaged that there should be two divisions; division of forest protection and division of afforestation. The division of forest protection would be charged with environmental protection, and move from the current pattern of randomized fining to more programmed function with specific agents responsible for specific areas assigned on the basis of protection needs. The protection division would assume an educational role with local populace and work in concert with them. The afforestation division would be mandated with extension function and agents assigned to this division would work exclusively on community forestry activities.

(ii) Transfer of some of the forest management functions to the local people

The people's participation component of community forestry equation can only come to fruition when local-level controls are restored. In view of the limited resources of forest service and the problematic situation concerning recurrent costs facing the Forestry and Beekeeping Department, much more responsibility should be shouldered by the local population. The modalities for ensuring local participation may include: contractual arrangements in some cases. The negotiations of these contracts requires a high degree of cultural adeptness and patience. Some villagers in this study expressed their desire to use "local organizations" which would be responsible for enforcing regulations surrounding forest resource usage. Successful application of these types of initiatives could result in forest service and villagers working in partnership."

But besides these structural changes a thorough acculturation of a forester is required (Umans, 1993). Acculturation is the process of social and cultural change, set in motion through contact with

another society or culture. Within forestry education, people are acculturated in the culture of land owners and managers, particularly the state forestry service (Dargavel et.al, 1985; Dove, 1986), rather than in the culture of local forest users. So far forestry students are acculturated to understand primarily all technically and biologically oriented forestry journals, rather than the very few sociological and anthropologically oriented journals (Umans, 1993). This however, does not apply only to students but also to most professional foresters in Tanzania. Van Maaren (1986) writing on the relation between forestry and culture said *"the consumption per capita of forest products differs widely between various parts of the world not only because of contrasts in the standard of living and the size of the forest resource but also because of differences in behaviour and habits of the people. In this way, the culture of any society plays its own role and should not be neglected."*

9.3 Prospects and outlook

The road ahead, like the trail behind for community forestry development in Tanzania, promises to be rocky and fraught with pitfalls. Policy evolution, and to a certain degree policy revolution, must be pursued with one eye on the types of policy reforms that are solely needed and the other on the political realities at hand. Somehow the political will to support these reforms must be tapped. Like anything else, good policy dependent on good information, but as Van Maaren (1986) commented *"if foresters want to improve the existing forest policy, they have to initiate an action by putting forward a comprehensive conception of the optimum use of forest resources"*. In view of the current short supply of information on the optimum use of forests in Tanzania, researchers from universities and research institutions must be encouraged to supply it.

A more realistic view of policy reform needs to be presented. The forest police function must be viewed as an essential one, which needs to be improved and made more effective and acceptable to the local populace not to be eliminated as some people suggests. Correctly structured, the police function will be complement and supportive to forest extension efforts. Policy reform is a gradual, long-term process. A major task of forest policy is to settle the priorities and the right balance between long term and short term objectives and between measures to satisfy local rural needs of wood for fuel and other domestic use on the other hand and producing wood for industry and primary urban use or export on the other hand. It is widely known that national forest policies especially in poor countries have tended to place too much emphasis on long term industrial (urban) objectives and too little on satisfying short term needs of people living in and near forests (Van Maaren, 1986). There are now welcome signs in Tanzania that this trend as a result of the Tropical Forestry Action Plan, is

gradually being rectified.

Finally, it requires no special emphasis to note that forests can only survive and fulfill their role, if forest users and forest owners are prepared to take a long term view of forest management; but few people outside forestry do take a long term view in daily life. For that reason, forest owners and foresters occasionally get out of step with the rest of the society and withdraw behind their trees; this is unfortunate: foresters are part of the society and should act accordingly. Only that way, can foresters contribute, to a better knowledge and understanding of forestry by the public and by those who form public opinion. Of course, foresters must be prepared not only to talk and teach but also to learn and listen (Van Maaren, 1986).

REFERENCES

- Abrahams, P. 1982.
Historical Sociology. West Compton house near Shepton Mallet:
Open books pub. Ltd.
- Aiken, S.R. and C.H. Leigh, 1992.
Vanishing Rain Forests; The ecological transition in Malaysia.
Oxford, Clarendon Press.
- Alriksson, B. and A. Ohlsson, 1990.
Farming systems with special reference to agroforestry. A
literature review and field study in Babati district,
Tanzania. Working paper no.129; Forests, Trees and People
project. Swedish University of Agricultural Sciences.
International Rural Development Center, Uppsalla, Sweden.
- Arce, A. 1993
Negotiating agricultural development: entanglements of
bureaucrats and rural producers in Western Mexico. Wageningen
Studies in Sociology No. 34, Agricultural University
Wageningen, the Netherlands.
- Arhem, K. 1985
Pastoral Man in the Garden of Eden. The Masai of Ngorongoro
Conservation Area, Tanzania. Uppsala Research Reports in
Cultural Anthropology, Uppsala, Sweden.
- Arnold, J.E.M. 1983.
Community forestry and meeting fuelwood needs. Commonwealth
Forestry Review 62 (3): 183-189.
- Arnold, J.E.M. 1987.
Community forestry. AMBIO 16 (2/3): 123-128.
- Arnold, J.E.M. and J.J. Jongma, 1978.
Fuelwood and charcoal in developing countries: An economic
survey. Unasylva, 29 (118): 2-9.
- Arnold, J.E.M. and J.G. Campbell, 1988.
Collective management of hill forests in Nepal: The community
forestry development project; In: Proceedings of the
conference on common property resource management. National
Academy Press, Washington, DC, p. 425-455.
- Arnold J.E.M. and W.C. Stewart, 1989.
Common property management in India. Report to the Indian
Agricultural Division, World Bank, Washington D.C., USA.
- Artz, N.E.; B.E. Norton and J.T. O'Rourke, 1986.
Management of common grazing lands: Timahdite, Morroco. In:
BOSTID, Proceedings of the conference on common property
resource management. National Research Council, Washington,
DC., USA., p. 259 -280.
- Baidya, K.N. 1975.
The firewood crisis in India: A major socio-cultural problem
of rural communities. Center for environmental studies,
University of Tasmania, Hobart, Tasmania.
- Ban, A.W. van den and H.S. Hawkins, 1988.
Agricultural Extension. Harlow, UK, Longman Scientific and
Technical.

- Barnes, G. 1978.
The nature of deforestation problem: Trends and Policy indications. Proceedings of the strategy conference on tropical deforestation. US Department of State and US Agency of International Development. Washington, DC, USA.
- Barrow, E.G.C. 1988.
Trees and Pastoralists: The case of Pokot and Turkana. Social forestry network paper no. 6b. Overseas Development Institute, London, UK.
- Barrow, E.G.C. 1991.
Evaluating the effectiveness of participatory extension programmes in pastoral systems based on existing traditional values. *Agroforestry Systems* 14: 1-21.
- Baum, W.C. 1982.
The project cycle. The World Bank; Washington, DC, USA.
- Bierschenk, T. 1988.
Development projects as arenas of negotiation for strategic groups: A case study from Benin. *Sociologia Ruralis* 27 (2/3): 146-160.
- Bitanyi, H.F. 1990.
Threats on genetic resource and diversity. Paper presented at the first national workshop for conservation strategy for Tanzania, Dodoma, Tanzania 12 - 17 November, 1990.
- Boserup, E. 1965.
The conditions of agricultural growth: The economics of agrarian change under population pressure. Aldine, Chicago, USA.
- Brokensha, D. and B.W. Riley, 1980a.
Introduction to cash crops in marginal areas in Kenya. In: Bates, H.H. and M.F. Lofchie (eds); *Indigenous knowledge systems and development*. University Press of America, Washington, DC, USA, p 244 - 274.
- Brokensha, D. and B.W. Riley, 1980b.
Mbeere knowledge of their vegetation and its relevance for development: A case study from Kenya. In: Brokensha, D.; D.M. Warren and O. Werner (eds); *Indigenous knowledge systems and development*. University Press of America, Washington, DC, USA, p 11-127.
- Brokensha, D.; D.M. Warren and O. Werner (eds), 1980.
Indigenous knowledge systems and development, University Press of America, Washington, DC, USA.
- Brokensha, D. and A.H.P. Castro, 1988.
Common property resources. Paper presented at FAO expert consultation on forestry and food security. FAO, Rome, 15-20 February, 1988, FAO, Rome, Italy..
- Bronson, B. 1972.
From labour and the evolution of food production. In: B. Spooner (ed), *Population growth: anthropological implications*. MIT Press, Cambridge, USA, p 128-190.

