

**HUMAN DEVELOPMENT REPORT
FOR SHINYANGA REGION**

COTTON SECTOR STUDY

VOL I: MAIN REPORT

FINAL

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
PART I	
1 INTRODUCTION.....	3
1.0 BACKGROUND AND OBJECTIVES OF THE STUDY.....	3
1.1 Background.....	3
1.2 Objectives.....	3
1.3 Methodology.....	4
1.3.1 On Production.....	5
1.3.2 On Farm Size.....	5
1.3.3 On Farm Budget.....	5
PART II	
2.0 REGIONAL ECONOMY	7
2.1 A Brief Review of Regional Economy	7
2.1.1 Administrative Set-up	7
2.1.2 Population	8
2.2 Economic Activities.....	9
2.2.1 General Overview.....	9
2.2.2 Crop Production in the Region	10
2.2.3 Cotton Production in the Region	12
2.3 Contribution of Cotton to the Regional Economy	15
2.4 Major Problems of Agricultural Production in the Region.....	20
2.4.1 Weather Condition	20
2.4.2 Availability and Distribution of Farm Inputs.....	21
2.4.3 Amount of Farm Inputs Sold to Farmers.....	24
2.5 Specific Problems Related to Cotton Production in the Region	26
2.5.1 Supply and Distribution of Inputs and Chemicals.....	26
2.5.2 Seed Production	30
2.5.3 Cotton Oil and Seed Cake Production	32
2.5.4 Cotton Ginning Capacity.....	32
2.6 Cotton Purchases and Delivery in Shinyanga Region.....	33
PART III	
3.0 ROLE OF INSTITUTIONS SUPPORTING THE COTTON SECTOR ...	36
3.1 Government Departments.....	36
3.3.1 Ministry of Agriculture and Livestock Development.....	36
3.3.2 District Officials.....	37
3.2 Co-operative Union and Primary Societies	38
.....	
3.2.1 Historical Background	38
3.2.2 The Impact of Market Liberalization	38
3.2.3 Views of the Co-operative Officials	39
3.2.4 Performance of Union's Societies/Branches in Cotton Collection	41
3.2.5 Impact of Distance on Cotton Collection from Primary Societies	43

3.3	Private Sector Investment	47
PART IV		
4.0	COTTON PRODUCTION AT HOUSEHOLD LEVEL	50
4.1	Household Characteristics	50
4.1.1	Demographic Features	50
4.1.2	Household's Main Activities.....	53
4.2	Impact of Cotton Production on Household's Welfare.....	55
4.3	Women Labour Input in Cotton Production	59
4.4	Expenditure Lines.....	61
4.8	Farm Size and Distribution	64
4.9	Cost of Cotton Production	66
PART V		
5.0	INTERVENTIONS	71
5.1	Technical Intervention	71
5.2	Financial Intervention	72
5.3	Socio-economic Intervention	72
5.4	Institutional Intervention	73
	CONCLUSION AND RECOMMENDATIONS	74
	CONCLUSION	74
	RECOMMENDATION	75
	APPENDIX TABLES	
1	Terms of Reference :Sector Studies - Cotton	78

LIST OF TABLES

	Page
Table 1.1 Districts, Villages and Number of Respondents Visits.....	6
2.1 Administrative Set-up of Shinyanga Region (1996/97).....	7
2.2 Distribution of Land Area by District in Shinyanga Region (sq. km).....	8
2.3 Distribution of Population in Shinyanga Region.....	8
2.4 Value of Livestock and Livestock Products (1996/97).....	9
2.5 Production Levels of Crops in Shinyanga Region (Actual ha) 1992-93-1996/97.....	10
2.6 Crop Production in Shinyanga Region 1992/93-1996/97(Metric Tonnes)	11
2.7 Crop Yield Levels in Shinyanga Region 1992/93-1996/97 (Ton/Ha).....	12
2.8 Cotton production by District in Shinyanga Region 1992/93-1996/97 (ha)	12
2.9(a) Production Trend of Cotton Crop in Shinyanga Region (Metric Tonnes)	13
2.9(b) Production Trend and Projections of Cotton Production in Shinyanga Region (1992/93 - 2001/2002) Metric Tonnes	14
2.10 Production Trend of Cotton in Shinyanga Region Yields (Tons/ha)	14
2.11 Production and Sales of Cotton.....	15
2.12 Production and Sales of Cotton Lint.....	16
2.13 Production and Sales of Cotton Seeds.....	17
2.14 Production and Sales of Cotton Oil	18
2.15 Production and Sales Trend of Cotton Seed Cakes in Shinyanga.....	19
2.16 Amount of Cotton Seeds Distributed to Primary Societies (1992/93-/97).....	20
2.17 Mean Rainfall Pattern in the Districts of Shinyanga Region (1998/89-1990/91)...	21
2.18 Availability and Distribution of Agricultural Inputs in Shinyanga Region (1988/89-96/97).....	23
2.19 Availability and Distribution of Farm Inputs in Maswa and Meatu.....	24
2.20 Sales of Farm Inputs to Farmers at Luguru Branch 1992/93-1996/97.....	25
2.21 Total Sales of Arm Inputs by the Private Sector (1994/95).....	26
2.22 Mean Distribution of Different Types of Chemical Inputs in Uzogore Branch in Shinyanga Region 1991/92 (Litres).....	27
2.23 Simple Regression Results of Inputs Use and Cotton Production.....	27
2.24 Relationship between Chemical Input Distribution and Mean Cotton Output Shinyanga Region (1991/92)	27
2.25 Mean Levels of Cotton Production by Type of Input Used at Uzogore (1993/94).....	28
2.26 Volume of Inputs Used and Mean Production of Cotton 1993/94.....	29
2.27 Mean Production and Distribution of Cotton Seeds in Shinyanga Region (1991/92-93/94) Metric Tonnes.....	30
2.28 Production and Distribution of Cotton Seeds in Shinyanga Region 1993/94 (Metric Tonnes).....	31
2.29 Mean Cotton Oil and Cake Production in Shinyanga Region (1991/92-1993/94) (Metric Tonnes).....	32
2.30 Mean Production of Cotton Lint in Shinyanga Region (1991/92-93/94).....	33
2.31 Total Number of Societies Involved in Cotton Purchases in Shinyanga Region.....	34
2.32 Mean Collections and Deliveries of Cotton in Shinyanga Region (1991/92-93/94) (Metric Tonnes).....	35
3.1 Collection Trends of Cotton from Branches in Shinyanga Region (1992/93-96/97)...	41
3.2 Purchase of Cotton by Various Agents in Shinyanga Region (1996/97).....	43
3.3 Average Collection of Cotton from Primary Societies in Relation to Distance in Shinyanga.....	44
3.4 Impact of Distance on Cotton Collection from Primary Societies Luguru Branch ...	44

3.5	Impact of Distance on Cotton Collection from Primary Societies Meatu Branch	45
3.6	Impact of Distance on Cotton Collection from Primary Societies Uzogore Branch..	46
4.1	Sample Frame of Interviewed Heads of Households.....	50
4.2	Households Population by Gender in Shinyanga.....	51
4.3	Age Structure of Household Members.....	52
4.4	Main Occupation of Economically Active Family Members.....	53
4.5	Main Occupation of all Household Members.....	54
4.6	Off-Farm Income by Village.....	55
4.7 (a)	Summary of Problems Affecting Marginalized Farmers in Cotton Production (Absolute Points = Number of Responses from the FGD)	56
4.7 (b)	Summary of Problems Affecting Marginalized Farmers in Cotton Production (Percentage).....	57
4.8 (a)	Farmers Responses on Possible Solutions (Absolute Points).....	58
4.8 (b)	Farmers Responses on Possible Solutions (Percentage).....	58
4.9	Women Labour Input in Cotton Production..(Percentage).....	60
4.10 (a)	Expenditure Lines by Households (Absolute Points)	62
4.10 (b)	Expenditure Lines by Households (percentage).....	63
4.11	Farm Size and Distribution for all Villages (percentage).....	65
4.12	Estimates of Cost of Production and Incomes from Cotton Production in Shinyanga (Ox-plough Technology) 1996/97	66
4.13 (a)	Estimates of Cost of Cotton Production of all Villages (Tshs/Acre).....	68
4.13 (b)	Estimates of Cost of Cotton Production of all Villages (%).....	69

LIST OF FIGURES

	Page
Fig: 2.1 Cotton Production Trend in Shinyanga Region (1992/93-96/97).....	13
2.2 Cotton Yield Trend in Shinyanga Region: 1992/93-96/97 (Tons/ha).....	15
2.3 Production and Sales Trend of Cotton Lint in Shinyanga Region.....	16
2.4 Production and Sales of Cotton Seeds in Shinyanga Region.....	17
2.5 Production and Sales Trend of Cotton Oil in Shinyanga Region.....	18
2.6 Production and Sales Trend of Seeds Cakes in Shinyanga.....	19
2.7 Amount of Cotton Seeds Distributed to Primary Societies/Farmers.....	20
2.8 Cotton Production and Input Use at Luguru (1991/92 Season)	28
2.9 Inputs Distributed Against Unit Price at Uzogore Branch (1993/94)	29
3.1 Cotton Collection Trend in Shinyanga Region (1992/93-96/97) Metric Tonnes.....	42
3.2 Average Collection (92-94) Luguru Branch.....	45
3.3 Average Collection Trend (94-97) Meatu.....	46
4.4 Total Collection (92-94).....	47

ABBREVIATIONS

BoS	=	Bureau of Statistics
DALDO	=	District Agricultural and Livestock Development Officer
DED	=	District Executive Director
ESRF	=	Economic and Social Research Foundation
FDG	=	Focus Discussion Group
GDP	=	Gross Domestic Product
HRDP	=	Human Resource Development Project
KACU	=	Kahama Co-operative Union
KCC	=	Kahama Cotton Company
MDB	=	Marketing Development Bureau
MP	=	Member of Parliament
PPA	=	Participatory Poverty Assessment
PRA	=	Participatory Rural Appraisal
RALDO	=	Regional Agricultural and Livestock Development Officer
RAS	=	Regional Administrative Secretary
RTC	=	Regional Trading Company
SHIRECU	=	Shinyanga Region Co-operative Union
STAMICO	=	State Mining Corporation
TANAA	=	Tanzania Agricultural Adjustment Agreement Programme
TCLCB	=	Tanzania Cotton Lint and Seed Board
TCMB	=	Tanzania Cotton Marketing Board
VEO	=	Village Executive Officer
WCGA	=	Western Cotton Growing Area
WEO	=	Ward Executive Officer

LIST OF PEOPLE MET FOR DISCUSSIONS

No.	Name	Function
1	Choto Laurent	Branch Manager, Malampaka Ginnery
2	Constantine Balance	Agricultural Extension Officer, Bumera Village
3	Dave Lorimar	General Manager, Cargill Ginnery, Lalago
4	Emmanuel Ntejo	KACU Chairman
5	Ernest Mapinda	Ward Executive Officer (WEO), Bumera Village
6	Grace Malle	Ward Secretary-Bumera Village
7	Hamadi, H	Director, LALAGO Cotton Ginnery
8	Hassan H. Matondo	Branch Accountant, Malampaka Ginnery
9	Jigata Seni	Branch Manager- Mhunze Ginnery
10	Jitinya, L.	Village Executive Officer, Nghómboko Village
11	Juma Matondo	Branch Manager-Luguru Ginnery
12	Leonard Kilinda	Ag. Village Executive Officer, Bushitala Village
13	Lucas Njile	Agricultural Extension Officer, Mwanzoya Village
14	Lukuba L.	Branch Accountant, Sola Ginnery
15	Lunyembeleka. M.	Ward Executive Officer (WEO), Ibingo Village
16	Lupandisha Julius	Asst. Branch Manager-Kahama Ginnery
17	Luzumba N.J.	Agricultural Officer, Bariadi.
18	Mahinda K.M	Planning Officer, Bariadi
19	Masera. R.K.	Manager-DUMON (T) LTD, Bukombe District
20	Mayala F.K.	Branch Manager, Sola Ginnery
21	Mwalulu J.C.N.	District Administrative Secretary, Bariadi
22	Mwanri. H.	Manager-DUMON (T) LTD, Kahama District
23	Richard John Sangisangi	Ward Executive Officer (WEO), Bunambiyu Village
24	Salehe Shaaban Mohamed	Manager-Kahama Cotton Company (KCC)
25	Samuel Mabele	Branch Manager- Uzogore Ginnery
26	Silla, N.	Ag. District Agricultural and Livestock Officer, Bariadi
27	Swedi H. Munkasa	Operations Manager-KCC
28	Tabu Saguda	Village Executive Officer (VEO), Mwanzoya Village

EXECUTIVE SUMMARY.

1. Shinyanga is one of the leading regions for cotton production in the western cotton growing area (WCGA) where about 95% of the crop is produced. The other important regions are Mara and Mwanza. The cotton study covered all the district of Shinyanga region and 10 villages in total. The villages were selected on the basis of the potentials for cotton production vis a vis other (food) crops. There were 222 respondents out of whom 51 were women (24%).
2. The cotton study intends to quantify the potential in cotton production, marketing and processing for poverty reductions. The Study involves the identification of wealthier and poorer households, problems faced by poorer households especially women in cotton production, the analysis of the production by farm size and the share of cotton income in total income.
3. Cotton takes the second place after maize in total land put under cultivation in the region. The area under cotton has been fluctuating from year to year between 1992/93 and 1996/97 but there is an increasing trend. The area registers an average growth rate of about 7.7% over the period. Cotton production (tonnage) also registers a positive growth of about 4.6% per annum over the same period. That means farmers have increased their efforts in cotton production but due to unfavourable weather conditions and other production problems the cotton yields show a declining trend. The cotton yield (ton/ha) has declined by about 19% between 1992/93 and 1996/97. The yield of about 550 kg/ha is, however, above the national average by about 15% and below the regional set target of 1 ton/ha.
4. The expansion of the area under cotton has resulted into a decline of the area under food crops. This has serious food security implications at the household level given the fact that the returns to labour from cotton are at present very low.
5. The cotton contribution to the regional economy averaged Tshs. 14 billion (1992/93 to 1996/97). The value of cotton lint averaged Tshs. 16 billion while cotton seeds, cotton oil and cotton cake contributed an average of Tshs. 357 mil; 404 mil.; and 212 mil. respectively. Therefore, cotton by-products contributed about Tshs. 973 mill to the regional economy. In comparison, livestock and livestock products contributed about Tshs. 12 billion in 1996/97.
6. At the household level cotton is the main cash earner to most families. Poor families, with little or no cattle, depend very much on cotton production as a source of income. The production of food crops especially maize, paddy, cassava, millet and sorghum is mainly for subsistence purposes.
7. Despite the importance of cotton to the regional economy and to the household incomes the cotton sector is beset with a number of problems.

The cotton production in the region is low, yielding about 550kg/ha which is substantially below the yield potential of the varieties grown by about 45%. The low productivity and non use of adequate inputs contribute greatly to the poor performance of the cotton sector.

- b) High input prices compared to low producer prices have forced cotton farmers to use less cotton inputs and only when it is absolutely necessary. Producer prices have in real terms never reflected the cost of production. That makes cotton to be less competitive compared to paddy and maize and also compared to tobacco in some villages. Cotton, it seems, is grown as a matter of tradition despite its generally low returns to labour. In most cases, especially for vulnerable groups (poorer families and women) there is no alternative source of income.

- c) The performance of the co-operative unions has been less than satisfactory not only due to delay in payments but also due to neglect of marginalized farmers. The marketing services are offered mostly to farmers closer to the branches at a radius of about 50 km from the centre. Private buyers are also unlikely to offer their services to the district farmers mainly due to inaccessibility (poor roads and bridges infrastructure). That means farmers in the periphery face marketing problems despite more or less equal potential for cotton production. This has a far reaching negative effect on poverty alleviation.
- d) The private buyers and ginneries have to a great extent taken over the marketing functions such that some Union branches could not purchase the expected level of cotton. Luguru branch, for example, had an expectation of purchasing some 12.6 mill kgs of cotton in 1996/97 season but could only get 5 mill kgs, i.e. less than half. Farmers are in general happy with the presence of private initiative in cotton marketing. The liberalised marketing has improved farmers income in the sense that they (sometimes) get relatively higher prices but more importantly they get the money in cash and prompt.
- e) Availability of cotton seeds and quality of seeds is a big problem to farmers. The seed quality is of major concern because of the possibility of mixing cotton from different areas and regions by the private buyers. As such there is no stop centre for seed quality control.
- f) There has been a big concern among the farmers, village and government leaders that the future of cotton is in jeopardy because of non control of seeds. The mixing of cotton from different places and areas may also bring about a mixture of seeds which may not be suitable for growing in certain localities due poor resistance to some diseases and different soil and weather conditions.
- g) The distribution of chemical inputs and fertilisers to farmers is less than adequate. Now that the marketing of inputs is fully liberalised, there still remains the question whether private operators will be able to deliver quality inputs timely and at affordable price. As of now private buyers/operators do not distribute inputs to the required levels. Those who distribute is on cash basis and due to high prices, poor farmers can not afford. The union has also stooped distributing inputs on credit basis.
- h) Modern farm equipment is not readily available to farmers especially the poor ones. The hiring costs are usually high and if manageable they get the equipment late (after the owners have used them on their own fields).
- i) Shortage of labour, especially among the poorer families and female headed households is yet another constraint to cotton production. These families for lack of alternative source of income, they are forced to hire out their labour to other peoples' fields in order to get money to buy food. In that way, they have less labour to cater for their own cotton farms. The hiring-in of labour is also expensive and not many (poor) households can afford.
- j) On expenditure side, many women are not involved in the planning. First they often do not know the exact amount that was obtained from crop sales. Much of the money is hence spent by men on trivial or unnecessary things like drunkenness, marrying additional one or two wives etc. So the plight of women and children on isolation and deprivation continues unabated.

PART 1

1. INTRODUCTION

1.0 BACKGROUND AND OBJECTIVES OF THE STUDY

1.1 Background

The overall purpose of the Human Development Report Project (HDRP) for Shinyanga is to enhance the living conditions and the lives of the people. Many projects before may also have had this purpose and achieved it to some degree. This project will make all possible attempts to contribute to the improvement of Shinyanga from the perspective of the poorest. As far as possible it will compliment and build on the work of similar studies and not duplicate them. Hence the main concern of the study is to advocate an holistic approach to poverty and promote a development process that enlarges people's choices by placing people at the centre of development. The HDR will be formulated based on information from two major types of activities:

- a) Participatory Poverty Assessment (PPA) in Shinyanga.
- b) Economic and social studies of the potential of different productive sectors for poverty reduction potential and analysis of issues e.g. gender and environment that relate practically and strategically to poverty reduction actions. Therefore, HDR seeks to focus on identification of types of poor households, their livelihood strategies and constraints and the opportunities to intervene effectively to strengthen poor people's livelihoods.

The cotton sector study will provide substantive analysis of the adequacy of a cash crops promotion approach to poverty reduction. It will quantify the potential in cotton production, marketing and processing for poverty reduction. It will contextualise findings in relation to macro-economic policies, globalisation of economic activity, liberalisation of crop marketing and multinational and other private sector activity in the sector. It will examine the impact of cotton production on poor households, on women, on food security and on the environment. This will involve a cost of cultivation study, stratified by farm size and giving adequate coverage to poorer households. It will involve analysis of the distribution of production by farm size and the share of cotton income in total income. It will require analysis of the distribution of benefits from production, marketing and processing.

The effectiveness of the institutions servicing the cotton sector (for example, Government Departments, Co-operative Union and Societies, Private ginnery companies) will be reviewed. The study will also propose some technical, financial, socio-economic and institutional interventions.

1.2 Objectives

Within the overall objective of preparing a Human Development Report and Poverty Eradication Strategy for Shinyanga Region, the cotton sector study is guided by the following main objectives:

- a) To review the present, past and potential future contribution of the cotton production, processing and marketing to the economy of Shinyanga Region

- b) To examine the impact of cotton cultivation on the economic and social status of rural households, men, women and children, the importance of cotton for income and employment generation and its implications for food security and environmentally sustainable land use;
- c) To assess the effectiveness of the institutions supporting the cotton sector, with particular reference to the impact of liberalised marketing, private sector investment, and the weakening of farmers' co-operatives and government agencies on seed and agro-chemical distribution, production, finance, research and extension services, seed cotton and lint quality and farmer payments;
- d) To propose technical, institutional, financial and socio-economic interventions which would strengthen the contribution of the cotton sector to a programme for poverty alleviation in Shinyanga Region.

1.3 Methodology

The study is based on both secondary and primary data sources. The secondary data was collected from government offices (Ministry of Agriculture), Co-operative Union (SHIRECU), Regional offices (RAS), Tanzania Cotton Marketing Board (TCMB), Marketing Development Bureau (MDB), Bureau of Statistics (BoS), District Officials (DED), etc.

The choice of the villages to visit for the household survey was guided by the recommendations received from the District officials, especially the DED and the agricultural officers. Four main factors were put under consideration. First was the potentiality of the villages based on historical fame for cotton production. Such villages were, for example, Bushitala in Maswa, Bunambiyu in Shinyanga Rural, Ng'homboko in Meatu and Mbiti in Bariadi district. The other factor was the production of other food and cash crops which may compete with cotton in terms of importance and level of production. Villages like Mwanzola (Bariadi) and Bumera (Bariadi) were also important producers of paddy and maize respectively. Runzewe village (Bukombe) is famous for the production of tobacco. The third factor was the presence of alternative income generating activities like mining which may cause farmers to put less emphasis on cotton production and its effect on community's welfare especially the poor. An example of such a village is Mwime in Kahama where there is a lot of small scale mining activities. At Ibingo village in Shinyanga Rural cotton production has been abandoned in favour of paddy and vegetables. The last factor was the presence of chronic hunger, an indication of food insecurity. Such a village was Kishapu in Shinyanga Rural. So in total 10 villages were visited (see also Table 1.1).

