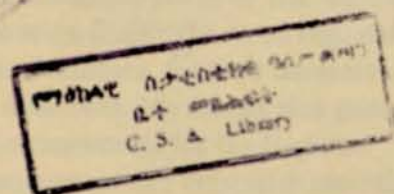


12

**Estimation of Gross Domestic Product
of
Tigray National Regional Administration
(1994/95-1995/96)**

(Phase -One Report)



**Bureau of Planning and Economic Development
of Tigray Region,
November, 1997.
Mekelle, Tigray**

FORWARD

Among the duties and responsibilities vested upon the Bureau of Planning and Economic Development of Tigray region are the preparation of short, medium, and long term operational and perspective development plans in collaboration with other sectoral bureaux, monitoring and evaluating their implementation. Besides, initiating and developing studies which provide macro-economic feature of the region helpful for policy formulation and analysis.

To execute the above duties it is felt necessary to collect and organise data on manpower resources, economic and social infrastructure facilities, activities of all production and service sectors in the region and all other necessary data helpful to formulate appropriate development plans and other economic analysis. Besides, it is also necessary to establish a database which enables estimate the level of growth of each production and service sector and the region's economy at large.

Since the establishment of the Bureau it have been trying to strengthen its database useful for analytical purposes. But the existing interrelated data organisation and management problems in the region and the lack of sufficient manpower with the required skills have been a major bottleneck to meet its duties.

Currently, as part of the endeavours of the bureau efforts are exerted to come up with the compilation and estimation of our region's GDP for two successive years. The document attempts to discuss in detail the main concepts and definitions of basic indicators used in the estimation of regional GDP by economic activity, coverage, sources of data and methods of estimation of each sector/sub-sector.

The document is believed to be less analytical than would be desirable as it's compiled in situations of serious data gaps and absence of reliable data.

This document was made possible by unreserved dedication of the ad-hoc committee members of the regional Bureau of Planning and Economic Development of Tigray region.

It is my hope and belief that once the system of Regional Income Account is established in the region it will serve as an important tool in the hands of governmental decision makers and planners.

I would like to forward my deep most appreciation to the technical assistance put in by the National Accounts Team of the Ministry of Planning and Economic Co-operation (~~Country~~), to all regional bureaux, Ministries, and other institutions which contributed to this document, for their unreserved support in providing the necessary data for the preparation of the document. My thanks also goes to UNECA for their support of financing and making the necessary arrangements for the Regional Workshop on Regional Income Accounting held in Mekelle and assignment of a computer specialist who was helpful in data organisation and processing.

Finally, the Bureau of Planning and Economic Development of Tigray welcomes comments and suggestions which would help to improve the quality of the estimation of Regional Gross Domestic Product (GDP) of the region.

Table of Contents

	<u>Page</u>
Forward-----	I
List of tables-----	II
Part I	
1. Executive Summary-----	V
2. Introduction-----	IX
3. Basic Concepts and definitions of regional accounts aggregates-----	XII
Part II Estimation of Gross value added by economic activity	
Chapter 1 Agriculture and allied activities	
1.1. Crop-----	1
1.2. Livestock-----	10
1.3. Fishing-----	25
1.4. Forestry-----	28
Chapter 2 Industry	
2.1. Mining and Quarrying-----	39
2.2. Manufacturing-----	46
2.3. Electricity, Gas and Water supply-----	63
2.4. Construction-----	70
Chapter 3 Distributive Services	
3.1. Trade-----	76
3.2. Hotels, Restaurants, Bars and others-----	92
3.3. Transport and Communication-----	104
Chapter 4 Other services	
4.1. Banking and Insurance-----	112
4.2. Real Estate and Ownership of Dwellings-----	117
4.3. Public Administration and Defence-----	119
4.4. Education-----	130
4.5. Health-----	142
4.6. Domestic Services-----	148
4.7. Other Services-----	152
Part III Conclusion and Recommendation-----	155

List of Tables

	<u>Page</u>
1. Estimation of gross domestic product by economic activity-----	VII
2. Estimation of Tigray RGDP by economic activity at constant factor cost ,1994/95-1995/96 ----	VIII
3. Proportion of RGDP to national GDP by economic activity at constant factor cost, 1994/95-1995/96--- -----	VIII
4. Distribution of total area cultivated by crop types, 1993/94-1995/96-----	2
5. Production harvested and Growth in the amount produced, 1993/94-1995/96-----	3
6. Estimation of GVA from Crop Sub-sector at Current M.P.,1994/95-----	4
7. Summery of the estimation of GVA from Crop Sub-sector at Current M.P,1994/95-----	5
8. Estimation of GVA of crop sub-sector at current market price ,1995/96-----	6
9. Summery of the estimation of GVA from Crop Sub-sector at Current M.P.,1995/96-----	7
10. Estimation of GVA of crop sub-sector at constant factor cost, 1995/96-----	8
11. Estimation of annual GVA of dung used as a source of fuel, 1993/94-----	14
12. Data on the production aspects and the estimation of GVA of the livestock sub-sector, 1994/95-1995/96-----	17
13.Data on the production aspects and estimation of GVA of the livestock sub-sector , 1994/95-1995/96-----	21
14.Estimation of GVA of fishing production at current factor cost ,1994/95-1995/96-----	26
15.Estimation of GVA of fishing production at constant factor cost, 1994/95-1995/96-----	27
16.Prjeected total population and household size,1994/95-----	30
17.Distribution of households by income class and settlement typology-----	30
18.Expenditure on energy from total income by income group and by settlement typology-----	32
19.Estimation of Gross output of Forest products,1994/95-----	36
20.Estimation of Gross output of Forest products,1995/96 at current F.C.-----	37
21.Estimation of Gross output of Forest products,1995/96 at Constant F.C.-----	38
22.Estimation of GVA from mining sub-sector at current market price, 1994/95-1995/96-----	41
23.Estimation of GVA from minerals for construction at Current F.C.1994/95-1995/96-----	42
24.Estimation of GVA from quarrying at Current M.P, 1994/95-1995/96-----	43
25.Estimation of GVA from quarrying in rural areas at current F.C.,1994/95-1995/96-----	44
26.Gross Value of production and Gross Value Added from Mining, 1994/95-1995/96-----	45
27.Gross Value of production and Gross value Added from Quarrying, 1994/95-1995/96-----	45
28.Summery of the estimation of Gross value added per flour mill by category,1995/96-----	51
29.Summery of the GVA from manufacturing,1994/95-1995/96, both at current and constant F.C.----	55
30.Number of small scale manufacturing enterprises in Tigray region licensed by Trade Bureau, by zone, 1993/94-1995/96-----	56
31.Summery of the estimation of GVA from Medium scale of Manufacturing industries, 1994/95-1995/96-----	57
32. Survey results of the estimation of GVA from grinding mills, 1994/95-----	58
33.Survey results of the estimation or Gross value added from metal and woodworks, 1994/95-----	60
34.Sample survey result on the income of artisians,1995/96-----	61
35.Estimation of GVA from electricity sub-sector for, 1994/95-1995/96 at Current F.C-----	66
36.Estimation of GVA from electricity sub-sector for, 1994/95-1995/96 at Constant F.C.-----	67
37.Estimation of GVA from Urban Water Supply an Sewerage, 1994/95-1995/96 at Current F.C--	68
38.Estimation of water sub-sector GVA from rural and other towns which are not accounted elsewhere ,1994/95-1995/96-----	69
39.Estimation of GVA from Construction undertaken by the central government capital expenditure both at Current and Constant F.C., 1994/95-1995/96.-----	72

40. Estimation of Gross value added of construction from regional government capital expenditure both at Current and Constant F.C., 1994/95-1995/96-----	73
41. Estimation of GVA from private commercial and industrial building constructions ,and construction activities Undertaken by NGOS both at Current and Constant F.C., 1994/95-1995/96-----	74
42. Estimation of GVA from Rural Construction both at Current and Constant F.C, 1994/95-1995/96---	75
43. Estimation of GVA of Urban Dwelling Constructions both at Current and Constant F.C, 1994/95-1995/96-----	75
44. Summery of the Gross Value Added from Grain Trade by category, 1994/95-----	80
45. Summery of the estimation of the GVA per establishment by group, 1994/95-----	81
46. Summery of the GVA estimation from wholesale and retail trade both at Current and Constant F.C., 1994/95-1995/96-----	84
47. Survey result of the estimation of GVA at Current F.C. from Grain trade, 1994/95-----	86
48. Estimation of GVA from liqueur wholesale at Current F.C., 1994/95-----	90
49. Amount of petroleum distributed in Tigray region in 1994/95, by zone-----	91
50. Survey results on the monthly consumption of intermediate input of fuel stations, 1995/96-----	91
51. Summery of the GVA estimation at Curr. F.C. from Hotels, 1994/95, by group of establishment-----	95
52. Summery of the GVA estimation at Current F.C. from Bars, 1995/96, by group of establishment-----	98
53. Summery of the GVA estimation from hotels, bars, restaurants, snack bars, and "miess" houses both at Current and Constant F.C., 1994/95-1995/96-----	99
54. Survey results of the estimation of GVA from Hotels at Current F.C., 1994/95-----	100
55. Survey results of the estimation of GVA from Restaurants at Current F.C., 1994/95-----	101
56. Survey results of the estimation of GVA from Bars at Current F.C., 1994/95-----	102
57. Number of service rendering establishments, amount of capital and number of workers, in Tigray region licensed by Tourism Bureau by, zone, 1993/94-1995/96-----	103
58. Estimation of GVA from Driving Carts of two and 4-wheels for freight transport , 1994/95-----	109-
59. Estimation of GVA from Animal Transport , 1994/95-----	110
60. Estimation of GVA from Telecommunication sub-sector at Current F.C., 1994/95-----	110
61. Estimation of GVA from Postal Service sub-sector both at Current M.P. and Constant F.C., 1994/95---	11
62. Estimation of GVA from Transport and Communication at Constant F.C., 1994/95-1995/96-----	111
63. Esimation of GVA from Banking at CFC, 1994/95-1995/96-----	114
64. Estimation of GVA from Insurance at CFC, 1994/95-1995/96-----	115
65. Estimation GVA from Banking and Insurance at Current and Constant F.C. 1994/95-1995/96-----	116
66. Estimation of GVA from Real state and ownership of dwellings, 1994/95-1995/96-----	118
67. Estimation of GVA from Public administration and Defence sector GVA at Current and Constant F.C., 1994/95-1995/96-----	123-
68. Regional government Revenue from sales and charges, 1994/95-1995/96-----	124
69. Recurrent Expenditure of Regional Government, 1994/95-1995/96-----	125
70. Recurrent Expenditure of Regional Public Administration (Excluding Education and Health), 1994/95-1995/96-----	126
71. Total Capital expenditure of Regional Government , 1994/95-1995/96-----	127
72. Total Capital Expen. of Regional Gov't(Excluding Education and Health), 1994/95-1995/96---	128
73. Total expenditure Municipalities of Tigray Regional Adm., 1994/95-1995/96-----	129
74. Estim. of GVA from Education sector at Current F.C., 1994/95-1995/96-----	134
75. Estim. of GVA from Education sector at Constant F.C., 1994/95-1995/96-----	135
76. Summery of Recurrent Expenditure of education Bureau , 1994/95-1995/96-----	137
77. Pension Contribution for Education sector, 1994/95-1995/96-----	138
78. Recu. Expditure of Mekelle University College, 1994/95-1995/96-----	139
79. Recu Expenditure of Mekelle Business College, 1994/95-1995/96-----	140

80. Estim. of GVA from Health Sector or at Current F.C., 1994/95-1995/96-----	144
81. Estim. of GVA from Health Sector at Constant F.C., 1994/95-1995/96-----	145
82. Estim. of Recurrent Expenditure of Regional Health Bureau, 1994/95-1995/96-----	146
83. Estim. of Capital Expenditure of Health Sub-sector, 1994/95-1995/96-----	147
84. Estim. of GVA from Domestic Services, 1994/95-1995/96-----	151
85. Estim. of GVA from Other Services, 1994/95-1995/96-----	154

Part- I

Executive Summary

Introduction

Basic Concepts and Definitions

Executive Summary

Among the regions which were hard hit by the prolonged civil war and recurrent draught is the Tigray National Regional Administration . Besides the wounds of war and natural calamities , tigray have long been marginalized from development and overall attention by the biased and inappropriate policies of the past regimes .

Since the down fall of the Derge regime and end of the civil war in the country peace and stability has prevailed in the region has enabled to channel immense financial , material , and manpower resources with the integrated effort of the people , government , and other charity organisations to reconstruct and rehabilitate the region . Besides , the New Economic policy launched by the then transitional Government of Ethiopia and other appropriate development policies and strategies devised and being implemented by the government ushered the opening of a new era for the private investment opportunities in the country at large and in Tigray in particular .

This integrated development activities was undertaken in all spheres of the social and economic infrastructures , namely , agriculture and natural resources development , industry , health , education , manufacturing , transport and communication , trade , hotel, domestic and other services .

It is time to measure the impact of all these development activities at a given point of time, the relative progress the region is making over time and the contribution of each activity to the region's economy . This may enable to initiate policy proposals and to devise development directions for the better performance of the economy and improvement of the livelihood of the society . It is with this idea that the regional income accounting is initiated .

Although the experience and lessons acquired before to carryout the task at regional level is known to be minimal , the Bureau of Planning and Economic Development of Tigray region with its limited number of experts and short training's has come up with the output of the initial effort of the regional income accounting task .

With the given accounting estimation the Regional Gross Domestic product real in 1994/95 have been estimated at Birr 2,817.66 millions . In this fiscal year the agriculture sector (along with its allied activities) which dominates the tigray Economy contributed for approximately 63.80 per cent of the regional Gross Domestic Product , and employ's 90 percent of the region's worker .Where as , industry , distributive services and other services contributed about 23.03 % , 4.38%,and 8.8% respectively ,and employ's about 2 % ,4 % ,and 4 % of the regional worker's respectively . In the given year the regional GDP is estimated to have contributed 22.28 % to National GDP .

Similarly , in 1995/96 the overall regional GDP is estimated to have grown by 7.31 % , i.e. ,from the amount stated above to Birr 3023.70 millions . This growth is contributed by 6,67 % in agriculture , 6.93 % in industry ,16.21 %in distributive services ,and 8.55 % in other services . (for further details refer table 1-2) . The Regional GDP in this accounting year is estimated to have constituted 21.62 % of the National GDP .

Besides , the per capita GDP at regional level in 1994/95 and 1995/96 have been estimated in real terms at Birr 904.79 and Birr 946.86 . It showed an increase of 4.46 % in real terms .The per capita food production in kilograms per annum in the two consecutive years is estimated to be 226,86 KGs and 237.61 KGs respectively . The annual per capital meat and milk consumption in 1994./95 production year is estimated at 13.22 KGs and 13 litters per annume respectively where as , in 1995/96 production year 13.49 kgs and 13.74 litters respectively. Egg and butter consumption's are also estimated to be minimal , i.e. ,at an average 6 units of egg and 0.705 kGs of butter per person per annum . Further details of the estimates are presented in the respective chapters .

Table __: Estimation of Tigray Regional Gross Domestic Product by Economic Activity at constant Factor cost and its percentage share from, 1994/95-1995/96.
In million birr

No.	Economic activity	1994/95		1995/96		Real growth rate
		GVA at Cons. F.C.	percentage share(in %)	GVA at Cons. F.C.	percentage share(in %)	
1.00	Agriculture and allied activities	1797.60	63.80	1917.50	63.42	6.67
2.00	Industry	648.75	23.02	693.70	22.94	6.93
3.00	Distributive Services	123.40	4.38	143.40	4.74	16.21
4.00	Other Services	247.91	8.80	269.10	8.90	8.55
	GDP at Current&Constant F.C.	2817.66	100.00	3023.70	100.00	7.31

INTRODUCTION

1.1. General

The economic future of a region depends among other things upon its human and natural resources, its economic structure, the capacity and vigour of the regional economy, government's ability to create a favourable environment, and the actions and aspirations of the private decision makers. Economic analysis in general, and regional accounts in particular, should be designed to help policy makers understand the forces and interactions of various activities in the economy.