- Brouwers, J.H.A.M. 1993.
Rural people's response to soil fertility decline. The Adja case (Benin). PhD dissertation. Wageningen Agricultural University Papers 93-4, Wageningen, the Netherlands.
- Bruce, J.W. 1989.
Community forestry. Rapid appraisal of tree and land tenure. Community Forestry Note No.5, FAO, Rome, Italy.
- Bruce, J.W.; L. Fortmann and J. Riddel 1985.
Tree and tenure: An introduction. In: L. Fortmann and J. Riddel (eds), Trees and tenure. An annotated bibliography for agroforesters and others. Land tenure center, Madison, USA.
- Brunig, E.F. 1977.
The tropical rainforest: A wasted asset or an essential biospheric resource. AMBIO 6(4):187-191.
- Bugnicourt, J. 1982.
Popular participation in development in Africa. In Mandl, I.P. (ed), Community participation: current issues and lessons learnt. UNICEF, Geneva, Switzerland.
- Bunker, S.G. 1983.
Forces of destruction in Amazonian. Environment 22 (7).
- Burton, R.F. 1860.
The Lake Region of Central Africa. Longmans Green, London, UK.
- Capital Development Authority, 1975.
A portrait of Dodoma. National Printing Company, Dar es salaam, Tanzania.
- Carlson, A. 1983.
Integrating women in agricultural projects: case studies of ten FAO assisted field projects. FAO, Rome, Italy.
- Carrington, J.F. 1983.
Linguistic pit-falls in upper Zairian folk taxonomy research. JATBA 30(2): 149-159.
- Castro, C.P. 1984.
Look again foresters, at this thing they call social forestry, now. Tropical forests 1 (1).
- Cernea, M.M. 1985.
Putting people first. Oxford University Press, Oxford, UK..
- Chambers, R. 1983.
Rural development: Putting the Last First. Longman Scientific and Technical, Harlow, UK.
- Chambers, R.; A. Pacey and L.A. Thrupp, 1989.
Farmer First: Farmer innovation and agricultural research. Intermediate Technology Publications, London, UK. 218p.
- Chandrasekharan, C. 1985.
Rural participation in forestry activities. Paper presented at the IX World Forestry Congress. Mexico City, Mexico.
- Chayanov, A. 1966.
The theory of peasant economy. In: Thorner, D., B. Kerblay and R.E.F. Smith (eds), The American Economic Association, Hamewood, Illinois, USA.
- Checkland, P. and J. Scholes, 1990.
Soft systems methodology in action. J. Wiley, Chicester, UK.

- Christiansson, C. 1981.
Soil erosion and sedimentation in semi-arid Tanzania.
Institute of African studies, Uppsala, Sweden.
- Ciriacy-Wintrup, S.V. and R.C. Bishop, 1975.
Common property as a concept in natural resource policy.
Natural Resources Journal 15: 713-727.
- Clauson, G. Sir, 1953.
Communal tenure, FAO Agricultural studies no. 17, Rome, Italy.
- Cohen, J.M. and N.T. Uphoff, 1977.
Rural development participation: Concepts and measures for
project design, implementation and evaluation. Rural
Development Committee. Cornell University, Cornell, USA.
- Cohen, J.M. and N.T. Uphoff, 1980.
Participation's place in rural development: Seeking clarity
through specificity. World Development 8: 213 - 235.
- Collier, P.; S. Randwan; S. Wangwe and A. Wagner 1986.
Labour and poverty in Rural Tanzania. Ujamaa and Rural
Development in the United Republic of Tanzania. Clarendon
Press, Oxford, UK.
- Comaroff, J.L. 1982.
Class and culture in peasant economy: The transformation of
land tenure in Barolong. In: Webner, R.P. (ed) Land reform in
the making. Tradition, public policy and ideology in Botswana.
London, Rex Collings.
- Crehan, K. and A. Von Oppen, 1988.
Understanding of "Development". An arena of struggle.
Sociologia Ruralis 27(2/3): 113-145.
- Dargavel, J.; M. Hobley and S. Kengen, 1985.
Forestry for development and underdevelopment of forestry. In:
Dargavel, J. and G. Simpson (eds), Forestry, success or
failure in developing countries. Center for Resource and
Environmental studies. Australian National University,
Canberra, Australia. CRES Working paper 1985/20, p. 1-37.
- Darnhofer, T. 1983.
Plant water requirements and water availability assessments.
Temperature and development. In: Resources of Agroforestry
Diagnosis and Design. ICRAF, Nairobi, Kenya.
- Das, K. 1977.
Pressure on Park Logger. Far Eastern Economic Review 56p.
- Dawe, A. 1979.
Theories of Social Action. In: Bottomore, T. and R. Nisbet
(eds), A history of sociological analysis, Hernemann, London,
UK.
- Desmond, d' Albergo, 1983.
Ideology and Process of Participatory Evaluation. Indian
Social Institute, New Delhi, India.
- Diederichsen, H. and C.W. Sianga, 1992.
Towards Restoring the Environment : SECAP's Experience. Paper
presented at the First short course on "management of natural
resources and sustainable agriculture". Sokoine University of
Agriculture, Morogoro, Tanzania.

- De Vaus, D.A. 1986.
Surveys in Social Research. Contemporary Social Research. Department of Sociology, La Trobe University, Melbourne, Australia.
- Douglas, J.J. 1983.
A re-appraisal of forestry for development in tropical countries. Martinus Nijhoff, The Hague, Netherlands.
- Dove, M.R. 1986
Peasant versus government perception and use of the environment: a case study of Banjarese ecology and river basin development in South Kalimantan. *Journal of Southeast Asian studies* 17(1): 113-136
- Dove, M.R. 1991.
The implications of Cernea's Azad Kashmir study for creating social institutions. Overseas Development Institute, London, UK. *Social Forestry Network Newsletter* 12: 18-19.
- Draz, O. 1978.
Revival of the Hema System of Range Development Programme. In: Hyder, D.N. (ed), *Proceedings of the First International Rangelands Congress*, Denver, USA, p. 100-103.
- Duerr, W.A.; D.E. Teeguarden; N.B. Christansen and S. Guttenberg, 1979.
Forest Resource Management. Decision-making principles and Cases. W.B. Saunders Company. Philadelphia; London; Toronto.
- Dusseldorp, D.B.W.M. van 1981.
Participation in planned development: influenced by the governments of developing countries at local level in the rural areas. In: *Essays in Rural Sociology in the honour of R.A.J. van Lier*. Wageningen, The Netherlands.
- Dusseldorp, D.B.W.M. van, 1991.
Planned development via projects. Its necessity, limitations and possible improvements. *Sociologia Ruralis* 30: 336-352.
- Dusseldorp, D.B.W.M. van and G. Frerks, 1985.
Popular participation in planned development projects in the third world. Wageningen Agricultural University, Wageningen, The Netherlands.
- Eckholm, E.P. 1976.
Loosing ground: Environmental stress and world food prospects. W.W. Norton, New York, USA.
- Ellis, J.E.; D.L. Coppock; J.T. McCabe; K. Galvin and J. Wienpahl, 1984.
Aspects of energy consumption in a pastoral ecosystem. Wood-use by South Turkana. In: Barnes, C.; J. Ensmiger and P. O'Keefe (eds). *Wood, energy and households. Perspectives on rural Kenya*. Beijer Institute and Scandinavian Institute of African studies. Sweden, p. 164-187.
- ETC-Foundation, 1987.
A composite reference to collection of reports of SADCC energy development. Fuelwood study. Luanda, Angola.
- FAO, 1969.
Modernizing institutions to promote forestry development. In: *The state of agriculture*. FAO, Rome, Italy, p. 127-133.