Data collection at the household level (primary data) for the cotton sector study was based on some PRA methods, for example the Focus Group Discussions (FDGs) and the ranking of issues (problems and solutions) based on the group's consensus. The group was composed of both women and men, although the latter were predominant. On average there were 18 men and 5 women involved in the discussions.

The observations based on the FGD's were supplemented by views drawn from the village studies conducted for the PPA and from the workshop which was held in Shinyanga from 24th to 28th November to discuss results from the PPA and sector studies. The conventional quantitative household survey was not done because of limited time but reference is made to such studies which were conducted in the region earlier on.

Some information and views were also collected from various institutions which are directly connected with the cotton sector (Co-operative Union, both private and Unions ginneries, Government staff and some traders).

A checklist was prepared and this was necessary in order to facilitate systematic and consistent discussions. Discussions were facilitated by the consultant and there was a recorder and an interpreter. The checklist contained the following basic questions:

1.3.1 On Production:

- (I) Who are the most efficient cotton growers?
- (ii) What makes it difficult for poorer farmers/women farmers to achieve similar results?
- (iii) What is the impact of cotton production on food production, particularly for poorer households?
- (iv) How could the constraints be overcome?
- (v) What is the current and past role of women in cotton production, i.e. what impact does the crop have on their economic situation?
- (vi) Is the emergence of private buyers (rather than Co-operatives) likely to influence women and poorer households' involvement in this sector?

1.3.2 On Farm Size

- (I) What is the average farm size of wealthier households?
- (ii) What is the average farm size of middle level household?
- (iii) What is the average farm size of poorest households including women?
- (iv) How much land in each farm size range is allocated to cotton production?
- (v) What proportion of land is allocated to other crops?

1.3.3 On Farm Budget

- (i) What is the current cost of production of cotton on an acre of land
 - Cost of land preparation
 - Cost of planting
 - Cost of weeding
 - Cost of spaying
 - Cost of harvesting
 - Cost of transport.
- (ii) What are the returns to farmers from that plot?
- (iii) How do the costs and return to land and labour from cotton production compare to the costs and returns from production of other crops

The checklist was important for soliciting comparable information but discussions in some villages went beyond what is shown in this list. The total number of villages visited and households interviewed is shown in Table 1.1 below.

Table 1.1: Districts, Villages and Number of Respondents Visited.

Districts	Villages	No. of Respondents			% of Women	Distance from District. (kms)
		Men	Women	Total		
Maswa	Bushitala	24	4	28	14.3	30
Bariadi	Mbiti	20	5	25	20.0	12
	Mwanzola	14	9	23	39.1	30
Shinyanga (R)	Bumera	26	6	32	18.8	34
	Bunambiyu	11	2	13	15.4	29
	Ibingo	15	7	22	31.8	17
Bukombe	Kishapu	9	6	15	40	58
	Runzewe	14	4	18	22.2	40
Kahama	Mwime	18	4	22	18.2	6
Meatu	Ng'ombeko	20	4	24	16.7	25
Total	TOTAL	171	51	222		
Average	AVERAGE	17.1	5.1	23	23.7	27

The number of people available for the discussions ranged between 13 and 32 with an average of 23 people in the 10 villages visited. Among these, women accounted for between 2 and 9 with an average of 5. Discussions were held with men and women together. Women were encouraged to talk and in our judgment there were no suppression of expression by men during the discussions. However, women represented only about 22% of the whole group. We can say we had a total of 222 of respondents in our sample. Some villages were closer to the district headquarters than others. For example Mwime village in Kahama district was only 6 kms away from Kahama while Kishapu was about 58 kilometers away. On average the villages were located some 27 kilometers from the district headquarters.

PART II

2.0 REGIONAL ECONOMY

2.1 A Brief Review of Regional Economy

2.1.1 Administrative Set-up

Shinyanga region is in the north-western part of Tanzania. It is bordered with Mwanza, Kagera and Mara regions to the north, Arusha region to the east, Singida and Tabora to the south, and Kigoma region to the west. The dominant tribes here are Wasukuma, Wanyamwezi and Wasumbwa. There are also some smaller tribes. Administratively, the region is divided into 6 districts, 25 Divisions, 118 wards and 738 villages distributed as shown in Table 2.1.

Table 2.1: Administrative Set-up of Shinyanga Region (1996/97)

District	No. of Division	No of Wards	No of Villages	Total Villages (%)	Area (km ²)	Number of Households
Bariadi	4	26	124	14.9	9777	65289
Kahama	8	34	215	25.8	9461	172106
Maswa	3	18	77	9.2	2736	43702
Meatu	3	19	72	8.6	8871	26128
Shinyanga Urban	3	13	22	2.6	548	27988
Shinyanga Rural	6	36	209	25.2	8906	73928
Bukombe	3	14	114	13.7	10482	87179
TOTAL	27	160	833	1000.0	50781	49410

Source: Regional Administrative Secretary, Shinyanga, 1997.

Kahama and Shinyanga rural are the largest districts in terms of the number of divisions, wards and villages. The two districts possess about 40.7 of all villages. As expected Shinyanga urban has the least number of villages, followed by Meatu district.

The region has a total area of about 50,781 sq. kilometres out of which 18,300 sq. kms (36.0%) is for forest and game reserve ; 31,400 sq. kms (61.8%) is arable and livestock land; and the remaining 1,100 sq. kms are hilly, rocky and gully areas which are unsuitable for cultivation. The district-wise distribution of the total land area (km²) is as shown in Table 2.2 below:

Kahama and Bukombe are by far the largest districts in terms of total land area and also in terms of total arable land. The former is 39.3% and the latter 29.8%. Bariadi and Shinyanga (both rural and urban) occupy more or less the same area (21.6 and 21.3% respectively). Maswa and Meatu were one district before the creation of the new district of Meatu. They both occupy 27.3% of the arable land or 23.5% of the total regional land area.

Table 2.2: Distribution of Land Area by District in Shinyanga Region (Sq. km)

District	Forest Area	Arable Land	% of Total	Total	% of Total
Bariadi	1.7	9444	21.6	9777	19.3
Kahama & Bukombe	6897.4	13046	29.8	19943	39.3
Maswa & Meatu	1.8	11919	27.3	11607	22.8
Shinyanga (Rural & Urban)	141.3	9313	21.3	9454	18.6
TOTAL	7042.2	43722	100.0	50781	100.0

Source: Regional Administrative Secretary, Shinyanga, 1997

2.1.2 Population:

Following the 1988 population census, Shinyanga region had 1,774,537 people that year. With an average annual growth rate of 2.91, the region was expected to have 2,133,006 people in 1994. The district-wise distribution of this population is shown in Table 2.3. Again Kahama district is the most populated one with a very high growth rate of over 5.6%. About 32.7% of the population live in this district, followed by Bariadi with 20.9% and Shinyanga rural with 20.3%. Shinyanga urban and Meatu are the least populated districts, with 5.9 and 8.4% respectively. The regional population density is very high, i.e. 42 people per sq. km compared to the national average of 17.

Table 2.3. Distribution of Population in Shinyanga Region

District	1988 ¹	1994	Growth Rate	% of Total	Area	Population Density
Bariadi	382383	445528	2.58	20.9	9777	47.17
Kahama/Bukombe	503204	698191	5.61	32.7	19943	35.01
Maswa	221194	255917	2.46	12.0	11607 ²	15.02
Meatu	159439	179079	1.98	8.4		
Shinyanga Rural	405605	433121	1.10	20.3	9454 ³	13.34
Shinyanga Urban	100724	126130	3.82	5.9		
Total	1774537	2133006	2.91	100.0	50781	42.02

Source: Regional Development Director, Shinyanga, 1994.

Kahama has the highest growth rate and hence higher population because of the following reasons:

- a) High soil fertility which attracts many farmers and livestock keepers.
- b) There are many areas in the district with gold deposits, hence many people flock into the district for mining activities.
- c) Plenty of forest areas which people can clear and make new settlements.

¹ National Population Census of 1988

² Includes the current Meatu district

³ Includes Shinyanga Urban district

2.2 Economic Activities

2.2.1 General Overview

About 97% of the population live in the rural areas of this region. Their livelihood depends almost entirely on agriculture and grazing. The standard of living is still low due to low agricultural output and productivity. This because the whole agricultural production is dependent on rainfall which is normally inadequate and unreliable, low production technology, lack of the necessary inputs and chemicals and inadequate extension services.

The economy of the region mainly depends on agricultural production and livestock keeping. The major food crops grown in this region include sorghum, millets, maize, paddy, sweet potatoes, legumes and cassava. Cash crops on the other hand, comprise mostly of cotton, tobacco and sunflower. The major types of livestock include cattle, goat, sheep and poultry. There is also a number of donkeys kept in the region.

From the livestock census of 1984, the region is second after Arusha in the number of livestock reared. There were a total of 1,852,656 cattle, 833,451 goats, 480,393 sheep, 10,821 donkeys and 937,947 poultry. This was a complete count, but a sample census of 1993¹ shows the region has 1,866,000 cattle (local), 1,113,000 goats, 405,000 sheep, some 2,000,000 chicken and 15,000 donkeys.

In 1996/97, the value of livestock and livestock products in Shinyanga region amounted to about Tshs 12 billion (Table 2.4).

Table 2.4: Value of Livestock and Livestock Products (1996/97)

Type	Total Number	Value (Tshs)
Cow	141,732	9,153,603,350
Goat	47,960	344,827,200
Sheep	17,349	93,107,300
Poultry	202,183	226,336,800
Eggs (dz)	183,840	230,760,550
Milk (ltr)	750,000	89,940,000
Ghee (ltr)	45,200	958,000
Hides & Skins (pcs)	95,200	1,634,755,000
TOTAL		11,784,288,200

Source: Regional Administrative Secretary, Shinyanga, 1997

Apart from agricultural production the inhabitants of the region are also engaged in other economic activities like mining and other minor activities (fishing, hunting, petty businesses). The large scale diamond mining is carried out at Mwadui and New Almasi mines. About 5,000 people are employed at the Mwadui mines. Small scale gold mining is carried out at Itilima (Shinyanga rural) and Bulyanghulu (Kahama) villages. The state mining corporation (STAMICO) has made some researches in the Bulyanghulu area and found out that it is suitable for the government's involvement in the mining. Right now plans are under way for the government to take over the area.

¹ URT: National Sample Census of Agriculture 1993/94. Tanzania Mainland: Report Vol. II (Household Characteristics, Livestock Count, Implements and Storage). Bureau of Statistics, Planning Commission, July 1994, Dar es Salaam.

The small non-agricultural industries in the region include tailoring, shoe repair, carpentry, ox-carts workshops, garages, saw mills etc. The region does not have many industries. The only functional large scale industries are oil mills and ginneries, most of which are public entities.

2.2.2 Crop Production in the Region

In Shinyanga region maize production is leading by 29.7% of all the land put under cultivation followed by cotton with 17.3%. If food crops are grouped together (i.e. maize, sorghum, millets, paddy, cassava, sweet potatoes and legumes), they assume about two thirds (69.1%) of the cultivated land. The rest (30.1%) is for cash crops (groundnuts, sunflower, tobacco and cotton) to which cotton contributes about 56%, as an average of the five past years (Table 2.5).

The data shows also that out of the 31,400 sq. kms. arable land only 914,229 ha on average is put under cultivation, which represents about 29.1 of the arable land or slightly less than 20% of total land area. This implies there is still room for increased production in the region.

The total land use for cultivation appears to be on the decline between 1992/93 and 1996/97. The annual average growth rate for total hectares was -3.3%. Considering the most important crops only, then the area under maize, as an important staple food, had also a negative growth rate of about 3.7% per annum compared with the more drought resistant crops (sorghum and millets) whose area was decreasing at an annual average rate of 17.9%. This is despite the emphasis by the regional authorities to increase the production of such crops in order to reduce risks of food insecurity among the households due to the persistent drought in the region.

The area under cotton on the other hand, was also growing rapidly over the period as shown by the 7.7% average annual growth rate. The question we pose at this juncture is whether cotton, as a cash crop, is more propagated at the expense of food crops. If so, how does cotton cater for food security problem among the household?. In other words, can cotton growing really help in alleviating poverty in the region?. If not what can be done? However, the area under cotton dropped sharply between 1995/96 and 1996/97 from the peak of 205,123 ha to 181,386 ha (-11.6%), most likely as a result of drought.

Table 2.5: Production Levels of Crops in Shinyanga Region (Actual ha) 1992/93-1996/97

YEAR	1992/93	1993/94	1994/95	1995/96	1996/97	TOTAL	AVERAGE	% OF TOTAL	% CHANGE 1993-97
Maize	353207	218120	345094	312781	233750	1462952	292590	29.7	-33.8
Sorghum	264481	138211	111172	115180	87481	716525	143305	14.6	-66.9
B/Millets	28528	30139	28930	23233	35746	146576	29315	3.0	25.3
Paddy	71025	56686	105966	76853	55640	366170	73234	7.4	-21.7
Cassava	51510	59686	49519	48382	77153	286250	57250	5.8	49.8
S/potatoes	88587	63359	128638	77382	63274	421240	84248	8.6	-28.6
G/Nuts	69777	66135	118181	66426	62054	382573	76515	7.8	-11.1
Pulses	58702	41745	51990	62072	71227	285736	57147	5.8	21.3
Cotton	170785	110809	183206	205123	181386	851309	170262	17.3	6.2
TOTAL	1156602	784890	1122696	987432	867711	4919331	983866	100.0	-25.0

Source: Regional Administrative Secretary, Shinyanga, 1997.

The crop output in terms of tonnage is shown in Table 2.6. Even here maize is leading by 28.3% followed closely by the bulky cassava and sweet potatoes (20.6% and 29.6% respectively). Paddy accounts for 18.2% while Sorghum for 11.8% of the total volume. Although cotton takes the second position in terms of land area, it comes sixth in tonnage (9.5%) over the five year period. But it is leading in the group of cash crops.

Here the average annual growth rate of total crop output between 1992/93 and 1996/97 was negative 10.2%. Cotton output on the other hand had a positive growth rate of 4.6% per annum. The production of the drought resistant crops registered a negative output growth of about 6.6% per annum over the five year period. The other drought resistant crops like cassava and sweet potatoes had a much higher negative output growth of 14.9% per year.

It appears from Tables 2.5 and 2.6 that at the regional level cotton production in terms of area and tonnage has been increasing over the five year period compared to food crops. This means there is a bias from the farmers' point of view towards the production of more cotton as a cash crop. There is still no real danger of food insecurity among the household if the cotton produced is of good quality, has a good market and can fetch reasonable prices from both local and international markets. Farmers will have increased incomes from which they can buy food in case of need from other regions that have more comparative advantage for food production.

Table 2.6: Crop Production in Shinyanga Region 1992/93-1996/97 (Metric Tonnes)

YEAR	1992/93	1993/94	1994/95	1995/96	1996/97	TOTAL	AVERAGE	% OF %	
								TOTAL	CHANGE 1993-97
Maize	329080	244294	386506	350314	80472	1390666	278133	28.3	-75.5
Sorghum	129576	158943	127847	132457	29349	578172	115634	11.8	-77.3
B/Millet	26098	34660	33270	26718	77438	198184	39637	4.0	196.7
Paddy	214307	141716	264915	192133	84073	897144	179429	18.2	-60.8
Cassava	206024	238744	198076	193528	179257	1015629	203126	20.6	-13.0
S/potatoes	354348	253436	514552	309528	22146	1454010	290802	29.6	-93.8
G/Nuts	48844	46295	82727	53140	31027	262033	52407	5.3	-36.5
Pulses	41082	29222	36392	267771	24149	398616	79723	8.1	-41.2
Cotton	106823	58962	100764	107933	91820	466302	93260	9.5	-14.0
TOTAL	1456182	1206272	1745049	1633522	619731	6660756	1332151	135.4	-57.4

Source: Regional Agricultural and Livestock Development Officer (RALDO), Shinyanga, 1997.

The crop yields over the period are given in Table 2.7, most of the crops and especially the drought resistance crops are below the national average. Of particular interest is the cotton yield which is above the national average by over 15.1%. It is however, below the regional set target of 1.0 tonne per ha.

Table 2.7: Crop Yield Levels in Shinyanga Region 1992/93 - 1996/97 (Ton/Ha).

YEAR	1992/93	1993/94	1994/95	1995/96	1996/97	AVERAGE YIELD	% CHANGE 1993-97
CROP							
Maize	0.9317	1.1200	1.1200	1.1200	0.3443	0.9272	-63.0
Sorghum	0.4899	1.1500	1.1500	1.1500	0.3355	0.8551	-31.5
B/Millets	0.9148	1.1500	1.1500	1.1500	2.1663	1.3062	136.8
Paddy	3.0173	2.5000	2.5000	2.5000	1.5110	2.4057	-49.9
Cassava	3.9997	4.0000	4.0000	4.0000	2.3234	3.6646	-41.9
S/potatoes	4.0000	4.0000	4.0000	4.0000	0.3500	3.2700	-91.2
G/Nuts	0.7000	0.7000	0.7000	0.8000	0.5000	0.6800	-28.6
Pulses	0.6998	0.7000	0.7000	4.3139	0.3390	1.3506	-51.6
Cotton	0.6255	0.5321	0.5500	0.5262	0.5062	0.5480	-19.1
TOTAL	1.2590	1.5369	1.5543	1.6543	0.7142	1.3437	-43.3

Source: Own Calculations from Table 2.5 and 2.6.

2.2.3 Cotton Production in the Region

Cotton production in the different district is shown in Table 2.8. Kahama and Bukombe are treated together and they form about 30.2% of the land put under cotton in the region. Shinyanga rural alone contributes 27.4% of the total area. Meatu, Bariadi, and Maswa follow in that order. As an average of the five year period (1992/93 - 1996/97), the area under cotton in the region is 170.280 ha.

Table 2.8: Cotton Production by District in Shinyanga Region 1992/93-1996/97 (Ha)

DISTRICT	BARIADI	KAHAHA/ BUKOMBE	MASWA	MEATU	SHINYANGA	TOTAL
1992/93	31374	37887	23800	41929	35795	170785
1993/94	15425	30087	13516	21026	30755	110809
1994/95	23789	56763	18940	21614	62100	183206
1995/96	25891	55420	32038	34543	57231	205123
1996/97	13433	77029	19870	23914	47230	181476
AVERAGE	21982	51437	21633	28605	46622	170280
%	12.9	30.2	12.7	16.8	27.4	100.0

Source: Regional Agricultural and Livestock Development Officer (RALDO), Shinyanga, 1997.

The cotton tonnage produced in the districts between 1992/93 and 1995/96 is shown in the Table 2.9(a). Again Kahama and Bukombe contribute the highest (29.0%) of the total tonnage because they are treated together. Otherwise Shinyanga rural is the leading cotton producer as it gives 25.8% of all cotton in the region. Meatu (16.2%), Bariadi (14.9%), and Maswa (14.1%) follow the rest in that order. On average Shinyanga produces about 93.260 Metric tonnes.

The regional trend in production (Hectares and Tonnage) is shown in Fig. 2.1. There was a slight decline between 1992/93 to 1993/94 both in terms of ha and tonnage. Again both picked up between 1993/94 and 1995/96 before dropping slightly between 1995/96 and 1996/97. This drop was basically due to drought between the two seasons.

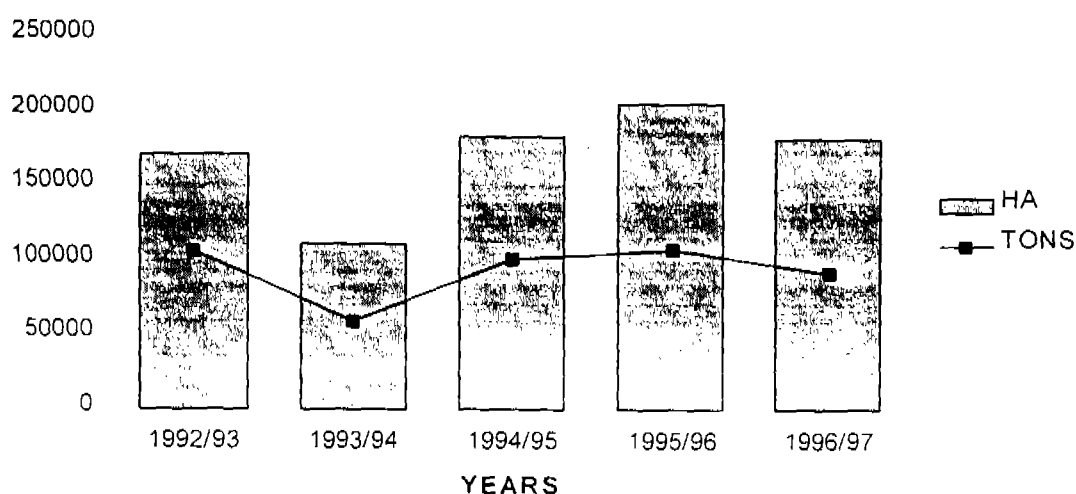
Table 2.9 (a): Production Trend of Cotton Crop in Shinyanga Region (Metric Tonnes)

DISTRICT	BARIADI	KAHAMA BUKOMBE	MASWA	MEATU	SHINYANGA	TOTAL
1992/93	18000	26500	11900	25367	25056	106823
1993/94	7713	18354	8168	6251	18476	58962
1994/95	13084	31220	10417	11888	34155	100764
1995/96	15564	27469	19377	20898	24625	107933
1996/97	15000	31820	16000	11000	18000	91820
AVERAGE	13872	27073	13172	15081	24062	93260
%	14.9	29.0	14.1	16.2	25.8	100.0
AAGR (%)	6.95	10.8	16.2	10.8	0.95	4.6

AAGR = Average Annual Growth Rate

Source: Regional Agricultural and Livestock Development Officer (RALDO), Shinyanga. 1997.