In Ethiopia, work on national income accounting started more than four decades ago. Estimates of gross domestic product /GDP/ by kind of activity at current and constant factor cost and the expenditure aggregates at current market prices have been compiled by ministry of Economic Development and co-operation. Due to the centralised nature of administration and planning till recently no attempt was made to explore and develop regional income accounts. Currently, regional governments have the power and responsibilities, under the broad national policies of the country, to devise and implement appropriate development policies and strategies of their economies. The Regional government, taking advantage of the favourable political environment have been making strenuous efforts to put in place viable political and administrative structures as the basis for the development of the region.

In this case, the development of proper and comprehensive accounting system of the economy is undoubtedly felt necessary. This is essential at regional level not only to measure the economic and social status of a region at a given point of time but also the relative progress the region is making over time. In order to do this, it will be necessary to compile data on various aspects of the economy at regional level. The estimation of Regional Gross Domestic product /RGDP/ is of considerable importance to Tigray region as it provides a measure of economic well being of the region, and it gives a measure of the economic growth of the region.

Initial effort has been made by the regional Bureau of planning and Economic Development to estimate Regional Gross Domestic product by supply side in order to indicate the economic growth of the region.

This Document discusses in detail, the coverage, the sources of data and, method of estimation sector by sector. It is divided into four parts. Part I deals with executive summary, introduction, and the system of regional accounts which consists the concepts and definitions of the basic Indicators used in the estimation of Regional Gross Domestic Product /RGDP/ by supply side of the region. Part III deals briefly with the coverage of the study, sources of data used and method of estimation exercised. And part IV deals briefly the major gaps in the existing data system and makes recommendations for the collection of essential statistics required for satisfactory measurement of regional income and construction of the recommended system of Regional accounts.

1.2 Objective

The major objectives of the study can be divided into two parts.

1. Broad objective

-To establish system of Regional; accounts and estimate Regional Gross Domestic Product that indicates level of development and living standard of the people.

2. Specific objectives

-Estimation the Region's GDP by supply current and constant factor cost

To establish economic data base

-To facilitate a smooth flow of economic information between sectoral bureaux and zones with the regional planning and Economic Development bureau.

-To train manpower undertake the task of Regional Income accounting on continuous basis and establish Regional Income account team. And

-Estimation of RGDP by Demand side at current market prices.

1.3 Methodology

The contribution of different sectors to Regional Gross Domestic Product could be estimated by different methods depending upon the nature and availability of data. The three methods used in the estimation regional Gross Domestic product was.

- The production method
- The income method
- The expenditure method .

Out of the three methods, the most common method used for estimating RGDP by economic activity was the production method in order to arrive at the gross value added /GVA/ . This method involves the valuation of gross value of out put of the sectors by deducting the cost the of intermediate in puts used in the process of production to arrive at the GVA. The income method consists of components of factor incomes in the form of wages and salaries, operating surplus and depreciation generated in the process of production. The expenditure method is used in estimating the gross value added contribution to regional GDP of public administration, education, health, construction, etc .

1.3.1 Achievements

- Different formats were developed by referring materials of the work-shop organised by MEDAC .

- Data for estimation of RGDP were collected both at regional, zonal, and Federal Government /Addis Abeba / levels.

- Small Scale Surveys where under taken to fill the data gaps and for cross checking purposes.

- The accounting period for the estimation of TRGDP was selected , 1994/95 and 1995/96 fiscal years.
- The 1994/95 was selected as a base year for the region.
- Estimation of RGDP by supply side at current and constant factor cost was compiled.

1.4 Coverage and major limitations of the study

The regional income accounting task in this initial phase of the study tried to assess all production and service sectors whether it's run/ undertaken by private, community, government or non-government bodies. These sectors may be divided into a number of activities like agriculture, forestry, fishing, mining, quarrying, manufacturing, small scale industries and handicrafts, electricity, water supply, construction, trade, hotels and restaurants transport and communications, real estate and public administration and defence / police and local Militias/, education, health, domestic and other services.

In the course of the study the major limitations were the following :-

1. **The data problems** : As the study assesses a wide range of activities in various sectors of the economy, it required production/service data, price data, various production coefficients and rates in all these activities. In this respect, the data organisation problem in many sectors/sub-sectors, lack of specialised studies in many areas of the sectors and in some areas of the activities data inconsistencies, incomprehensiveness and unsuccessfulness of the data was the major problem.
2. **Supra Regional Characteristics of some activities**: Activities whose operation extends beyond the boundary of one region or activities which are administered by Federal Government serving all regions equally is said to have a supra regional activity. In this particular case the air transport and defence are activities which have such characteristics. Such type of activities until they are studied and our share is estimate, it has currently been difficult to aggregate them in the regional GDP of our region.
3. **Lack of sufficient references and experience**: As the exercise of developing regional accounts is the an initial effort there was an obvious lack of experience and reference materials to get through with the task in acceptable time . The references we have at hand are the training workshop manuals only , and the technical consultancy help expected from UNECA was not more than computer training.
4. **Logistics Problems** : As the task requires discussions and contacts with various sector offices at all levels, farmers owners of establishments, enterprises institutes about their activities and other field works, although the bureau has done its best to tackle the problem, the assignment of a vehicle specifically meant for the study was felt necessary. This problem had a contribution to limiting field works. Besides, the help of computers in data storage organisation and analysis during the study was crucial . However, the computer we had among six /then three/ experts was only one. Although the UNECA had sent two laptop computers they were worn out and helpless and sent back soon.

BASIC CONCEPTS AND DEFINITIONS OF REGIONAL ACCOUNTS AGGREGATES

The basic concepts and definitions of the terms used in estimation of Regional Gross Domestic product by supply side largely follow those given in the UN-system of National accounts ,and is described in detail below .

1.1 Regional Gross Domestic Product / RGDP /

Regional Gross Domestic Product by definition is a measure in monetary terms of the volume of all goods and services produced by an economy during a given period of time , accounted with out duplication . The measure obviously has to be in value terms as the different units of production and different measures of services are not directly additive . In the case of a closed economy the measure amounts to domestic product . An important characteristic of this measure is its comprehensiveness . The measure covers all the goods and services produced by the residents of a region . Thus ,the goods cover all possible items produced as for example , agricultural crops , livestock and livestock products mineral products, manufacturing of various consumer items for consumption , machinery transport equipment , etc . ,construction of buildings , roads, dams , bridges , etc. The services , similarly cover a wide spectrum including health and education services , trading services , domestic services , government services , etc .

All goods and services produced during the period have to be included whether they are marketed i.e. , exchanged for money or bartered or produced for own use . For example , some of the products of agriculture , forestry and fishing are used for own consumption of producers and therefore an imputed value of these products are also to be included . Similarly , accounts must also be taken of the rental of buildings which are owned and occupied by the owners themselves . Own account construction activities are also similarly to be included . However certain other activities like some services of house wives are excluded from production due to the problem of measurements .

Another important feature of the measure is that it is an unduplicated value of output or in other words only the value added at each stage of processing is taken into account while measuring the total , i.e. ,in the measurement of regional output a distinction is made between "final " and " intermediate" products and unduplicated total is one that is confined to the value of the final products and excluded all intermediate products . Thus the Regional Gross Domestic Product is not the total value of goods and services produced but only the value of the final products excluding the value of inputs of raw materials and services used in the process of production .

The concept of RGDP corresponds to a similar concept of Gross Domestic product at national level . In addition to GDP , there is the concept of Gross National

Product /GNP /, while RGDP refers to production originating within the geographic boundaries of the region , GNP refers to the income accruing to the region .

GNP is derived from GDP by adding the net factor income received from abroad . At the regional level, one can envisage a concept of income accruing corresponding to the GNP at national level . The Two measures , 1) income originating ,and 2) income accruing may make substantial difference in the estimates at regional level . For example , there may be absentee landowners in a region who may primarily live in another region and hence transfer the income earned from the property in one region for use in other region . Similarly an employee or the owner of an enterprise may have his residence in another . Therefore , in regions surrounding a metropolitan city , and also in smaller regions , the issue of place if residence versus place of activity becomes much more relevant and concerns not only income from capital but also income from labour . Such measurements have to be well defined and the statistics to be collected for the purpose have to a joint endeavour of central and regional authorities .

As stated already the difference between the two concepts is due to inter-regional transfers of factor incomes between regions . In the case of the nation , it is comparatively easy to compile GNP from GDP as the transactions between the country and other countries are generally well recorded and maintained in foreign trade statistics as well as balance of payment statistics . As against this , the regional boundaries within the country are open and there are not only free flow of goods among regions but also mobility of factors of production in the form of labour and capital between regions , and these transactions are not recorded and such statistics are not maintained . Therefore it is difficult to measure regional product on an accruing basis for the timing .

The regional income could be measured either on a gross basis or a net basis . The difference between the two is that in the gross estimates no deduction is made for consumption of fixed capital / CFC / . Which takes place in the process of production , where as in the net measure such allowances are made . Capital is one of the primary factors used in production and this results in the CFC and hence , a reduction in the economic life of capital . In other words , the capital depreciates as a result of its use in the process of production . The CFC measures the replacement value of the part of the capital stock which has been used up in the production process during the year .

Regional Gross Domestic product may be compiled by kind of activity . For this purpose the regional economy may be divided into a number of activities like agriculture , forestry , fishing . mining and quarrying , manufacturing , small scale industries and handicrafts , electricity and water supply , construction , trade , hotels , and restaurants , transport and communication , real estate and ownership of dwellings , banking and insurance , public administration and defence , education services , health services , domestic and other services . Each of the group may be further divided into sub- sectors depending upon the importance of the activity and availability of data at regional level . While the details of sources and methods of estimation of each activity will be discussed in detail in the following chapters .

The contribution of different activities to Regional Gross Domestic Product could be estimated by different methods depending upon the nature of available data . The three methods which could be adopted are :

- i) The production method

ii) The income method , and

iii) The expenditure method .

The first approach looks at the way output is produced . It measures the contribution to output made by each producer , by deducting from the total value of its output the value of the goods and services it has purchased from other producers and used up in producing its own output . What is left is the value added by the producer in question , what is used up in production is intermediate consumption . With some minor adjustments , the total value added by all producers equals RGDP . this method of compilation is commonly known as the production approach to RGDP .

The second approach considers the costs incurred by the producer within his own operation . The income paid out to employees , indirect taxes , consumption of fixed capital , and the operating surplus ; this also adds up to value added . this method is often called the income approach , but may more exactly be referred to as the cost approach .

The third method , known as the expenditure approach , looks at the final uses of regions output for private consumption , government consumption , capital formation and net exports , in other words , it shows what becomes of the output once it has been produced .

The scope and coverage of different transactions appearing in the accounts under which all items of revenue and expenditure are classified below .

1.2 Intermediate Consumption represents consumption of raw materials , stores and spare parts , water , power and fuel ; freight charges ; handling and inspection charges ; advertisement expenses ; insurance premium ; commission , stationery ; printing ; telephone bills , postage and telegrams ; travelling and daily allowances, legal expenses , rates and taxes and bank charges . Current repairs and maintenance of fixed assets are covered here .

1.3 Compensation of employees consists of 1) wages and salaries , and 2) Pensions .

Wages and salaries include pay of officers and staff , house rent allowances , dearness allowances , city compensatory allowances over time allowances , provident funds and value of benefits in kind . the pension fund represents the actual amount of pensions paid during the accounting year including the commuted value of pension .

1.4 Consumption of fixed capital represents the current replacement cost of the reproducible fixed assets used up during the period of account as result of normal wear and tear , foreseen obsolescence and the normal rate of accidental damage .Unforeseen obsolescence , catastrophes and the depletion of natural resources are not taken into account .

1.5 Operating surplus is measured as the excess of gross output at market prices of an enterprise over the sum of its intermediate consumption , compensation of employees , consumption Of fixed capital and indirect taxes , net of subsidies .

1.6 Output of goods and services consists of the value at market prices of goods and services produced by the enterprises . The total value of sales of goods and

services during the year is adjusted for net changes in stocks of finished and semi-finished goods and work in-progress to obtain estimated of the output .

1.7 Indirect taxes cover taxes assessed in respect of production , sales , purchases or use of goods and services of producers which they charge to production . The principal taxes in this category are state excise duties , general sales tax , regulatory duty on motor spirit , diesel oil , taxes on vehicles , electricity duties , sale of judicial and non-judicial stamps ; registration fees , entertainment tax . etc .

1.8 Subsidies include all grants on current account , which industries receive from the government . These take the form of either direct payments to producers or the difference between the buying and the selling prices of government trading organisations

1.9 Choice of Base year as the name implies the period that provides the weights for an index is described as the base year . This period usually (but not always) coincides with the reference period to which the comparisons relate . In our case the 1994/95 is taken as the base year .

The general rule for choosing the base year is that in principle it should be a " normal " year . However , as the reader clearly understands it is very difficult to find such a period as " normal " refers to a number of important variables that reflects the situation of the regional economy and / or market behaviour .

Nevertheless , for the practical situation at hand , the year 1994/95 in Tigray could be sited as a " normal " period /or year in terms of agricultural production , and for its data accessibility to treat the give year as a base year .

1,10 Factor cost versus Market prices

The production and income approach measures the domestic product as the cost paid to the factor of production and is known as domestic product at factor cost . However , the various forms of final output when considered from the point of expenditure are valued at market prices i.e. , the actual price which either the consumers or producers pay for purchase of goods and services where for consumption or for investment . This measurement is called the expenditure at market prices . When valued in this way this measure will be different from the product or income measure factor cost . The market value of the goods and services will include the indirect taxes like excise duties customs , sales tax etc. , levied by the government on the goods and services . Similarly , the price paid by the consumer will not include any subsidy which the government pays to the producer . Hence , the market value of final expenditure would exceed the total obtained at factor cost by the amount of indirect taxes reduced by the value of subsidies . Domestic Product can therefore be measured either at market prices or at factor cost one differing from the other by the amount of net indirect taxes (indirect taxes less subsidies) .

1.11 Current versus constant prices

Regional income regardless of the concept is obviously measured at prices prevailing during the period or in other words at current prices . When calculated over a number of years , the changes in regional income would , therefore , include implicitly not only the effect of the changes in production but also the changes in prices . This estimate compared over the period would not , therefore , give a proper measure of the overall real increase in production of the region or the economic welfare of the people or growth of the economy . Therefore , it would be necessary to eliminate the effect of prices , or in other words to recompute the whole series at given prices of one particular base year . Regional income thus computed is termed as regional income at constant prices or in real terms . Therefore , the some of the indexes used to deflate the Gross value added estimated at current factor cost to constant are :

- extrapolation method
- volume index method
- wage index method ,and
- double-deflation method .

Part- II

Estimation of Gross Value Added by Economic Activity

Chapter-1

Agriculture and Allied Activities

- Crop Production
- Livestock Production
- Fishery
- Forestry

AGRICULTURE

Introduction

Over 80% of the region's population is directly or indirectly engaged in agriculture. The largest proportion of the regions GDP and foreign earnings is constituted by agriculture.

Therefore, measuring its level of growth and contribution to the overall growth of the region's economy is important to initiate policy proposals and development program for better performance of the sector. It is with this idea that the regional agricultural income accounting is initiated.

In the agricultural sector, the main sub-sectors included are the crop and livestock sub-sectors. In both sub-sectors major economic activities undertaken by peasants, commercial farmers, enterprises, non-governmental organizations and others have been considered in accounting the gross value added of the sector.