- FAO, 1978
Forestry for local community development. FAO Forestry paper no. 7, FAO, Rome, Italy.
- FAO, 1982.
People's participation in rural development. FAO, Rome, Italy.
- FAO, 1984.
Understanding tree use in farming systems. Workshop on planning fuelwood projects with participation of rural people-Lilongwe, Malawi, 12-30 November, 1984. FAO, Rome, Italy.
- FAO, 1985.
Tree growing by rural people. FAO Forestry paper no. 64, FAO, Rome, Italy.
- FAO, 1990a.
Forestry and Food Security. FAO Forestry paper no. 90, FAO, Rome.
- FAO, 1990b.
Community forestry: Herders' decision-making in natural resource management in arid and semi-arid Africa. Community forestry note No. 4, FAO, Rome, Italy.
- Fernandes, E.C.M.; A. O'kingati and J. Maghembe, 1984
The Chagga home-garden: A multistorey agroforestry cropping system on Mt. Kilimanjaro, Northern Tanzania; Agroforestry systems 2: 73-86
- Fisher, R.J. 1989.
Indigenous systems of common property management in Nepal. Working paper no.18. Environmental and Policy Institute. East-West Center, Honolulu, Hawaii, USA.
- Fleuret, P.C. and Fleuret, A.K. 1978.
Fuelwood use in the peasant community: A Tanzanian case study. Journal of Developing areas 12: 315- 322.
- Fortmann L. and J.W. Bruce (eds), 1988.
Whose trees? Proprietary dimensions of forestry. Rural studies series, Westview Press, Boulder, USA.
- Galaty, J.G. 1981.
Masai pastoral ideology and change. In: Salzaman, P.C. (ed) Contemporary nomadic and pastoral people: Africa and Latin America. College of William and Mary, Williamsburg, USA, Studies in third world societies, no. 17: 1-22
- Garcia-Zamor, J.C. 1985.
Public participation in development planning and management. Westview Press, Boulder, USA.
- Gerden, C.A.; W. Siria and S. Tobias 1988.
Indigenous and government forest conservation in Ugogo. Division of forestry, Ministry of Lands, Natural Resources and Tourism, Dar es salaam, Tanzania.
- Gerden, C.A. and S. Mtallo, 1990.
Traditional forest reserves in Babati district, Tanzania. Working paper no. 128, Swedish University of Agricultural Sciences, International Rural Development Center, Uppsala, Sweden.

- Giddens, A. 1979.
Central problems in social theory: Action, structure and contradiction in social analysis. Macmillan Press Ltd., London, UK.
- Giddens, A. 1984.
The constitution of society: Outline of the theory of structuration. Polity Press, Cambridge, UK.
- Giddens, A. 1987.
Social theory and modern sociology. Polity Press in association with Basil Blackwell, Oxford, UK.
- Gilmour, D.A.; G.C. King and M. Hobley, 1989.
Management of forests for local use in the hills of Nepal: Changing forest management paradigms. *Journal of World Forest Resource Management* 4: 93-110.
- Gittel, M. 1980.
Limits to citizen participation. Sage publications, London, UK.
- Gladwin, C.H.; R. Zabawa and D. Zimet, 1984
A critical appraisal . Michigan State University Rural Development Paper No. 6. East Lansing, Michigan.
- Glaeser, B. 1977.
Economic implications of ecological sustainability in the agricultural development of East Africa. *Vierteljahresberichte Probleme der Entwicklungsländer* 70: 305-316.
- Global 2000, 1980.
Report to the President of US: Entering the 21st century, Vol. 1. Pergamon Press, New York, USA.
- Gluckman, M. 1951.
The Lozi of Barotseland in north-western Rhodesia. In: Colson, E. and M. Gluckmann (eds), *Seven tribes of British Central Africa*. Oxford University Press, Oxford, UK, p. 1-93.
- Gluckman, M. 1968.
The utility of the equilibrium model in the study of social change. *American Anthropologist* 70: 219-237.
- Goodman, L. J. and R.M. Love (eds), 1980.
Management of development projects. Pergamon Press, New York, USA.
- Gregersen, H.; S. Draper and D. Elz (eds) 1989.
People and Trees. The role of social forestry in sustainable development. EDI seminar series. The World Bank, Washington, DC, USA.
- Gronow, J. and N.K. Shrestha, 1988.
Manual for a re-orientation workshop on community forestry, Koshi hills, Community forestry project, Dhankuta.
- Hardin, G. 1968.
The Tragedy of the Commons. *Science* 162: 1243- 1248.
- Harris, M. 1968.
Emics, Ethics and New Ethnography. In: M. Harris, *The rise of anthropological theory*. Crowell, New York, USA.

- Harris, B. 1978.
Access and cooperative: A study of intermedium in structural change in Sri Lanka dry zone paddy production. *Development and Change* 9: 277-298.
- Hayami, Y. and V. Ruttan, 1985.
Agricultural development: An international perspective. John Hopkins University Press, Baltimore, USA.
- Heijdra, H. 1989
Social encounters and interfaces between farmers and intervening actors: the emergence of local organization in Western Mexico. In: Long, N. (ed), *Encounters at the interface: a perspective on social discontinuities in rural development*. Wageningen Agricultural University, Wageningen, The Netherlands, *Wageningen studies in sociology* 27: 53-101.
- Heynen, J.D. 1974.
National Policy, Foreign Aid and Rural Development: A case study of LIDEP's vegetable component in Lushoto district, Tanzania. *Bulletin Geografisch Instituut Rijksuniversiteit Utrecht* 2(3): 1-165.
- Hindness, B. 1986.
Actors and social relations. In: Wardell, M.L. and S.P. Turner (eds), *Sociological theory in transition*. Allen and Unwin. Boston, London and Sydney.
- Hjort, A. and W. Ostberg, 1978.
Farming and herding in Botswana. SAREC report, Swedish Agency for research cooperation with developing countries, Stockholm, Sweden.
- Hoek, A. van den 1992.
Planning as a learning process: A strategy for planning land use programmes at local level with special reference to the uplands of Java. Ph.D thesis, Wageningen Agricultural University, Wageningen, The Netherlands.
- Honadle, G.H. and J.K. Rosengard, 1983.
Projectized development in perspective. *Public administration and development* 3: 299-305.
- Hoskins, M.W. 1979.
Women in forestry for local community development: A programme guide. Agency for International Development, Washington, DC, USA.
- Hoskins, M.W. 1980.
Community forestry depends on women. *Unasylva*. 32 (130): 27-32.
- Hoskins, M.W. 1983.
Rural women, forest outputs and forest projects. FAO, Rome, Italy.
- Hoskins, M.W. 1990.
Community forestry. *CIKARD Newsletter* 2(1):5. Iowa State University Press, Ames, USA.
- Howes, M. 1979.
The uses of indigenous technical knowledge in development. *IDS Bulletin* 10(2): 12-23.