Fig. 2.1: Cotton Production Trend in Shinyanga Region (1992/93-96/97)



Cotton production projections for the next five years are shown in Table 2.9(b). Projections are based on the average annual growth rates for each district (Table 2.9a). Assuming other things remain constant, there will be a gradual increase in cotton production over the next five years. Total production is expected to reach about 115,000 tons from the region. Production increases from the districts will only be meaningful for poverty alleviation if the quality and value of the crop will be increased and guaranteed.

Table 2.9 (b): Production Trend and Projections of Cotton Production in Shinyanga Region
(1992/93-2001/2002) Metric Tonnes

	Bariadi	Kahama/ Bukombe	Maswa	Meatu	Shinyanga	Total
1992/93	18000	26500	11900	25367	25056	106823
1993/94	7713	18354	8168	6251	18476	58962
1994/95	13084	31220	10417	11888	34155	100764
1995/96	15564	27469	19377	20898	24625	107933
1996/97	15000	31820	16000	11000	18000	91820
1997/98	16043	35257	18592	12188	18171	96044
1998/99	17157	39064	21604	13504	18344	100462
1999/2000	18350	43283	25104	14963	18518	105083
2000/2001	19625	47958	29171	16579	18694	109917
2001/2002	20989	53137	33896	18369	18871	114973

Source: Projections based on Average Annual Growth Rates in Table 2.9 (a)

On yields (Table 2.10), Bariadi district has the highest average yield of 0.6683 ton/ha, followed by Maswa, 0.6129 ton/ha, then Kahama and Bukombe, 0.5536 ton/ha, Shinyanga, 0.5324 ton/ha and lastly Meatu, 0.5036 ton/ha. The average for the region is 0.5479 ton/ha over the five year period (1992/93 - 1996/97). Bariadi and Maswa districts show a clear increasing yields with time. As for Maswa this probably due to the presence of other related agricultural programmes like ox-weeders⁵ and organic farming, from which farmers may have adopted on their farms.

Results from Farming Systems Research have shown that many farmers cannot manage to weed all their fields properly as they do not have enough labour available in weeding period. As most people in Maswa and in other districts already cultivate by ploughs, the introduction of ox-drawn weeders have led to considerable better weeding in Maswa and therefore relatively higher yields. It was not clear why yields were on the increase in Bariadi but it is possible that more chemicals, farm manure and fertilisers are applied in this District compared to others.

Table 2.10: Production Trend of Cotton in Shinyanga Region :Yields (Tons/ha)

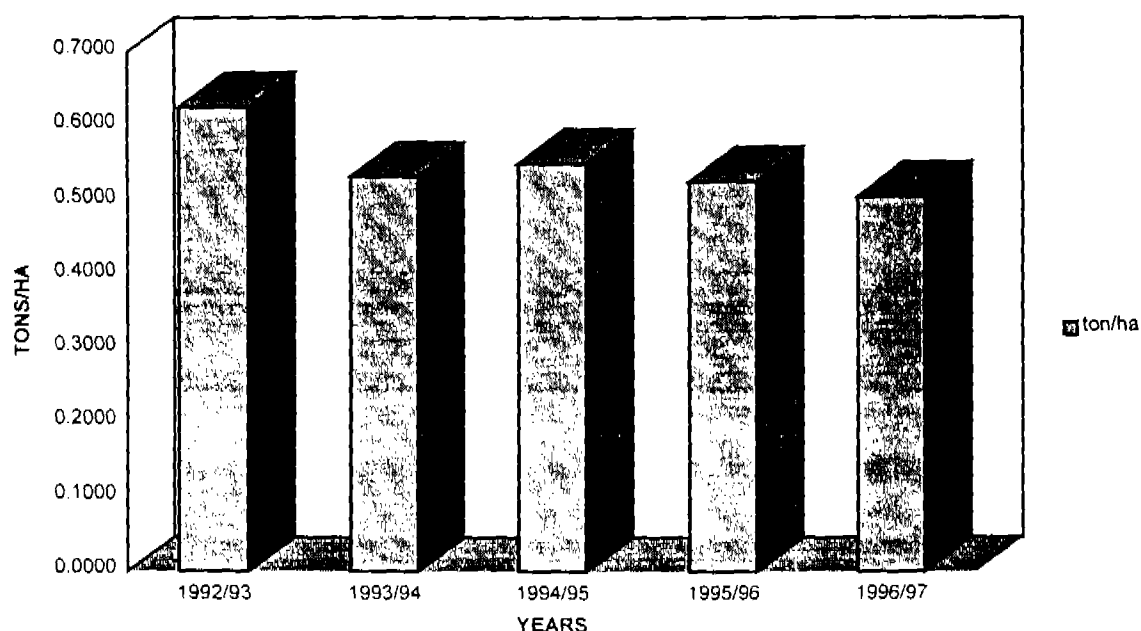
DISTRICT	BARIADI	KAHAMA/ BUKOMBE	MASWA	MEATU	SHINYANGA	TOTAL
1992/93	0.5737	0.6994	0.5000	0.6050	0.7000	0.6255
1993/94	0.5000	0.6100	0.6043	0.2973	0.6007	0.5321
1994/95	0.5500	0.5500	0.5500	0.5500	0.5500	0.5500
1995/96	0.6011	0.4957	0.6048	0.6050	0.4303	0.5262
1996/97	1.1167	0.4131	0.8052	0.4600	0.3811	0.5060
AVERAGE	0.6683	0.5536	0.6129	0.5035	0.5324	0.5479

Source: Own Calculations from Tables 2.8 and 2.9 (a).

⁵ Maswa District Rural Development Programme (TZ/91/018): Position Paper, August, 1994.

Looking at the regional trends we see clearly the cotton yield (tons/ha) shows a declining tendency over the five year period as demonstrated in Fig. 2.2. The reasons for the decline are most likely due to soil infertility, lack of chemical inputs and fertilisers.

Fig. 2.2: Cotton Yield Trend in Shinyanga Region: 1992/93-96/97 (Tons/ha).



2.3 Contribution of Cotton to the Regional Economy

The contribution of cotton to the regional GDP can be evaluated in terms of the seed cotton sold together with cotton lint, seed cake, cotton seeds and cotton oil. As for the seed cotton (raw cotton), the average value between 1992/93 and 1996/97 amounts to Tshs. 14 Billion (Table 2.11). The highest was in 1994/95 (Tshs. 20.5 Billion) and the lowest was in 1992/93 (Tshs. 6.4 Billion). The increase in price per kg. is 233% while the value shows an increase of almost 187%.

Table 2.11 : Production and Sales^a of cotton

Year	Tonnes	Unit Price (Tshs/Kg.)	Total Value
1992/93	106823	60	6,409,380,000
1993/94	58962	120	7,075,440,000
1994/95	100764	203	20,455,092,000
1995/96	107933	165	17,808,945,000
1996/97	91820	200	18,364,000,000
AVERAGE	93260	150	14,022,571,400

Source: Regional Agricultural and Livestock Development Officer (RALDO). Shinyanga, 1997.

^a Total sales are regarded as total production because almost 99.9% of cotton production is sold.

The production and sales of cotton lint are shown in Table 2.12. Following the decline in production of cotton in some years, there is also a decline of the cotton lint. For example in 1992/93, there was a production of 215,202 bales while in 1996/97 there were only 113,600 bales produced, i.e. a drop of about 47%. The cotton lint sold also dropped from 125,524 bales to 119,990 bales, a decline of about 4.4%. The decline is not only attributed by the fall in production in some seasons but also by the decline of the ginning capacity. Most of cotton ginneries belonging to the Co-operative Union are old and they lack spare parts⁷.

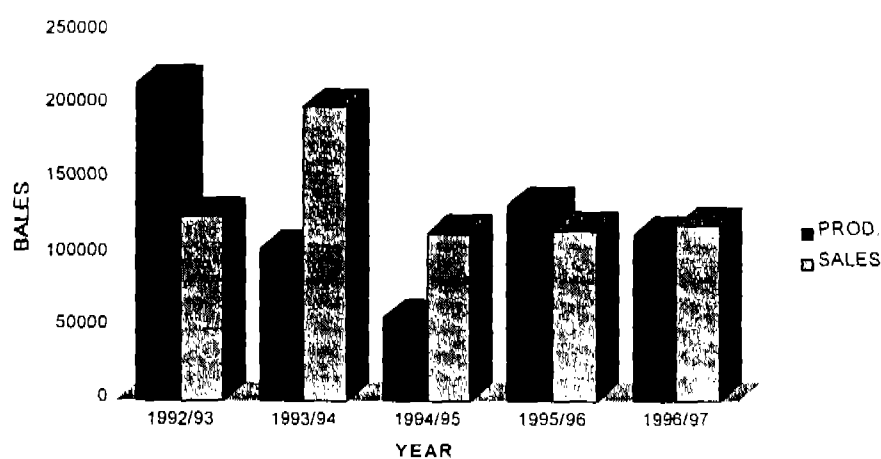
However, the total value increased from Tshs. 8.8 billion to Tshs 18.4 billion, i.e. an increase of about 109%. This follows from an increase of the average price per bale from Tshs. 69,800 in 1992/93 to Tshs. 152,900 i.e. an increase of about 119%. The decline in trends of both production and sales are shown in Figure 2.3. The average value of the cotton lint over the five year period is about Tshs. 16 billion. The highest was in 1995/96 (Tshs. 21 billion) and the lowest was in 1992/93 (Tshs. 9 billion).

Table 2.12 : Production and Sales of Cotton Lint

Year	Production (Bales)	Sales (Bales) ⁸	Average Price per Bale (Tshs)	Sales as % of Prod.	Total Value (Tshs)
1992/93	215202	125524	69800	58.3	8761575200
1993/94	104297	200054	89600	191.8	17924838400
1994/95	57575	114381	128800	198.7	14732272800
1995/96	133307	116688	181300	87.5	21155534400
1996/97	113600	119990	152900	105.6	18346471000
AVERAGE	124796	135327	124480	128	16184138360

Source: SHIRECU, 1997.

Fig. 2.3: Production and Sales Trend of Cotton Lint in Shinyanga Region



⁷ Wangwe, S.M. et al: Agricultural Marketing of Cotton and Maize in Tanzania. ESRF, September 1997; Preliminary Draft Report.

⁸ Where sales exceed production it means that there was a carry-over stock from previous season(s)

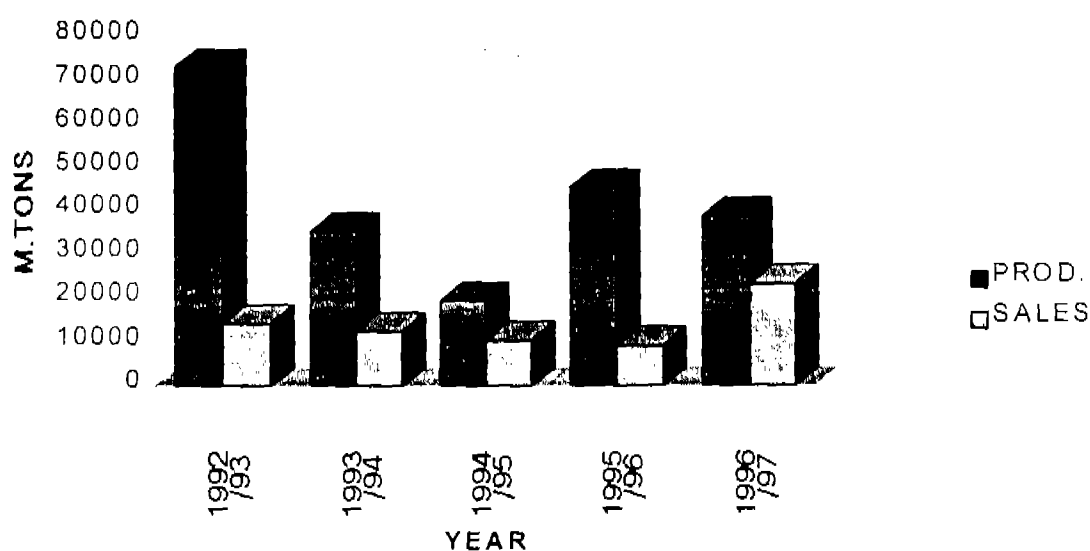
The production and sales of cotton seeds show a declining trend from 1992/93 to 1994/95 before registering a slight increase from 1994/95 to 1996/97 (Table 2.13). Overall, the production of seeds dropped from 73,170 tonnes to 38,828 tonnes in 1996/97, i.e. a decline of about 47%. The amount of seeds sold averages only 38%, the range being between 20 and 60%. The declining trend is also shown in Figure 2.4. The total value from the sale of cotton seeds averages Tshs. 36 billion.

Table 2.13 : Production and Sales of Cotton Seeds

Year	Production (M.Tons)	Sales (M.Tons)	Average price per Metric Ton	Sales as % of Prod.	Total Value (Tshs)
1992/93	73170	14492	16000	19.8	231872000
1993/94	35460	12714	18800	35.9	239023200
1994/95	19575	10494	28000	53.6	293832000
1995/96	45324	9390	37000	20.7	347430000
1996/97	38828	23251	29000	59.9	674279000
AVERAGE	42471	14068	25760	38	357287240

Source: SHIRECU, 1997.

Fig. 2.4: Production and Sales of Cotton Seeds in Shinyanga Region



Like the other cotton by-products, cotton oil production and sales were also declining over time (Table 2.14). Except for the season 1993/94 when production had reached a peak of 104,505 tins⁹ and sales of 89,189 tins, all the years experience a steady decline. For example production in 1992/93 was 86,310 tins which dropped to a low of 46,760 tins in 1996/97 (-46%). Sales on the other hand dropped from 88,762 tins to only 51,771 tins by 1996/97 (-42%). The Table shows also that whenever the average price per tin increased, the amount of oil sold declined. In general there has

⁹ A tin weighs about 18 kgs

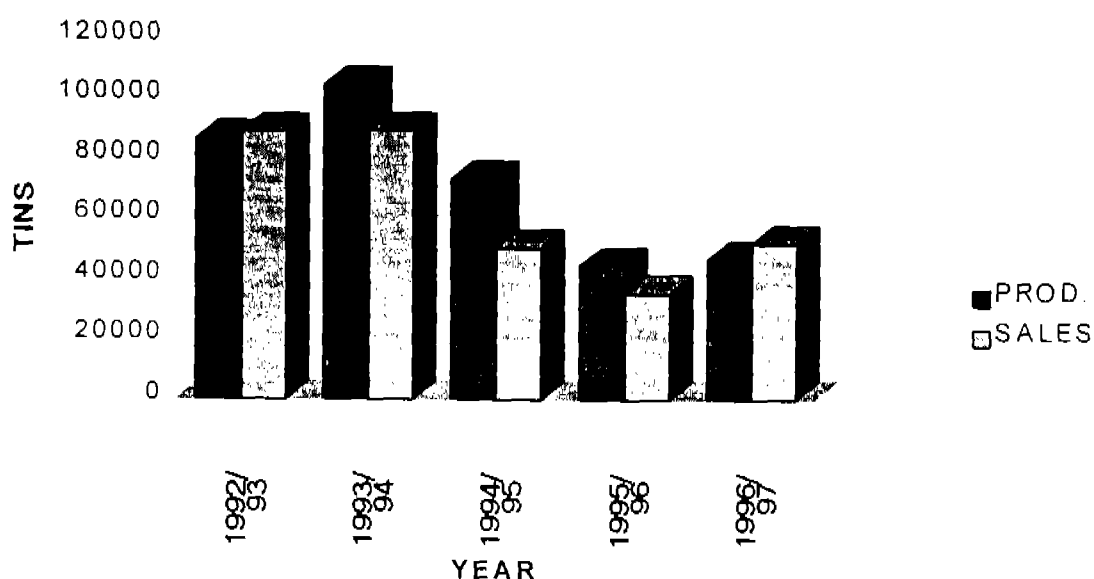
been an increasing trend in price, i.e. from Tshs 3,400 in 1992/93 to Tshs 8,300 (144%). The value obtained from cotton oil over the period was Tshs 405 mill., with a range of between Tshs 302 mill. and Tshs 517 mill. The declining trends of both production and sales are shown in Fig. 2.5.

Table 2.14: Production and Sales¹⁰ of Cotton Oil

Year	Production (Tins)	Sales (Tins)	Average Price per Tin (Tshs)	Sales as % of Prod	Total Value (Tshs)
1992/93	86310	88762	3400	102.8	301,790,800
1993/94	104505	89189	5800	85.3	517,296,200
1994/95	73060	50398	8000	69.0	403,184,000
1995/96	44497	35315	10500	79.4	370,807,500
1996/97	46760	51771	8300	110.7	429,699,300
AVERAGE	71026	63087	7200	88.8	404,555,560

Source: SHIRECU, Shinyanga, 1997.

Fig. 2.5: Production and Sales Trend of Cotton oil in Shinyanga Region



Another by-product of cotton is seed cake. Between 1992/93 and 1996/97 an average of 5,228 tons were produced in the region while 4,769 tons were sold, fetching an average value of about Tshs 212 million. The declining trend in both production and sales is also evident in Table 2.15 and Fig. 2.5. Production had declined by about 41% and the sales by almost 26%. The demand for seed cakes is mostly in the northern regions of Arusha and Kilimanjaro where improved dairy cattle are kept.

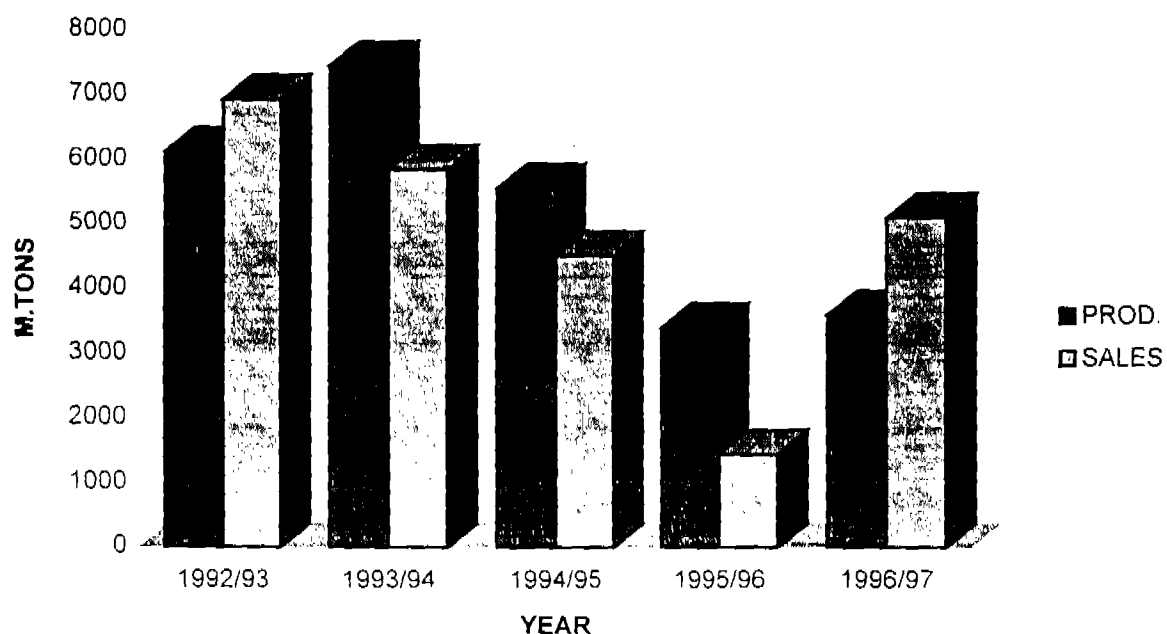
¹⁰ In some years sales exceed production because of the carry-over stocks from the previous season(s).

Table 2.15: Production and Sales Trend of Cotton Seed Cakes in Shinyanga

Year	Production (Tons)	Sales (Tshs)	Average Price per Ton (Tshs)	Sales as % of Prod.	Total Value (Tshs)
1992/93	6119	6931	34,300	113.3	237,733,300
1993/94	7457	5855	29,000	78.5	169,795,000
1994/95	5561	4513	58,400	81.2	263,559,200
1995/96	3408	1446	57,000	42.4	82,422,000
1996/97	3597	5100	59,700	141.8	304,470,000
AVERAGE	5228	4769	47,680	91.4	211,595,900

Source: SHIRECU, 1997.

Fig. 2.6: Production and Sales Trend of Seed Cakes in Shinyanga



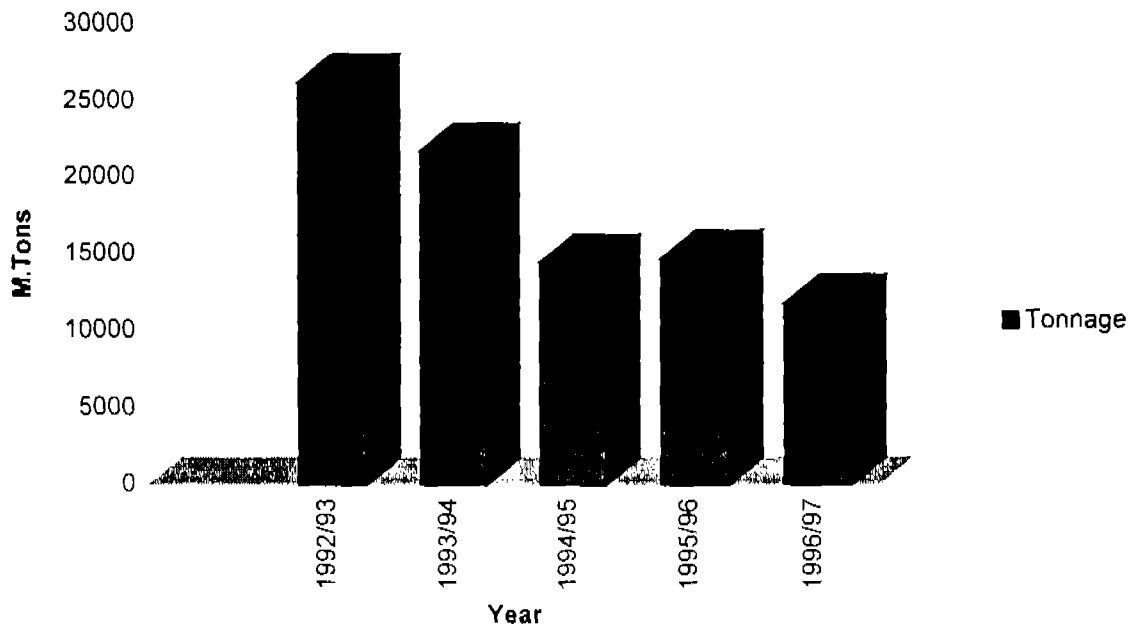
The amount of seed distributed to the societies was also on a gradual decline over the same period (Table 2.16). This is in part due to the failure of the co-operative union to distribute to all farmers all the seed requirements. With the introduction of the liberalised market, private buyers were also required to distribute seeds and other inputs to the villages/societies with which they have had contract to purchase cotton from. Again Fig. 2.16 depicts the clear declining trend, which should be reversed if cotton production is to be increased in future.