In the crop sub-sector it has been tried to include the growing and production of field crops, provision of agricultural services, for instance, extension services to establish and promote the growth of crops and/or protect from diseases or insects both in the main and bulg seasons.

In the livestock sub-sector the rearing of animals and poultry and production of livestock products such as meat, milk, and milk products (butter and cheese), raw hides and skins, eggs, honey, beeswax and animal dung meant for fuel have been accounted to estimate gross value added of the sub-sector.

In the livestock sub-sector although the major sources of data were CSA survey studies and BoA&NRD for Tigray region lots of other sources and own small scale surveys had a contribution in the course of estimating the value added of the sub-sector. Whereas in the crop sub-sector the main source of data is the BoA&NRD for the region.

The methodology applied to estimate the gross value added of the sector in both is largely the production approach and in some part of the livestock sub-sector (particularly the dung meant for fuel) we used the expenditure approach to estimate the value added.

Further details of the coverage, sources of data and methodologies applied in both sub-sectors are presented as follows.

1. Crop Sub-Sector

Coverage and Sources of data

In this sub-sector it has been tried to include cereals, pulses, oilseeds, vegetables, fruits, and stimulant crops for this accounting purpose. The crop byproducts (hay & straw) haven't been accounted in the estimation for the very reason that as it's an output in crop sub-sector it's an input in the livestock sub-sector. Therefore, as they offset each other within the same sector

including it in both sub-sectors is believed to have little or no significance in the gross value added of the agricultural sector. Whereas crop residues used as source of fuel are accounted in the forestry sector.

The main source of data in this sub-sector is BoA&NRD for Tigray region. This source have been preferred to CSA first, its comprehensive and wide range assessment of crop types produced within the region and wereda based monthly successive producers' price data, secondly, its clear description of factors and their share for crop losses, and thirdly, its estimation of some region specific crops like "Dokoko" and "Hanfetse" which weren't considered in the CSA survey study documents.

In this sub-sector all crops produced (in Belg & Main seasons) in the given production year and all intermediate inputs used (traditional seeds, and seedlings, improved seeds, commercial fertilizers, chemicals, and others) have been considered to estimate the annual value added of the sub-sector.

Methods of Estimation

The methodology exercised to estimate the value added of the sub-sector is the production approach.

The total area cultivated, production harvested, and the producers' price data have been compiled from zonal departments of A&NRD. This enabled us to distinctly compile the rainfed and irrigated productions, the Bulge and Main season productions.

With regard to the compilation of the amount utilized and price of intermediate inputs the modern inputs (improved seeds, commercial fertilizers and chemicals) distributed to farmers by the BoA&NRD within the given

production year have been accounted. Whereas, the traditional seeds used have been estimated from the seeding rates of various crop types with farmers' management practices (converting the local measurements to Kgs and then to Qts). The particular source is the field survey results of BoA&NRD (Gebremedhin, 1989E.C.).

The input which was differently treated is the seed inputs of the fruit trees, cash and stimulant crops. As these permanent crops give production after 3-5 years and for the next several years, it was found to be difficult to estimate the intermediate inputs (particularly the seed input) at a given production year. At last we agreed to consider the cost of new plantings of these permanent crops in the given accounting year. For the consecutive production years the cost of seedlings planted have been taken as the cost of intermediate inputs.

Here, it's important to note that such type of crops (except the stimulants) are distributed to farmers freely (and/or at a highly subsidized price). But however, for this accounting purpose, we took the average cost of other tree seedlings to estimate the cost of fruit tree seedlings, cash and stimulant crop seedlings planted in the given production year.

Besides, there are very few crops, such as linseed and some vegetable crops, which aren't sufficiently estimated and not included in the income accounting. Such data are believed to have little impact on the comprehensiveness of the value added of the sub-sector.

Value Added of Crop Sub-Sector

Area cultivated

according to the data compiled from zonal departments of A&NRD the total area cultivated in 1993/94, 1994/95, and 1995/96 production years were 919508.63ha, 949959.7 ha and 1016377.22ha both in the main and bulge seasons respectively. Whereas the CSA documents estimate the total cultivation in the three consecutive years were 1605983ha, 534550ha, and 509220ha respectively. For the above given CSA estimates neither of the documents have stated justifications for the high variabilities of land cultivations, for instance a 67% decrement in 1994/95, from year to year. In this case there is an important reason to consider BoA&NRD estimates to account the gross value added of the sub-sector. Therefore, the cultivated area distribution among various crop types and their change in cultivation from year to year is presented in the following table.

Table—: Distribution of the total area cultivated by different crop types (in 000's) and change in cultivation (in %) from 1993/94 through 1995/96 production years.

	Area cultivated (in has)			Growth (in %)	
	1993/94	1994/95	1995/96	1994/95	1995/96
Cereals	784.10	803.27	850.92	2.44	5.93
Pulses	65.66	60.80	64.58	-7.40	6.22
Oilseeds	66.98	76.46	92.14	14.16	20.50
Vegetables	0.98	2.02	1.96	106.40	-3.30
Fruits	0.098	0.107	0.12	10.00	10.93
Cash crops	1.65	7.28	6.64	339.00	-8.79
	919.51	949.96	1016.37	3.31	6.99

As have been shown above the area cultivated with various crop types were changed in a given year and/or from year to year at different rates but in gross the total area cultivated increased slightly among the three consecutive production years at the rate of 3.31% and 6.99% respectively.

Production harvested

According to BoA&NRD the total production harvested in 1993/94, 1994/95 and 1995/96 fiscal years were 6680760.49Qts, 7141363.18Qts and 7199359.38Qts respectively.

Similar to the change in area cultivation the production harvested also varied from crop to crop and from year to year.

In general, as is shown in the table below the production in gross increased from 1993/94 to 1994/95 fiscal year by 6.89% and by 0.81% from 1995/96 to 1996/97 fiscal year.

Table— :Production harvested (in 000's) and change in the amount produced in 1993/94 to 1995/96 fiscal years .

	Production 1993/94	harvested(in Qts)		Growth	
		1994/95	1995/96	1994/95	1995/96
Cereals	5914.51	6149.04	6296.30	3.97	2.39
Pulses	340.44	351.15	314.80	3.14	-10.35
Oilseeds	326.28	312.40	345.66	4.25	10.65
Vegetables	63.15	249.23	172.12	294.65	-30.94
Fruits	10.87	11.95	13.22	10.00	10.58
Cash crops	25.50	67.57	57.26	165.00	-15.27
	6680.76	7141.36	7199.36	6.89	0.81

Producers' price

The prices of crops used for valuating the harvested productions are the producers' price established at wereda level and compiled by the zonal departments of A&NRD. In this case, we took the average prices of all zones representing the producers' price of the region. It is also important to note that the successiveness and comprehensiveness of the price data compiled by the BoA&NRD was found to be better than the price data compiled in the CSA documents.

Value Added of the Crop Sub-Sector

The gross value of production, i.e. the GG value of production less the total value of intermediate inputs, in 1993/94, 1994/95, and 1995/96 production years is estimated at Birr 7,733.30 million, Birr 8,749.86 million, and Birr 8,190.80 million respectively. The nominal growth rate among the three consecutive years are 13.15% and -6.39%. The negative growth is because of the combined effect of the price decrement and an increase in inputs use.

Table 6 : Estimation of Gross Value of Production from Crop-Subsector, 1994/95 Prod. Year.

Type of Crops	Area Cultivated in Hec	Total Production Net of wastage (In Qnts)	Producers' Price (Birr/Qnt)	Gross Gross Value of Production (Birr)	Seeding Rate In (Qnt/Hec)	Quantity of Traditional Seed Inputs (qnts)	Value of Traditional Seed Input (Birr)	Gross Value of Production (Birr)
	2	3	4	5=(3x4)	6	7=(2X6)	8=(4x7)	9=(5-8)
1.0 Gross Value of Production and Consumption of Traditional Seed Inputs								
1.1. Cereals	803276.81	6149045.90		1080715230.56			112862660.75	967852569.81
Teff	140330.39	638139.05	238.79	152378039.38	0.45	63148.68	15078957.11	137299082.28
Barley	143203.07	1360091.29	182.62	248386468.99	1.62	231988.97	42366951.75	206019517.24
Wheat	90444.85	597952.13	196.45	117464724.56	1.87	169131.87	33225115.14	84239609.43
Maize	81724.49	720271.54	159.47	114865103.37	0.39	31872.55	5082866.23	109782237.13
Sorghum	218469.38	2022711.59	150.28	303973759.94	0.18	39324.49	5909696.99	298064062.95
Millet	117718.60	728011.24	177.75	129401917.88	0.37	43555.88	7741933.25	121659984.63
Other cereals(E.g.Hanfets)	11386.03	81869.06	174.00	14245216.44	1.75	19868.62	3457140.29	10788076.15
1.2. Pulses	60800.77	351151.82		75474983.46			13528155.28	61946828.18
Field Peas	9224.90	54556.22	225.11	12281217.80	1.62	14898.21	3353753.35	8927464.45
Horse bean	21128.26	149572.75	212.49	31782645.26	1.14	24086.22	5118069.11	26664576.15
Chick peas	12704.02	54274.35	222.42	12071888.30	0.63	8003.53	1780173.35	10291714.95
Haricot bean	3517.25	20143.42	162.78	3278926.72	1.00	3517.25	572534.61	2706392.12
Lentils	7995.42	35218.49	254.37	8958665.66	1.00	7995.42	2033826.40	6924839.26
Vetch	5924.17	35883.34	189.01	6782449.64	0.54	3199.05	604665.22	6177784.42
'Dokoko'	306.75	1503.25	212.33	319190.08	1.00	306.75	65133.25	254056.83
1.3. Oil seeds	76466.11	312403.17		78421294.88			20099752.52	58321542.36
Neug	4380.91	11999.94	206.67	2480079.03	0.24	1051.42	217301.15	2262777.88
Lin seed(flax)	7878.54	26590.43	216.43	5755026.91	0.29	2284.78	494499.37	5260527.54
Sunflower	18.00	24.00	180.94	4342.50	0.23	4.05	732.80	3609.70
Fenugreek	559.55	1981.63	331.82	657536.21	0.11	58.75	19495.09	638041.12
Sesame	63629.11	271807.17	255.79	69524310.23	1.19	75718.64	19367724.11	50156586.12
1.4. Vegetables	2025.29	249235.23		72710376.46			1016231.81	71694144.65
Onion	921.24	115994.76	313.29	36339611.71	0.04	36.85	11544.43	36328067.29
Garlic	NA	NA					NA	NA
Pepper	265.15	14711.54	808.84	11899331.05	0.10	25.19	20373.93	11878957.13
Potatoes	221.20	41225.90	230.48	9501708.62	19Qnt/Ha	4202.71	968635.70	8533072.93
sweat potatoes	1.55	108.60	150.00	16290.00	0.15	0.23	34.77	16255.23
Tomatoes	269.73	38831.37	237.98	9241172.64	0.19	51.25	12196.05	9228976.59
Cabbage	136.56	17860.59	151.29	2702084.01	0.01	0.68	103.30	2701980.71
Lettuce	40.04	5249.22	131.03	687806.89	0.02	0.68	89.19	687717.70
Swisschard	66.57	6871.47	119.68	822401.96	0.06	3.99	478.04	821923.92
Carrot	81.97	6696.68	168.25	1126716.41	0.15	12.30	2068.72	1124647.69
Redbeets	21.30	1685.10	221.50	373253.16	0.15	3.20	707.70	372545.46
1.5. Fruits	107.80	11954.80		2690197.54			1014.15	2689183.39
Oranges	4.40	533.50	379.13	202263.19		0.00	33.00	202230.19
Lemons	3.30	440.00	246.50	108460.00		0.00	0.00	108460.00
Bannanas	84.70	3377.00	230.75	779242.75		0.00	78.45	779164.30
Pappaya	9.90	7163.20	210.50	1507853.60		0.00	856.20	1506997.40
Manderin	1.10	1.10	180.00	198.00		0.00	0.00	198.00
Others(Annanas,Zietihun, etc...)	4.40	440.00	209.50	92180.00		0.00	46.50	92133.50
1.6. Cash crops	7282.98	67572.26		24445375.80			18.15	24445357.65
cotton	6983.45	53239.00	360.71	19204017.15		0.00	0.00	19204017.15
Chat	23.10	213.40	250.00	53350.00		0.00	0.00	53350.00
Coffee	17.60	242.00	1400.00	338800.00		0.00	18.15	338781.85
Gesho	258.28	13853.11	350.00	4848589.90		0.00	0.00	4848589.90
Sugercane	0.55	24.75	25.00	618.75		0.00	0.00	618.75
Total	949959.75	7141363.18		1334457458.70			147507832.66	1186949626.03

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2.0 Consumption of modern inputs

Type of Input	Unit	Qty	Unit Price	Total
2.1. Comm. fertilizer(s)				
Dap	Qts	35406.50	143.24	5071784.48
Urea	"			9194.50
2.2. Improved seed(s)				
Wheat	"	45307.50	133.00	6025897.50
Teff	"	2053.66	250.00	513415.00
Maize	"	835.00	162.00	135270.00
2.3. Chemicals				
Actelio 2%	"	34.11	19.80	675.42
Malathin	Liters	69.75	35.10	2448.23
Total			Birr	11758685.13

Table 7 :Estimation of G.V.A. of Crop Sub-sector at Current M.P. ,1994/95 Prod. Year.

	Unit	
GG Value of production at the current market price	Birr	1334457458.70
Value of traditional seed inputs at the current market price	Birr	147507832.66
Value of modern inputs at the current market price	Birr	11758685.13
G.V.A. of Crop S-s at Cur. M.P.	Birr	1175190940.91

Table :Estimation of Gross Value of Production from crop-Subsector, 1995/96 Prod.Year.