- Howes, M. 1980.
The uses of indigenous technical knowledge in development. In: Brokensha, D.; D.M. Warren and O. Werner (eds), *Indigenous knowledge systems and development*. University Press of America, Washington, DC, USA, p. 35-351.
- Howes, M. and R. Chambers 1979
Indigenous technical knowledge: Analysis, implications and issues. *IDS Bulletin* 10(2): 5-11.
- Hunter, G. 1981.
A hard look at "participation"; discussion paper. Agriculture Administration Network Paper no. 6. Overseas Development Institute, London, UK.
- Ibrahim, A.K.K. 1991.
Women in the Tanzania agricultural extension service. Paper presented at the 6th TSAEE workshop, held at CCT - Dodoma, Tanzania; November, 1991.
- Ichikawa, M. 1987.
Preliminary report on the ethnobotany of Suiei Dorobo in northern Kenya. African study monographs supplementary issue no. 7. Center for African Area studies, Kyoto University, Kyoto, Japan.
- Jacobs, A.H. 1980.
Pastoral Masai and tropical rural development. In: Bates, R.H. and M.F. Lofchie (eds), *Agricultural development in Africa. Issues of public policy*. Praeger, New York, USA, p. 275-300.
- James R.W. and G.M. Fimbo, 1973.
Customary land law of Tanzania. East African Literature Bureau, Nairobi, Dar es salaam and Kampala.
- Johansson, L. 1989.
Successful tree growers in Babati district. SUAS/IRDC working paper no. 155, Swedish University of Agricultural Sciences, Uppsala, Sweden.
- Johansson L. and T.H. Msangi, 1988.
Management plan for the Chambogo forest reserve. Tanga Integrated Rural Development Programme; Soil Erosion Control and Agroforestry Project; Lushoto, Tanzania.
- Johnson, A. 1980.
Ethnoecology and planting practices in the swiden agricultural systems. In: Brokensha, D.; D.M. Warren and O. Werner (eds), *Indigenous knowledge systems and development*. University Press of America, Washington, DC, USA, p. 49-66.
- Kaale, B.K. and I. Munisi, 1984.
Fuelwood crisis. Forest Division, Ministry of Natural Resources and Tourism, Dar es salaam, Tanzania.
- Kajembe, G.C. 1988.
Socio-economic constraints in designing and implementing village forestry programme in Tanzania: A case study of Morogoro district. M.Sc Thesis, Management of Natural Resources and Sustainable Agriculture, Agricultural University of Norway, AaS, Norway.

- Kajembe, G.C. 1993.
Communal resource management: an overview. Paper presented at the extension approaches conference, Hifadhi Mazingira Project, Iringa, Tanzania.
- Kajembe, G.C. and D. Mwaseba, 1993.
Extension and Communication Programme for the East Usambara Catchment Forest Project. Consultancy report; Sokoine University of Agriculture, Morogoro, Tanzania.
- Kamondo, B.M. 1993
Farmers' practices in tree seed handling and their future role in tree seed supply: an exploratory survey carried out in the Kakamega -Kisii, Siaya - South Nyanza, Kitale and Nakuru regions, Kenya. M.Sc thesis in Tropical forestry, Department of Forestry, Wageningen Agricultural University, Wageningen, The Netherlands.
- Kerkhof, P. 1990.
Agroforestry in Africa. A survey of project experiences. PANOS, London, UK.
- Knight, C.G. 1974.
Ecology and change: Rural modernization in an african community. Academic Press, New York, USA.
- Korten, D.C. and R. Klauss (eds) 1984.
People centered development: Contributions toward theory and planning frameworks. Kumarian Press, West Hartford, USA.
- Landon, J.R. 1984.
Booker tropical soil manual. A handbook for soil survey and agricultural land evaluation in the tropics and sub-tropics. Longman, New York, USA.
- Lane, C.R. 1992
Alienation of Barbaig Pasture Land: Policy Implications for Pastoral Development in Tanzania. University of Sussex at Brighton and International Institute for Environmental Development, London, U.K.
- Lawry, S.W. 1988.
Tenure policy and natural resource management in Sahelian West Africa. Seminar paper on Tenure policy and natural resource management, Africa Bureau USAID, Washington, DC, USA.
- Legesse, A. 1984.
Boran-Gabra pastoralism in historical perspective. In: Joss, P.J.; P.W. Lynch and O.B. Williams (eds), Rangelands: A resource under siege. Proceedings second international rangelands congress. Adelaide, Australia, p. 481-482
- Lekanne dit Deprez, B.E.J.C. and K.F. Wiersum, 1993.
The forestry agent at the interface between local-level environmental management and external policy: reflections on forestry interventions in the Sahel. To appear in: Drijver, C.A.; B. Venema and J.P.M. van der Breemer (eds), Local management of nature and natural resources in the national context of Africa.
- Lewis-Beck, M.S. 1983.
Applied regression: An introduction. Quantitative application in social sciences. Sage publications, London, UK.

- Long, N. 1977.
An introduction to the sociology of rural development.
Tavistock Publications, London, UK.
- Long, N. 1984.
Creating space for change: A perspective on the sociology of development. Inaugural lecture for Professorship of Empirical Sociology of non-western countries, Wageningen Agricultural University, Wageningen, The Netherlands.
- Long, N. 1989 (ed).
Encounters at the interface: A perspective on social discontinuities in rural development, Wageningen studies in sociology no. 27, Wageningen Agricultural University, Wageningen, The Netherlands.
- Long, N. and J.D. van der Ploeg, 1989.
Demythologizing planned intervention: An actor perspective. *Sociologia Ruralis* 29(3/4): 226-249.
- Lundgren, L. 1980.
Comparison of surface runoff and soil loss from runoff plots in forest and small-scale agriculture in the Usambara Mountains, Tanzania. Dep. Physical Geography, University of Stockholm, Sweden, Forskningsrapport No. 38.
- Maaren, A. van 1986.
Forest Policy: An advanced course on M.Sc level. Forestry Faculty, Gadjah Mada University, Yogyakarta, Indonesia.
- Maaren, A. van 1990.
Forest management: An advanced course on management systems and yield regulations. Department of forestry, Wageningen Agricultural University, The Netherlands.
- Machooka, M.S. 1984.
People's participation in integrated rural development in Black Africa. Seminar report series 5 no. 2, Paris, France.
- Magno, V.C. 1985.
Strengthening people's participation in forestry development through forestry extension: Approaches, issues and directions. Paper 9th World Forestry Congress, Mexico.
- Maliki, A. 1984.
The Wodaabe. In: Swift, J.J. (ed), Pastoral development in central Niger. Report of Niger range and livestock project. USAID/ Ministry of Rural Development, Niamey, Niger, p. 255-530.
- Marx, K. 1962 (Originally published 1852).
The eighteenth Brumaire of Louis Bonaparte. In: Selected works (two volumes). Foreign Languages Publishing House, Moscow, USSR.
- Mathews, W. 1983.
Global vegetation and land use. *Journal of Climate and Applied Meteorology* 22: 474-487.
- Mayfield, B.J. 1985.
Go to the people: Releasing the rural poor through people's school system. West Hartford, USA.

- Meehan, P. 1980.
Science, ethnoscience and knowledge-utilization. In: Brokensha, D., D.M. Warren and O. Werner (eds), *Indigenous knowledge systems and development*, University Press of America, Washington DC, USA.
- Merrill, D. 1979.
Household labour allocation patterns and the contribution of children, Chan Kom, Yucatan, Mexico. Paper prepared for the Research Institute for the Study of Man, New York, USA.
- Messerschmidt, D. A. 1990.
The uses of anthropology in agro/social forest research and design: Approaches to anthropological forestry, IOF Project Discussion paper no. 90/2, Pokhara, Nepal.
- Middleton, J. and G. Kershaw, 1972.
The Kikuyu and Kamba of Kenya. International African Institute, London, UK.
- Midgley, J.; H. Anthony; M. Hardiman and D. Narine, 1986.
Community participation, social development and the state. Methuen, London, UK.
- Ministry of Natural Resources and Tourism (MNRT), 1989.
Tanzania Forestry Action Plan 1990/91-2007/08. Dar es salaam, Tanzania.
- Mlay, W.F.I. 1986.
Environmental implications of land use patterns in the new village in Tanzania. In: Arnten, J. W. (ed) *Land policy and government in eastern and southern Africa: Selected papers presented at a workshop held in Gaborone, Botswana, 14-19 February 1986*.
- Mnzava, E.M. 1983.
Tree planting in Tanzania: Voice from the villagers. Division of Forestry, Ministry of Natural Resources and Tourism, Dar es salaam, Tanzania.
- Morss, E. R. and D.D. Gow, 1985.
Implementing rural development projects. Lessons from AID World Bank experiences. Westview Press, London, UK.
- Murray, G.F. 1987.
Land tenure and agroforestry in Haiti: A case study in anthropological project design. In: J.B. Raintree (ed); *Land, trees and tenure*; ICRAF, Nairobi and Land Tenure Center, University of Wisconsin, Madison, USA, p. 323-328.
- Mwihomeke, S.T. 1987.
Agroforestry for densely populated Tanzanian highlands. M.Sc Thesis in Environmental forestry; University College of North Wales, Bangor, UK.
- Myers, N. 1984.
The primary source: Tropical forests and our future. Norton, New York, USA.
- Nag, M.; B. White; B. Peet and R. Creighton, 1978.
An anthropological approach to the study of the economic value of children in Java and Nepal. *Human organization* 19(2): 293-306.