Table 2.16: Amount of Cotton Seeds Distributed to Primary Societies (1992/93-96/97)

Year	Tonnage
1992/93	26275
1993/94	21698
1994/95	14469
1995/96	14718
1996/97	11751

Source: SHIRECU, 1997.

Fig. 2.7: Amount of Cotton Seeds Distributed to Primary Societies/Farmers



2.4. Major Problems of Agricultural Production in the Region

2.4.1. Weather Condition

In general there is a persistent drought in the region. Rainfall pattern is not reliable. There are periods with long dry spells when it should rain and sometimes rain comes at very unexpected periods of the year. On average the region receives between 600mm and 1600mm of rain per year. Meatu district is much drier as it receives on average only about 690mm of rain per annum. There has been a long period of drought situation since 1991/92 which has affected crops output up to 1996/97. Table 2.17 shows the amount of rainfall in the districts between 1988/89 and 1990/91¹¹.

¹¹Latest Figures for 1992/93-1995/96 were not available at the time of writing this report

For the three year period, the average rainfall was 947.8mm which poured in 73 days. The highest mean rainfall was about 1150mm in Bariadi and the least mean was 812mm in Maswa (at that time together with Meatu). Short rains come between November and January and long and heavy rains between March and May. June to September are dry months where practically no rains appear. These are also the harvesting and marketing months. This is also the slack period in which people engage themselves in income generating non-agricultural activities.

Table 2.17 Mean Rainfall Pattern in the Districts of Shinyanga Region (1988/89-1990/91)

MONTH	BARIADI		MASWA		KAHAMA		SHINYANGA		TOTAL	
	mm	Days	mm	Days	mm	Days	mm	Days	mm	Days
Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sep	22.7	2.7	10.8	1.7	19.2	2.3	0.0	0.0	13.2	1.7
Oct	44.0	7.0	20.4	6.3	37.0	3.7	15.2	3.3	29.1	5.1
Nov	162.5	9.3	99.7	12.0	129.4	10.7	95.9	9.0	121.9	10.3
Dec	152.7	15.7	90.9	14.7	186.1	12.7	201.9	14.7	157.9	14.4
Jan	98.3	4.7	106.3	9.0	92.1	6.3	100.5	9.3	99.3	7.3
Feb	163.5	7.0	100.7	10.0	115.2	8.0	102.4	9.0	120.4	8.5
Mar	259.0	8.0	192.6	11.7	186.4	9.7	175.3	10.0	203.3	9.8
Apr	171.2	12.3	107.1	13.0	134.8	8.3	92.1	6.7	126.3	10.1
May	76.0	8.0	83.3	8.0	108.3	5.7	37.5	2.0	76.3	5.9
Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1149.9	74.7	811.8	86.3	1008.5	67.3	820.8	64.0	947.8	73.1

Source: Regional Agriculture and Livestock Development Officer, Shinyanga, 1994.

2.4.2 Availability and Distribution of Farm Inputs

Apart from the sporadic and inadequate rainfall, one other problem which leads to low performances in agricultural production is the limited access to the required farm inputs. Most inputs are either not available or inadequate. Sometimes they are available and distributed to the wrong place and time. This applies to all types of inputs (chemical fertilisers, chemical pesticides/ insecticides, and seeds). Their prices are too high and they keep on rising to the extent that many farmers, in the absence of subsidies, cannot afford to purchase at all or they can only afford a limited number and quantity/volume. The final results are the observed low performances in terms of production per unit area.

From Table 2.18, it can be discerned that the supply of the commonly used artificial fertilisers (TSP, SA, CAN and Urea) is on average only 53% of the demand. This demand represents the amount that was requested by the farmers themselves through their co-operative societies. It is most likely that it is the amount that farmers could afford to buy and not the effective demand that is usually recommended by the Ministry of Agriculture.

The worst affected among the fertilisers was Urea which was only about 3% and in some years (1988/89 and 1989/90) it was not available at all. For CAN it appears that the supply is encouragingly good as it is shown to be above the demand but in reality, this is only because not all the supplies of a particular year are distributed to the production sites at the required time. As such

most of it remains in the societies and are carried over to the new requisition in the next season. We observe that for this input the distribution is on average 86% of the supply. As a mean for all fertilizers, the distribution is only 43% of the demand or 82% of the supply.

As for the chemical inputs (pesticides and insecticides for cotton production only), the situation is even worse. Here availability is a real problem. It is only 42% of the demand on average. Again carry-over stock boost the supply of a particular season. Large volumes of U-Kombi, Sumicidin and Cymbush 6ED were carried over to next seasons. What is actually distributed is well below demand by almost 70%. The distribution is also about 70% of the supply. Distribution in this case refers to the volume that farmers managed to purchase from their societies and apply to cotton production.

The availability and distribution of seeds is much better. At least 86% of the demand is supplied by the union. However, the distribution is only 59% of the demand or 68% of the supply. These are the improved varieties of maize, sorghum and beans but a large proportion of farmers still use their own local varieties from previous harvests. At least they have an option here. An alternative solution to artificial fertilisers is also available whereby farmers can apply animal and/or compost manure. In fact majority of farmers use animal manure (obtained from their large stocks of livestock) on cotton.

Table 2.18. Availability and Distribution of Agricultural Inputs in Shinyanga Region
(1988/89-90/91)

	Type of Input	1988/89			1989/90			1990/91			TOTAL			% of Distr as Dem		Distri as % of % of Supp. Dem	
		Demand	Supply	Distrib	Demand	Supply	Distrib	Demand	Supply	Distrib	Demand	Supply	Distrib	%	%	%	
ARTIFICIAL FERTILISERS (Tons)	TSP	750.0	656.0	262.6	750.0	404.7	202.1	820.0	328.0	328.0	2320.0	1388.7	792.7	59.9	34.2	57.1	
	SA	1150.0	461.1	464.1	1500.0	346.0	321.2	925.0	826.2	826.0	3575.0	1633.3	1611.3	45.7	45.1	98.7	
	CAN	400.0	510.0	406.9	400.0	448.3	374.7	500.0	554.3	525.0	1300.0	1512.6	1306.0	116.4	100.5	86.3	
	UREA	500.0	0.0	0.0	500.0	0.0	0.0	500.0	38.6	38.0	1500.0	38.6	38.0	2.6	2.5	98.4	
TOTAL		2800.0	1627.1	1133.6	3150.0	1199.0	898.0	2745.0	1747.1	1717.0	8695.0	4573.2	3748.0	52.6	43.1	82.0	
CHEMICAL INPUTS (Liters)	Thiodan	150000.0	179747.0	54564.0	150000.0	14474.0	97624.0	1453680.0	143680.0	140480.0	1753680.0	337901.0	292668.0	19.3	16.7	86.6	
	U-Kombi	100000.0	94182.0	23805.0	100000.0	112004.0	41592.0	88314.0	122914.0	121514.0	288314.0	329100.0	186911.0	114.1	64.8	56.8	
	Cymbush	150000.0	113046.0	43953.0	150000.0	71055.0	62618.0	90125.0	20925.0	28925.0	390125.0	205026.0	135496.0	52.6	34.7	66.1	
	Ripcord	10000.0	6702.0	2478.0	10000.0	3256.0	791.0	20000.0	17469.0	17465.0	40000.0	27427.0	20734.0	68.6	51.8	75.6	
	Sumicidin	10000.0	34064.0	5643.0	10000.0	33607.0	20799.0	35406.0	58808.0	58808.0	55406.0	126479.0	85250.0	228.3	153.9	67.4	
	Karate	0.0	0.0	0.0	60000.0	50000.0	31916.0	64183.0	14183.0	14183.0	124183.0	64183.0	46099.0	51.7	37.1	71.8	
	Cymbush 6ED	10000.0	11696.0	2333.0	10000.0	12413.0	9420.0	0.0	0.0	0.0	20000.0	24109.0	11753.0	120.5	58.8	48.7	
	Cotoran	4000.0	4225.0	167.0	6100.0	4050.0	1680.0	10000.0	7700.0	7700.0	20100.0	15975.0	9547.0	79.5	47.5	59.8	
	Gesaprin	4000.0	1120.0	130.0	4000.0	990.0	190.0	1740.0	740.0	740.0	9740.0	2850.0	1060.0	29.3	10.9	37.2	
	Propanil	4000.0	750.0	80.0	1000.0	695.0	55.0	1280.0	280.0	280.0	6280.0	1725.0	415.0	27.5	6.6	24.1	
TOTAL		442000.0	445532.0	133153.0	501100.0	302544.0	266685.0	1764728.0	386699.0	390095.0	2707828.0	1134775.0	789933.0	41.9	29.2	69.6	
SEEDS (Tons)	Katumani	20.0	23.5	14.1	20.0	23.2	14.1	20.1	20.2	20.2	60.1	66.9	48.4	111.3	80.5	72.3	
	UCA	20.0	19.7	5.3	20.0	19.7	5.3	22.0	22.0	22.0	62.0	61.4	32.7	99.0	52.7	53.3	
	Serena	15.0				3.2	3.2	3.2	3.2	3.2	18.2	6.4	6.4	35.2	35.2	100.0	
	Beans	5.0	5.0	3.2	20.0	0.0	0.0	15.5	15.3	15.3	40.5	20.3	18.4	50.1	45.4	90.6	
TOTAL		60.0	48.2	22.6	60.0	46.1	22.6	60.8	60.7	60.7	180.8	155.0	105.9	85.7	58.6	68.3	

Source: SHIRECU, 1994.

Recent data on the demand and supply of inputs for the whole region is not available but the situation will most likely be the same as previous years or even worse due to the withdrawal of the government on the question of subsidising farmers with inputs.

At the same time the co-operatives have withdrawn from supply of the inputs on credit and the private sector is yet to fill the gap¹². An example is given from the data available for Maswa and Meatu districts for 1992/93 (Table 2.19).

Table 2.19: Availability and Distribution of Farm Inputs in Maswa and Meatu Districts (1992/93)

	Type	Demand	Carry-over From 1992	Supply	Total Supply	Carry-over as % of Total	Supply as % of Dem.
ARTIFICIAL	<i>TSP</i>	123.3	29.9	0.0	29.9	100.0	24.3
FERTILISERS	<i>SA</i>	175.0	0.0	5.6	5.6	0.0	3.2
(Tons)	<i>CAN</i>	56.4	1.4	0.0	1.4	100.0	2.5
TOTAL		354.8	31.3	5.6	36.9	84.8	10.4
	<i>Cymbush ULV</i>	15000.0	894.0	0.0	894.0	100.0	6.0
CHEMICAL	<i>Thiodan</i>	20000.0	4126.0	1000.0	80.5	80.5	25.6
INPUTS	<i>Karate ULV</i>	1000.0	179.0	0.0	100.0	100.0	17.9
(Litres)	<i>Polytrin</i>	5000.0	370.0	2400.0	13.4	13.4	55.4
	<i>Ripcord</i>	7000.0	983.0	0.0	100.0	100.0	14.0
TOTAL		48000.0	6552.0	3400.0	9952.0	65.8	20.7

Source: District Agriculture and Livestock Development Officer, Maswa, 1993.

The supply for 1992/93 depended largely on the carry-over stocks from 1991/92 rather than new deliveries. Carry-overs were 85% and 66% for fertilisers and chemical inputs respectively. On the average, the supply of fertilisers was only about 10% of the demand. The range is between 2 and 24%. For the chemicals the supply was 21% of the demand, with a range of between 6 and 55%. Although the actual distribution to the farmers is not indicated, it is expected to be even lower than these levels.

2.4.3 Amount of Farm Inputs Sold to Farmers

The amount of farm inputs by type and value sold to farmers between 1992/93 and 1996/97 at Luguru Branch is shown in Table 2.20 below. The unit price of the inputs have been increasing from one year to another, e.g. Thiodan was sold at Tshs. 2001.65 in 1992/93 but it was Tshs. 2900.0 in 1995/96 (45% increase). Likewise Karate 2ED was sold at Tshs 7100.75 in 1992/93 and it was Tshs. 8100 in 1995/96 (14% increase). The total value of all the inputs sold in 1993/94 amounted to Tshs. 21.8 million while almost the same type of inputs but relatively smaller quantities sold in 1995/96 had a value of about Tshs. 42.4 million hence an increase of 95%.

¹²The World Bank: Voices of the Poor: Poverty and Social Capital in Tanzania. 1997. p 42

Table 2.20: Sales of Farm Inputs to Farmers at Luguru Branch (1992/93 - 1996/97)

FARM INPUT	QUANTITY UNIT	PRICE/UNIT	VALUE (TSHS)
1992/93			
<i>Thiodan</i>	20 Lts	2001.65	40033.00
<i>Cymbush 6ED</i>	136 Boz	3746.30	509496.80
<i>Karate 2ED</i>	3 Boz	7100.75	21302.25
TOTAL			570832.05
1993/94			
<i>Thiodan</i>	3600 Lts	2111.65	7601940.00
<i>Polytrin</i>	2600 Lts	2023.15	5260190.00
<i>Cymbush</i>	594 Boz	3776.30	2243122.20
<i>Karate 2ED</i>	252 Lts	7170.75	1807029.00
<i>Nurelle</i>	200 Lts	2145.35	429070.00
<i>Cotoran</i>	10 Lts	2694.25	26942.50
<i>Karate ULV</i>	520 Lts	2536.95	1319214.00
<i>Fenom C</i>	800 Lts	2082.45	1665960.00
<i>Bulldog</i>	1400 Lts	2338.70	3274180.00
<i>Cymbush YIV</i>	400 Lts	1185.20	474080.00
TOTAL			24101727.70
1994/95			
<i>Thiodan</i>	1600 Lts	2111.65	3378640.00
<i>Cymbush</i>	1855 Boz	3776.20	7004851.00
<i>Karate</i>	279 Boz	7170.75	2000639.25
<i>Karate ULV</i>	540 Lts	2536.95	1369953.00
TOTAL			13754083.25
1995/96			
<i>Thiodan</i>	930 Lts	2900.00	2697000.00
<i>Polytrin</i>	1495 Lts	2750.00	4111250.00
<i>Nurelle</i>	3585 Lts	2700.00	9679500.00
<i>Fenom C</i>	260 Lts	2950.00	767000.00
<i>Karate ULV</i>	4300 Lts	2950.00	12685000.00
<i>Karate ULV</i>	280 Lts	3500.00	980000.00
<i>Cymbush ULV</i>	2 Lts	2100.00	4200.00
<i>Decis</i>	570 Lts	2273.80	1296066.00
<i>Bulldog</i>	2077 Lts	2950.00	6127150.00
<i>Karate 2ED</i>	502 Boz	8100.00	4066200.00
TOTAL			42413366.00
1996/97			
<i>Nurelle</i>	1073 Lts	2700.00	2897100.00
<i>Polytrin</i>	397 Lts	2750.00	1091750.00
<i>Fenom C</i>	579 Lts	2950.00	1708050.00
<i>Bulldog</i>	928 Lts	2950.00	2737600.00
TOTAL			8434500.00

Source: SHIRECU, 1997.

The distribution of inputs by the private sector in 1994/95 season is shown in Table 2.21. If one compares the amount of inputs sold by the private sector with those sold by the co-operative union in the same year one finds that the private sector supplies very little quantities. For example the

Therefore, they can sell their cotton to:

- primary societies for the Union
- private trader at farmgate who assembles cotton from several farmers and then transport it to a private ginnery
- directly to a private ginnery
- TCLSB.

Given this wide choice, the producers have benefited from the market competition. They get paid cash and on the spot. There is evidence to show that in the past few years of liberalized marketing system, cotton production started to pick up (Undolle P.M., 1997 op. cit). That means the market environment has improved and farmers have increased production. The movement of cotton from the farm to the final destination is now faster than before liberalization.

In the long run, however, the impact of liberalization is expected to be positive only if some of the problems that have emerged can be dealt with as soon as possible. For example, while now there is prompt payments and that there is no immense problem in ginning, the distribution of seeds to cotton producers for planting is inadequate and unclear. The private sector has not managed to fill this gap. Seeds of different varieties, diseased and non-diseased have been mixed up. So unless there is a centralized seed distribution system which will ensure not only quality, quantity and suitability but also timely distribution to the desired locations, the future of cotton production is in jeopardy. It is the very poor who will be mostly hurt because they lack of alternative income generating opportunities.

The positive impact will also be sustained in future if solutions to the problems of credit availability, distribution of farm inputs at affordable prices and increase in farm gate price (producer prices) can be found.

3.2.3 Views of the Co-operative Officials

According to the co-operative officials, the introduction of liberalised cotton market has both advantages and disadvantages. The only advantage mentioned is that there is high level of competition in the market and farmers now get paid cash and prompt. The disadvantages are manifold:

- a) After liberalisation of market, the purchase of cotton from various places has definitely helped farmers in selling their produce but it has also led to mixing of the crop and hence the seeds from different areas. There is, therefore, lack of specific variety for specific location by soil type and weather conditions. This may lead to high levels of infestation for lack of resistant varieties suitable for certain locations. This issue was raised by almost every institution that is involved in cotton marketing.
- b) Before liberalisation, there was a grading system of cotton into AR and BR according to quality. Nowadays in a liberalised marketing environment, farmers no longer separate the two types. All cotton is purchased at the same price. This affects negatively the quality of the cotton in the world market and hence fetching lower prices. It also tarnishes the name of Tanzanian cotton in the world market.
- c) Liberalised market has created a loophole for fraud in selling cotton. For example, cotton can be stolen from one place and be sold to another place and different buyer without notice. If this happens then it is definite that some farmers may lose a years income which could have

bad consequences on food security, especially for the poor. The village may also not be able to get its cess from the cotton sales.

- d) By allowing private buyers and ginneries to engaged themselves in cotton marketing, the branches of the Co-operative Union have not managed to meet their targeted purchases. For example, Luguru Branch had planned to purchase some 12.6 mill kgs of raw cotton from the farmers in 1996/97 season. Instead it could only buy about 5 mill. Kgs., which is slightly less than half. Part of the reason is the bureaucratic procedures at the regional level. It takes too long to make a decision on how to cope or handle a specific situation. An example was given that on 26th June, 1997, the price was announced by the Union to be Tshs 165/kg. At this time the private buyers were already offering Tshs 200 per kg. It took three weeks to decide to raise the Union`s price to Tshs 200 to match with the open market. During this period no cotton was sold to Luguru branch. This had happened to the other branches as well.
- e) In some other areas the problems were more of political nature than the market liberation as such. For example, some locations in Bariadi District were not popular to the CCM government. The co-operative officials were complaining of open campaigns not to sell cotton to the Union. But we think the real issue here was the price difference. If the Union had been offering the same or even higher prices and pay cash, farmers would still sell their produce to it.
- f) The co-operative officials were also complaining of cheating by the private buyers in terms of the weighing scales. It is a government regulation that these scales are checked regularly by authorised dealers, but the private buyers use their own scales which can be manipulated to measure 5 to 10 kgs of cotton less for each sale. By doing that they are able to raise the price even above Tshs 200 per kg, something the Union cannot do. Our own observation in the field tends to confirm this allegation because we had seen a buyer purchasing cotton under a big tree where the scale was hung, without any supervision. This was in Mbiti (Bariadi) village.
- g) The officials also warned on possible loss of revenue to the District Councils, Village governments and to the school fund if the private buyer continue to purchase cotton unmonitored. Many of them evade paying the levies and are engaged in smuggling. There was no strong evidence to prove this but this complaint was also raised by even the registered private ginneries like Cargil and Lalago.
- h) The major snag with the Union (SHIRECU) in this competitive environment is that it has often no cash to pay on site. If the Union had enough funds, it would get first priority from the farmers because it also distributes seeds and inputs. Private buyers with no ginneries within the region should not be allowed to purchase cotton from farmers because these are the ones who normally operate without licences and the destination of purchased cotton is often not known to local or regional authority. Sometimes cotton even crosses the boarder. The trade in this case is basically barter trade and does not go through any known financial transactions.

This is again is against the main objective of a free market but we do believe that the question of control and monitoring through central and local government by-laws and regulations should not be underplayed.

In view of the above problems the co-operative officials have given a few suggestions for improvement. First they said that the government is required to find ways to monitor purchases and

all activities involved in cotton purchase. If this is not taken seriously then, in future, cotton production will decline because of infestations. Two ways were suggested as solutions:-

- i) To strengthen the Ukiriguru research station on seed varieties and recommend locations for application. As of now Ukiriguru is rendered useless and can as well close down for lack of government support. Research on cotton should be on a continuous basis. We find this to be a sound proposition, and in addition *all* cotton buyers should contribute to the research fund for this purpose. This fund should also be used for stabilising prices and for seed multiplication.
- ii) For the interest of obtaining quality cotton seeds and to maintain the quality of cotton, the co-operative officials said that it is advisable to demarcate zones of cotton purchases. That means private ginneries in Shinyanga should purchase and gin cotton from Shinyanga region only. Other regions have to do the same. Nevertheless, competition should be encouraged to continue within the region in order to maintain the quality of cotton and high prices to farmers.