Type of Crops	Area Cultivated In Hec	Total Production Net of wastage (In Qnts)	Producers' Price (Birr/Qnt)	Gross Value of Production (Birr)	Seeding Rate In (Qnt/Hec)	Quantity of Traditional Seed Inputs (qnts)	Value of Traditional Seed Input (Birr)	Gross Value of Production (Birr)
1	2	3	4	5=(3x4)	6	7=(2X6)	8=(4x7)	9=(5-8)
Cereals	850924.09	6295301.25		1071088548.31			120176327.09	950912221.21
Teff	160449.78	707743.21	236.77	167572359.83	0.45	72202.39	17095360.35	150476999.48
Barley	153537.08	1018778.67	181.27	184674008.60	1.62	248730.06	45087298.25	139586710.36
Wheat	92394.44	627348.68	196.88	123512408.12	1.87	172777.60	34016454.44	89495953.68
Maize	70123.11	640846.98	142.31	91198933.72	0.39	27348.01	3891895.72	87307038.01
Sorghum	239543.33	2523447.10	144.73	365218498.78	0.18	43117.80	6240439.11	358978059.68
Millet	115982.17	689648.61	176.73	118346998.85	0.37	42913.40	7584085.69	110762913.15
Oates	33.00	268.00	388.75	104185.00	1.57	51.81	20141.14	84043.86
Other cereals(E.g.'Hanfets')	18861.20	108220.00	189.07	20461155.40	1.75	33007.10	6240652.40	14220503.00
Pulses	64585.45	314803.24		72427602.44			15038534.76	67389067.67
Field Peas	11121.48	44754.28	205.67	9204556.82	1.62	17961.18	3694053.88	5510502.95
Horse bean	20587.32	104271.16	228.60	23836508.83	1.14	23469.54	5365165.32	18471343.50
Chick peas	13240.16	83813.94	243.41	20401203.52	0.63	8341.30	2030361.24	18370842.28
Haricot bean	4067.00	17447.05	218.20	3806917.23	1.00	4067.00	887412.62	2919504.61
Lentils	7617.26	24853.09	273.11	6787664.49	1.00	7617.26	2080360.15	4707304.34
Vetch	7242.95	36804.45	210.83	7759565.48	0.54	3911.19	824605.78	6934959.70
'Dokoko'	709.29	2859.28	220.75	631186.06	1.00	709.29	156575.77	474610.29
Oil seeds	92146.74	345660.51		120194842.70			34473684.72	85721157.98
Neug	5863.38	19974.78	205.67	4108138.10	0.24	1407.21	289415.80	3818722.49
Lin seed(flax)	8009.86	23984.93	226.79	5439577.78	0.29	2322.86	526804.83	4912772.95
Fenugreek	1310.50	4008.00	350.00	1402800.00	0.11	137.60	48160.88	1354639.13
Sesame	76963.00	297692.80	366.97	109244326.82	1.19	91585.97	33609303.41	75635023.41
Vegetables	1958.48	172117.38		58803656.21			584111.54	58219544.68
Onion	829.41	77090.63	334.14	25758731.19	0.04	33.18	11085.39	25747645.80
Garlic	16.00	325.00	413.91	134521.97	0.01	0.10	39.74	134482.23
Pepper	596.52	26218.68	370.05	9701384.01	0.01	3.58	1324.43	9700059.58
Potatoes	131.34	21769.76	220.18	4793320.27	19.00	2495.50	549464.99	4243855.28
sweet potatoes	3.11	301.89	150.00	45283.50	33000St.Cu	0.01	1.50	45282.00
Tomatoes	157.68	23564.30	689.21	16240783.93	0.19	29.96	20648.61	16220135.32
Cabbage	70.03	8840.61	84.53	747326.23	0.01	0.35	29.60	747296.63
Lettuce	39.76	2991.44	104.67	313104.05	0.02	0.68	70.75	313033.31
Swisschard	63.61	7047.91	63.86	450092.96	0.06	3.82	243.74	449849.22
Carrot	36.58	2897.62	131.44	380857.14	0.15	5.49	721.20	380135.94
Redbeets	14.44	1071.54	222.34	238250.97	0.15	2.17	481.60	237769.37
Fruits	119.58	13219.89		2283171.42		0.00	1281.30	2282125.32
Oranges	4.84	586.85	163.75	96096.69		0.00	0.00	96096.69
Lemons	3.63	484.00	159.10	77004.40		0.00	0.00	77004.40
Bannanas	93.17	3714.70	173.68	645176.76		0.00	29.85	645146.91
Pappaya	10.89	7879.52	173.68	1368531.29		0.00	1018.25	1367515.04
Zlethun	1.00	69.72	173.68	12109.11		0.00	0.00	12109.11
Mandarin	1.21	1.10	173.68	191.05		0.00	0.00	191.05
Others	4.84	484.00	173.68	84062.12		0.00	235.20	84062.12
Cash crops	6642.88	57257.11		16205235.32		0.00	775.05	16205235.32
cotton	6313.00	41292.50	252.70	10434791.72		0.00	0.00	10434791.72
Chat	25.41	234.74	250.00	58685.00		0.00	0.00	58685.00
Coffee	19.36	266.20	1400.00	372680.00		0.00	775.05	372680.00
Gesho	284.11	15238.42	350.00	5333447.35		0.00	0.00	5333447.35
Supercane	1.00	225.25	25.00	5631.25		0.00	0.00	5631.25
Total	1016377.20	7199359.37		1341003056.40			170274714.47	1170726126.63

Table :Total Qty and cost modern intermediate inputs utilized in 1987/88 prod. year & its price by zone

Type of Input	Unit	Qty	Total Cost
Comm. fertilizer(s)			
Dap	Qts	56730.40	7472370.60
Urea	"	7448.00	1251348.00
Improved seed(s)			
Wheat	"	8636.57	1873919.12
Teff	"	1289.23	466146.06
Maize	"	220.20	26425.20
Chemicals			
Actelic 2%	"	11.80	675.42
Malathin	Liters	394.75	2448.23
2-4-D	"	76.00	3496.60
Grand star	Kgs	38.03	1261.28
Zinc Phosphate	Kgs	31.00	372.00
		Birr	11098462.51

Table :Estimation of Gross Value Added of crop-Subsector in 1995/96 Prod.Year at current factor cost.

	Unit	
GG Value of production at current market price	Birr	1341003056.40
Value of traditional seed inputs at cur. market price	Birr	17024714.47
Value of modern inputs at current market price	Birr	11098462.51
G.V.A. of Crop S-s at Curr. F.C.	Birr	1312879879.42

Table 10 :Estimation of Gross Value of Production from crop-Subsector in 1995/96 Prod.Year at the base year price(1994/95).

Type of Crops	Area Cultivated in Hec	Total Production Net of wastage (In Qnts)	Producers' Price (Blrr/Qnt)	Gross Value of Production (Blrr)	Seeding Rate in (Qnt/Hec)	Quantity of Traditional Seed Inputs (qnts)	Value of Traditional Seed Input (Blrr)	Gross Value of Production (Blrr)
1	2	3	4	5=(3x4)	6	7=(2X6)	8=(4x7)	9=(5-8)
1.0 Gross Value of Production and Consumption of Traditional Seed Inputs								
1.1. Cereals	850924.09	6296301.25		1097678244.21			120838625.75	976839618.47
Teff	160449.76	707743.21	238.79	168998469.42	0.45	72202.39	17240848.89	151757620.53
Barley	153537.08	1018778.67	182.62	186054302.09	1.62	248730.06	45424290.47	140630011.62
Wheat	92394.44	627348.68	196.45	123239530.11	1.87	172777.60	33941301.32	89298228.79
Maize	70123.11	640846.98	159.47	102198894.12	0.39	27348.01	4361316.76	97837577.36
Sorghum	239543.33	2523447.10	150.28	379224456.32	0.18	43117.80	6479757.01	372744699.31
Millet	115982.17	669648.61	177.75	119028127.15	0.37	42913.40	7627734.76	111400392.39
Oates	33.00	268.00	388.75	104185.00	1.57	51.81	2014.14	84043.86
Other cereals(E.g 'Harfets')	18861.20	108220.00	174.00	18830280.00	1.75	33007.10	5743235.40	13087044.60
1.2. Pulses	64585.45	314803.24		67599071.26			14376126.74	53223944.51
Field Peas	11121.48	44754.28	225.11	10074691.03	1.62	17961.18	4043263.80	6031427.22
Horse bean	20587.32	104271.16	212.49	22156531.11	1.14	23469.54	4987032.84	17169498.27
Chick peas	13240.16	83813.94	222.42	18642185.89	0.63	8341.30	1855300.92	16786884.97
Haricot bean	4067.00	17447.05	162.78	2840014.18	1.00	4067.00	662022.39	2177991.80
Lentils	7617.26	24853.09	254.37	6321977.31	1.00	7617.26	1937631.08	4384346.23
Vetch	7242.95	36804.45	189.01	6956551.28	0.54	3911.19	739269.80	6217281.48
'Dokoko'	709.29	2859.28	212.33	607120.45	1.00	709.29	150605.91	456514.54
1.3. Oil seeds	92146.74	345660.51		86794779.70			24265590.02	62529189.68
Neug	5863.38	19974.78	206.67	4128273.39	0.24	1407.21	290834.12	3837439.27
Lin seed(flax)	8009.86	23984.93	216.43	5191111.57	0.29	2322.86	502741.71	4688369.86
Fenugreek	1310.50	4008.00	331.82	1329917.86	0.11	137.60	45658.69	1284259.17
Sesame	76963.00	297692.80	255.79	76145476.89	1.19	91585.97	23426355.50	52719121.39
1.4. Vegetables	1958.48	172117.38		59459651.03			597621.18	58862029.85
Onion	829.41	77090.63	313.29	24151466.50	0.04	33.18	10393.70	24141072.81
Garlic	16.00	325.00	413.91	134521.97	0.01	0.10	39.74	134462.23
Pepper	596.52	26216.68	808.84	21205186.60	0.01	3.58	2894.92	21202291.67
Potatoes	131.34	21769.76	230.48	5017474.94	19.00	2495.50	575160.15	4442314.79
sweet potatoes	3.11	301.89	150.00	45283.50	33000St. Cuttings	0.01	1.50	45282.00
Tomatoes	157.68	23564.30	237.98	5607882.61	0.19	29.96	7129.89	5600752.72
Cabbage	70.03	8840.61	151.29	1337473.79	0.01	0.35	52.97	1337420.81
Lettuce	39.76	2991.44	131.03	391969.29	0.02	0.68	88.57	391880.72
Swisschard	63.61	7047.91	119.68	843518.93	0.06	3.82	456.78	843062.14
Carrot	36.58	2897.62	168.25	487524.57	0.15	5.49	923.19	486601.38
Redbeets	14.44	1071.54	221.50	237348.34	0.15	2.17	479.77	236868.57
1.5. Fruits	119.58	13219.89		2973803.83		0.00	1281.30	2955421.85
Oranges	4.84	586.85	379.13	222489.51	0.00	0.00	0.00	222489.51
Lemons	3.63	484.00	246.50	119306.00	0.00	0.00	0.00	119306.00
Bananas	93.17	3714.70	230.75	857167.03	0.00	0.00	29.85	857137.18
Papaya	10.89	7879.52	210.50	1658638.96	0.00	0.00	1016.25	1657622.71
Zizithun	1.00	69.72	209.50	14606.34	0.00	0.00	0.00	14606.34
Mandarin	1.21	1.10	180.00	198.00	0.00	0.00	0.00	198.00
Others	4.84	484.00	209.50	101398.00	0.00	0.00	235.20	84062.12
1.6. Cash crops	6642.88	57257.11		16205235.32		0.00	775.05	16205235.32
cotton	6313.00	41292.50	360.71	10434791.72	0.00	0.00	0.00	10434791.72
Chat	25.41	234.74	250.00	58685.00	0.00	0.00	0.00	58685.00
Coffee	19.36	266.20	1400.00	372680.00	0.00	0.00	775.05	372680.00
Gesho	284.11	15238.42	350.00	5333447.35	0.00	0.00	0.00	5333447.35
Sugarcane	1.00	225.25	25.00	5631.25	0.00	0.00	0.00	5631.25
Total	1016377.20	7199359.37		1330710785.35			160079020.04	1170726126.63

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2.0 Consumption of modern inputs valued at the base year price.

Type of Input	Unit	Qty	Total	
			Unit Price	Total Price
2.1. Comm. fertilizer(s)				
Dap	Qts	56730.40	143.24	8126314.72
Urea	"	7448.00	131.35	978294.80
2.2. Improved Seeds				
Wheat	"	8636.57	133.00	1148663.81
Teff	"	1289.23	250.00	322307.50
Maize	"	220.20	162.00	35672.40
2.3 Chemicals				
Actelic 2%	"	11.80	19.80	233.64
Malathin	Liters	394.75	35.10	13855.75
2-4-D	"	76.00	46.01	3496.60
Grand star	Kgs	36.03	35.00	1261.28
Zinc Phosphate	Kgs	31.00	12.00	372.00
Total			Birr	10630472.51

3.0 Table 11 :Estimation of Gross Value Added of Crop Sub-sector in 1995/96 at constant factor cost.

	Unit	
3.1. GG Value of production at the base year price	Birr	1330710785.35
3.2. Value of traditional seed inputs at the base year price	Birr	160079020.04
3.3. Value of modern inputs at the base year price	Birr	10630472.51
3.4. Gross Value Added of Crop Sub-sector at Constant F.C.	Birr	1160001292.80

LIVE STOCK

Live stock serves to the larger portion of the rural farming households as source of food, draught power, fuel and fertilizer, means of storage wealth and source of supplementary income. It's also an important source of foreign earning to the government.

However, the contribution and existing share of the sub sector to the economy particularly at regional level have never been estimated and measured. But now as part of the RIA study income accounting of the sub sector has been done to estimate its share in the over all economy of the region and the production features of the sub sector.

COVERAGE AND SOURCES OF DATA

In livestock sub sector the rearing of animals and poultry and production of livestock products such as meat, milk, and milk products (butter and cheese), raw hides and skins, egg, honey bee wax and animal dung meant of fuel have been accounted to estimate the gross value added of the sub sector.

In the estimation of the GVA of the sub sector although the major sources of data were CSA survey studies and BoA& NRD Tigray region, lots of other sources and own small scale surveys had a contribution in the estimation procedures.

The animal population size have been taken from CSA survey studies. The population estimation here is distributed by age and sex of all animal types and it's found to be convenient for valuation and clearly sets the statistical reliability of the estimates. Where as the other source namely socio-economic survey SAERP\BoA& NRD,1997 reveals the animal population by household holding and by range. This sort of interpretation made it difficult to verify and compare the statistical reliability of the estimates. In this case we undoubtedly prefer the CSA estimates to other sources. But however , because of the 1994 population and housing census the animal population was not estimated in 1994. Therefore the income accounting for the livestock sub sector have been done for the next two years only.

METHODS OF ESTIMATION

The very different nature of this sub sector in the course of estimating its value added in every step required specialized studies. For this particular purpose it was not feasible in many respects to largely rely in primary information. Except the prices of edible meat components which were collected through surveying butchery houses other data meant for estimation largely relied on secondary information.

The methodology applied in estimating the value added of the sub sector is largely production approach. But an expenditure approach has also been used to estimate the VA of dung used as source of fuel.

VALUE ADDED OF THE LIVESTOCK SUB SECTOR

ANIMAL POPULATIONS SIZE

The comprehensive size of animal population is the prime condition for estimation of the value added of the sub sector. According to CSA the cattle, sheep, Goats, camels, horses, Asses, Mules and poultry population in 1994/95 F.Y were 627710, 814390, 1450680, 14090, 17200, 222850, 4370 and 2258980 respectively. Where as in 1988 production year the total size increased to 1728860, 1027620, 1293640, 14510, 17706, 261440, 4501 and 2952080 respectively.

But other main source the socio-economic survey (SAERP/BoA & NRD, 1997) have established the average animal holding of a household in the studied area population in 1994/95F.Y.

But this estimation first does not sufficiently reveal the structure (age and sex composition) of the stock so that anyone cannot appropriately account the value added of the stock change secondly, no proper statistical procedure set forth to blow up the established average animal holdings to the rest of the household population, and thirdly it's not backed by the essential production coefficients to estimate the value added of the sub sector. Therefore for this accounting purpose we have chosen the CSA estimates.

PRODUCTION COMPONENTS OF LIVESTOCK SUB-SECTOR

MILK AND MILK PRODUCTS.

According to CSA on 1994/95 F.Y. there had been 425599 indigenous and 2741 cross breed milking cows in the region where as in 1995/96 F.Y. this number includes to 452124 and 2912 milking cows respectively. Besides, 608750, and 496040 milking goats in the two consecutive years.

The average lactation period of an indigenous breed cow is 6.19 month (CSA, 1987 E.C.) and of the cross breed 8.7 months (DDE, 1978 E.C.) and that of goat 2 months (kidding rate two times a year, farmers usually milk half of the doe they have), (Farm Africa 1997).

At an average an indigenous breed cow provides 180.13 liters (average milk yield /cow/day is 0.97 liter) of milk in the given milking year (CSA, 1987 E.C.), and 1153 liters that of cross breed cow with farmers' management level (DDE, 1978 E.C.). And an annual average milk production of 9.6 liter by a doe. Ewes are not usually milked by most farmers. They suggest shortage of grazing land, the milk produced is not even enough for the lambs. Some others think if they milk their ewes they will be susceptible to fleas.

According to the zonal BoA&NRDs milking camels in the region is not significant as most low land nomads are bounded to the Afar region.

With the above given information total of 85667954 and 89560616.12 liters of milk is estimated to have been produced within the region in the two consecutive years. This milk is partly converted to butter and the rest is sold unchanged or consumed.