- Ndossi, M.A.T. 1990.
Local people's participation in social forestry programmes: Two case studies carried out in Mufindi and Iringa rural districts, Iringa region, Tanzania. M.Sc Thesis in Tropical forestry, Department of forestry, Wageningen Agricultural University, Wageningen, The Netherlands.
- Noronha, R. and F.J. Lethem, 1983.
Traditional land tenure and land use systems in the design of agricultural projects, World Bank staff working paper no. 561, Washington, DC, USA.
- Noronha, R. and J.S. Spears, 1985.
Sociological variables in forestry project design. In: Cernea, M.M. (ed), Putting people first: Sociological variables in rural development. Oxford University Press, Oxford, UK, p. 227-266.
- Oakley, A. and D. Marsden, 1984.
Approaches to participation in rural development. International labour office, Geneva, Switzerland.
- O'kitingati, A.; J. Maghembe; E.C.M. Fernandes and G.H. Weaver, 1984.
Plant species in the Kilimanjaro agroforestry system. Agroforestry systems 2: 177-186.
- O'kitingati, A. and G.C. Kajembe, 1991.
Training programme for Shinyanga soil conservation and afforestation project. Preliminary consultancy report, Sokoine University of Agriculture, Morogoro, Tanzania.
- Olson, J.S. 1975.
Productivity of forest ecosystems. In: National Research Council, Productivity of world ecosystems. National Academy Press, Washington, DC, USA.
- Padoch, C. and A.P. Vayda, 1983.
Patterns of resource use and human settlement in tropical forests. In: Golley, F.B.; H. Lieth and M.J.A. Werger (eds), Tropical rain forest ecosystems, structure and function. Elsevier, Amsterdam, the Netherlands, Ecosystems of the world no. 14a: 301-313.
- Poate, C.D. and A.D. Daplyn, 1988.
Data for agrarian development. Cambridge University Press, Cambridge, UK
- Postel, S. and L. Heise, 1988.
Reforestation the earth. World watch paper no. 83, World watch institute, Washington, DC, USA.
- Ploeg, J.D. van der, 1986.
The agricultural labour process and commoditization. In: Long, N. (ed), The commoditization debate: Labour process, strategy and social network. Wageningen Agricultural University, Wageningen, The Netherlands, p.24-57.
- Plumbo, D.J. (ed) 1987.
The politics of program evaluation. University of California Press, Berkeley, Los Angeles, USA.

- Plumwood V. and R. Routley, 1982.
World rainforest destruction: The social factors. *The Ecologists* 12(1): 4-22.
- Rambo, A.T. 1979.
Primitive man's impact on genetic resource of Malaysian tropical rainforest. *Malaysian Applied Biology* 8(1): 59-65.
- Ranger, T.O. 1978.
Bureaucracy, politics and society in provincial town in Sri Lanka. PhD Thesis. University of California, San Diego, USA.
- Repetto, R. 1988.
The forest for the trees? Government policies and the misuse of forest resources. World Resource Institute. Washington, DC, USA.
- Rhoades, R. and A. Bebbington, 1988.
Farmers who experiment: An untapped resource for agricultural research and development? International Potato Center (CIP), Lima, Peru.
- Richards, P. 1975.
Alternative strategies for the African environment: Folk ecology as a basis for community oriented agricultural development. In: Richards, P. (ed), *African environment: Problems and prospective*. International African Institute, Special report no. 1, London, UK.
- Richards, P. 1979.
Community environmental knowledge in African rural development. *IDS Bulletin* 10(2): 28 - 36.
- Richards, P. 1980
Community environmental knowledge in African rural development. In: *Indigenous knowledge systems and development*. University Press of America, Washington DC, USA, p 181-194.
- Richards, P. 1985.
Indigenous agricultural revolution. Hutchinson and Co, London, UK.
- Richards, P. 1988.
Experimenting farmers and agricultural research. Paper prepared for ILEIA Workshop on Participatory Technology Development, ILEIA, Leusden, The Netherlands.
- Riddell, J.C. 1988.
Dynamics of land tenure and spontaneous changes in African agrarian systems. In: *Land reform no. 1/2*, FAO, Rome, Italy.
- Rigby, P. 1967.
"Ugogo" Local government changes and the national elections. In: Cliffe, L. (ed), *One party democracy*. East African Publishing House, Nairobi, Kenya.
- Rigby, p. 1969
Cattle and Kinship among the Gogo. Ithaca, Cornell University Press, Cornell, USA.
- Rondinelli, D.A. (ed) 1977.
Planning development projects. Hutchinson and Ross, Stroudsburg Pennsylvania, USA.

- Rugh, J. 1986.
Self evaluation: Ideas for participatory evaluation of rural community development project. World Neighbours, Oklohama, USA.
- Runge, C.F. 1986.
Common property and collective action in economic development. World development 14(5): 623-635.
- Rwambali, E.G. 1992.
The gender issue and extension in Tanzania. Department of Agricultural Education and Extension; Sokoine University of Agriculture, Morogoro, Tanzania.
- Sachs, C. and V. Caye, 1989.
Women in Agricultural Development In: Compton, J.L.(ed); The Transformation of International Agricultural Research and Development. Riemer Publishers.
- Sahlins, M. 1972.
Stone age economics. Tavistock Publications, London, UK.
- Sajise, P.E. 1991.
The evaluation of social forestry in the Philippines: Lessons learned and some questions asked. Institute of Environmental and Management, University of Philippines at Los Banos College, Laguna, Philippines.
- Samaniego, C. 1978.
Peasant movements at the turn of the century and the rise of the independent farmer in the central highlands of Peru.
- Sen, D. and P.K. Das, 1987.
The management of people's participation in community forestry: Some issues. Social forestry network paper no. 4d Overseas Development Institute, London, UK.
- Shrire, C. 1980.
An enquiry into the evolutionary status and apparent identity of San hunter/gatherers. Human ecology 8(1): 9-32.
- Siriwardema, S.S.A.L. 1989.
From planned intervention to negotiated development: The struggle of bureaucrats, farmers and traders in the Mahaweli irrigation scheme in Sri Lanka. PhD Thesis, Wageningen Agricultural University, Wageningen, The Netherlands.
- Skutsch, M.M. 1985.
Forestry by the people for the people: Some major problems in Tanzania's village afforestation programme. International Tree Crops Journal 3: 147-169.
- Sollart, K.M. 1986.
Traditional tree management and conservation methods in the Sahel. BOS Document no. 4, Wageningen, The Netherlands.
- Southwold, M. 1964.
Leadership, authority and the village community. In: Fallers, L.A. and A.I. Richards, (eds), The king's men: Leadership and status in Buganda on the eve of independence, Oxford University Press, London, UK, p. 211-255
- Spencer, P. 1965.
The Samburu: A study of gerontocracy in nomadic tribe. Routledge and Kegan Paul, London, UK.