We think demarcation is not really a feasible solution as it would water down the spirit of liberalisation which enhances competition for better quality. Instead we tend to suggest that the seeds for future planting should be obtained from authorised institutions where they have been adequately treated (dusting) and control on quality and suitability should be ensured by such institutions. Farmers should adequately be informed on what type of seeds are suitable for their location and where to obtain them. Instead of issuing free seeds to farmers, these could be sold at cost to farmers in well identifiable packages. We believe if they are sold at affordable prices, farmers including the poor would be able to purchase them. They would also tend to be more careful on the handling and application of the seeds.

3.2.4 Performance of Union's Societies/Branches in Cotton Collection:

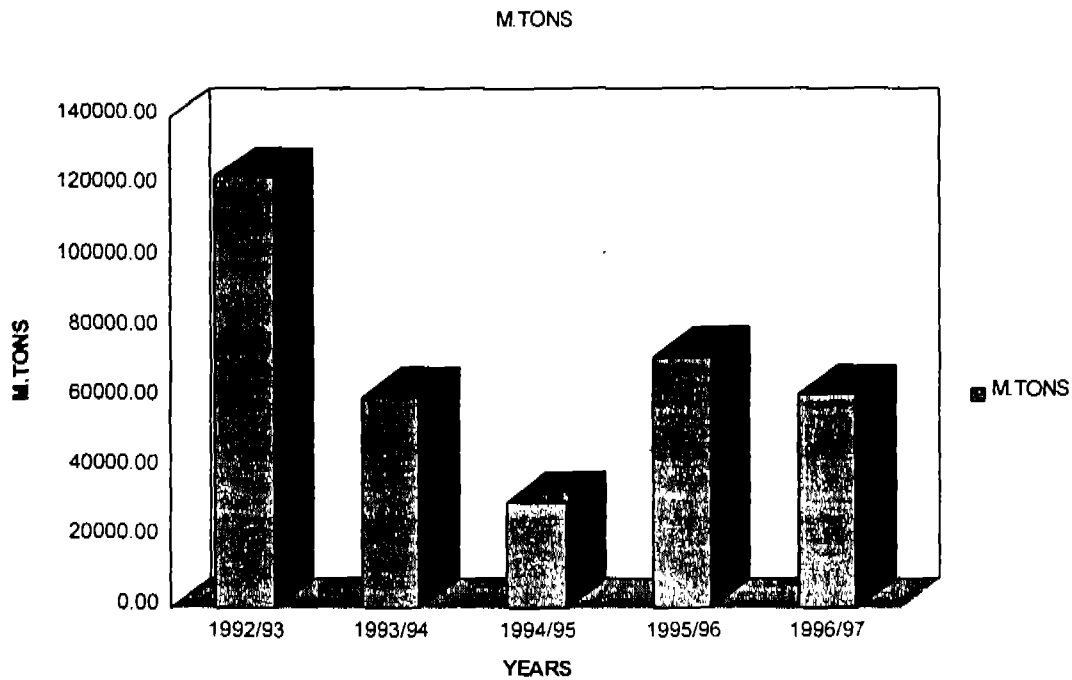
In addition to the above, there is a host of other problems which have affected the performance of the Co-operative Union and its societies in cotton handling and marketing. Such other problems include managerial skills, thefts and embezzlement of funds all of which contributed to the poor performance of the Union over time. Table 3.1 and Fig 3.1 give a trend of the performance in cotton collection in the period between 1992/93 and 1996/97.

Table 3.1 Collection Trends of Cotton from Branches in Shinyanga Region (1992/93-96/97)

BRANCH NAME	1992/93	1993/94	1994/95	1995/96	1996/97	TOTAL	AVG	% of Branch	% change 92/93 -96/97
MHUNZE	11900.2	6703.4	3238.9	8545.2	9594.3	39982.0	7996.4	11.6	-19.4
MALAMPAKA	10383.2	6147.7	4353.7	8972.8	8308.6	38165.9	7633.2	11.0	-20.0
LUGURU	34672.5	15568.6	9640.7	22856.4	14761.0	97499.2	19499.8	28.2	-57.4
SOLA	11627.4	7694.2	2039.0	8226.0	6436.7	36023.3	7204.7	10.4	-44.6
MEATU	15120.8	9543.9	3438.2	10479.9	7746.7	46329.5	9265.9	13.4	-48.8
KAHAMA	25219.0	9967.0	3955.2	4820.4	5050.4	49012.0	9802.4	14.2	-80.0
UZOGORE	14005.9	4349.8	3357.6	7777.0	8928.6	38418.9	7683.8	11.1	-36.3
TOTAL	122929.0	59974.6	30023.4	71677.7	60826.3	345430.8	69086.2	100.0	-50.5
AVERAGE	17561.3	8567.8	4289.1	10239.7	8689.5	49347.3	9869.5		-43.8

Source: SHIRECU, 1997.

Fig. 3.1: Cotton Collection Trend in Shinyanga Region (1992/93-96/97) Metric Tonnes.



Sola branch has been purchasing cotton from about 32 societies between 1992/93 and 1996/97. On average, Sola has been collecting about 7,205 metric tonnes of seed cotton of which about 7,181 metric tonnes (99.7%) have been delivered to the ginnery. Between 1992/93 and 1996/97 collection from the societies by Sola Branch had dropped by about 45%, i.e. from 11,627.4 tonnes to 6,436.7 tonnes.

Mhunze branch has also collected less cotton in 1996/97 compared to 1992/93 i.e. less by 19%. Malampaka and Luguru branches had collected less cotton by 20% and 57% respectively. In Meatu District about 49% less cotton was collected by co-operative Union (SHIRECU) between those two periods. Operations in Kahama district were more affected since about 80% less cotton has been collected over the five year period i.e. between 1992/93 and 1996/97. This may be because many farmers have switched to tobacco and paddy production and many youths are currently engaged in mining activities rather than cotton production.

In general, there has been an overall drop of about 50% in the region in cotton production over the same period. As shown in Figure 3.1, the peak collection in 1992/93 has never been reached. There was a sharp decline between 1992/93 and 1994/95 of about 76% i.e. from 122,929 metric tonnes to 30,023. This is basically the period when farmers were not paid in cash and there was a long delay in the payment on credit. In 1995/96 collection rose to 71,678 tonnes and dropped again to 60,826 tonnes. This is the time when most of the societies began paying cash to farmers following the example of procedures by the private buyers and ginneries.

It shows that the market share of the Union is shrinking as more and more private competitors enter the market. As we pointed out before, it will have a positive impact on the poor and the vulnerable

group if all the operators in the market observe the regulations and the set by-laws. These on the other hand, should not form the basis for discouraging the private initiatives.

In the 1996/97 season there were about 12 different operators in the region. Two of them were Unions. Table 3.2 shows that about 108,306 tons of cotton were collected from Shinyanga during this season. Out of these SHIRECU collected some 62,388 tons¹⁸, which represents about 57.8% of all purchases. Together with KACU they command slightly over 60% of the market share. From the private sector, CARGILL is the major operator. Like SHIRECU it offers its services to all districts. So CARGILL handles about a quarter of all purchases (25.4%).

Table 3.2: Purchase of Cotton by Various Agents in Shinyanga Region (1996/97)

Agent	District	Tons	% Share
SHIRECU	All Districts	62,388	57.60
KACU	Kahama	3,536	3.26
CARGILL	All Districts	27,550	25.44
LALAGO	Bariadi/Maswa	1,100	1.02
S&C.G.CO	Bariadi/Kahama	271	0.25
CMC	Bariadi/Kahama	345	0.32
VIRIAN	Bariadi	1,842	1.70
BIBITI	Bariadi/Maswa	8,014	7.40
MEATU	Meatu/Bariadi	1,180	1.09
TANGIN	Shinyanga Rural	1,640	1.51
USOMELA	Bariadi	200	0.18
E.NGWENANGWA	Bariadi	240	0.22
TOTAL		108,306	100.00

Source: MDB©1997) Marketing Development Bureau, Ministry of Agriculture and Livestock Development, Dar es Salaam.

3.2.5 Impact of Distance on Cotton Collection from Primary Societies

The operations of co-operative union is such that there is a tendency of offering its services to the nearest societies than the distant ones. This is largely due to the heavy cost of transportation that is involved. These societies operate more within a radius of about 50 kms from the branch headquarter. Table 3.3 shows that, except for Kahama branch, the highest collection in terms of tonnage and the number of societies serviced are in the range of 0.1 to 50 kms. So very few societies and low tonnages of cotton are collected in the distance range of 100 kms and above.

Some statistical tests were run to show the impact of distance from the societies to the branches on the amount of cotton collected over several years where data was available. For example Luguru branch shows a declining levels of collection as distance increases. The sample data is for all societies that are located more than 50 kms away from the Luguru ginnery. The data from 1991/92 to 1993/94 all show negative coefficients of association (Table 3.3). The T-statistics are all significant at 1% level except for the year 1993/94 which was significant at 5% level. Table 3.4 and figure 3.2 show these declining collections with distance for the Luguru branch.

¹⁸ The problem of data inconsistency can be witnessed here. Table 3.1 gives a figure of 60,826 tons while here we have 62,388. However, since the difference is not large we will still use both figures.

Table 3.3: Average Collection of Cotton from Primary Societies in Relation to Distance in Shinyanga

BRANCH	KM RANGE	0 - 50	50.1 - 70	70.1 - 100	ABOVE 100	TOTAL	%
KAHAMA (1992-97)	N	35	27	57	17	136	24.9
	VALID %	25.7	19.9	41.9	12.5	100	
	MEAN	59.5	100.5	74.0	627.5	144.7	12.3
	STDEV	47.4	95.4	60.2	2364.5	836.8	
MHUNZE (1993-97)	N	32	11	4	NA	47	8.6
	VALID %	68.1	23.4	8.5	NA	100	
	MEAN	153.3	199.3	225.8	NA	170.2	14.5
	STDEV	61.0	58.7	60.0	NA	64.5	
UZOGORE (1992 -94)	N	42	33	27	15	117	21.4
	VALID %	35.9	28.2	23.1	12.8	100	
	MEAN	78.3	150.5	73.4	59.1	95.2	8.1
	STDEV	63.0	156.8	58.1	45.3	102.5	
MEATU (1994 - 97)	N	NA	7	13	33	54	9.9
	VALID %	NA	13.2	24.5	62.3	100	
	MEAN	NA	194.5	168.8	129.7	148.0	12.6
	STDEV	NA	127.2	154.2	120.1	129.7	
SOLA (1993 -97)	N	25	6	2	NA	34	6.2
	VALID %	75.7	18.2	6.1	NA	100	
	MEAN	220.0	184.7	298.4	NA	218.3	18.6
	STDEV	109.2	69.9	115.1	NA	103.6	
MALAMPAKA (1993 -97)	N	33	4	2	5	44	8.1
	VALID %	75	9.1	4.5	11.4	100	
	MEAN	162.5	196.3	270.2	183.6	172.8	14.7
	STDEV	89.2	117.9	32.7	136.9	96.5	
LUGURU (1992 - 94)	N	43	36	20	14	114	20.9
	VALID %	38	31.9	17.7	12.4	100	
	MEAN	291.6	220.6	171.9	112.7	225.6	19.2
	STDEV	159.3	139.4	136.4	121.4	155.7	
TOTAL N					546	100.0	
TOTAL M					1174.9	100.0	

NA = Not Available

Table 3.4: Impact of Distance on Cotton Collection from Primary Societies
Luguru Branch (N=70).

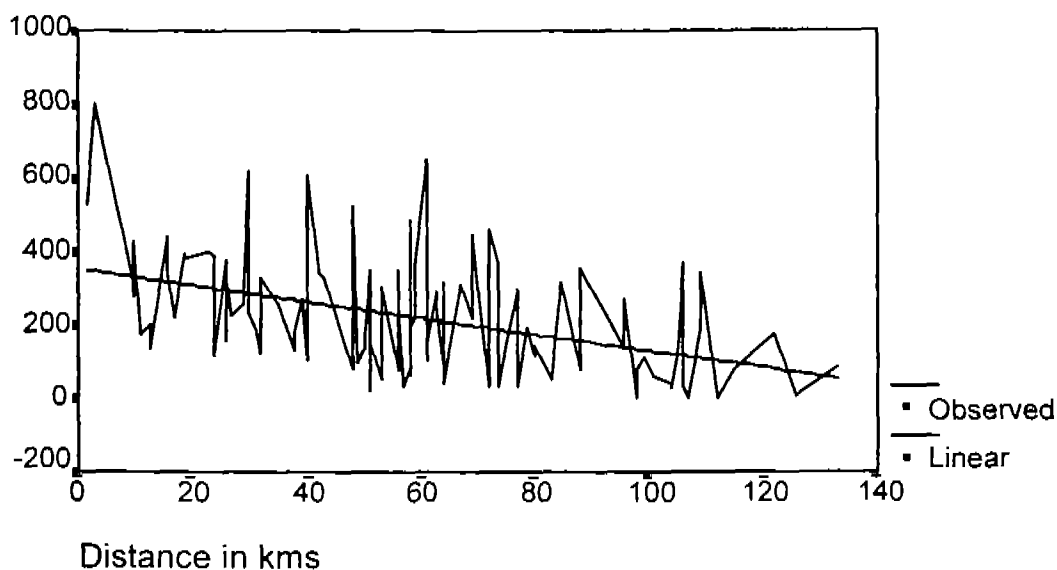
Year	Constant	Coefficient. β	T-Statistic	Sign. F	Multiple R	R ²	R ² Adj.	SE
1991/92	383.059	-2.215	-2.061***	0.0431	0.2425	0.0588	0.0449	194.904
1992/93	434.724	-2.420	-2.488***	0.0153	0.2888	0.0834	0.0699	176.429
1993/94	156.679	-0.857	-1.942**	0.0562	0.2293	0.0526	0.0386	79.987
Totcol ¹⁰	974.462	-5.492	-2.461***	0.0164	0.2860	0.0818	0.0683	404.649

*** Significant at 1% Level

** Significant at 5% Level

¹⁰ Total Collections from 1992/93 to 1996/97 in Metric Tonnes

Fig. 3.2: Average collection (92-94) Luguru Branch



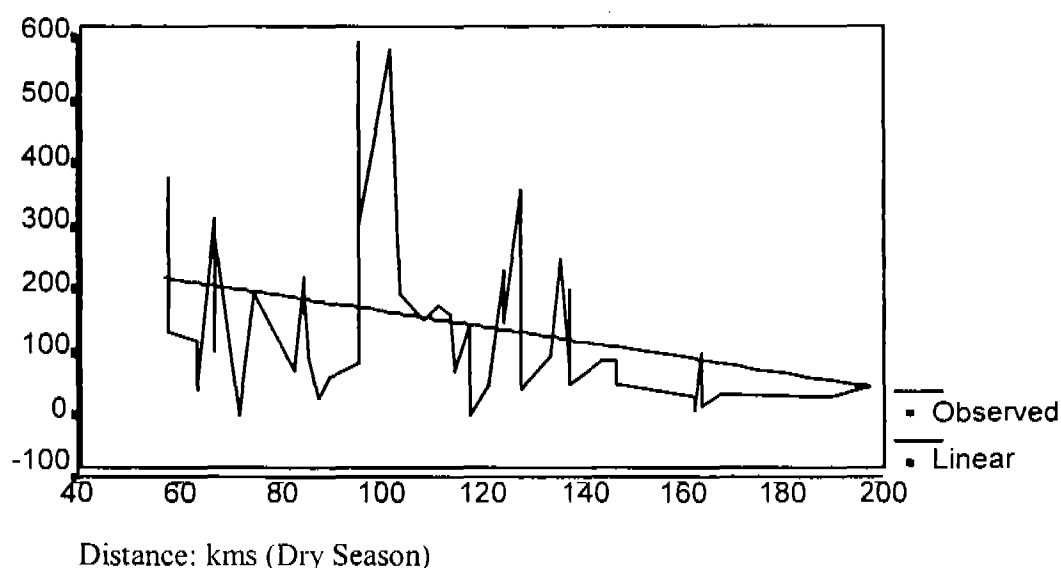
The same test was applied for Meatu branch whereby the performance of collection from societies located above 50 kms was observed. All coefficients between 1994/95 and 1996/97, total collection, and average collection over the period show negative coefficients, i.e. collections were declining as distances were increased. All T-statistics are significant at 1% level over the entire period (See Table 3.5 and figure 3.3).

Table 3.5: Impact of Distance on Cotton Collection from Primary Societies Meatu Branch (N=54).

Year	Constant	Coefficient t β	T- Statistic	Significant F	Multiple R	R ²	R ² Adj.	SE
1994/95	118.09	-0.46	-2.064***	0.0441	0.2776	0.0771	0.0589	55.7355
1995/96	436.23	-2.09	-2.758***	0.0080	0.3603	0.1298	0.1128	186.8928
1996/97	337.01	-1.64	-2.836***	0.0065	0.3690	0.1362	0.1193	143.1588
Totcoll	1147.81	-4.86	-2.422***	0.0191	0.3211	0.1031	0.0855	496.2348
Avecoll	286.95	-1.22	-2.422***	0.0191	0.3211	0.1031	0.0855	124.0587

*** Significant at 1% level

Fig. 3.3: Average Collection Collection trend (94-97) Meatu



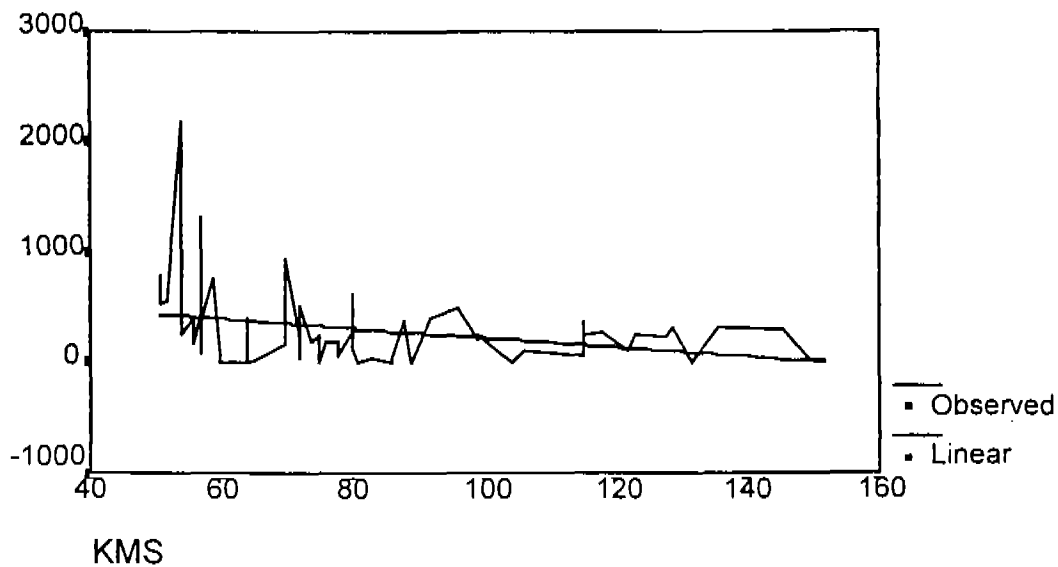
Uzogore branch applies the same principle of not collecting cotton from the distant societies. The results also show a negative association between distance and cotton output. This applies for all years under review i.e. 1991/92 to 1993/94, total collection, and average collection. The T-statistics are also significant between 0.1% and 10% level (Table 3.6 and Figure 3.4).

Table 3.6: Impact of Distance on Cotton Collection from Primary Societies
Uzogore Branch (N=75) (kms above 50)

Year	Constant	Coefficient β	T-Statistic	Significance F	Multiple R	R ²	R ²	SE
199/921	369.71	-2.83	-3.395***	0.0011	0.3692	0.1363	0.1245	191.155
1992/93	183.79	-0.69	-1.332*	0.1871	0.1540	0.0237	0.0103	119.773
1993/94	105.79	-0.79	-3.150***	0.0024	0.3459	0.1197	0.1076	57.289
Totcoll	659.31	-4.31	-2.934**	0.0045	0.3247	0.1055	0.0932	337.075
Avecoll	219.77	-1.44	-2.934**	0.0045	0.3247	0.1055	0.0932	112358

*** Significance at 0.1% level
** Significance at 0.5% level
* Significance at 10% level

FIG. 4.4: Total Collection (92-94)



It is only Mhunze and Kahama branches which did not show these phenomena. As for Kahama, this is probably because of the relatively good road infrastructure. Most of the collections from Mhunze were concentrated in the 50 kms radius.

Those marginalized villages that do not get services of the co-operative Union branches could only mean that the market for their cotton is limited. For marketing cost reasons, even the private buyers may not be buying much cotton from them. If family income is one of the possible measure for poverty alleviation, it means that most of the farmers in these will continue to be under severe poverty.

In order to reach all farmers almost equally irrespective of distance, the government has to put more effort in opening and rehabilitation of more rural feeder roads and bridges. These have to be passable throughout the year.

3.3 Private Sector Investment

Discussions were also held with the private buyers and private companies which have invested in the cotton sector in the region. The idea was to find out their contribution to the sector and their impact on the welfare of the farmers and especially the poor and women. There were some fruitful discussions and they had also pointed out the advantages and disadvantages of cotton market liberalisation. The most important investors were Cargil Cotton Ginnery, Lalago Cotton Ginnery and Nipha Pamba Engineering Co. Ltd., and some private buyers outside the region like Virian from Bunda District (Mara region) and Mudimu Oil Mill also from Mara region. Here will give a brief account of those who provided some useful information.

a) Cargil Cotton Ginnery

The Cargil company has two ginneries in the region. One is at Lalago in Maswa district and the other one is at Masumbwe in Kahama district. This company operates in the region for the past three years. Apart from cotton purchases it has set up some 40 acres of demonstration plots. There has been some good response from the farmers. Cargil admits

that there is a problem of co-ordination among the cotton buyers with respect to information about the availability of good quality cotton seeds for distribution to farmers.