Most studies agree on the point that half of the milk produced is meant for butter production and from twenty liters of milk one can produce a kilo of butter. With these assumptions in the two consecutive years a total of 2208091.5 kgs and 2308424.9 kgs of butter is estimated to have been produced. In addition to butter, a total of 40625886 liters and 42471883 liters of cheese it is estimated to have been produced in 1994/95 and 1995/96 F.Y.

MEAT

According to CSA estimate the proportion of beef cattle meant for meat over the total cattle population in the two consecutive years were 3.7% and 3.75 % in 1994/95 and 1995/96 F.Y., i.e., a total of 12460 and 16900 cattle respectively. Besides various studies estimate the slaughter rates for sheep and goat between 30-40%. But the total quantity of slaughtings estimated with the use of the above coefficients significantly varied when compared to total number of hides and skins delivered to central market from the region and that remained uncollected. Therefore, for this accounting purpose we took the total quantity of hides and skins collected in the given year and with 20% allowance for the uncollected one's (although BoA&NRD over estimates the uncollected size) as a basis to estimate total quantity of slaughtings.

With regard to off take rates of poultry since there is no regionally developed coefficient we have taken the national estimate that almost all chicken (about 98%) are slaughtered at the end of the year.

The average live weight of a cattle estimated to be 269.50 kgs and that of sheep, goat and chicken are 30 kgs, 27 kgs and a kg respectively (hides and skins Improvement Handbook, MOA/FAO, 1989). But however this document has also estimated that only 49.10% of the total weight of the animal is edible. The rest the inedible component of the animal such as the blood, bone, horn, rumen ingesta, hides and skins and others.

Therefore based on the above considerations the only accounted quantity of meat from the estimated slaughtering is the edible component only (the 49.01 % of the total live weight of the slaughtered animals). Although inedible the hides and skins are accounted as marketable by-product of the sub sector. Where as there is no current effort made to utilize the by products such as blood, meal, bone meal and etc. no income from this by products is currently accounted in this subject.

With the above given information it has been estimated that a total of 41,818,049.01 kgs and 183327247.30 kgs of edible meat had been produced in 1994/95 and 1995/96 F.Y. This is estimated to worth Birr 386,893,762.00 and Birr 1,972,274,914.18 respectively. In the case of the different edible components (the red meat, liver, intestine, tongue, kidney, lung and other) are valued separately, and then added up to make the total value added of the meat produced.

HIDES AND SKINS

From the above estimated cattle, sheep and goat slaughtering a total of 141,695 hides and 1,596,375 skins had been produced in 1994/95 F.Y. and a total of 150,500 hides and 1650582 skins are estimated to have been produced in 1995/96 F.Y. The total hides and skins produced in the two consecutive years are estimated to worth Birr 21.11 and 18.5 millions respectively.

EGG

According to CSA from the total poultry population it was estimated that a total of 428730 and 496570 egg laying hens existed in 1994/95 F.Y. and 1995/96 F.Y. respectively.

Egg production in the region is constrained by shortage of feed, poor husbandry practice (housing, feeding, sanitation disease) etc. and poor genetic potential of indigenous breed. The production system is farm yard productive system. The Birds live as scavengers on residence premises without any investment. The average egg produce of a hen per one cycle ranges 8-12 egg and total of 40-60 egg year with a monthly brooding period of 10-14 day (BoA&NR, 1997).

Therefore with the above given information it has been estimated that a total of 21.44 and 24.83 million eggs have been produced in 1994/95 and 1995/96 F.Y. this is estimated to worth Birr 8.57 and Birr 7.45 millions respectively.

HONEY AND BEE WAX

According to CSA total of 131,240 traditional and 710 modern beehive in 1995/96 F.Y. Besides it estimated an average 5,81 kgs honey products per traditional beehive per production season and the average frequency of harvesting honey production per year per traditional beehive is 1.19 times.

The average honey production per modern beehive is estimated to be 20.14 kgs with the average frequency of harvesting 2.02 times year.

With the above information given a total of 936,265 kgs and 932,600.7 kgs of honey is estimated to have been produced in 1994/95 and 1995/96 F.Y. respectively.

Although most of the wax produced in the region is believed to remain uncollected it's estimated that at an average about 635 grams of pure wax could have been harvested annually from a beehive (Apiculture Program, SAERP/WARDIS, 1997). other source (Imperial. Ethiopian Government Technical Agency) put the proportion of honey to beewax as 10 to 1. This estimate is on full occupational efficiency of the beehives.

Any way according to the recent estimate of SAERP/WARDIS from the already produced quantity of honey a

Year	Month	Day	Time	Location	Species	Sex	Age	Weight (g)	Length (mm)	Wing (mm)	Tarsus (mm)	Bill (mm)	Clay (mm)	Notes
1998	Jan	15	08:00	Field	Redstart	♂	Adult	12.5	110	75	25	15	10	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	11.8	105	70	24	14	9	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	13.2	115	80	26	16	11	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	12.8	112	78	25	15	10	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	13.5	118	82	27	17	12	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	13.0	116	80	26	16	11	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	13.8	120	84	28	18	13	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	13.3	118	82	27	17	12	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	14.0	122	86	29	19	14	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	13.6	120	84	28	18	13	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	14.2	124	88	30	20	15	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	13.9	122	86	29	19	14	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	14.5	126	90	31	21	16	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	14.1	124	88	30	20	15	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	14.8	128	92	32	22	17	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	14.4	126	90	31	21	16	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	15.0	130	94	33	23	18	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	14.6	128	92	32	22	17	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	15.2	132	96	34	24	19	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	14.8	130	94	33	23	18	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	15.5	134	98	35	25	20	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	15.1	132	96	34	24	19	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	15.8	136	100	36	26	21	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	15.4	134	98	35	25	20	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	16.0	138	102	37	27	22	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	15.6	136	100	36	26	21	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	16.2	140	104	38	28	23	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	15.8	138	102	37	27	22	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	16.5	142	106	39	29	24	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	16.1	140	104	38	28	23	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	16.8	144	108	40	30	25	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	16.4	142	106	39	29	24	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	17.0	146	110	41	31	26	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	16.6	144	108	40	30	25	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	17.2	148	112	42	32	27	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	16.8	146	110	41	31	26	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	17.5	150	114	43	33	28	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	17.1	148	112	42	32	27	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	17.8	152	116	44	34	29	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	17.4	150	114	43	33	28	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	18.0	154	118	45	35	30	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	17.6	152	116	44	34	29	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	18.2	156	120	46	36	31	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	17.8	154	118	45	35	30	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	18.5	158	122	47	37	32	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	18.1	156	120	46	36	31	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	18.8	160	124	48	38	33	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	18.4	158	122	47	37	32	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	19.0	162	126	49	39	34	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	18.6	160	124	48	38	33	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	19.2	164	128	50	40	35	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	18.8	162	126	49	39	34	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	19.5	166	130	51	41	36	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	19.1	164	128	50	40	35	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	19.8	168	132	52	42	37	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	19.4	166	130	51	41	36	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	20.0	170	134	53	43	38	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	19.6	168	132	52	42	37	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	20.2	172	136	54	44	39	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	19.8	170	134	53	43	38	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	20.5	174	138	55	45	40	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	20.1	172	136	54	44	39	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	20.8	176	140	56	46	41	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	20.4	174	138	55	45	40	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	21.0	178	142	57	47	42	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	20.6	176	140	56	46	41	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	21.2	180	144	58	48	43	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	20.8	178	142	57	47	42	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	21.5	182	146	59	49	44	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	21.1	180	144	58	48	43	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	21.8	184	148	60	50	45	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	21.4	182	146	59	49	44	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	22.0	186	150	61	51	46	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	21.6	184	148	60	50	45	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	22.2	188	152	62	52	47	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	21.8	186	150	61	51	46	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	22.5	190	154	63	53	48	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	22.1	188	152	62	52	47	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	22.8	192	156	64	54	49	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	22.4	190	154	63	53	48	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	23.0	194	158	65	55	50	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	22.6	192	156	64	54	49	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	23.2	196	160	66	56	51	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	22.8	194	158	65	55	50	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	23.5	198	162	67	57	52	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	23.1	196	160	66	56	51	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	23.8	200	164	68	58	53	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	23.4	198	162	67	57	52	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	24.0	202	166	69	59	54	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	23.6	200	164	68	58	53	Immature
1998	Jan	15	08:00	Field	Redstart	♂	Adult	24.2	204	168	70	60	55	Immature
1998	Jan	15	08:00	Field	Redstart	♀	Adult	23.8	202	166	69	59	54	Immature

For the two consecutive years (1987 and 1988 E.C.) the total value added is estimated to be Birr 1057439.24 and 1057439,24 respectively. The population growth and pattern energy consumption assumed to show little or no significant change in one or two years time.

STOCK CHANGE

Stockchange is one important element of the gross value added of the livestock sub sector.

From the already given two years animal population size it was not difficult to establish the stock change and its value added in 1988 E.C. But for the previous year (1987 E.C.) it was not possible to directly estimate the stock change as there was no estimates of animal population in 1993/94 F.Y. by similar source. In this case although there were two options that enable to estimate the animal population in 1993/94.(these are either taking the BoA&NRD 1993/94 F.Y. animal population estimate which have no successive years estimates or estimating back the 1994/95 F.Y. CSA estimates with the use of coefficients like natural fertility rates (birth rates less mortality rate), overall offtake rates, and other rates. But both estimates were found to be by far away from the real situation. In this case we left the stock change blank in 1994/95 F.Y. until confidentially acceptable coefficients are developed at regionally level. The value added of stock change for the year 1995/96 is estimated to be Birr 97.60 millions.

INTERMEDIATE INPUTS OF LIVESTOCK SUB SECTOR

The major intermediate inputs in the livestock sub sector are the prepared animal feed and poultry feed, salt used for cattle, animal vaccines, milk used for butter, milk suckled by calves and finally eggs used for hatching.

In this case because of lack of regionally developed coefficients for inputs use like salt for cattle, milk suckled by calves and others we took national coefficients to estimate their annual consumption.

Milk used for butter and eggs used for hatching are also importance intermediate inputs of the sub sector.

In the production component part we already estimated 45-50% of the milk is churned for butter making where as the eggs used for hatching are estimated from the already given hatched chicken population with 5-10% allowance for spoilage.

No organized data is available with regard to prepared animal feed particularly for the imported ones'. Thus, for this particular purpose we took the sales of frusca and finebrane (fruscallo) of the Quiha Flour Factory to estimate the consumption. We understood from our assessment in Shire & Maichow that there are very minimum quantity of oilcake meant for animal feed and we tried to incorporate the sales of the organized oil makers.

The other important intermediate input is the poultry feed. With regard to poultry, the traditional poultry management in the region is that chickens are usually left out to farmyard for scavenging and little or no investment is made on the chickens except pitthroughs of grains sometimes. Therefore, for this accounting purpose we accounted the grain supplies only (from the cumulative grower ration requirement for the cocks and cockreles, and from the cumulative grower and layer ration requirement for the egg layers).

A bird till its mature age (usually estimated b/n 19-20 weeks) is recommended to get supplied cumulatively with atleast 7,889gms of variouse ration components (like corn, bone & meat meal, salt, nueg cake, fine bran, limestone& others). As poultry feed is not an important agenda in the case of traditional rareres, in our current accounting of poultry feed we only took the cost of the grain component of the recommended ration (i.e., the 45% of the 7,889gms=3,550.05gms) for the cocks & cockreles. Whereas, for egg laying hens (since they extend thier stay for the purpose of egg laying for the next 3 months)we increased their consumption by the estimated time ahead of the others solely meant for slaughter by 3,206.25gms(i.e. a total of 6,756.30gms/hen/year). With the above estimations a total of Birr 806,040.00 and Birr 1,056,734 are spent for poultry feed.

Estimation of Gross Value Added of Livestock at Constant Factor Cost

The above estimated gross value added of the sub-sector have been estimated at the current market price of the products and the intermediate inputs. As this sort of estimation is believed not to indicate the real GDP growth, it has now been deflated at the base year price (here, the currently fixed base year is 1994/95 F.Y. for its data sufficiency and believed to be reliable in relative to nearer production years). In the course of deflation the technique exercised is the double deflation method ,i.e., deflating both the production and the inputs at the base year price.

Therefore, with this method of estimation the gross value added of livestock sub-sector in 1994/95 and 1995/96 at constant factor cost have been estimated at Birr512.30 million and Birr644.53 respectively.

Detail supportive anaytical tables have been annexed in detail as follows:

Total size of cattle meant for slaughter	Number	141695	150500
Total size of sheep meant for slaughter	"	613430	774043
Total size of goat meant for slaughter	"	982945	876539
Total size of chicken meant for slaughter	"	2213600	2893038.00
Total live wt of cattle	In Kgs	38186730.37	40559750.00
Total live wt of sheep	"	18402868.31	23221290.00
Total live wt of goat	"	26539628.08	23666553.00
Total live wt of chicken meant for slaughter	"	2213800.40	2893038.00
Edible carcass wt of the live cattle meant for slaughter(49.01% of the t. w)	"	18711497.88	19678333.48
Edible carcass wt of the live sheep meant for slaughter()	"	9017420.17	11380754.23
Edible carcass wt of the live goats meant for slaughter ()	"	13004368.76	11568977.63
Edible carcass wt of the live chickens meant for slaughter ()	"	1084762.20	1417877.90
Out of the total edible carcass wt the Red meat(w/h is 35%)*8*	"	26870035.01	31619220.00
Out of the total edible carcass wt the small & large intestain (w/h is 3%)*8*	"	2560288.71	2710219.00
Out of the total edible carcass wt the Liver(w/h is 1.2%)*8*	"	1024115.49	1084087.50
Out of the total edible carcass wt the Kidney(w/h is 1.0%)*8*	"	853429.57	903406.35
Out of the total edible carcass wt the lung (w/h is 1.2%)*8*	"	1024115.49	1084087.50
Out of the total edible carcass wt the tongue (w/h is 0.03%)*8*	"	25602.89	27102.19
Out of the total edible carcass wt the blood,bil,&brain (w/h in total is 7.23%)*8*	"	6460461.86	6531627.60
Hides & Skins Meant for Sale			
Hide	Number	141695	150500.00
Skin:Sheep	"	613430	774043.00
Skin:Goat	"	982945	876539.00
Egg			
Egg laying hens	Number	428730.00	496570.00
Average annual egg production/hen/Yr	"	50.00	50.00
Total egg production	"	2143650.00	24828500.00
Honey			
From traditional beehives	In Kgs	936264.99	932600.69
From modern beehives	"	907380.20	903715.90
Total quantity of beeswax	"	28884.79	28884.79
Butter			
Milk used for butter,50% of the total milk production	Its	42833977.00	44780008.06
Amount of butter=5% of the milk used for butter prod.*1.031Kgs	Kgs	2208091.51	2308424.88
Output of animal dung for fuel@*@			
Rural	In Cts	2771022.20	2854152.85
Urban	"	260668.30	268488.34
Total	"	3031690.50	3122641.19
Producers' Price of Animals & Animal Products			
Oxen	Birr/Live animal	852.58	929.50
Bull	"	738.40	858.88
Cow	"	749.00	803.94
Hiefer	"	612.44	768.50
Calf:Male	"	382.00	374.75
Calf:Female	"	393.68	407.25
Sheep:castrated	"	139.50	149.50
:uncastrated	"	92.25	88.63
:Young female sheep	"	85.00	86.00
:Ewe	"	80.89	94.00
Goat:castrated	"	130.98	165.00
:uncastrated	"	72.42	77.00
:milking goat(doe)	"	89.31	113.00
:young fermal goat	"	72.42	94.00
Pullet	"	9.04	8.66
Cock	"	8.07	10.41
Hen	"	9.04	8.66
Donkey	"	310.00	403.75
Horse	"	699.00	628.00
Mule	"	1011.67	1019.75
Camel	"	1426.33	1651.00
Skin:sheep	Birr/Unit	12.52	10.95
:goat	"	10.14	7.21
Hide	"	24.47	24.36
Milk	Birr/lt	2.15	2.25
Cheese	"	1.30	1.50
Butter	Birr/Kg	27.01	23.28
Egg	Birr/Unit	0.36	0.31
Honey	Birr/Kg	15.92	14.60
Beewax	Birr/Bread wax(0.25Kgs)	3.75	3.75
Meat	Birr/Kg		
Red meat	Birr/Kg	12.00	14.00
Liver	Birr/Kg	2.50	2.50
Intestain	Birr/Kg	8.00	8.00
Tonge	Birr/Kg	6.00	6.50
Kidney	Birr/Yg	4.00	4.50
Lung	Birr/set	3.00	3.00
Salt	Birr/Kg	1.78	1.47
Stock change			
Cattle	Number	170910.00	101150.00
sheep	"	252461.00	213230.00
Goat	"	449711.00	-157040.00
Camel	"	423.00	420.00
Horse	"	510.00	515.72
Asse	"	6685.00	36590.00
Mule	"	131.00	131.10
Poultry	"	693100.00	693100.00
Gross value of stock change			
Cattle	Birr	182746101.10	97601063.69
sheep	"	106186383.00	69844075.00
Goat	"	26306436.20	22282535.00
Camel	"	41058614.30	-17635592.00
Horse	"	603324.90	693420.00
Asse	"	356490.00	323872.79
Mule	"	2072350.00	15582642.00
Poultry	"	132532.70	133590.90
Gross value of animal products			
Milk	Birr	92090050.55	100755693.14
Butter	Birr	56640551.80	53740131.22