- Stephens, A. 1988.
Participatory monitoring and evaluation. Handbook for training field workers. Regional office for Asia and Pacific. FAO, Bangkok, Thailand.
- Stigter, K. 1987.
Traditional manipulation of microclimate factors: Knowledge to be used. ILEIA Newsletter 3(3): 5-6.
- Storas, F. 1987.
Internal or implication - the effects of Turkana social organization on ecological balance. Paper presented at a workshop on changing rights in property and problems of pastoral development in the Sahel. Manchester University, Manchester, UK.
- Street, J.M. 1969.
An evaluation of the concept of carrying capacity. Geography 21(2): 104-107.
- Subedi, B.P.; C.L. Das and Messerschmidt, 1990.
Tenure in the Terai: A rapid appraisal of tree and land tenure. Forests, Trees and People Newsletter no. 11, Uppsala, Sweden.
- Swedforest Consulting AB, 1986.
Report from the joint mission on village forestry and industrial plantations. Ministry of Lands, Natural Resources and Tourism, Dar es salaam, Tanzania.
- Tanga Integrated Rural Development Programme/ Soil Erosion and Agroforestry Project (TIRIDEP/SECAP), 1988.
Progress Report. Soil Erosion and Agroforestry Project, East Usambara, Lushoto, Tanzania.
- Thomlinson, R. 1965.
Sociological concepts and research: Acquisition, analysis and interpretation of social information. California State College, Los Angeles, USA.
- Umali, D.L. 1983.
Sowing the wind in forestry. Report on the FAO/SIDA seminar in forestry extension. FAO, Rome, Italy.
- Umans, L. 1993.
Analysis and topology of indigenous forest management in the humid tropics of Asia. Stichting BOS & IKC-NBLF - National Reference Center for Nature; Forests and Landscape. Ministry of Agriculture, Nature Management and Fisheries; Wageningen, The Netherlands.
- Uphoff, T.N.; J.M. Cohen and A.A. Goldsmith, 1979.
Feasibility and application of rural development participation: A state-of the-art paper. Rural development committee, Cornell University, Cornell, USA.
- UNESCO, 1978.
Management of Natural Resources in Africa: Traditional strategies and modern decision-making. MAB Technical note no. 9, UNESCO, Paris, France.
- US Congress, Office of Technology Assessment, 1987.
Technologies to maintain biological diversity, Washington, DC, USA.

- Veer, C.P. 1984.
Social forestry in Java. Perspectives, principles and a proposal for research and development. In: Dijk, H. van; P. Poel, der van and R. Schinkel(eds), Social forestry and farming systems research: Two case studies on Java. FONC Project Communication 1987-3, appendix. Fakultas Kehutanan Universitas Gadjah Mada, Yogyakarta, Indonesia.
- Warner, K. 1993.
Patterns of farmer tree growing in Tanzania: A socio-economic analysis. In: Patterns of Farmer tree growing in Africa: A socio-economic analysis. Oxford Forestry Institute, UK and International Center for Research in Agroforestry, Nairobi, Kenya, p. 149-171.
- Warren, D.M. and P.M. Meehan (1980).
Applied ethnoscience and dialogical communication in rural development. In: Brokensha, D.; D.M. Warren and O. Werner, O. (eds), Indigenous knowledge systems and development. University Press of America, Washington, DC, USA, p. 317-334.
- Westman, P. 1988.
Trees and Shrubs in Dodoma district. Dodoma, Tanzania.
- Westoby, J.J. 1978.
Forest industries for socio-economic development. Proceedings of the 8th World Forestry Congress, Jarkata, Indonesia, Vol. v p. 19-35.
- White, T.A. 1982.
Community participation. A discussion of the arguments. In: Mandl, I.P. (ed); Community participation: Current Issues and Lessons learned. UNICEF, Geneva, Switzerland.
- Wiersum, K.F. (ed), 1984a.
Strategies and designs for afforestation, reforestation and tree planting. Proceedings of an International Symposium on the occasion of 100 years of forestry education and research in the Netherlands. PUDOC, Wageningen, The Netherlands.
- Wiersum, K.F. 1984b.
Developing strategies for social forestry: A conceptual framework. Working Paper Environment and Policy Institute, East-West Center, Honolulu, Hawaii, USA.
- Wiersum, K.F. 1985.
Trees in agricultural and livestock development. Netherlands Journal of Agricultural Science 33(2): 105-114.
- Wiersum, K.F.; P.C.L. Anspasch; J.H.A. Boerboom; C. Oxby, A. de Rouw and C.P. Veer 1985.
Development of ecological methods of upland farming in Usambara Mountains, Tanzania. FAO Forestry paper no. 50/1, p. 57-82, FAO, Rome, Italy.
- Wiersum, K.F. (ed), 1988.
Viewpoints on Agroforestry. Wageningen Agricultural University, Wageningen, Wageningen, The Netherlands.
- Wiersum, K.F. 1989a.
Forestry and development: An overview. Netherlands Review of Development Studies 2 (1988/89): 7-16.

- Wiersum, K.F. 1989b.
Planning agroforestry for sustainable land use. In: W.W. Budd, I. Duchhardt, L.H. Hardesty & F. Steiner (eds), Planning for agroforestry. Elsevier, Amsterdam, Developments in Landscape Management and Urban Planning 6c, p. 18-32.
- Wiersum, K.F. 1989c.
Forestry and Rural Development. Lecture Course F550 - 121. Department of Forestry, Wageningen Agricultural University, Wageningen, The Netherlands.
- Wiersum, K.F. 1992.
Dimensions and major components of forest and tree management systems. International Agricultural Center, 5th International Course on the Design of Community Forestry, Wageningen, The Netherlands.
- Winter, E.H. 1968.
Some aspects of political organization and land tenure among the Iraqw. Kyoto University of African Studies 2: 1-29.
- Wolfe, M. 1982.
Participation in economic development. A conceptual framework. In: Mandl, I.P. (ed), Community Participation: Current Issues and Lessons Learned. UNICEF, Geneva, Switzerland.
- World Bank, 1978.
Forestry Sector Policy Paper. Washington, DC, USA.
- World Commission on Environment and Development, 1987.
Our Common Future. Oxford University Press, London, UK.
- Wormald, T. J. 1984.
The management of natural forests in the arid and semi-arid of East and Southern Africa. A report to Overseas Development Administration, London, UK.
- Wzorec, C. 1986.
Rapti Zone training of trainers course design. PADCO, Washington, DC, USA.

APPENDIX 1

HOUSEHOLD QUESTIONNAIRE FORM

NAME OF ENUMERATOR: -----DATE-----
 VILLAGE:-----DISTRICT: -----
 HOUSEHOLD IDENTIFICATION NO.-----

1. BASELINE DATA:

- (i) Name of head of household-----
 (ii) Sex 1. Male
 2. Female
 (iii) Age-----Years
 (iv) Years spent in school-----
 (v) Marital status 1. Single
 2. Married
 3. Separated
 4. Divorced
 5. Widowed
 (vi) Religion 1. Christian
 2. Moslem
 3. Traditional
 4. Others
 (vii) Tribe (Ethnicity) 1. Sambaa
 2. Gogo
 3. Others
 (viii) Social position 1. Common man/woman
 2. Ten cell leader
 3. Village government leader
 4. Religious leader
 5. Teacher
 6. Others

2. HOUSEHOLD COMPOSITION:

- (a) Males:
 (i) Under 18 years:-----
 (ii) 18 - 55 years:-----
 (iii) Over 55 years:-----
 (b) Females:
 (i) Under 18 years:-----
 (ii) 18 - 55 years:-----
 (iii) Over 55 years:-----

3. LAND USE HISTORY:

- (a) Since when have you been residing at this village?

- (b) Since when have you been farming this particular land?

(c) How did you get this land?

1. Inheritance
2. Purchase
3. Inheritance/ Purchase
4. Given by the village govt.
5. Others (Specify):

4. FARM PRODUCTION SYSTEM:

(a) Land:

- (i) Number of land parcels-----
- (ii) Cultivated land-----ha
- (ii) Fallow land-----ha.
- (iv) Who is in the household has control on land-use decisions?

1. Man
2. Woman
3. Both

(b) Labour:

- (i) How many people work in the farm full time?

- (ii) How many people work in the farm part time?

(c) Crop subsystem:

- (i) What crops are raised in the farm?

Crop		Main use	
Annual	Perennial	Food	Cash

(ii) Do men and women work with different crops?

1. Yes

2. No

If yes specify:

(d) Livestock subsystem:

What type of Livestock do you keep?

Type	Number

(e) Which trees are present in the farm (both exotic and indigenous)?