The future of cotton in the region is good but more attention is needed on the quality. More research is required. The UK84 variety which is still in use up to now is 12 years old and can only give an estimated yield of 300-400 kgs/acre while the potential is for 2000-3000 kgs/acre. Cargil had asked TCMB/TCLSB for the UK91 variety which is supposed to be better but up to the time of our discussions there was no answer. The company at Lalago gave TCMB Tshs 0.5 per each kg bought for research purposes in 1995/96 season. In 1996/97 Tshs 0.6 per kg was paid. There was a general complaint raised by the management that so far it is only Cargil which pays. The other private companies have not honoured this commitment which could be a substantial contribution to research on better varieties. The company was looking at the possibility of importing improved seeds from Malawi and Zimbabwe. To be able to do this, an import licence is required. The company's head office was trying to make a follow-up on this issue. If this is possible, there will be good chances of improving production by the farmers.

Cargil does distribute inputs to farmers. In the 1996/97 season some 1,020 litres of Karate were distributed. The other inputs distributed in the same season were Nordox (612 bags of 50kgs each and Bulldog (3,490 litres). However, it was not mentioned whether these volumes were sufficient for the company's members or not but given the prevailing costs of inputs it is less likely that the poorer farmers could afford to buy those inputs.

There was an idea that was floated by Cargil on the formation of a Cotton Ginnery Association. The idea is to have a platform for regulation of inputs and up-keep of the code of conduct in cotton business so that ethical and moral values are not violated by some unscrupulous dealers.

The Masumbwe ginnery of Cargil in Kahama district had purchased a total of 3,163,126 kgs of raw cotton from 27 societies in 1996/97 season. Almost the same amount (3,397,900 kgs) were also bought from 27 societies in Bukombe district. Some inputs were also distributed to farmers in these areas although the quantities were not known as they were sold to individuals rather than to societies.

b) Lalago Cotton Ginnery

This company started its operations in 1995. The company faces a problem of storage capacity. Arrangements have been made with the village governments to provide godowns at maximum fee of Tshs 2-3 per kgs of cotton purchased. This has enabled the company to purchase more cotton from the farmers. The company also pays two types of cess: the produce cess and cess for the Education Board as required by regulation.

The problem of good quality seeds was also a critical issue as raised by the other public and private cotton buyers and farmers alike. They contend that liberalisation has brought with it the problem of cotton and seeds quality. On chemical inputs the company has tried to supply them to farmers but their high prices are crowding out a lot of poor farmers from purchasing.

This company produces about 30 bales of cotton lint per day. The local markets are mainly the Morogoro Polytex and Sunflag of Arusha. Some cotton lint is also sold to the world market. The Lalago Oil mill in Maswa can produce about 4,000 litres of cotton oil per week and about 10,000 kgs of seed cake per week.

c) Mwanhunzi Ginnery (Meatu)

This company started operations in 1995/96 season. The company usually purchases cotton from Meatu and Maswa Districts. There was a lack of enough cotton for its ginnery in 1996/97 season. They were ginning about half of its installed capacity. The main reason for this discrepancy was the competitive environment in the cotton market. There are some private buyers from Mwanza and Mara who come to the district to purchase cotton.

However, the company management still sees a bright future in cotton production because the competition will benefit the farmers to increase production. The company also mentioned that for the above to happen, there should be an authorized institution to monitor the distribution of good quality seeds and chemical inputs. Private buyers should not avoid paying taxes and levies to the village government and the district council.

The company distributes chemicals. For example, in 1996/97 about 710 litres of Fenom were distributed to 15 societies within the district. It also sold this chemical input to individuals. In this season 24 farmers had bought inputs from this company.

All the above mentioned private companies are showing an optimistic future of the cotton sector and they have contributed to the improvement of the farmers welfare by offering cash promptly to farmers. In so doing most farmers especially the poor and the vulnerable can meet their immediate needs particularly food supplies. The presence of such companies have increased the morale of the farmers to increase cotton production.

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PART IV

4.0 COTTON PRODUCTION AT HOUSEHOLD LEVEL

4.1 Household Characteristics

4.1.1 Demographic Features

This section gives a general overview of the main demographic characteristics in the region. Since this was not possible to get during the field survey through the PRA methods, we draw the general features from an earlier survey conducted in the Region in 1993/94²⁰. We think it is important to know the demographic characteristics of the rural households when discussing cotton production at the household level. However, the main features include the sample frame of the earlier survey, the distribution of population by gender and the age structure. This survey covered three districts of Maswa, Kahama and Shinyanga Rural. A total of 135 households were interviewed. A sample frame of heads of households is shown in Table 4.1.

Table 4.1: Sample Frame of Interviewed Heads of Households

District	Male		Female		Total	
	No.	%	No.	%	No.	%
Maswa	41	30.4	4	3.0	45	33.3
Kahama	42	31.1	3	2.2	45	33.3
Shinyanga (R)	45	33.3	0	0	45	33.3
Total	128	94.8	7	5.2	135	99.9

Source: Maro, W.E. A Vertical Analysis of Cotton production in Shinyanga Region (1996): Draft.

The Table shows that about 95% of the interviewed heads of households were men. This is not much different from other studies. In their wider survey in the region, the Bureau of Statistics had a sample of 290,936 agricultural households out of which 262,039 were male headed (90%) and the rest 28,897) female headed (10%)²¹.

The mean household size was found to be 6.5 in the three districts with a minimum of 1.0 and maximum of 15 people per household. The gender differentiation within the households is as shown in Table 4.2.

²⁰ Maro, W.E.: "A Vertical Analysis of Cotton Production in Shinyanga Region 1993/94, Draft.

²¹ URT: National Sample Census of Agriculture 1993/94: Tanzania Mainland: Report Vol. II (Household Characteristics, Livestock Count, Implements and Storage): Bureau of Statistics, Planning Commission, Dar es Salaam, July 1994, p. 19; Table 1-02A.

Table 4.2: Households Population by Gender in Shinyanga

District	Village	Male		Female		Total	
		No	%	No.	%	No.	%
Maswa	Budekwa	58	50.4	57	49.6	115	100.0
	Wigeleko	34	44.7	42	55.3	76	100.0
	Lali	60	54.1	51	45.9	111	100.0
	Sub-total	152	50.3	150	49.7	302	100.0
Kahama	Bwelwa	53	52.0	49	48.0	102	100.0
	Nyamilangano	36	50.0	50	50.0	72	100.0
	Nyandekwa	50	50.0	50	50.0	100	100.0
	Sub-Total	139	50.7	135	49.3	274	100.0
Shinyanga(R)	Ipeja	58	55.8	46	44.2	104	100.0
	Bunambiya	39	43.3	51	56.7	90	100.0
	Mishepo	61	56.5	47	43.5	108	100.0
	Sub-Total	158	52.3	144	47.7	302	100.0
TOTAL		449	51.1	429	48.9	878	100.0

Source: Maro, W.E. op. cit., (1996).

The survey indicated that the gender composition is slightly in favour of men (51.1%) against women (48.9%) in total. There are minor variations in the three districts which all show that men are slightly more than women: 50.3% in Maswa, 50.7% in Kahama and 52.3% in Shinyanga Rural. Results from other Regions which are also famous for cotton production indicate that women are slightly more than men. For example they were 50.3% in Mwanza Region and 52.4% in Mara Region (Maro, W.E., op. cit.).

The age structure of the family members in the visited villages is given in Table 4.3. The distribution of the age group in the region indicates that children below the age of 14 years²² form about 45.1% in the region. There are slight variations in the districts. In Maswa they formed 43.5% while in Kahama and Shinyanga Rural their contributions were 45.9% and 46.0% respectively.

The economically active population form about 50%. These are in the age group of between 15 and 55 years. Those of 56 years and above form about 5%. This indicates that these together with the children form a dependency ratio of slight over 50%. This has a serious implication on food security in the region since it is only about half of the population that can cater for the entire population in food supply and other requirements.

²² For our study we treat all members of the households at the age of 14 and below to be children either under age or attending school, hence still highly dependent on their parents/guardians.

Table 4.3: Age Structure of Household Members

District	Village	Age Group												Total	
		0 - 14 Yrs		15 - 25 Yrs		20 - 35 Yrs		36 - 45 Yrs		45 - 55 Yrs		56 Yrs & above		No.	%
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Maswa	Budekwa	46	41.8	23	20.9	19	17.3	13	11.8	5	4.5	4	3.6	110	100.0
	Wigeleko	26	44.1	14	23.7	7	11.9	5	8.5	2	3.4	5	8.5	59	100.0
	Lali	48	44.9	27	25.2	10	9.3	12	11.2	5	4.7	5	4.7	107	100.0
	Sub-total	120	43.5	64	23.2	36	13.0	30	10.9	12	4.3	14	5.1	276	100.0
Kahama	Bwelwa	47	48.0	26	26.5	8	8.2	10	10.2	5	5.1	2	2.0	98	100.0
	Nyamilangano	26	36.6	20	28.2	12	16.9	4	5.6	4	5.6	5	7.0	71	100.0
	Nyandekwa	49	50.5	19.0	19.6	7	7.2	4	4.1	8	8.2	10	10.3	97	100.0
	Sub-Total	122	45.9	65	24.4	27	10.2	18	6.8	17	6.4	17	6.4	266	100.0
Shinyanga(R)	Ipeja	43	45.3	26	27.4	13	13.7	6	6.3	4	4.2	3	3.2	95	100.0
	Bunambiya	38	42.7	19	21.3	17	19.1	7	7.9	4	4.5	4	4.5	89	100.0
	Mishepo	47	50.0	23	24.5	12	12.8	5	5.3	4	4.3	3	3.2	94	100.0
	Sub-Total	127	46.0	68	24.5	42	15.1	18	6.5	12	4.3	10	3.6	278	100.0
TOTAL		370	45.1	197	24.0	105	12.8	66	8.0	41	5.0	41	5.0	820	100.0

Note: Out of a total 878 household members, 820 (93.4%) had their ages indicated by the heads of households.

Source: Maro, W.E. op. cit., (1996).

4.1.2 Households' Main Activities

The main occupation of most of the economically active population is farming as indicated by the 87.8% of the responses from the three districts (Table 4.4)

Table 4.4: Main Occupation of Economically Active Family Members:

Main Occupation	No	%
Farming ²³	438	87.8
Non Farming	6	1.2
Unemployed	3	0.6
Looking after cattle	3	0.6
Other		
Total	499	100.0

Source: Maro, W.E. A Vertical Analysis of Cotton production in Shinyanga Region (1996): Draft.

Looking at the activities of all household members the following picture emerges (Table 4.5). The table serves two purposes. First to show the composition of children who are either under age or at school. These form about 43% of entire population. Some of the children are engaged in child labour (about 6%). Including these children, the main occupation is on farming (includes livestock keeping) which account for about 50% of all activities. If one nets out the composition of children, then the contribution of farming to total household activities sums up to about 87.7% as we had seen earlier (Table 4.4). Looking after cattle here is defined as an employment in this activity rather than owning cattle.

²³ Includes livestock keeping.

Table 4.5: Main Occupation of All Household Members

District	Village	Under-School Age		At School		Farming ¹		Non-Farming		Unemployed		Looks after Cattle		Child Labour		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Maswa	Budekwa	25	21.7	24	20.9	57	49.6	1	0.9	2	1.7	1	0.9	5	4.3	115	100.0
	Wigeleko	19	25.0	12	15.8	40	52.6	-	-	-	-	-	-	5	6.6	76	100.0
	Lali	25	22.5	29	26.1	52	46.8	1	0.9	-	-	1	0.9	3	2.7	111	100.0
	Sub-total	69	22.8	65	21.5	149	49.3	2	0.7	2	0.7	2	0.7	13	4.3	302	100.0
Kahama	Bwelwa	29	28.4	15	14.7	51	50.0	-	-	-	-	-	-	7	6.9	102	100.0
	Nyamilangano	15	20.8	13	18.1	43	59.7	-	-	-	-	-	-	1	1.4	72	100.0
	Nyandekwa	24	24.0	21	21.0	41	41.0	3	3.0	-	-	-	-	11	11.0	100.0	100.0
	Sub-Total	68	24.8	49	17.9	135	49.3	3	1.1	0	0	0	0	19	6.9	274	100.0
Shinyanga(R)	Ipeja	27	26.0	21	20.2	51	49.0	-	-	1	1.0	-	-	4	3.8	104	100.0
	Bunambiyu	22	24.4	11	12.2	48	53.3	1	1.1	-	-	1	1.1	7	7.8	90	100.0
	Mishepo	20	18.5	27	25.0	55	50.9	-	-	-	-	-	-	6	5.6	108	100.0
	Sub-Total	69	22.8	59	19.6	154	51.0	1	0.3	1	0.3	1	0.3	17	5.7	302	100.0
TOTAL		206	23.5	173	19.7	438	49.9	6	0.7	3	0.3	3	0.3	49	5.6	878	100.0

Source: Maro, W.E. op. cit., (1996).

¹Includes livestock keeping.

Table 4.6 also show that the majority of the interviewed households earn their income from agriculture. About 95.5% indicated that their main source of income is from agriculture. The range is between 86 and 97% among the visited villages.

Table 4.6: Off-Farm Income by Village

STATUS	Income Outside Farm?		Female		Total	
	Yes		No			
	Count	%	Count	%	Count	%
Bwelwa	3	2.9%	99	97.1%	102	100.0%
Bunambiyu	8	8.9%	82	91.1%	90	100.0%
Budekwa	4	3.5%	111	96.5%	115	100.0%
Nyamilangano	10	13.9%	62	86.1%	72	100.0%
Mishepo	3	2.8%	105	97.2%	108	100.0%
Lali	7	6.3%	104	93.7%	111	100.0%
Nyandekwa	6	6.0%	94	94.0%	100	100.0%
Ipeja	2	1.9%	102	98.1%	104	100.0%
Wigeleko	5	6.6%	71	93.4%	76	100.0%
TOTAL	48	5.5%	830	94.5%	878	100.0%

Source: Maro, W.E. op. cit., (1996).

However, there may be some villages where agriculture may not take the leading position. For example from the PPA study at Songambe village in Shinyanga Rural district, the matrix scoring on the major sources of income and livelihood it is indicated that business contributed about 63% to the income while livestock and agriculture contributed 4.5% and 32.5% respectively. So agriculture including livestock contributed about 37% of the total income of the households. But this sample did not specifically address the poorer segment of the population whose income would by and large originate from wage labour and farming rather from business.

4.2 Impact of Cotton Production on Household's Welfare

This section of the report gives a synthesis of the major findings from the survey at the household level using some of the PRA methods. The main aim is to look at the impact of cotton production on the households' welfare. We are particularly interested to know whether cotton production has had any impact on poor households, women and environment. It is also of interest to assess its impact on food security and poverty reduction. The detailed discussion of the results from the case studies are given in Vol. II of this report.

Out of the ten villages visited, eight grow cotton. Table 4.7(a) and 4.7(b) give a summary of issues which the focus group in each village has raised to indicate the major problems that poor farmers face in cotton production. In total there are 227 points (here referred to as responses). There were 16 different problems raised. The most important one is on cotton prices (25%). Most of the farmers complained of low producer prices which render cotton production a non-viable economic activity.

The next important problem is the lack of oxen and oxen ploughs (16%). Not all families have oxen for ploughing and their hiring cost is unaffordable to most poor farmers. Farmers were also complaining on high prices of chemical inputs and their availability. The two problems together form 18% of the responses. The lack of capital and credit facilities are other important problems. The two combined form about 14% of the total responses.

Another problem that farmers face is inadequate household labour for all other activities that are carried out by the household. For example, households have also got to grow food crops and keep livestock using the same labour. This may lead to cultivating smaller areas of cotton. There may also be a problem of land in the sense that some areas have to be left as pastures for livestock. One village (Kishapu) was specifically complaining of hunger such that family labour is hired out to other people's fields in order to get money to purchase food. So very little time is left for their own cotton production.

Availability of cotton seeds and quality of seeds appear to be a big problem to farmers. The cotton buyers are not distributing seeds as required. The seed quality is of major concern because of the different buyers mixing cotton from different areas and regions. Sometimes seeds do not germinate because they are not suitable for certain locations as far as weather and soil quality are concerned.

Table 4.7(a): Summary of Problems Affecting Marginalized Farmers in Cotton Production (Absolute Points = Number of responses from the FGD)

Problems	Bushi tala	Mbiti	Mwanzola	Bu-mera	Bunambiyu	Kishapu	Ru-nzewe	Ngho- mboko	Total	%
High prices of chemicals	8	6	NA	NA	NA	3	5	NA	22	9.69
Lack of chemical inputs	5	4	6	NA	3	NA	4	NA	22	9.69
Lack of capital	4	NA	NA	NA	5	NA	3	4	16	7.05
Inadequate household labour	3	NA	NA	NA	NA	NA	NA	6	9	3.96
Lack of oxen & ploughs	2	2	11	NA	7	5	NA	10	37	16.30
Lack of extension services	2	NA	NA	NA	NA	NA	NA	NA	2	0.88
Low cotton prices	10	11	9	11	4	3	9	NA	57	25.11
Increase in diesel prices	NA	2	NA	NA	NA	NA	NA	NA	2	0.88
Small farming area	NA	NA	3	NA	NA	4	NA	3	10	4.41
Poor weather conditions	NA	NA	1	3	NA	NA	NA	NA	4	1.76
Availability of cotton seeds	NA	NA	2	5	NA	2	NA	NA	9	3.96
Lack of credit facilities	NA	NA	NA	15	NA	NA	NA	NA	15	6.61
Poor cotton seeds quality	NA	NA	NA	8	NA	NA	NA	NA	8	3.52
Hunger	NA	NA	NA	NA	NA	6	NA	NA	6	2.64
Competition with livestock	NA	NA	NA	NA	NA	NA	NA	3	3	1.32
Competition with food crops	NA	NA	NA	NA	NA	NA	NA	5	5	2.20
TOTAL	34	25	32	42	19	23	21	31	227	100.00
AVERAGE	4.86	5.00	5.33	8.40	4.75	3.83	5.25	5.17	14.20	6.25

NA= No Answer

Source: Field Survey (Case Studies, Vol. II), 1997

Table 4.7(b) shows the percentages of the total responses given in Table 4.7(a). It also gives the average percentages of each problem as mentioned by the villagers. Following these problems, the villagers were asked to mention possible solutions to these problems. Each village gave a set of ideas which are summarised in Tables 4.8(a) and 4.8(b). The question of increase in producer prices has been mentioned as the most important solution. At least 31% of the respondents were of this idea. Provision of credit facilities (26%) is the second most important solution followed by supply of adequate chemicals at affordable prices. This together with the lowering of the inputs prices form 27% of the responses.

Table 4.7(b): Summary of Problems Affecting Marginalized Farmers in Cotton Production (Percentage)

Problems	Bushi-tala	Mbiti	Mwanzola	Bumera	Bunambiye	Kishapu	Runzewe	Nghomboko
High prices of chemicals	23.50	24.0	NA	NA	NA	13.1	23.8	NA
Lack of chemical inputs	14.70	16.0	18.8	NA	15.8	NA	19.0	NA
Lack of capital	11.80	NA	NA	NA	26.3	NA	14.4	12.5
Inadequate h/hold labour	8.80	NA	NA	NA	NA	NA	NA	19.4
Lack of oxen & ploughs	5.90	8.0	34.4	NA	36.8	21.7	NA	32.3
Lack of extension services	5.9	NA	NA	NA	NA	NA	NA	NA
Low cotton prices	29.4	44.0	28.0	26.2	21.1	13.0	42.8	NA
Increase in diesel prices	NA	8.0	NA	NA	NA	NA	NA	NA
Small farming area	NA	NA	9.4	NA	NA	17.4	NA	9.7
Poor weather conditions	NA	NA	3.1	7.1	NA	NA	NA	NA
Availability of cotton seeds	NA	NA	6.3	11.9	NA	8.7	NA	NA
Lack of credit facilities	NA	NA	NA	35.7	NA	NA	NA	NA
Poor cotton seeds quality	NA	NA	NA	19.1	NA	NA	NA	NA
Hunger	NA	NA	NA	NA	NA	26.1	NA	NA
Competition with livestock	NA	NA	NA	NA	NA	NA	NA	9.7
Competition with food crops	NA	NA	NA	NA	NA	NA	NA	16.5
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AVERAGE	14.3	20.0	16.7	20.0	25.0	16.7	25.0	16.7

NA= No Answer

Source: Field Survey (Case Studies, Vol. II), 1997

There is also a need for the government to control the quality of cotton seeds, to increase control of seed cotton and to oversee the operations of the liberalised market. The villagers were also asking the government to remove the import duty and sales tax on diesel. Other solutions include improvement of extension services, revival of local textile industries and provision of adequate farming equipment. Table 4.8(b) is a reflection to of table 4.8(a) indicating the percentages of the responses on each solution in each village.