Cheese	Birr	52899961.60	63811938.99
Egg	Birr	772589.21	7696835.00
Honey	Birr	14900657.32	13615970.07
Beewax(40% of the total honey produced)	Birr	314205.93	311253.00
Meat		386893762.00	475554805.73
Red meat	Birr	358440420.09	442669080.00
Liver	Birr	2560288.71	3710218.70
Intestain	Birr	20482309.72	21681752.00
Tonge	Birr	153617.32	176164.23
Kidney	Birr	3413718.29	4065328.30
Lung	Birr	1843407.87	3252262.50
Skin:Sheep	Birr	7680142.90	8475770.85
Goat	Birr	9967067.21	6354907.75
Hide	Birr	3467270.10	3666180.00
Gross Gross Value of the Livestock Sub-sector	Birr	636225557.20	808713944.50
Stock changes	*	NA	97601063.69
Meat	*	386893762.00	475554805.73
Milk	*	92093050.55	100756693.14
Cheese	*	59640551.80	40302277.25
Butter	*	52899961.60	53740131.22
Egg	*	7311448.80	7278452.80
Honey	*	14900657.32	13615970.07
Beewax	*	314205.93	311253.00
Hide & skin	*	21114480.21	18496858.60
Dung	*	1057439.00	1057439.00
Gross Value of Intermediate Inputs		123926210.42	133234272.30
Salt for cattle(1.03Kgs/head/Yr)(National)	Birr	2984243.51	2617668.93
Poultry feed	*	80604	1056734.90
Animal vaccines	*	456684.47	615955.40
Prepared animal feed(frusca & fine bran)	*	408840.00	434491.00
Milk suckled by calves(0.3lit/cow/day)(National)	*	27577240.59	28392083.64
Milk used for butter	*	92093050.55	100756693.14
Eggs used for hatching	*	406151.30	418382.20
Total			
Gross Value Added of Livestock Sub-sector		512299346.78	675479672.21
Gross Gross of Livestock Out put		636225557.20	808713944.50
Less: Gross Value Intermediate Inputs		123926210.42	133234272.30

Gross Gross Value of the Livestock Sub-sector at Current F.C.	Birr	636225557.20	808713944.50
Stock changes	*	NA	97001063.69
Meat	*	388260762.00	475554805.73
Milk	*	92090050.55	100755663.14
Cheese	*	59640551.80	40302277.25
Butter	*	52899061.00	53740131.22
Egg	*	7311448.80	7278452.80
Honey	*	14900657.32	13615970.07
Beewax	*	314205.93	311253.00
Hide & skins	*	21114480.21	18496858.60
Dung	*	1057439.00	1057439.00
Gross Value of Intermediate Inputs at Current F.C.		123926210.42	133234272.30
Salt for cattle(1.03Kgs/head/Yr)(National)	Birr	2984243.51	2617966.93
Poultry feed	*	80604	1056734.90
Animal vaccines	*	456684.47	615955.40
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Milk used for butter	*	92090050.55	100755663.14
Eggs used for hatching	*	406151.30	418382.20
Gross Value Added of Livestock Sub-sector at Current F.C.		512299346.78	675479672.21
Gross Gross Value of Livestock Out put		636225557.20	808713944.50
Less: Gross Value Intermediate Inputs		123926210.42	133234272.30
Total Regional Estimates of:			
Annual meat consumptions(in Kgs)		41818049.01	43659750.14
Annual milk consumptions(in Lts)		42833977.00	44780308.06
Annual Egg consumptions(number)		20300580.00	23478880.00
Butter consumption(in Kgs)		2208091.51	2308424.88
Total population of the region(1995)=		3164284	3259212
Annual Regional Percapita consumption (Estimates of the RIA)			
Meat consumptions(in Kgs)		13	13
Milk consumptions(in Lts)		14	14
Egg consumptions(number)		6	7
Butter consumption(in Kgs)		1	1
Compaire where we are:			
Estimates of FAO, Agro-stat, 1992. Percapita consumption of meat&milk(Kg/person)in different parts of the world			
	Meat		Milk
In the Developed Society		82	75
In the Developing Society		18	87
In Africa		11	28
In the Middle East		20	61
In the Far East		15	27

Table :Data on the production aspects and the estimation of G.V.A. of the livestock s-s, in 1994/95 and 1995/96 Prod. Years.

, for private peasant holdings at Constant F.C.

...the animal pop'n sizes are in thousands

Production components	Unit	Production Year	
		1994/95	1995/96
Animal Population Size			
Cattle	Number	1627.710	1728.860
Male Population	.	807.110	875.450
Under 1 year	.	127.020	123.120
Between 1 and two years	.	130.570	92.760
Greater or equal to 2 years	.	549.520	659.570
Female total	.	820.600	853.410
Under 1 year	.	141.260	157.420
Between 1 and two years	.	101.580	111.310
Greater or equal to 2 years	.	577.790	584.690
Out of the total Female cattle	.		
Indigenous breed	.	815.35(99.36%)	
Hybrid	.	5.24(0.64%)	
Sheep	.	814.390	1027.620
Male total	.	208.240	290.750
Under 1 year	.	111.420	181.940
Between 1 and two years	.	41.080	50.570
Greater or equal to 2 year	.	53.740	58.240
Female	.	635.150	736.870
Under 1 year	.	139.420	157.630
Between 1 and 2 years	.	74.180	110.270
Greater or equal to 2 year	.	421.550	468.970
Goats	.	1450.680	1293.640
Male total	.	460.620	417.730
Under 1 year	.	204.000	187.340
Between 1 and 2 years	.	89.010	87.350
Greater or equal to 2 years	.	167.610	143.030
Female total	.	990.060	875.910
Under 1 year	.	228.220	201.940
Between 1 and 2 years	.	155.090	177.930
Greater or equal to 2 years	.	608.750	496.040
camels	.	14.090	14.510
Horses	.	17.19	17.706
Asses	.	222.850	261.440
Male total	.	112.280	137.630
under 3 years	.	35.010	35.080
3 years and above	.	77.270	102.540
Female total	.	110.570	123.810
Under 3 years	.	27.060	26.700
3 years and above	.	83.510	97.110
Mules	.	4.370	4.501
Poultry	.	2258.980	2952.080
Cocks	.	120.700	252.980
Cockerels	.	177.980	216.470
Pullets	.	224.640	313.600
Laying hens	.	428.730	496.570
Non-laying hens	.	180.010	322.850
Chicks	.	1126.920	1349.620
Total No. of beehives	.	131.950	130.710
Traditional	.	131.240	130.710
Modern	.	0.710	0.710
Major Production Coefficients			
Average live weight	Kgs		
Cattle	.	269.500	269.500
Sheep	.	30.000	30.000
Goat	.	27.000	27.000
Chicken	.	1.00	1.00
Average Edible Carcass Wt of live animal(National) (49,01% of the total live wt)	.		
Cattle	.	131.080	131.080
Sheep	.	14.700	14.700
goat	.	13.230	13.230
Overall milking Cows	Number	428.340	455.036
Indigenous breed	.	425.599	452.124
Crossbreed	.	2.741	2.912
Milking goats	.	608.750	496.040
Average milk yield per year			
Cow	Liters		
From indigenous breed	.		
Regional average	.	180.130	
From cross breed*** (at farmers' mgt level)	.	1153.000	
Goat (average milk production/does/day)	.	160ml/day	
Lactation period	Months		
Cow	.		
Indigenous breed	.		
Regional average	.	6.190	
Cross breed***	.	8.700	
Goat	.	2.000	
(Kidding rate two times a year, farmers usually milk half of the doe they hav			
Average annual egg production per hen* @	Number	40-60	
Average honey prod./beehive(Traditinal)/prod. season	Kgs	5.810	
Frequency of production/Year/Beehive(Traditional)	Rate	1.190	
Average honey prod./beehive(Modern)(National)	Kgs	20.140	

sheep			252461.00	186230.00
Goat			449711.00	-157050.00
Camel			423.00	420.00
Horse			510.00	515.72
Asse			6685.00	38590.00
Mule			131.00	131.10
Poultry			693100.00	1132060.00
	Gross value of stock change	Birr	182746101.10	101028975.43
Cattle			106186383.00	81906924.05
sheep			26306436.20	16311646.40
Goat			41058614.30	-14330534.20
Camel			603324.90	599060.00
Horse			356490.00	360488.98
Asse			2072350.00	11962900.00
Mule			132532.70	132629.50
Poultry			6029970.00	4085860.70
	Gross value of animal products			
Milk		Birr	92093050.55	96277662.33
Butter		Birr	59640551.80	62350556.55
Cheese		Birr	52899961.60	55213447.90
Egg		Birr	7311448.80	8452396.80
Honey		Birr	14900657.32	14842340.14
Beewax(40% of the total honey produced)		Birr	314205.93	311253.19
Meat			386893762.00	410851111.79
Red meat		Birr	358440420.09	379430640.00
Liver		Birr	2560288.71	2710218.75
Intestain		Birr	20482309.72	21681752.00
Tonge		Birr	153617.32	162613.14
Kidney		Birr	3413718.29	3613625.40
Lung		Birr	1843407.87	3252262.50
Skine:Sheep		Birr	7680142.90	9688438.22
:Goat		Birr	9967067.21	8888105.46
Hide		Birr	3467270.10	3682735.00
	Gross Gross Value of the Livestock Sub-sector	Birr	636225557.20	772644461.80
Stock changes				101028975.43
Meat		NA	386893762.00	410851111.79
Milk			92093050.55	96277662.33
Cheese			59640551.80	55213447.90
Butter			52899961.60	62350556.55
Egg			7311448.80	8452396.80
Honey			14900657.32	14842340.14
Beewax			314205.93	311253.19
Hide & skine			21114480.21	22259278.68
Dung			1057439.00	1057439.00
	Gross Value of Intermediate Inputs		123926210.42	128113877.10
Salt for cattle(1.03Kgs/head/Yr)(National)		Birr	2984243.51	3169691.92
Poultry feed			806040.	1056734.90
Animal vaccines			456684.47	615955.40
Prepared animal feed(frusca & fine bran)			408840.00	434491.00
Milk suckled by calves(0.3lit/cow/day)(National)			27577240.59	27130213.26
Milk used for butter			92093050.55	96277662.33
Eggs used for hatching			406151.30	485863.20
	Total			
	Gross Value Added of Livestock Sub-sector		512299346.78	644530584.70
	Gross Gross of Livestock Out put		636225557.20	772644461.80
	Less: Gross Value Intermediate Inputs		123926210.42	128113877.10

Gross Value of the Livestock Sub-sector	Birr	636225557.20	772644461.80
Stock changes	*	NA	101028975.43
Meat	*	386893762.00	410851111.79
Milk	*	92093050.55	96277662.33
Cheese	*	59640551.80	55213447.90
Butter	*	52899961.60	62350556.55
Egg	*	7311448.80	8452396.80
Honey	*	14900657.32	14842340.14
Beewax	*	314205.93	311253.19
Hide & skins	*	21114480.21	22259278.68
Dung	*	1057439.00	1057439.00
Gross Value of Intermediate Inputs		123926210.42	128113877.10
Salt for cattle(1.03Kgs/head/Yr)(National)	Birr	2984243.51	3169691.92
Poultry feed	*	806040.	1056734.90
Animal vaccines	*	456684.47	615955.40
Prepared animal feed(trusca & fine bran)	*	408840.00	434491.00
Milk suckled by calves(0.3lit/cow/day)(National)	*	27577240.59	27130213.26
Milk used for butter	*	92093050.55	96277662.33
Eggs used for hatching	*	406151.30	485863.20
Total			
Gross Value Added of Livestock Sub-sector		512299346.78	644530584.70
Gross Gross of Livestock Out put		636225557.20	772644461.80
Less: Gross Value Intermediate Inputs		123926210.42	128113877.10

Total Regional Estimates of:			
Annual meat consumptions(In Kgs)		41818049.01	43959750.14
Annual milk consumptions(In Lts)		42833977.00	44780308.06
Annual Egg consumptions(number)		20309580.00	23478880.00
Butter consumption(In Kgs)		2208091.51	2308424.88
Total population of the region(1995)=			
Annual Regional Percapita consumption (Estimates of the RIA)		3164283.60	3259212.11
Meat consumptions(In Kgs)		13.22	13.49
Milk consumptions(In Lts)		13.54	13.74
Egg consumptions(number)		6.00	7.00
Butter consumption(In Kgs)		0.70	0.71
Compaire where we are:			

14
Table : Estimation of Gross Value added of Fish production at current factor cost, 1993/94-1995/96.

Production Year	Total Qty of Fish Produced & its Price				
	Total Qty(in Kgs)	Price (Birr/Kg)	Gross Value of Output	Cost of Int.inputs	Total Value Added Of Fishery
1986	8827.00	0.50	4413.50	400.00	4013.50
1987	12823.50	0.50	6411.75	640.00	5771.75
1988	3623.50	0.50	1811.75	180.00	1631.75

*The above production data considers only the fish production at Hashenge lake where there was an organized fishing activity.

Table :Estimation of Gross Value added of Fish production at constant factor cost,1993/94-1995/96.

Total Qty of Fish Produced & its Price					
Production Year	Total Qty(in Kgs)	Price (Birr/Kg)	Gross Value of Output	Cost of Int.inputs	Total Value Added Of Fishery
1986	8827.00	0.50	4413.50	400.00	4013.50
1987	12823.50	0.50	6411.75	640.00	5771.75
1988	3623.50	0.50	1811.75	180.00	1631.75

*The above production data considers only the fish production at Hashenge lake where there was an organized fishing activity.

Forestry

Coverage and Sources of Data

This sub-sector covers production and gathering of firewood including charcoal by exploitation of forestry, and cutting of trees for the production of logs and timber for use in industry and construction, production and gathering of other forest products such as gum, resin and incense.