Species	E/I	No.	Location	Uses	P/R

Key: E = Exotic
 I = Indigenous
 P = Planted
 R = Retained

(f) For planted trees; what was the planting stock?

Species	Planting stock

5. VILLAGE WOODLOTS:

- (a) Is there village woodlot?
 1. Yes
 2. No
- (b) If yes in 5 (a) above, do you participate in managing it?
 1. Yes
 2. No
- (c) If No in 5(b) above why?

6. KNOWLEDGE ABOUT THE PROJECTS:

- (a) Do you know the project called DOVAP/SECAP?

1. Yes

2. No

- (b) If yes in 6(a) above, what does it do?

7. EXTENSION SERVICES:

- (a) Are you being visited by an extension worker from DOVAP/SECAP?
 1. Yes (specify how many times per month)

2. No

8. PERSONAL OPINION:

- (a) What is your personal opinion about DOVAP/SECAP?

- (b) What is your opinion about the village leadership?

**INHEEMSE BEHEERSYSTEMEN ALS BASIS VOOR SOCIALE BOSBOUW
ONTWIKKELING IN TANZANIA:
EEN STUDIE IN DODOMA URBAN EN LUSHOTO DISTRICT**

SAMENVATTING

De pogingen, die de laatste twee decennia gedaan zijn om boeren in Tanzania te stimuleren meer bomen te integreren in hun landbouwsysteem, hebben weinig positieve effecten gehad. De meeste extern gesponsorde interventies waren gebaseerd op orthodoxe bosbouwtechnieken. Inheemse kennis en vaardigheden werden genegeerd. Er werd geen aandacht geschonken aan de gedachte dat de lokale bevolking in staat zou zijn om op basis van hun begrip van lokale mogelijkheden bruikbare oplossingen voor lokale problemen te ontwikkelen, en om praktische veldexperimenten op te zetten in antwoord op lokale knelpunten en mogelijkheden. Veel professionele bosbouwers waren sceptisch over de kennis en experimenten van boeren, deels omdat boeren zelden hun bevindingen hebben vastgelegd in geschriften, bijna nooit artikelen hebben geschreven over hun ontdekkingen en geen namen en patenten hebben verbonden aan hun uitvindingen. Niettemin zijn veel activiteiten die geassocieerd worden met innovatieve rurale ontwikkeling, zoals "agroforestry", al vele generaties in praktijk gebracht door lokale mensen zonder hulp van buitenaf. Deze studie heeft drie doelstellingen. Het eerste doel is empirisch te onderbouwen dat er een kloof bestaat tussen inheemse en professionele bos/boombeheersystemen. Het tweede doel is om te analyseren hoe projectinterventies confrontaties veroorzaken tussen lokale boeren en projecten, alsook een bepaalde mate van samenwerking en participatie. Ten derde wordt beoogd een model te ontwikkelen dat aangeeft hoe de kloof tussen lokale initiatieven en extern gesponsorde interventies overbrugd kan worden.

Er zijn in het onderzoek verschillende onderzoeks-methoden toegepast. Deze multi-methode benadering was gericht op de verzameling van zowel kwantitatieve als kwalitatieve gegevens en informatie. Deze verschillende onderzoeksmethoden (zoals participatieve observaties; formele surveys; inventarisaties van boombestand; analyses van sociale interacties; secundair bronnenonderzoek) werden gedeeltelijk afzonderlijk toegepast, maar zijn tevens op een geïntegreerde wijze gebruikt; hiertoe werden de uitkomsten van de verschillende soorten data verzameling zowel afzonderlijk als gezamenlijk geanalyseerd. De participatieve observaties waren gericht op het leren kennen en begrijpen van activiteiten van de lokale gemeenschap, specifieke groepen en individuele huishoudens. Deze waarnemingen gaven de context waarin andere gegevens werden geanalyseerd. De formele surveys werden uitgevoerd om classificaties te kunnen maken van de informatie over feiten en meningen. Boom-inventarisaties zijn uitgevoerd op het land van de huishoudens die deelnamen aan de surveys. Bij deze inventarisaties was de boer de leraar en de onderzoeker de

leerling. De studie van de processen die zich afspeelden op het raakvlak tussen verschillende sociale systemen ('social interface' analyse) was gericht op het leren begrijpen van de sociale transformaties die plaatsvonden tussen boeren en de bestudeerde projecten. De studie vereiste dat om de sociale werkelijkheid te kunnen begrijpen, het menselijk gedrag bestudeerd werd met dezelfde 'afstandelijkheid' en reflectie als van een chemicus die een reactie in een reageerbuis volgt. Drie methoden zijn gevolgd om de data te analyseren: statistische analyse van kwantitatieve gegevens, en inhoudsanalyse evenals structureel-functionele analyse van kwalitatieve informatie.

De studie geeft aan dat de oorzaken van ontbossing van complexe sociale aard en niet slechts van biologisch aard zijn. De wijd verspreide overbevolkingsverklaring, die oppervlakkig gezien plausibel is, is niet bestand tegen een gedetailleerde analyse van de meeste gevallen van hedendaagse destructie van tropisch regenwoud. De studie geeft aan, dat zodra de exclusieve focus op oncontroleerbare bevolkingsgroei als oorzaak van het probleem is verworpen, het duidelijk wordt dat de gebeurtenissen ten aanzien van tropische bossen niet meer onvermijdelijk zijn. Sociale bosbouw wordt vaak genoemd als een van de mogelijke oplossingen voor het ontbossingsprobleem. Een belangrijk kenmerk van sociale bosbouwprogramma's is actieve participatie van de lokale bevolking bij het bosbeheer; de externe betrokkenheid van professionele bosbouwers bij deze vorm van bosbeheer is primair ondersteunend en niet uitvoerend. Maar participatie van lokale bevolking kan alleen worden verkregen als rekening wordt gehouden met lokale gebruiken en initiatieven. Externe interventies vinden plaats binnen al bestaande leefwerelden van individuen en groepen en passeren daardoor bepaalde sociale en culturele filters. Externe sociale bosbouwinterventies moeten derhalve de mogelijkheid bieden om bijgesteld en omgevormd te worden op basis van de ter plaatse bestaande inheemse kennis en praktijken.

Het meest algemene inheemse bos/boombeheersysteem in de bestudeerde gebieden is de cultivering van verspreide bomen op de landbouwvelden. Wanneer bebost land in gebruik wordt genomen voor landbouw worden bepaalde inheemse boomsoorten die sociaal-economisch van belang zijn gehandhaafd. Als aanvulling op deze inheemse boomsoorten vindt ook aanplant van enige waardevolle exotische boomsoorten plaats. Dit geeft aan dat boeren zich goed bewust zijn van de waarde van zowel inheemse als uitheemse bomen. Boeren en professionele bosbouwers classificeren bomen echter nogal verschillend. Bijvoorbeeld professionele bosbouwers onderscheiden 'inheemse' en 'uitheemse' bomen, terwijl boeren een onderscheid maken tussen 'lokale' en 'nieuwe' soorten. Bepaalde exotische boomsoorten zoals *Mangifera indica* werden door boeren beschouwd als lokale boomsoorten. Ook bleek er een verschil te bestaan in de aard van lokale initiatieven en de extern gesponsorde interventies. In het verleden voerden boeren reeds agroforestry activiteiten uit, terwijl ze door externe voorlichters werden aanbevolen om bomen te

kappen. En tijdens de periode waarin de studie plaats vond, adviseerden de voorlichtingsdiensten om exotische boomsoorten tussen de akkergewassen te planten, terwijl de boeren deze soorten vooral op erfscindingen plantten. De studie wees ook uit, dat boeren experts waren op het gebied van regeneratie en teelt van bomen; bosbouwkundigen hebben meer te leren van de boeren dan te onderwijzen aan hen. In het algemeen bleek er een duidelijke kloof te bestaan tussen intern gegenereerde initiatieven en extern gesponsorde interventies ten aanzien van boom- en bosbeheer.