Table 4.8(a) Farmers Responses on Possible Solutions (Absolute Points)

Solutions	Bushi- tala	Mbiti	Mwa- zola	Bu- mera	Buna- mbiyu	Kishapu	Run- zewe	Ngho- mboko	Total	%
Increase in producer prices	12	9	5	9	4	3	10	7	59	31.40
Lower chemical prices	7	6	3	4	NA	NA	NA	NA	20	10.60
Provide credit facilities	6	2	10	14	6	2	3	6	49	26.10
Supply adequate chemicals at lower prices	5	NA	8	NA	2	4	7	4	30	16.00
Improve extension services	2	NA	NA	NA	NA	NA	NA	NA	2	1.10
Government to increase control on quality	NA	4	NA	NA	NA	NA	NA	NA	4	2.10
Remove import duty & sales tax on diesel	NA	2	NA	NA	NA	NA	NA	NA	2	1.10
Revive local textile industries	NA	2	NA	NA	NA	NA	NA	NA	2	1.10
Provide good quality cotton seeds	NA	NA	3	6	NA	3	NA	3	12	6.40
Control of open markets	NA	NA	NA	NA	2	NA	NA	NA	2	1.00
Provision of farming equipment	NA	NA	NA	NA	NA	6	NA	NA	6	3.10
TOTAL	32	25	29	33	14	18	20	20	188	100.00
AVERAGE	6.4	4.2	5.8	8.3	3.5	3.6	6.7	5	17.09	9.09

Source: Field Survey (Case Studies, Vol. II), 1997

Table 4.8(b) Farmers Responses on Possible Solutions (Percentage)

Solutions	Bushi- tala	Mbiti	Mwan- zola	Bu- mera	Buna- mbiyu	Kishapu	Run- zewe	Ngho- mboko
Increase in producer prices	37.5	36.0	17.3	27.3	28.6	16.70	50.0	35.0
Lower chemical prices	21.9	24.0	10.3	12.1	NA	NA	NA	NA
Provide credit facilities	18.8	8.0	34.5	42.2	42.8	11.10	15.0	30.0
Supply adequate chemicals at lower prices	15.6	NA	27.6	NA	14.3	22.20	35.0	20.0
Improve extension services	6.2	NA	NA	NA	NA	NA	NA	NA
Government to increase control on quality	NA	16.0	NA	NA	NA	NA	NA	NA
Remove import duty & sales tax on diesel	NA	8.0	NA	NA	NA	NA	NA	NA
Revive local textile industries	NA	8.0	NA	NA	NA	NA	NA	NA
Provide good quality cotton seeds	NA	NA	10.3	18.2	NA	16.70	NA	15.0
Control of open markets	NA	NA	NA	NA	14.3	NA	NA	NA
Provision of farming equipment	NA	NA	NA	NA	NA	33.30	NA	NA
TOTAL	100.0	100.0	100.0	100.0	100.0	100.00	100.0	100.0
AVERAGE	20.0	16.7	20.0	25.0	25.0	25.00	33.3	25.0

Source: Field Survey (Case Studies, Vol. II), 1997

4.3 Women Labour Input in Cotton Production

Discussions on the role of women in cotton production in all the villages visited gave a following picture (Table 4.9). The activities are divided in pre-harvest and post-harvest periods. There is little variation from village to village as far as women labour input is concerned. A clear picture which emerges here is that on average women are more engaged in the more labour intensive activities like land preparation, sowing and/or planting, weeding and harvesting. For example in land preparation, 42.5% of the workload is carried out by women. About 56% for sowing and planting, 61% for weeding and 62.5% for harvesting.

The table also shows that about 58.5% of women labour input is in the pre-harvest period and the rest in the post-harvest. Again here, about 22% is their involvement in harvesting. Women are almost completely left out when it comes to the marketing/selling of cotton. At Mwang'anda village the PPA study²⁴ also shows that women are not associated in the decision-making for selling of cotton among other possessions of the household.

In another survey²⁵ where the small holders were asked to estimate the amount of work done by women in regard to a number of selected agricultural activities, the following picture emerged:

- Tilling of land 59%
- Sowing 68%
- Weeding 69%
- Harvesting 71%

As one can see, these results compare favourably with our own. The weeding and harvesting are more labour intensive and that is where women offer most of their labour input.

²⁴PPA Draft Report, Mwang'anda, Maswa.

²⁵URT: National Sample Census of Agriculture 1993/94 (Tanzania Mainland, Report Vol. III: Planted Area, Crop Production, Yield Estimates) Ministry of Agriculture/Bureau of Statistics, July 1995, Dar es Salaam.

Table 4.9: Women Labour Input in Cotton Production (Percentage)

Activity	Bushitala		Mbiti		Mwanzola		Bumera		Bunambiyu		Kishapu		Runzewe		Ng'omboko		TOTAL		AVERAGE	
	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom
Land preparation	50.0	50.0	60.0	40.0	55.0	45.0	70.0	30.0	65.0	35.0	60.0	40.0	45.0	55.0	55.0	45.0	460.0	340.0	57.5	42.5
Sowing/Planting	50.0	50.0	45.0	55.0	50.0	50.0	35.0	65.0	50.0	50.0	40.0	60.0	40.0	60.0	40.0	60.0	350.0	450.0	43.8	56.3
Weeding	40.0	60.0	35.0	65.0	50.0	50.0	40.0	60.0	40.0	60.0	40.0	60.0	40.0	60.0	30.0	70.0	315.0	485.0	39.4	60.6
Spraying	95.0	5.0	90.0	10.0	100.0	0.0	100.0	0.0	90.0	10.0	100.0	0.0	95.0	5.0	80.0	20.0	750.0	50.0	93.8	6.3
Harvesting	40.0	60.0	50.0	50.0	40.0	60.0	45.0	55.0	30.0	70.0	30.0	70.0	25.0	75.0	40.0	60.0	300.0	500.0	37.5	62.5
Transport (from farm to household)	60.0	40.0	60.0	40.0	50.0	50.0	50.0	50.0	50.0	50.0	30.0	70.0	50.0	50.0	50.0	50.0	400.0	400.0	50.0	50.0
Transport (household to market)	90.0	10.0	100.0	0.0	80.0	20.0	100.0	0.0	100.0	0.0	100.0	0.0	90.0	10.0	100.0	0.0	760.0	40.0	95.0	5.0
Selling	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	800.0	0.0	100.0	0.0
TOTAL	525.0	275.0	540.0	260.0	525.0	275.0	540.0	260.0	525.0	275.0	500.0	300.0	485.0	315.0	495.0	305.0	4135.0	2265.0	516.9	283.1
AVERAGE	65.6	34.4	67.5	32.5	65.6	34.4	67.5	32.5	65.6	34.4	62.5	37.5	60.6	39.4	61.9	38.1	516.9	283.1	64.6	35.4

Source: Field Survey (Case Studies, Vol. II), 1997.

4.4 Expenditure Lines

A summary on the lines of expenditure after selling cotton is shown in Tables 4.10(a) and 4.10(b). The discussions on this issue were generally argumentative because of the fact that first, women usually do not know the exact amount of money obtained from cotton sales and secondly there are some expenditure lines that man do not want to disclose to their wives. The tables, however, show a consensus reached after long discussions among members of the discussion group. The most important line of expenditure is on the purchase of livestock especially oxen for farming. Purchase of cattle, according to the villagers, is the way of saving their wealth instead of taking their money to the ordinary banking system. This expenditure line was mentioned by at least 25.8% of the total respondents.

The next item is on the purchase of clothing, bedding and household utensils. The purchase of clothing is the idea that has been proposed mostly by the women group. The purchase of food featured as an important line of expenditure (16.7%). It implies that cotton production also acts as food security to the household. Another line of expenditure which is mainly for men is on leisure and beer drinking (12.6%). This together with marriage of second or third wives were the expenditure lines which were mainly refuted by men but women were very strong about these issues. The other items are basically minor ones for example repair or building of houses, food stores, purchase of bicycles, radios, etc., school fees, dowry and special fund for the next farming season or capital for business.

The PPA study at Kangeme village in Kahama district came with more or less similar expenditure pattern. The actual men's expenditure as corrected by women were first the purchase of farm inputs (25%), leisure (15%), food purchase (15%), construction of houses (10%), medicines (10%), preparation for crop production (5%), casual labour (5%) and finally clothing (5%).

Table 4.10(a): Expenditure Lines by Households(Absolute Points = Number of Responses from each village)

Expenditure Line	Bush- tala	Mbiti	Mwan- zola	Buna- mbiyu	Ki- shapu	Ru- nzeve	Ngho- mboko	TOT.	AVG	% OF TOT
Purchase of livestock/Oxen for farming	12	13	13	6	3	NA	4	51	8.5	25.8
Purchase of food	7		4	2	7	5	8	33	5.5	16.7
Purchase of clothing, bedding, household utensils	5	12	3	5	2	7	7	41	5.9	20.7
Purchase of bicycles, radios, etc.	4	NA	NA	NA	1	NA	NA	5	2.5	2.5
School fees/taxes	NA	1	2	NA	NA	2	NA	5	1.7	2.5
Dowry	NA	3	NA	NA	NA	NA	NA	3	3.0	1.5
Repair/building of houses	NA	9	3	2	NA	NA	NA	14	4.7	7.1
Leisure & beer drinking	NA	2	6	3	6	4	4	25	4.2	12.6
Special fund for next farming season	NA	2	2	NA	NA	3	NA	7	2.3	3.5
Marriage of second or third wife	NA	NA	7	3	NA	NA	NA	10	5.0	5.1
Capital for small business	NA	NA	1	NA	NA	NA	NA	1	1.0	0.5
Construction/repair of food stores	NA	NA	NA	NA	NA	NA	3	3	3.0	1.5
TOTAL	28	42.0	41.0	21.0	19.0	21.0	26.0	198	28.0	100
AVERAGE	7	6.0	4.6	3.5	3.8	4.2	5.2	34.3	4.9	

Source: Field Survey (Case Studies, Vol. II), 1997

Table 4.10(b): Expenditure Lines by Households (Percentage)

Expenditure Line	Bushi	Mbiti	Mwa-	Buna-	Ki-	Ru-	Ngho-	TOT	AVG	% OF
	tala		nzola	mbiyu	shapu	nzewe	mboko			TOT.
	%	%	%	%	%	%	%	%	%	%
Purchase of livestock/Oxen for farming	42.8	30.9	31.7	28.6	15.80	NA	15.3	165.1	27.5	23.6
Purchase of food	25.0	NA	9.8	9.5	36.80	23.80	30.7	135.6	22.6	19.4
Purchase of clothing, bedding, household utensils	17.9	28.6	7.3	23.8	10.50	33.30	26.8	148.2	21.2	21.2
Purchase of bicycles, radios, etc.	14.3	NA	NA	NA	5.30	NA	NA	19.6	9.8	2.8
School fees/taxes	NA	2.4	4.9	NA	NA	9.50	NA	16.8	5.6	2.4
Dowry	NA	7.2	NA	NA	NA	NA	NA	7.2	7.2	1.0
Repair/building of houses	NA	21.3	7.3	9.5	NA	NA	NA	38.1	12.7	5.4
Leisure & beer drinking	NA	4.8	14.6	14.3	31.60	19.10	15.3	99.7	16.6	14.2
Special fund for next farming season	NA	4.8	4.9	NA	NA	14.30	NA	24.0	8.0	3.4
Marriage of second or third wife	NA	NA	17.1	14.3	NA	NA	NA	31.4	15.7	4.5
Capital for small business	NA	NA	2.4	NA	NA	NA	NA	2.4	2.4	0.3
Construction/repair of food stores	NA	NA	NA	NA	NA	NA	11.9	11.9	11.9	1.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	700.0	100.0	100.0
AVERAGE	25.0	14.3	11.1	16.7	20.0	20.0	20.0	127.1	18.2	

Source: Field Survey (Case Studies, Vol. II), 1997

4.8 Farm Size and Distribution

Cotton production is dominated by small holders. Table 4.11 shows that in one village (Runzewe) about 75% did not grow cotton. Villagers were producing tobacco instead. In general about 50% of the cultivated land was put under cotton. About 40.6% of cotton producers own between 1 and 5 acres only. To these belong mostly the poorer farmers and women. Another 28.5% possess between 5.1 and 10 acres. That means almost 70% of the farmers are small producers owning between 1 and 10 acres (0.4 to 4 ha). The next group of farmers are those who own between 10.1 and 50 acres. These are about 17% of farmers. Very few indeed own above 50 acres (4.2%).

However, the larger farmers although very few are the ones who get higher yields of cotton per unit area because of their ability to use modern farming equipment, chemicals and fertilizers. They also possess reliable means of transport.

Other studies²⁶ on the number of holdings and the size of planted area for cotton in Tanzania indicated that those who planted less than 1 acre were about 16%, while those who planted between 1 and 5 acres (0.4 - 2.0 ha) were 55%. Those who planted above 5 acres were about 29%. So we see also here that almost 70% of all cotton producers are small farmers.

²⁶ URT, op. cit. App. A12; Table 1-12D.

Table 4.11: Farm Size and Distribution for all Villages (Percentage)

Farm Size Range	Bushitala	Mbiti	Mwanzola	Bumera	Bunambiyu	Kishapu	Runzewe	Nghómboko	TOTAL	AVERAGE	% OF TOTAL
(ACRES)	NA	NA	NA	NA	NA	NA	75.0	NA	75.0	75.0	9.4
1 - 5	70.0	85.0	90.0	75.0	NA	5.0	NA	NA	325.0	65.0	40.6
5.1 - 10	25.0	15.0	10.0	25.0		95.0	12.9	45.0	227.9	32.6	28.5
10.1 - 20	5.0	NA	NA	NA	28.0	NA	8.0	NA	41.0	13.7	5.1
20.1 - 40	NA	NA	NA	NA	NA	NA	4.1	50.0	54.1	27.1	6.8
40.1 - 50	NA	NA	NA	NA	40.0	NA	NA	3.0	43.0	21.5	5.4
50.1 - 100	NA	NA	NA	NA	30.0	NA	NA	2.0	32.0	16.0	4.0
100.1 - 300	NA	NA	NA	NA	2.0	NA	NA	NA	2.0	2.0	0.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	800.0	100.0	100.0

Source: Field Survey (Case Studies, Vol. II). 1997.

4.9 Cost of Cotton Production

The cost of cotton production was computed on the basis of the information provided by the discussion group in each village. A summary is given in Tables 4.12(a) and 4.12(b). The average total cost of production is Tshs. 54,018 per acre, when all farmers (efficient and less efficient) are considered together. The most costly activities are spraying and weeding which together account for about 50% of the total cost. Weeding is labour intensive and has to be carried out at least three times per season. Spraying also has to be carried out at least three times but the recommendation is to spray six times if one is to get a healthier crop. Spraying is costly because the chemical inputs used are very expensive.

The next costly activity is land preparation (16.8%) because of the hiring of the ox-ploughs and sometimes hiring of labour is necessary. In some areas, farmers have to hire land from others although this does not appear to be costly and it is only done in few villages. Transportation has to be hired and it is about 9.7% of the total cost. The other activities which are not very costly are sowing and/or planting and field clearing after harvesting. Together they make about 7.4% of the total cost.

When considering the poorest farmers separately, the total cost and returns to labour are shown in summary Table 4.13. The average gross income for the eight villages (two villages did not have cotton) was Tshs 91,125 per acre, while the average total cost was Tshs 55,163 per acre. This gives a net income of about Tshs 35,963 for the 1996/97 season²⁷.

Table 4.13 Estimates on Cost of Production and Incomes from Cotton Production in Shinyanga (Ox-plough Technology) 1996/97.

Village	Total Realization (Tshs/acre)	Total Cost (Tshs/acre)	Return to Labour (Tshs/acre)
Bushitala	90,000	41,800	48,200
Mbiti	100,000	63,500	36,500
Mwanzola	89,000	68,200	20,800
Bunera	89,000	58,100	30,900
Bunambiyu	89,000	53,400	35,600
Kishapu	72,000	43,500	28,500
Runzewe	100,000	57,500	42,500
Nghomboko	100,000	55,300	44,700
AVERAGE	91,125	55,163	35,963

Source: Field Survey (Case Studies, Vol. II), 1997.

MDB had estimated cost of cotton production and returns to labour for 1995/96 season, based on the type of technology used, i.e. hand-hoe, typical oxen, improved oxen, improved tractor and hired labour. Despite the problem of obtaining data due to reluctance on the part of some private traders to release information, especially during this period of market liberalization, MDB came up with an estimate of a net income of Tshs 77,618 per ha or Tshs 31,424 per acre, for a typical ox-plough technology. This figure is quite close to our estimate of Tshs 35,963 per acre for the 1996/97 season.

²⁷ A more in-depth survey and detailed analysis of cost of production is required. It will give a more clear picture on return to labour per man-days and income per capita and its impact on poverty and its eradication strategies.

Comparing this with the cost of production and returns to labour from other cash crops grown in the region, we clearly see that cotton is less competitive in terms of return to labour. The PPA study at Kangene village (Kahama district) has shown that the net income from tobacco averaged Tshs 80,000 per acre for the poorest farmers and Tshs 130,000 per acre for the more efficient farmers. About the same profit margin was observed at Runzewe village in Bukombe village during our survey.

At Mwime village (Kahama district) we found out the paddy²⁸ production is more profitable than cotton production. For example the cost of paddy production was Tshs 31,000 against that of cotton which was Tshs 55,163 per acre (more than one and half times higher). The net income, on the other hand, was Tshs 219,000 per acre for paddy against the average of Tshs 35,963 per acre from cotton (about six times more).

This is an indication that unless some necessary measures are taken, cotton will not be produced in areas where there is an alternative cash crop or alternative source of income. Indeed this was also the case at Mwamalole village (Meatu) where, as the PPA study here indicates, people openly said they can survive even without cultivating cotton. There are other sources of income in this village. They subsequently placed less institutional importance the co-operative society which handles cotton purchasing in this village (See the Venn Diagramme on next page drawn by villagers during the PPA study).

From this Diagramme, **UKOMBAKOMBA** means "A farm labour group which has men and women of all ages as members", while **PACHANGA** means "A farm labour group which only has young men as members).

²⁸ Although paddy is a food crop, it serves also as a cash crop when farmers get surpluses.

Table 4.13 (a): Estimates of Cost of Cotton Production of all villages (Tshs/Acre)

Activity	Bushitala	Mbiti (a)	Mbiti (b)	Mwan- zola	Bumera	Buna- mbiyu (a)	Buna- mbiyu (b)	Kishapu (a)	Kishapu (b)	Runzewe	Nghó- mboko	TOTAL	AVG	% OF TOT
Land hiring	NA	NA	NA	10000	5000	NA	NA	2500	2500	NA	NA	20000	5000.0	3.4
Land preparation	5000	8000	13000		10000	13000	15000	5000	10000	10000	5000	100000	9090.9	16.8
Sowing/planting	3000	2500	2500	3000	3000	1800	1800	3000	3000	3000	1000	27600	2509.1	4.6
Weeding	12000	14000	14000	10000	15000	6500	6500	10000	10000	16000	13000	127000	11545.5	21.4
Spraying	11500	18000	18000	21200	10600	17600	17600	12000	12000	13500	19800	171800	15618.2	28.9
Harvesting	9000	10000	10000	9000	7000	10000	10000	8000	8000	5000	7500	93500	8500.0	15.7
Transporting	1800	9000	9000	6000	6000	3000	3000	3000	3000	10000	4000	57800	5254.5	9.7
Field clearing		2000	2000	3000	1500	1500	1500	NA	NA	NA	5000	16500	2357.1	2.8
TOTAL	42300	63500	68500	58200	53100	53400	55400	41000	46000	57500	55300	594200	54875.3	100.0
AVERAGE	7050	9071.43	9785.71	8314.29	7585.71	7628.57	7914.29	6833.33	7666.67	9583.33	7900.00	84885.71	7839.3	

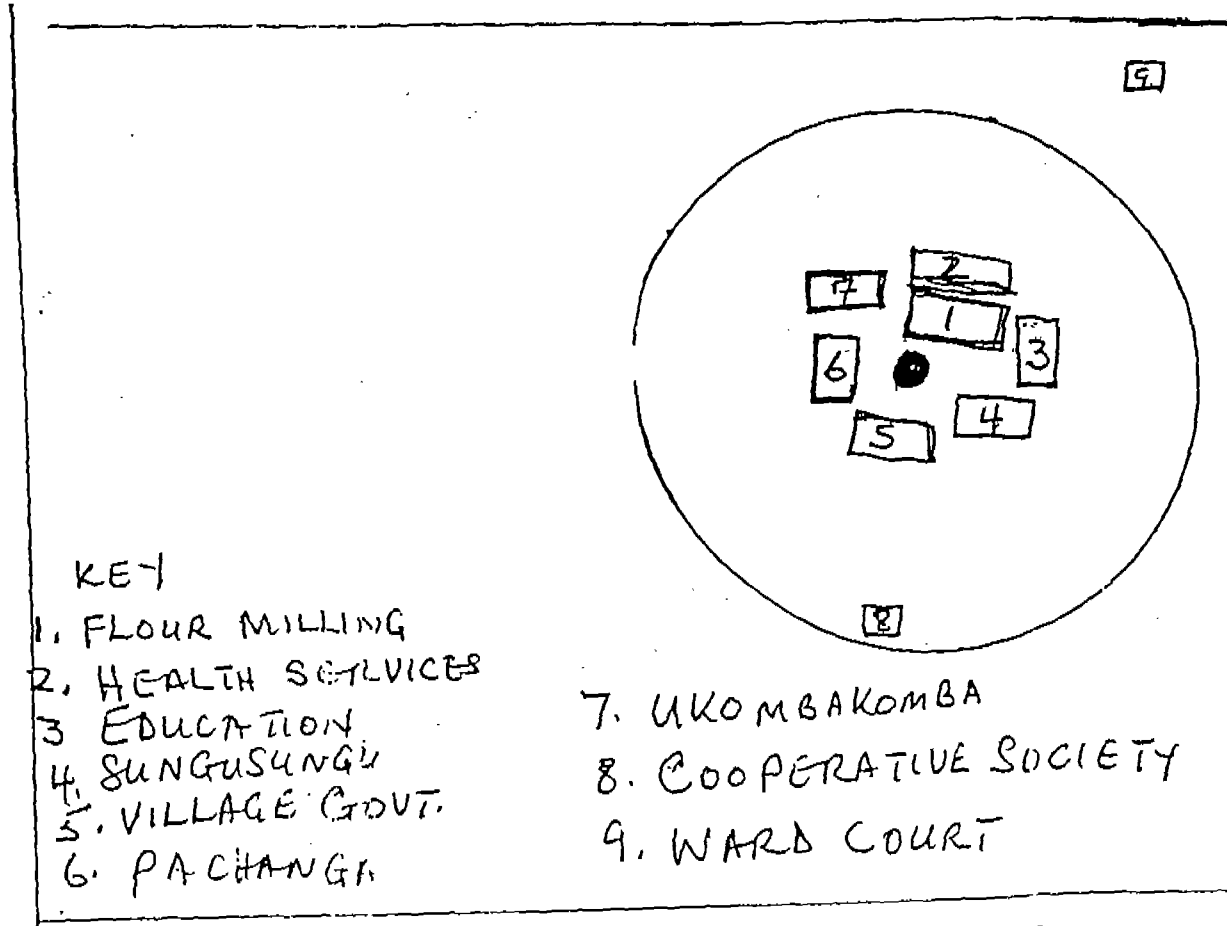
Source: Field Survey (Case Studies Vol. II), 1997.