Data on the consumption and expenditure of firewood and charcoal are collected from the bureau of Mines and Energy for Tigray region (from Energy survey results of Tigray region). Data on the gross output of gum and incense and its intermediate inputs consumption are collected from the organizations (enterprises) that produce them, namely, the Natural Gum Producing and Marketing enterprise, Guna and Suhul producing enterprises. Whereas data like the domestic wood consumptions in construction (particularly in rural constructions) are estimated as certain proportion of the total cost of rural constructions in the given year.

Methods of Estimation

Both the Product and Expenditure methods have been used in accordance to the nature of the available data. The gross value added of gum and incense are estimated through the product method whereas the gross value added of the fuel wood and charcoal meant for fire and wood consumptions in rural constructions are estimated through expenditure approach.

Gross Value Added of the Forestry Sub-sector

With the assumption that there could be little change in the total size of rural and urban households and pattern of energy consumption in the two consecutive years. The total annual expenditure on fuel wood, BLT, roots and charcoal has been estimated to be Birr 36,741,132.00 for each of the three consecutive years.

The gross value added of gum and incense in 1994/95 and 1995/96 are estimated at current market prices to be Birr 5.36 million and 6.22 million respectively.

In this case, estimates of the intermediate consumptions have been imputed from the expenditure accounts of the producing enterprises. From these accounts the total expense per quintal of gum or incense production have been considered as the bases for the estimation of the total cost of the intermediate inputs used in a given year.

In the case of the gross value added of domestic wood consumptions in rural constructions its total expenditure have been estimated as 25% of the total cost of the rural constructions, i.e., Birr 68,139,181.50 and Birr 75,351,705.00 in the two consecutive years.

In general, the gross value added of forestry sub-sector at current factor cost in 1994/95 and 1995/96 have been estimated Birr 110.84 million and Birr 120.56 million respectively.

To estimate the gross value added of forestry sub-sector at constant factor cost the double deflation method have been exercised. For the incense and gum production it has been tried to deflate both the input and the output. In the case of fuelwood consumption a population projection have been made to estimate the increase in consumption in the sense that expenditure on fuel wood consumption is structural atleast for some years. Whereas, for the rural constructions at an average a 10% increase in labour and construction materials in between the base year and 1995/96 (according to the estimates of the PW&UD bureau) have been considered as a reference to deflate the value added at constant factor cost.

With the above stated methodology the value added of the sub-sector in 1994/95 and 1995/96 at constant factor cost have been estimated to be Birr 110.84 and 112.96 millions respectively.

in million Birr

	At Curr. F.C.		At Cons.F.C.	
	1994/95	1995/96	1994/95	1995/96
Gum and Incense	68.14	75.35	68.14	67.82
Feul wood	37.34	38.99	37.34	38.99
Construction	5.36	6.22	5.36	6.15
Total	110.84	120.56	110.84	112.96

Details of the above analyses are presented in the following tables.

Table : Total Population and Household sizes of towns by settlement typology, 1993/94.

	Southern		Central		Eastern		Western		Total	
	Population	Household	Population	Household	Population	Household	Population	Household	Population	Household
Mekelle(>95000)	96938	24856							96938	24856
Large towns(25000-95000)	26179	6713	27148	775	37417	9594	25269	6829	116013	23911
Medium towns(5000-25000)	65588	16817	37601	10743	28140	7512	28370	7668	159699	42740
Small towns(<5000)	18647	4781	26309	7517	19951	5116	30921	8357	95828	25771
Rural	666157	158609	852792	189509	499438	110986	649402	141174	2667789	600278
Average HH size										
Urban		3.9 Urban		3.5 Urban		3.9 Urban		3.7		
Rural		4.2 Rural		4.5 Rural		4.5 Rural		4.6		

Table : Distribution of Households by Income class by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of income category in percent				
Mekelle(>95000)	4.3	7.2	20.1	44.1	24.4
Large towns(25000-95000)	0.4	4.3	20.3	52	23
Medium towns(5000-25000)	1.4	4.2	16.7	57.9	19.9
Small towns(<5000)	0.7	0.7	13.4	54.5	30.6
Rural	3.1	13	37	39.1	7.8

Table : Expenditure on energy from total income by income group by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of expenditure on energy from monthly income in percent				
Mekelle(>95000)	9.7	7.2	3.8	1.6	0.6
Large towns(25000-95000)	2.4	7.8	4.4	2.6	0.9
Medium towns(5000-25000)	5	4.6	3.1	2	1
Small towns(<5000)	0	25.3	4.6	2.3	1.1
Rural	3.8	4.2	3.4	1.7	0.9

Table : Distribution of Household by income group and their percapita monthly expenditure on energy from their monthly total income

	Income category(Birr/month)									
	<50	50-100		100-200		200-500		>500		
	Distributin of expenditure on energy from monthly income in percent									
	Huousehold Number	Exp. on energy/HH	Huousehold Number	Exp. on energy/HH	Huousehold Number	Exp. on energy/HH	Huousehold Number	Exp. on energy/HH	Huousehold Number	Exp. on energy/HH
Mekelle(>95000)	1069	4.85	1790	5.4	4996	5.7	10961	5.6	6065	3
Large towns(25000-95000)	124	1.2	1328	5.58	6271	6.6	16064	9.1	7105	4.5
Medium towns(5000-25000)	5942	2.5	1783	3.45	7088	4.65	24574	7	8446	5
Small towns(<5000)	180		180	18.98	1453	6.9	14045	8.05	7886	5.5
Rural	18609	1.9	78036	3.15	222103	5.1	234709	5.95	46822	4.5

Table : Estimation of total annual expenditure(gross value added) on/of fuelwood meant for energy, 1985 E.C

	Total percapita household energy consumption in megajouls	Proportion of energy generated from fuelwoods, BLT, roots and charcoal (in megajouls)	Total expenditure on energy per month	Total monthly expenditure on fuelwoods, BLT, roots and charcoal	Total annual expenditure on fuelwoods, BLT, roots and charcoal
Distributin of expenditure on energy from monthly income in percent					
Mekelle(>95000)	8721	92.9%	122904.45	114178.23	1370138.76
Large towns(25000-95000)	5941	84.38%	227102.54	191629.12	2299549.44
Medium towns(5000-25000)	6118	85.37%	268213.55	228973.91	2747686.92
Small towns(<5000)	4623	88.28%	169877.35	149967.73	1799612.76
Rural	13819	78.68%	302113.35	2377011.98	28524143.76
				Total annual expenditure(Birr)	36741131.64

Average annual expenditure on fuelwood/94/Year, Rural :Birr 47.52
 Average annual expenditure on fuelwood/94/Year, Urban :Birr66.29

16 Table 1: Expenditure on energy from total income by a household in the given income group & settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
Total expenditure on energy by a household(Birr/month)					
Mekelle(>95000)	4.85	5.40	5.70	5.60	3.00
Large towns(25000-95000)	1.20	5.85	6.60	9.10	4.50
Medium towns(5000-25000)	2.50	3.45	4.65	7.00	5.00
Small towns(<5000)	0.00	18.98	6.90	8.05	5.50
Rural	1.90	3.15	5.10	5.95	4.50

17 Table 1: Expenditure on energy from total income by income group by settlement typology

	Income category(Birr/month)					Total Expenditure
	<50	50-100	100-200	200-500	>500	
Total expenditure on energy by the households within the given income category(Birr/month)						
Mekelle(>95000)	5339.23	9953.93	29331.84	63225.91	18740.43	126591.35
Large towns(25000-95000)	118.22	6195.26	32997.04	116541.26	25490.32	181342.09
Medium towns(5000-25000)	1540.78	6378.82	34185.44	178421.98	43802.09	264329.10
Small towns(<5000)	0.00	3525.72	24542.70	116455.73	44873.77	189197.93
Rural	36417.07	253188.26	1166706.32	1438412.26	217018.51	3111742.41

18 Table 1: Estimation of total annual expenditure(gross value added) on/of fuelwood meant for energy, 1994/95

	Total percapita household energy consumption in megajouls	Proportion of energy generated from fuelwoods, BLT, roots and charcoal (in megajouls)	Total expenditure on energy per month	Total monthly expenditure on fuelwoods, BLT, roots and charcoal	Total annual expenditure on fuelwoods, BLT, roots and charcoal
Distributin of expenditure on energy from monthely income in percent					
Mekelle(>95000)	8721.00	92.9%	126591.35	117603.36	1411240.34
Large towns(25000-95000)	5941.00	84.38%	181342.09	153016.45	1836197.45
Medium towns(5000-25000)	8116.00	85.37%	264329.10	225657.75	2707893.02
Small towns(<5000)	4623.00	88.28%	189197.93	167023.93	2004287.21
Rural	13819.00	78.68%	3111742.41	2448318.93	29379827.10
Total annual expenditure(Birr)					37339445.12

Table : Projected total population and household sizes ,1994/95.

	Southern		Central		Eastern		Western		Total	
	Population	Household	Population	Household	Population	Household	Population	Household	Population	Household
Mekelle(>95000)	99848.00		25602.00						99848.00	25602.00
Large towns(25000-95000)	26964.00		6914.00	27962.00	7989.00	36540.00	9882.00	26027.00	7034.00	119493.00
Medium towns(5000-25000)	67556.00		17322.00	38729.00	11065.00	28984.00	7432.00	29221.00	7898.00	164490.00
Small towns(<5000)	19206.00		4924.00	27098.00	7743.00	20550.00	5269.00	31849.00	8608.00	98703.00
Rural	686142.00		163367.00	878376.00	195194.00	514421.00	114316.00	668884.00	145409.00	2747823.00

Table : Distribution of Households by income class by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of income category in percent				
Mekelle(>95000)	4.30	7.20	20.10	44.10	24.40
Large towns(25000-95000)	0.40	4.30	20.30	52.00	23.00
Medium towns(5000-25000)	1.40	4.20	16.70	57.90	19.90
Small towns(<5000)	0.70	0.70	13.40	54.50	30.60
Rural	3.10	13.00	37.00	39.10	7.80

Table : Distribution of Households by income class by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of households by income class				
Mekelle(>95000)	1100.87	1843.32	5145.94	11290.34	6246.81
Large towns(25000-95000)	98.51	1059.02	4999.55	12806.73	5684.52
Medium towns(5000-25000)	616.31	1848.93	7351.71	25488.85	8760.42
Small towns(<5000)	185.81	185.81	3556.91	14466.55	8122.50
Rural	19166.88	80377.22	228765.95	241749.96	48226.33

Table : Expenditure on energy from total income by income group by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of expenditure on energy from monthly income in percent				
Mekelle(>95000)	9.70	7.20	3.80	1.60	0.60
Large towns(25000-95000)	2.40	7.80	4.40	2.60	0.90
Medium towns(5000-25000)	5.00	4.60	3.10	2.00	1.00
Small towns(<5000)	0.00	25.30	4.60	2.30	1.10
Rural	3.80	4.20	3.40	1.70	0.90

Table : Projected total population and household sizes ,1994/95.

	Southern		Central		Eastern		Western		Total	
	Population	Household	Population	Household	Population	Household	Population	Household	Population	Household
Mekelle(>95000)	99846.00		25602.00						99846.00	25602.00
Large towns(25000-95000)	26964.00		6914.00	27962.00	7989.00	38540.00	9882.00	26027.00	7034.00	119493.00
Medium towns(5000>25000)	67556.00		17322.00	38729.00	11065.00	28984.00	7432.00	29221.00	7898.00	164490.00
Small towns(<5000)	19206.00		4924.00	27098.00	7743.00	20550.00	5269.00	31849.00	8608.00	98703.00
Rural	686142.00		163367.00	878376.00	195194.00	514421.00	114316.00	668884.00	145409.00	2747823.00
										618286.00

Table : Distribution of Households by Income class by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of income category in percent				
Mekelle(>95000)	4.30	7.20	20.10	44.10	24.40
Large towns(25000-95000)	0.40	4.30	20.30	52.00	23.00
Medium towns(5000>25000)	1.40	4.20	16.70	57.90	19.90
Small towns(<5000)	0.70	0.70	13.40	54.50	30.60
Rural	3.10	13.00	37.00	39.10	7.80

Table : Distribution of Households by Income class by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of households by income class				
Mekelle(>95000)	1100.87	1843.32	5145.94	11290.34	6246.81
Large towns(25000-95000)	98.51	1059.02	4999.55	12806.73	5664.52
Medium towns(5000>25000)	616.31	1848.93	7351.71	25488.85	8760.42
Small towns(<5000)	185.81	185.81	3556.91	14466.55	8122.50
Rural	19166.88	80377.22	228765.95	241749.96	48226.33

Table : Expenditure on energy from total income by Income group by settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Distribution of expenditure on energy from monthly income in percent				
Mekelle(>95000)	9.70	7.20	3.80	1.60	0.60
Large towns(25000-95000)	2.40	7.80	4.40	2.60	0.90
Medium towns(5000>25000)	5.00	4.60	3.10	2.00	1.00
Small towns(<5000)	0.00	25.30	4.60	2.30	1.10
Rural	3.80	4.20	3.40	1.70	0.90

16
Table 1: Expenditure on energy from total income by a household in the given income group & settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
	Total expenditure on energy by a household(Birr/month)				
Mekelle(>95000)	4.85	5.40	5.70	5.60	3.00
Large towns(25000-95000)	1.20	5.85	6.60	9.10	4.50
Medium towns(5000-25000)	2.50	3.45	4.65	7.00	5.00
Small towns(<5000)	0.00	18.98	6.90	8.05	5.50
Rural	1.90	3.15	5.10	5.95	4.50

17
Table 1: Expenditure on energy from total income by income group by settlement typology

	Income category(Birr/month)					Total Expenditure
	<50	50-100	100-200	200-500	>500	
	Total expenditure on energy by the households within the given income category(Birr/month)					
Mekelle(>95000)	5339.23	9953.93	29331.84	63225.91	18740.43	126591.35
Large towns(25000-95000)	118.22	6195.26	32997.04	116541.26	25490.32	181342.09
Medium towns(5000-25000)	1540.78	6378.82	34185.44	178421.98	43802.09	264329.10
Small towns(<5000)	0.00	3525.72	24542.70	116455.73	44673.77	189197.93
Rural	36417.07	253188.26	1166706.32	1438412.26	217018.51	3111742.41

18
Table 1: Estimation of total annual expenditure(gross value added) on/of fuelwood meant for energy, 1994/95

	Total percapita household energy consumption in megajouls	Proportion of energy generated from fuelwoods, BLT, roots and charcoal (in megajouls)	Total expenditure on energy per month	Total monthly expenditure on fuelwoods, BLT, roots and charcoal	Total annual expenditure on fuelwoods, BLT, roots and charcoal
	Distributin of expenditure on energy from monthly income in percent				
Mekelle(>95000)	8721.00	92.9%	126591.35	117603.36	1411240.34
Large towns(25000-95000)	5941.00	84.38%	181342.09	153016.45	1836197.45
Medium towns(5000-25000)	8116.00	85.37%	264329.10	225657.75	2707893.02
Small towns(<5000)	4823.00	88.28%	189197.93	167023.93	2004287.21
Rural	13819.00	78.68%	3111742.41	2448318.93	29379827.10
			Total annual expenditure(Birr)		37339445.12

Table : Expenditure on energy from total income by a household in the given income group & settlement typology

	Income category(Birr/month)				
	<50	50-100	100-200	200-500	>500
Total expenditure on energy by a household(Birr/month)					
Mekala(>95000)	4.85	5.40	5.70	5.00	3.00
Large towns(25000-95000)	1.20	5.85	6.80	9.10	4.50
Medium towns(5000-25000)	2.50	3.45	4.85	7.00	5.00
Small towns(<5000)	0.00	18.98	6.90	8.05	5.50
Rural	1.90	3.15	5.10	5.95	4.50

Table : Expenditure on energy from total income by income group by settlement typology

	Income category(Birr/month)					Total Expenditure
	<50	50-100	100-200	200-500	>500	
Total expenditure on energy by the households within the given income category(Birr/month)						
Mekala(>95000)	5495.05	10248.20	30210.00	65122.40	19302.00	130378.65
Large towns(25000-95000)	157.20	8242.65	43903.20	155073.10	33918.50	241292.65
Medium towns(5000-25000)	1575.00	6523.95	34983.35	182497.00	44800.00	270359.30
Small towns(<5000)	0.00	3624.23	25274.70	119945.00	48013.00	194856.93
Rural	37507.90	260782.20	1201702.80	1481561.90	223528.50	3205083.30

Table : Estimation of total annual expenditure(gross value added) on/of fuelwood meant for energy, 1994/95

	Total percapita household energy consumption in megajoules	Proportion of energy generated from fuelwoods, BLT, roots and charcoal (In megajoules)	Total expenditure on energy per month	Total monthly expenditure on fuelwoods, BLT, roots and charcoal	Total annual expenditure on fuelwoods, BLT, roots and charcoal
Distributin of expenditure on energy from monthly income in percent					
Mekala(>95000)	8721.00	92.9%	130378.65	121121.77	1453481.19
Large towns(25000-95000)	5941.00	84.38%	241292.65	203602.74	2443232.66
Medium towns(5000-25000)	8118.00	85.37%	270359.30	230805.73	2789868.81
Small towns(<5000)	4823.00	88.28%	194856.93	172019.69	2064236.32
Rural	13819.00	78.68%	3205083.30	2521759.54	30261114.49
Total annual expenditure(Birr)					38991713.67

Table :Estimation of Gross output of Forest Products,1994/95.