Voor het juist functioneren van een beheersysteem is een sociale organisatie voor planning en controle nodig. Het boerenhuishouden is een van de belangrijkste organisaties voor lokale bos/boombeheersystemen. Dergelijke huishoudens organiseren de inzet van arbeid; zij zijn tevens het brandpunt van het beslissingsproces ten aanzien van welke beheersmaatregelen uitgevoerd moeten worden en van de verdeling van de rechten en plichten tussen de gezinsleden. Echter de lokale bosbeheersystemen zijn niet beperkt tot het niveau van het huishouden, maar komen ook voor op supra-huishoudenniveau. De bestaande bosbeheersystemen op het niveau van de gemeenschap bleken nogal passief te zijn; ze bestonden voornamelijk uit serie erkende gebruiksrechten. Deze regels waren voornamelijk bedoeld om te reguleren wie toegang had tot bepaalde bos- of boomreserves en wie niet. In tegenstelling tot de beheersystemen op huishoudniveau waren ze niet gericht op het bereiken van bepaalde biologische doelen, zoals regeneratie van bos.

In de bestudeerde projecten is het concept 'participatie' toegepast in de betekenis van deelname van de lokale bevolking in de projecten van professionals en niet omgekeerd, dat wil zeggen: deelname van professionele bosbouwers in de landgebruiksstrategieën van de bevolking. Participatie werd opgevat als de deelname van de lokale bevolking bij de uitvoering van een reeds geformuleerd pakket van uitvoeringsmaatregelen ten behoeve van bepaalde doelgroepen. De bevoogdende houding van projectmedewerkers heeft geleid tot een situatie waarin lokale mensen een syndroom ontwikkelden van onderdanig gedrag. De lokale bevolking werd in geen enkel stadium van planning en evaluatie betrokken, alleen gebruikt als uitvoerders. Daardoor bleef het concept 'participatie' zoals uitgewerkt in de bestudeerde projecten, retorisch. Daarnaast is een belangrijk probleem bij het uitvoeringsproces ontstaan als gevolg van het verschil tussen de project aanname van uniformiteit in lokale boerenbedrijven en de diversiteit die in werkelijkheid bestaat. Ook bestonden er beperkingen in het formele communicatiesysteem en de overlegstructuren van de projecten. Als gevolg van starre procedures konden de dorpsvoorlichters niet effectief reageren wanneer ze werden geconfronteerd met heel diverse en relevante lokale beheerstrategieën en overlegstructuren.

De studie onthulde twee fundamentele kenmerken ten aanzien van het sociale grensvlak tussen extern gesponsorde interventies en intern

gegenereerde initiatieven. In de eerste plaats het verschil tussen het ontwikkelingsmodel dat de projecten hanteerden, gebaseerd op de professionele concepten betreffende de aflevering en verdeling van projectmiddelen, en de werkelijke strategieën van de dorpsvoorlichters die verantwoordelijk zijn voor de uitvoering van de ontwikkelingsactiviteiten in het veld. En in de tweede plaats de invloed die individuele boeren en groepen boeren als gevolg van hun dagelijkse strijd om het bestaan uitoefenen op de verwezenlijking van de interventiestrategieën van projecten.

Op basis van deze constatering worden in de studie drie sleutelcategorieën van actoren onderscheiden, die in aanmerking genomen moeten worden in sociale bosbouwprojecten: boeren, dorpsvoorlichters en projectcoördinatoren. De 'driehoek' van relaties tussen deze drie actor-categorieën vormt de sociale arena (de 'middle ground') van sociale bosbouw in Tanzania. Deze 'middle ground' heeft betrekking op het geheel van sociale processen en velden waarin de actoren proberen om een gemeenschappelijke basis te creëren voor hun onderhandelingen over middelen en ontwikkelingsalternatieven. Dit model werd ontwikkeld als een middel om een beter inzicht te verkrijgen in de sociale realiteit van sociale bosbouwprojecten, en in het belang van de strategische acties van en interacties tussen deze actoren op de uitkomsten van geplande interventies. Het 'middle ground' model benadrukt het belang van de rol van elk van de drie sleutelcategorieën van actoren bij het overbruggen van de kloof tussen intern gegenereerde initiatieven en extern gesponsorde interventies.

Een belangrijke vereiste voor het goed functioneren van de verschillende actorgroepen is het bestaan van een goed aangepast bosbeleid. De huidige starre, paramilitaire oriëntatie van het bosbeleid in Tanzania, met zijn restrictieve en bestraffende aanpak, is een belangrijke factor geweest bij het verloren gaan van verschillende traditionele beheersystemen. In veel gevallen is het beheer van de bosreserves uit handen van de lokale bevolking genomen. De boswet reflecteert nog steeds het voormalige beleid, dat voornamelijk gericht was op bosinstandhouding. Tot nu toe is de wet niet opgevat als een positief middel voor bosontwikkeling, maar slechts als juridisch middel om misbruik van het bos tegen te gaan. Het gevolg van deze criminologische benadering is dat de wet een obstakel wordt voor bosontwikkeling. Een meer positief bosbeleid is vereist om het concept van lokale participatie te veranderen van retoriek in werkelijkheid. Er zijn zeker geen pasklare oplossingen. Een van de mogelijke scenario's zou gericht kunnen zijn op de ontwikkeling en beproeving van innovatieve beleidsmaatregelen ter stimulering van effectieve sociale structuren voor lokaal bosbeheer. Hierbij kan gedacht worden aan het creëren van twee bosdivisies: een divisie voor bosbescherming en een divisie voor bebossing; en aan het overdragen van bepaalde beheerstaken aan de lokale bevolking.

De weg die voor ons ligt zal evenals het achterliggende pad van

sociale bosbouwontwikkeling in Tanzania, stenig en vol valkuilen zijn. De ontwikkeling en tot op zekere hoogte radicale vernieuwing van het beleid moet worden nagestreefd met één oog gericht op de noodzakelijke beleidshervormingen en het andere gericht op de huidige politieke realiteit. De politieke wil om deze hervormingen te ondersteunen moet worden aangeboord. Goed beleid bestaat bij de gratie van goede informatie. Daarom moeten bosbouwdeskundigen, wanneer zij het bestaande bosbeleid willen verbeteren, actie ondernemen door bruikbare alternatieven te leveren aan beleidsmakers.

ABOUT THE AUTHOR

The author was born in 1955 in Amani, Tanga, Tanzania. He is married with four children. In 1985, He completed his B.Sc (Forestry) at Sokoine University of Agriculture, Morogoro, Tanzania. As a requirement for the bachelor's degree, he carried out a research titled "Financial evaluation of the Kibaha fuelwood project". He graduated in M.Sc (Management of natural resources and sustainable agriculture) at the Agricultural University of Norway in 1988. As a requirement for the master's degree, he carried out a research titled "Socio-economic constraints in designing and implementing village forestry in Tanzania: a case study of Morogoro district".

After his master's degree, he worked briefly as a Assistant Lecturer at Sokoine University of Agriculture until 1989, when he was admitted for a three-month international course on the design of community forestry at the International Agricultural Centre, Wageningen, The Netherlands. In 1990, He was admitted for a PhD programme at the Department of Forestry, Wageningen Agricultural University, The Netherlands. He started the programme in 1991.

The author is a co-author of the book titled "Trees for village forestry ". He has also written a number of papers in the field of natural resource management. In 1991, He served as a consultant for the NORAD funded Shinyanga Soil conservation and afforestation project, and produced a preliminary report for the projects's training programme. He also served as a consultant for the FINNIDA funded East Usambara catchment forest project in 1993, and developed the projects's extension and communication programme.

Currently the author is a Lecturer and Co-ordinator for a NORAD funded three-month course titled "Management of natural resources and sustainable agriculture" at Sokoine University of Agriculture, Morogoro, Tanzania.

The author is a member of the Rural Development Forestry Network, based in London, U.K.; Forests, Trees and People Network, based in Uppsala, Sweden; International Society of Tropical Foresters, based in Bethesda, Maryland, USA; and International Knowledge Systems Network, based in the Hague, The Netherlands.