Table 4.13(b): Estimates of Cost of Cotton Production of all villages (Percentage)

Activity	Bushitala	Mbiti (a)	Mbiti (b)	Mwanzola	Bumera	Buna- mbiyu (a)	Buna- mbiyu (b)	Kishapu (a)	Kishapu (b)	Runzewe	Nghó- mboko	TOTAL	AVG
	%	%	%	%	%	%	%	%	%	%	%	%	%
Land hiring	NA	NA	NA	14.70	8.6	NA	NA	5.70	5.20	NA	NA	34.20	8.6
Land preparation	11.80	12.60	19.00	8.80	17.2	24.30	27.10	11.50	20.60	17.39	9.04	179.33	16.3
Sowing/planting	7.10	3.90	3.60	4.30	5.2	3.40	3.20	6.90	6.20	5.24	1.8	50.84	4.6
Weeding	28.40	22.00	20.40	14.70	25.8	12.20	11.70	23.00	20.60	27.82	23.5	230.12	20.9
Spraying	27.20	28.30	26.30	31.10	18.2	33.00	31.80	27.60	24.70	23.47	35.8	307.47	28.0
Harvesting	21.30	15.80	14.60	13.20	12.1	18.70	18.10	18.40	16.50	8.69	13.56	170.95	15.5
Transporting	4.20	14.20	13.20	8.80	10.3	5.60	5.40	6.90	6.20	17.39	7.26	99.45	9.0
Field clearing		3.20	2.90	4.30	2.6	2.80	2.70	NA	NA	NA	9.04	27.54	3.9
TOTAL	100	100	100	85.2	91.4	100	100	94.3	94.8	100	100	1065.7	
AVERAGE	16.7	14.3	14.3	12.2	13.1	14.3	14.3	15.7	15.8	16.7	14.3	152.2	14.7

Source: Field Survey (Case Studies, Vol. II), 1997.

VENN DIAGRAM INSTUTION AND SOCIAL SERVICES



PART V

5.0 INTERVENTIONS

From the discussions we have had so far, we realise that there is a necessity for some positive interventions from various circles for the prosperity of cotton production in the region and elsewhere in the country. This is for the benefit of the nation in general and the rural households in particular. In this section we outline our suggestions about the possible measures that can be taken.

5.1 Technical Intervention

The technical intervention in cotton marketing and ginning is directed mostly to the co-operative unions' performance and maintenance of their assets. We have indicated elsewhere in this report that about 60% of all cotton produced²⁹ in the region is handled by the co-operative unions (SHIRECU and KACU). The Union has, therefore, still a big role to play in the cotton market until such time that the private sector can satisfactorily take over all the functions, i.e. from cotton procurement, ginning and marketing of lint and all by-products.

In Shinyanga region the co-operative ginneries appear to be running at a much higher costs than most of the private ones which are also fewer in number. There is, therefore, the need for improved practical management in these ginneries. Overhead costs are high mainly due to over-employment which goes in most cases not by skills but by kinship and/or relationship. The Union has to restructure its administration and reduce the levels of employment.

There is also a fairly high chance of reducing the levels of transaction costs if the out-moded ginnery equipment are replaced. It will at the same time improve operational efficiency and hence increase capacity utilization. The availability of spare parts for the ginneries is a major problem not only to those owned by the Unions but also to the private ones. Most of the original spares are not available in the country. They have to be imported from outside the country and this often takes long due the bureaucracy if not corruption in the customs departments. During the survey, two ginneries: Luguru (co-operative union) and Mwanhuzi (private) had to close some operations waiting for the spares to arrive from abroad. Long idle time of machines increases costs to the ginneries. The government has to intervene and make sure that clearances for imported spares is speeded up.

The other technical aspect which affect both the co-operative union and the private sector almost equally is on the question of infrastructure, which basically refers to the roads, telecommunication and power supply. The run down of the road network raises the cost of transportation. Most of the feeder roads are impassable especially during the wet season. Sometimes the washed away bridges by previous floods remain unrepaired for a long time. The poor road infrastructure is the main reason behind the operations of the union branches to be closer to the centre. As we have found out, the branches offer their services mostly in a radius of about 50 kms from their centres, thus leaving out most of the distant locations. Obviously this will have a negative impact on the livelihood of particularly the vulnerable group.

Since road network plays a crucial role in market integration, the government has to direct more of its efforts towards upgrading and maintenance of these roads. The study by the World Bank suggests

²⁹ Estimates by the Ministry of Agriculture show that in 1996/97 season, about 47% of all cotton purchased was done by the co-operatives, 51% by private operators and 2% by others, including TCLSB.

URT: Ministry of Agriculture (1997): "Review of the Co-operative Movement in Tanzania".

that the farther a household is from the road, the less likely it is for the household to participate in markets³⁰. Likewise, households that are closer to the crop markets and served by better roads have on average higher incomes and hence more chances of combating poverty.

The poor telecommunication system makes the search and monitoring of marketing operations by both the union and private sector very difficult. It raises the search and monitoring costs. Frequent physical visits to the government departments/agencies and to the trading partners are necessary. This raises the transaction costs which are in most cases passed over to farmers in form of low producer prices. There is, therefore, every reason for the government to intervene also in this area by allowing private initiative to open up telecommunication systems even to the rural areas. The means the monopoly of the Tanzanian Telecommunication Company (TTLIC) has to be re-examined and allow competition to improve communication services.

Erratic power supply leads to increased costs of ginnery operations. This affects also both the union and privately owned ginneries. The power failure leads to use of generators to run the ginneries which obviously raises operational costs. It was mentioned, for example, that the generator used by Mwanhuzi ginnery (Meatu, private) needs about Tshs 700,000 per day for diesel fuel. Supply of reliable electricity is, therefore, another area where the government has to intervene so as to improve efficiency in cotton ginning.

5.2 Financial Intervention

The financial sector in Tanzania is currently not geared to channeling credit to the agricultural sector. Farmers and traders lack access to credit. The high cost of credit limits the expansion of more ginneries in the region. The barrier to credit to the farmers and traders is based on the premise that agricultural production is a risky activity since it depends almost entirely on the vicissitudes of weather. The lack of loanable funds³¹ in Tanzania is another major problem. The international financing is held back because of frequent and sudden policy changes.

The current collateral laws for loans are not realistic and they can hardly be accepted by the lending institutions. Therefore, the current land tenure should be changed to allow registered land ownership by the farmers themselves. This can then be used as a collateral for seeking credit funds from financial institutions. These are but a few important areas where government intervention is required in order to boost cotton production and raise incomes of the rural community.

5.3 Socio-economic Intervention

Inadequate and poor provision of social services (education, health, water, housing, sanitation etc) has negatively affected agricultural production and productivity. The most affected are the vulnerable groups to which poorer households and women are the majority. The government has a role to play in the provision of these important services, if the objective of poverty eradication is to be attained. Both the central and the local governments have to take necessary measures to not only provide those services but also to maintain the socio-cultural values and harmony.

There is need for the development of a social framework which can be taken aboard in the new forms of economic organizations. For example, educating people on the importance of establishing rules of governance and dispute resolution within groups can lead to improved performance of community groups. Creation of awareness on own responsibility will also enhance development.

³⁰ World Bank (1996) "Tanzania: The Challenge of Reforms: Growth, Incomes, and Welfare", Vol. II; Appendices and Statistical Annexes, Country Operations Division, Eastern Africa Department, Africa Region.

³¹ Satu, K. et al. op. cit.(1997).

5.4 Institutional Intervention

We view the transformation of the co-operative union into a genuine member-based organisation to be a crucial and first step in the institutional transformation. The staff and management of the union has hardly changed since the Co-operative Act of 1991. Farmers still see it as a government institution. Co-operative funds embezzlement and over-employment has led to the declining role of the co-operative union. There is need, therefore, for the government to turn the Co-operative Act of 1991³² into a reality. This is very important for increased farmers' welfare.

The role of the TCLSB has to be clearly defined. One can hardly see how TCLSB can impartially perform its duty of enforcing rules and regulations in the cotton market if it is, itself, actively engaged in purchasing cotton from farmers, have it ginned at a fee and export it. This is an important area where the government has to look into.

In order to attain higher productivity, cotton yields per unit area have to be improved. Cotton yields in Tanzania are at present much lower than in many other African countries. Satu et al (1997) mention that while yield in Tanzania fluctuate between 300 and 590 kg/ha, they range between 600 and 2000 kg/ha in Zimbabwe, Mali, Sudan and Egypt³³. The reason for the low yields in Tanzania are partly due to untimely delivery and application of chemical inputs and fertilizers as well as due to the mixing of cotton seeds.

Hence, there is a need for improving this situation. One way would be for the union as well as private operators to invest in farmers' service centres to bring inputs closer to farmers, at least in each ginnery catchment area. The recently established Agricultural Inputs Trust Fund should be at the centre of this proposed scheme. A workable credit system for farmers need to be formulated to enable them benefit from the use of these inputs.

³² It is stipulated in this Act that Primary Societies were to be formed by farmers, who would freely elect to join the society and provide share capital. These primary societies would then control the co-operative unions through their elected representatives.

³³ Satu, K et al. Op. cit. (1997).

CONCLUSION AND RECOMMENDATIONS

I. CONCLUSION

The Human Development Report (HDR) to which the cotton sector is an integral part seeks to identify types of poor households, their livelihood strategies and constraints and the opportunities to intervene effectively so as to strengthen poor peoples' livelihoods.

The cotton sector study is based on both secondary and primary data sources. Government offices, Co-operatives Unions, Regional and District authorities together with private agencies in cotton handling were the main sources of secondary information. The primary data arises from the village households. Some PRA methods like Focus Group Discussions, ranking of problems and solutions, perceptions on the lines of expenditure etc were applied. The usual conventional quantitative household survey was not carried out due to limited time and finance but reference is made on such studies which were conducted in the region before.

The choice of the villages to visit was based on the suggestions by the District Authorities on the potential importance of the villages in cotton production, presence of alternative cash and food crops, and the presence of food insecurity despite cotton production.

In general, cotton is the leading cash crop in the region. However, it takes second position after maize with regard to total land under cultivation. The area under cotton registers an average annual growth rate of about 7.7% between 1992/93 and 1996/97. Production in tonnage also registers a positive average annual growth rate of about 4.6% over the same period. Food crops generally have shown some declining trends in both acreage and tonnage. The issue of interest here is to find out whether the increase in cotton has happened at the expense of food crops and whether this would have a negative impact on food security. An interesting question also was on what impact cotton production has on the poorer households and women.

The liberalization of cotton market has improved farmers' income albeit at different levels. Cotton producer price has increased from Tshs 165 to 200 for the 1996/97 season and most of the payments were in cash and prompt. This has enabled farmers to meet their immediate needs. It is easy to conceptualise some increased incomes even to the poorest households and women due to the availability of the market for cotton.

However, the distant farmers could not benefit as much from the liberalized market because of the difficulties involved in reaching the remote areas. Transport costs over the bad roads are very high. It was observed that the union mainly operates within a radius of about 50 kms from its Branch centres. Very few of the societies/village above this distance received services from neither the union nor the private sector. This has a far reaching implication on the society's welfare in such villages.

At the household level cotton is the main cash earner to most people. The poorer households with little or no cattle depend very much on cotton production as a source of income. They cultivate cotton on their plots, although relatively small, or get income from wage labour on other richer families' cotton fields.

Cotton production in the region is very low, yielding about 550 kgs/ha, which is below the yield potential by about 45%. The low yields is explained by lack of chemical inputs and fertilizers and also by lack of credit facilities. Low cotton prices have also caused some farmers to abstain from cotton production. We have also observed the problem of distribution of cotton seeds. The private

cotton buyers do not distribute seeds to farmers as required. The distributed seeds are of poor quality because often they are mixed, i.e. those with disease and those which are healthy. The result is low germination rates in the next season.

The women labour input is relatively high especially in the labour-intensive activities like tilling of land, sowing, weeding and harvesting. Our study indicates that about 59% of all labour input is contributed by women. Other studies have shown that women labour inputs ranges between 59 and 71% across all activities.

Women, on the other hand, are cut off from cotton selling and they stand to benefit less from the sales because it is the men who do the budget planning and make final decision on the expenditure pattern. Gender education and sensitisation (both men and women) are, therefore, very necessary so that the benefits from cotton can be meaningful in combating poverty within the households. The expenditures have to be harmonised to reflect the actual needs of the family.

About 70% are small scale producers of cotton with planting areas of between 0.4 and 2.0 ha. Other studies have indicated similar magnitudes. It is almost impossible for such farmers to increase production and productivity without some support in acquiring chemical inputs, fertilisers, farm equipment and extension services. This is an important area where government intervention is necessary. The intervention here is seen as defining appropriate policies for support and monitoring rather than active engagement, for example, in cotton purchase and inputs distribution. The cost of cotton production is relatively higher than that of tobacco or paddy. This is mainly due to high costs of inputs and labour. The profit margins from cotton are much less than those from tobacco or paddy. For example, the net income per acre from tobacco is about Tshs 80,000 for poorer households while it was Tshs 35,963 per acre from cotton. The net income per household per acre from paddy production was about Tshs 219,000 per acre compared to Tshs 35, 963 per acre from cotton.

This situation has made farmers to turn away from cotton production especially in those areas where it is possible to have an alternative cash crop. This calls for a complete review of the cotton sector in terms of intervention in areas where transaction costs can be reduced, supply of input at affordable prices can be enhanced and provision of credit can be facilitated.

2. RECOMMENDATIONS

- 2.1 In order to get good quality cotton the union and other marketing agencies have to increase supervision/control at the primary society level. Institutions like TCMB/TCLSB should train more quality controllers for cotton such that at each ginnery catchment area there TCLSB is qualified quality controller.
- 2.2 Training of the community on the importance and use of modern technology needs to be enhanced. The formation of women and youth groups is important because they can be used as contact group for dissemination of technologies. This could take the form of mini-cotton growers' association.
- 2.3 There is a need to invest in farmers' service centres to bring inputs close to farmers, at least one in each ginnery catchment area and private operators are encouraged to participate in this through the recently established Agricultural Inputs Trust Fund. A workable credit system for farmers need to be formulated to enable them benefit from the use of these inputs.

- 2.4 The government should assist in the rehabilitation of feeder roads and bridges and make them passable throughout the year so that transport costs are reduced and distant farmers obtain marketing services from both the unions and private buyers. The cotton industry should contribute to the road funding by imposing a levy on cotton purchases.
- 2.5 Farmers must be assured of getting producer prices which offset the cost of production and ensure a reasonable profit margin. This will entice farmers to increase cotton production and hence their income. This is important for poverty alleviation purposes.
- 2.6 A community education on the pattern of expenditures from cotton income is important in raising the standard of living. As it happens now most men use the income for less important expenditure lines like leisure, drinking and marrying many wives.
- 2.7 Following liberalisation of marketing of cotton and changes in economic and political policies it is important to review all the by-laws and regulations governing the production, marketing and processing of the crop. While the by-laws under regulations are made to suit new policy changes, it is important for the concerned institutions to ensure that these laws and regulations are strictly followed and penalties are imposed on evaders, be they public or private. Political motives should not be allowed to violate the set by-laws/regulations.
- 2.8 The actors in the cotton industry should be encouraged to establish a form of "*cotton development fund*" which will be financed by farmers, processors and cotton marketers. This fund should in part act as price stabiliser and be used to fund research and seed multiplication.
- 2.9 Local textiles should be rehabilitated and made functional so as to increase local utilisation of cotton lint with a view to increase value added cotton and attain higher export price. A deliberate policy should be made to assist the textile sector make good quality products for local consumption and export. Farmers stand to gain more from the sales of their cotton.
- 2.10 More efforts should be geared towards full utilisation of cotton by products particularly cotton seeds, seed cake, husks, cotton oil etc. so as to increase the value of cotton which will ultimately benefit the farmers.

APPENDIX TABLES

APPENDIX TABLE I: Terms of Reference: Sector Studies - Cotton

1. Main Objective:

Within the overall objective of preparing a Human Development Report and Poverty Eradication Strategy for Shinyanga Region, the consultant will:

- (a) review the present, past and potential future contribution of the cotton production, processing and marketing to the economy of Shinyanga Region;
- (b) examine the impact of cotton cultivation on the economic and social status of rural households, including the participation of wealthy and poorer households, men, women and children, the importance of cotton for income and employment generation and its implications for food security and environmentally sustainable land use;
- (c) assess the effectiveness of the institutions supporting the cotton sector, with particular reference to the impact of liberalised marketing, private sector investment, and the weakening of farmers' co-operatives and government agencies on seed and agro-chemical distribution, production finance, research and extension services, seed cotton and lint quality and farmer payments;
- (d) propose technical, institutional, financial and socio-economic interventions which would strengthen the contribution of the cotton sector to a programme for poverty alleviation in Shinyanga Region.

2. Detailed Objectives

- (a) Cotton Production Statistics: collect from all available sources statistical data on the area of cotton planted and the amount of seed cotton produced in Shinyanga Region over the last five years. This should be broken down by District and (as far as possible) Division or ginnery catchment area.

Assess through consultations with farmer representatives, ginnery operators, Ministry of Agriculture, Co-operative and TCMB personnel the probable future trends in cotton planting and production in each part of the region over the next five years.

- (b) Economic Value: assess the contribution of seed cotton purchases, and of sales of lint, cotton seed, cotton seed oil and cotton seed cake to the regional economy and to household incomes. Show how the revenue generated has increased or decreased over the last five years. Relate cotton revenue to the revenue generated from other crop or livestock products.
- (c) Farm Size: undertake sample farm and household surveys in each district to verify available published data on - * the average, mean and range of farm sizes in each cotton growing area; * the percentage of holdings in each size range on which cotton is grown; * the average, mean and range of cotton plot size in each growing area; * the proportion of the farm planted to cotton and to other crops in each size range; * use PRA methods to relate the size of cotton plot and the proportion it forms of the total farm to household size and socio-economic status of the landholder.
- (d) Production Methods: review cotton yields and the adequacy of the methods used for cotton production; including land preparation, planting, weeding, pest control and harvesting. Assess the production constraints facing farmers in each size range, and consider how these constraints, especially those facing smaller farmers, might be overcome.

- (e) **Labour Use:** assess the amount of labour used for cotton production on a sample of farms in each area and size range. Examine the breakdown between use of family and hired labour, male and female workers, family and non-family children. Use PRA methods to identify periods of labour constraint in each area and size range, the impact of these constraints on other household activities particularly food production, and the rewards to hired labour broken down by activity and season.
- (f) **Farm Budgets:** use participatory budgeting methods with groups of cotton farmers representative of different categories, to calculate current, past and potential costs and returns from cotton production in each area and household type. Compare costs and returns of cotton cultivation with costs and returns of other enterprises in the farming system. Identify constraints which reduce the contribution of cotton and other enterprises to household income, and assess with farmers and other enterprises to household income, and assess with farmers and other participants how these might be overcome.
- (g) **Farmers' Organizations:** assess the effectiveness of any farmers' or indigenous organizations which operate in the cotton growing zone, review their functions and the changes that have taken place in the Co-operatives since their monopoly of cotton purchase was removed. Consider with cotton growers and other interested parties how farmers' organizations might be strengthened or modified so that they better serve the needs of the sector and particularly poorer farmers.
- (h) **Support Services:** review the production support services available to cotton growers and assess their adequacy, the extent to which they cover the needs of poor households as well as rich, and the ways in which they have changed following Structural Adjustment and market liberalization. Give particular attention to the following including views of all parties on how the constraints identified might be overcome: *seed multiplication and distribution: how far is pure seed of appropriate varieties available, including in remote areas, at the time that it is needed for planting? * agrochemical supply: are all farmers, especially poor ones, able to get access to agro-chemicals and fertilizers when they are needed? * input financing: is finance available, especially to poor farmers, on reasonable terms for purchase of production inputs? What is the recent experience of credit disbursement and recovery? What local experience or views are there on savings and credit schemes, group liability for loans, or cash only purchase? * research and extension services: what changes have there been in funding and delivery of research and extension since Structural Adjustment? How might the services become more effective?
- (i) **Seed Cotton Purchase:** review the procedures for purchase of seed cotton and payment of farmers, identify any weaknesses in location of buying points, facilities for sorting and weighing seed cotton storage, transport and quality control; assemble local views on how weaknesses in the system might be overcome.
- (j) **Cotton Prices:** review the trends in seed cotton, lint and cotton seed oil prices over the last five years, calculate movements in the proportion of the end price paid to growers, consider on the basis of production and processing costs whether the proportion paid to growers is reasonable, discuss with farmers and millers whether bonus payments related to quantities and quality of seed cotton are a workable option.
- (k) **Ginneries:** review the operation of ginneries in the region under state, co-operative and private ownership and management, assess the extent to which efficiency has improved or deteriorated

where ownership has changed, discuss with ginnery operators and farmer representatives whether a farmer ownership stake in the processing facility is feasible or desirable.

- (l) Social and Environmental Impact: assess with farmers and other parties the extent to which cotton production has contributed to or reduced social and economic inequality and deprivation in the region. Examine the current and potential future impact of cotton production on environmental improvement or degradation (forest, soil or water loss, chemical residues, etc).
- (m) Consider how the sector's positive impact on poverty alleviation can best be enhanced.

3. Methods

Throughout the consultancy participatory methods of appraisal and consultation should be used, to ensure that the conclusions and proposals made are based on a clear understanding of the priorities of all sectors of the rural community. Particular care should be taken to include more remote and lower potential districts, as well as representatives of disadvantaged farmer groups, in the sample selected for collection and analysis of information. The findings should be reported to and discussed with these groups before submission to the National Project Co-ordinator.