Description	Unit	State	Guna	Sihul
1.Gross output of forest products				
1.1.Total annual production	Qts	300.8	34382.8	5323.21
1.1.1.Gum olebinium white	"	300.8	31358.75	4943.79
1.1.2.Gum olebinium black	"	-	1824.05	379.42
1.1.3.Gum arabic	"	-	1200	-
2.Producers' price of forest products				
2.1.Producers' price of Gum olebinium white	Birr/Qt	148	156	140
2.2.Producers' price of Gum olebinium black	"	-	50	70
2.3.Producers' price of Gum arabic	Birr	82029.00	64599.37	34551.90
3.Total cost of intermediate inputs	Birr	3215.63	367561	56902

Total cost of intermediate inputs	=	8857524.32
Gross value of output	=	5790776
Less:Total cost of intermediate inputs	=	427678.6
Total gross value added of forest products		5363097

Table 20. Estimation of Gross output of Forest Products, 1995/96 at current F.C.

Description	Unit	State	Guna	Sihul
1. Gross output of forest products				
1.1. Total annual production	Qts	554.25	43345.02	2836.17
1.1.1. Gum olebinium white	"	554.25	40742.57	2100.00
1.1.2. Gum olebinium black	"	-	602.45	736.17
1.1.3. Gum arabic	"	-	2000.00	-
2. Producers' price of forest products				
2.1. Producers' price of Gum olebinium white	Birr/Qt	148.00	156.00	140.00
2.2. Producers' price of Gum olebinium black	"	-	50.00	70.00
2.3. Producers' price of Gum arabic	"	-	37.00	-
3. Gross value of output	Birr	82029.00	6459963.42	345531.90
4. Total cost of intermediate inputs	Birr	7898.03	617663.90	40415.25
			Gross value of output	= 6887524.32
			Total cost of intermediate inputs	= 665977.18
			Total gross value added of forest products	= 6221547.14 =====

21
Table : Estimation of Gross output of Forest Products at Constant F.C., 1995/96

Description	Unit	State	Guna	Sihul
1. Gross output of forest products				
1.1. Total annual production	Qts	554.25	43345.02	2836.17
1.1.1. Gum olebinium white	"	554.25	40742.57	2100.00
1.1.2. Gum olebinium black	"	-	602.45	736.17
1.1.3. Gum arabic	"	-	2000.00	-
2. Producers' price of forest products				
2.1. Producers' price of Gum olebinium white	Birr/Qt	148.00	156.00	140.00
2.2. Producers' price of Gum olebinium black	"	-	50.00	70.00
2.3. Producers' price of Gum arabic	"	-	37.00	-
3. Gross value of output	Birr	82029.00	6459963.42	345531.90
4. Total cost of intermediate inputs	Birr	8687.83	679430.29	44456.78

Gross value of output	=	6887524.32
Total cost of intermediate inputs	=	732574.90
Total gross value added of forest products	=	6154949.42
		=====

Chapter-2

Industry

- Mining and Quarrying**
- Manufacturing**
- Electricity, Gas and Water**
- Construction**

MINING AND QUARRYING

This section is intended to discuss the coverage, source of data, and method of estimation of the gross value added /GVA/ of Tigray region from Mining and Quarrying sector

Coverage

In principle the activities covered under this sector are extraction or collection of Naturally occurring minerals and materials. These include extraction of minerals like gold, tantalum, natural gas or steam, and quarrying of construction minerals and rocks like building stone, marble, limestone, and granite. In practice the actual coverage of this sector is limited to the activities of artisanal mining like alluvial gold and quarrying like building stone, river sand, selected materials marble granite and limestone. The activity of salt mining and the exploration of minerals is not included.

The existing exercise of Regional Income Account covers the different quarrying and mining activities. In the region mining is at its infant stage since most of the minerals are under exploration. However, alluvial gold mining commonly practised by artisanal miners is included.

SOURCES OF DATA

The main sources of data are: The Bureau Water mines, and Energy, Bureau of Finance and their respective Zonal Departments, The Artisanal miners and local administrators. The population and Housing censuses report of CSA has also been used for deriving the addition of housing stocks.

The Regional Bureau of Water, Mines and energy, and Finance have provided information and data on the estimated quantity of construction minerals and rocks produced as well as the amount of mining and quarrying royalty fees. The royalty fee return assist in estimation the quantity of quarrying production.

METHOD OF ESTIMATION

Current price estimates

For activities designated to belong to this sub-sector either production or income approaches can be applied.

The activities of organized enterprises for whom adequate accounting system exists and such data sources are accessible, either income or production approach can effectively be used. If production approach is used to arrive at then the basic procedure is to arrive at the gross value of production and deducting the cost of intermediate inputs.

Cost of intermediate inputs includes all industrial and non-industrial costs excluding the costs of primary factors of production to the extent that they are directly employed by the production unit for which the income accounts are being prepared. This briefly means that all material inputs and services which are the output of other production units are considered as intermediate inputs are cost of raw material, indirect labour, external supervisory costs, heat, light power and other energy used (including water), factory or machinery supplies used / which are believed to have a service life of less than a year / miscellaneous overhead costs, sales promotion, advertisement and other selling and distribution expenses and other miscellaneous expenses. Deduction of all intermediate inputs from the gross value of production results in the gross of value added at market prices and further subtraction of indirect taxes net of subsidies will give gross value added at factor cost.

Coming to the income side, the method involves summation of all factor payments involved in the production activity of the enterprises . This is nothing but aggregation of all payments to labour / direct labour /, profit to ownership , interest to capital and depreciation allowances . To be more specific , from the income side, gross value added is the sum of all payments to employees be it production , sales or administrative / except per diem which are meant to cover additional costs involved due to temporary placement of the worker / workers irrespective of the nature and terms of employment , interest expenses paid to the working capital involved in the production process , profit of the owners of the enterprise / including proprietorship income) and of course depreciation of fixed capital like machinery , tools , buildings and furniture .

Therefore the estimates for mining are derived by analysing the data obtained from artisan gold miners , and the estimates from quarrying are derived by analysing the data obtained from private companies and from royalty payments collected by the Regional Bureaux and WME and Finance . Because of the absence of reliable data GVA from quarrying in Urban areas is calculated based on the royalty rate payment . In the case of gross value added of rural quarrying activities the volume of rural house construction is use as indicator . Because most of the output of quarrying is used as input for construction . Therefore the total cost of stone ,and selected materials of the rural house residence is estimated to constitute 40% of the total rural construction cost . At the same time detail quantity of intermediate consumption's are not available , hence the intermediate consumption has been taken as a proportion of the gross output based on the consultation of experts of the Bureaux of WME and Public Works and Urban Developments .

Constant price Estimates

The constant price estimates are intended to measure the economic activity without taking into account the effect of price change . It is a measure of the Economic activity had prices of all goods directly or indirectly related with the production process been remained unchanged . It is useful to show the real trends in the economic activity of the sector /sub-sector/ .

In practice what should be done to obtain real /constant price estimates / is to value each and every item involved in the derivation of value added at the base year price . Often this is not applicable because no complete record of base year prices are available . Alternatively either prices deflation or quantity (volume) index may be used to derive constant price estimates .

In deriving the gross value added at constant factor cost for quarrying sub-sector a total value index is first constructed and then is multiplied by the base year value added at current factor cost .

The estimation of gross value added at constant factor cost for the mining sub-sector have been derived by first obtaining quantity index of gold and then is multiplied by the base year value added at current factor cost .

Table 22 : Estimation GVA from Mining sub-sector				
At current market price				
no	DESCRIPTION	1994/95	1995/96	
1	Gross value of output	3774943.00	906153.00	
	1.1 Gold	3744943.00	906153.00	
2	Cost of intermediate inputs	49036.00	31433.00	
	2.1 Material cost	35206.00	17603.00	
	2.2 Other costs	13830.00	13830.00	
3	GVA at CMP /1-3/	3739737.00	874720.00	
4	Indirect taxes	62915.00	15102.00	
5	Subsidies	0.00	0.00	
	GVA at CFC /3-4+5/	3676822.00	859618.00	
N.B. Alluvial gold is extensively mined traditionally in Central & Western Tigray ,				
but it is being marketed illegally to neighbouring countries				

TABLE 23 : Estimation of GVA from minerals for construction at Current F.C.1994/95-1995/96.

No	Description	1994/95	1995/96
1	Gross value of output	6531279.00	6806058.00
	1.1 Marble	5455906.00	5313090.00
	1.2 Granite	26992.00	170202.00
	1.3 Limestone	1048381.00	1322766.00
2	Cost of intermediate input	186054.00	1380744.00
	2.1 Marble	155725.00	1062343.00
	2.2 Granite	1741.00	33481.00
	2.3 Limestone	28588.00	284920.00
3	GVA at CMP /1-2 /	6345225.00	5425314.00
4	Indirect taxes	10304.00	15318.00
5	Subsidies	0.00	0.00
	GGVA at CFC /3-4+5/	6334921.00	5409996.00

TABLE 24 : Estimation of GVA from Quarrying at Current M.P., 1994/95-1995/96.

No.	Description	1994/95	1995/96
1	gross value of output	12208682.00	22984357.00
	1.1 Stone	9608666.00	15681698.00
	1.2 Sand	2471776.00	4995309.00
	1.3 Selected material	128240.00	2307350.00
2	Cost of Intermediate inputs /25% of gross output /	957670.00	5746088.00
	2.1 Stone	240166.00	3920424.00
	2.2 Sand	685444.00	1248827.00
	2.3 Selected Material	32060.00	576837.00
3	GVA at CMP /1-2 /	11251012.00	17238269.00
4	Indirect taxes	435484.00	733163.00
5	Subsidies	0.00	0.00
	GVA at CFC /3-4+5 /	10815528.00	16505106.00

N.b: Intermediate input is taken on consultation of experts of bureau of Water,
Mines & Energy

Because of the absence of reliable information GDP is calculated from
royalty rate payment

TABLE 25 Estimation of of GVA from Quarring in Rural areas at current F. c.

No.	Description	1994/95	1995/96
1	Cost of Housing unit	8325.00	9000.00
2	Total value of stone and selected materia	3330.00	3600.00
3	Addition of Housing stock	50369	51523
4	Gross value of output (3*4)	167728770.00	185482800.00
5	Cost of intermediate inputs (20 % of Gross vallue of output)	33545754.00	37096560.00
6	GVA at CMP	134183016.00	148386240.00

Table 26 : Gross Value of Production and Gross Value Added from Mining, 1994/95-1995/96.

Year	Gross value of production at CMP	Gross Value added	
		at Current F.C.	at Constant F.C.
1994/95	3774943	3676822.00	3676822.00
1995/96	906153	859618.00	882599.60

Table--:Gross Value of Production and Gross Value Added from Quarrying, 1994/95-1995/96.

Year	Gross value of production at current MP	Gross Value Added	
		at current factor cost	at constant factor cost
1994/95	186288731.00	151333465.00	151333465.00
1995/96	215273215.00	170301342.00	174879292.87
	Volume Index=116%		

MANUFACTURING

Manufacturing here is defined according to International Standard Industrial Classification (ISIC Revision-3) as "the physical or chemical transformation of materials or components into new products, whether the work is performed by power - driven machines or by hand, whether it is done in a factory or in the workers home, and whether the products are sold at wholesale or retail level. The assembly of the component parts of manufactured products is also considered as manufacturing activities."

Manufacturing, for simplicity, has further been divided into three sub-sectors

- 1) Large and Medium scale manufacturing
- 2) Small scale manufacturing
- 3) Handicrafts

Large and Medium scale manufacturing

This sub-sector, according to the CSA survey report on Manufacturing Industries (January, 1997), includes all manufacturing establishments employing more than 10 persons and using power driven machinery irrespective of the type of ownership of the enterprise. The assembling of component parts of manufactured goods is also included in this sub-sector.

Method of Estimation

The first task to be undertaken in the process of value added computation from large and medium scale manufacturing industries is identify the number of establishments that can be categorized as large and medium manufacturing industries. Hence the list of the establishments, which were operational through the 1993/94-1995/96 , has been identified. Accordingly in the year 1993/94 there were only two manufacturing industries in the region .One assembling of manufactured parts and another a flour mill Factory. As to their ownership, the former is privately owned where as the latter is publicly owned. In the year 1994/95, the number of medium and large scale manufacturing industries has risen to 5. The three new operational manufacturing plants are all privately owned. The other two are engaged in the manufacture of general metal and wood products and paper and printing. The number of the manufacturing industries further grew the year 1995/96 to 10.

Once the number of manufacturing industries is established, the next step was to obtain a detailed profit and loss statement of the respective establishments. The prepared statement was designed to include all essential items which are helpful in estimating the value added of the sub-sector by both income and production approaches. This data collection format was dispatched to all industries in all towns. We were able to collect the required data as scheduled.

The value added by the sub-sector was estimated based on the collected data. For those industries which use detailed accounting system, their value added has been estimated by the income approach. Where as, for the others the production approach was adopted.

The estimated gross value added by each manufacturing industry for the years 1993/94 - 1994/95 is presented in the annexure. Please refer to this table for the detail of the estimation procedure. According to the summary result, the total gross value added by large and medium manufacturing industries for the year 1993/94 is estimated to be Birr 2.18 million . Out of this total value added manufacturing of food products accounted for Birr 1.64 million and assembly of the component parts of manufacturing products Birr 5.43 million worth of value added.

In the year 1994/95 the estimated gross value added by manufacturing industries is estimated to be Birr 13.21 million. Out of the total Birr 2.64 million worth gross value is added by assembly of the component parts of manufacturing products. The remaining Birr 7.54 million worth gross value is accounted for metal, garment, and paper manufacturing industries. The increase in the value added in the year 1994/95 is mainly because of the increasing number of establishments in the sub-sector, which contributes to an increase of ---% in production.

Similarly the gross value added for the year 1995/96 is estimated at Birr 29.67 million. The results are summerized under table--- below. The manufacturing of component parts products Birr 1.14 million, food manufacturing Birr 1.67 million, manufacturing of metal and wood products Birr 1.48 million. The remaining manufacturing industries such as, garment factory, manufacturing of paper and printing, manufacturing of brick, leasing machinery have constituted a value added worth of Birr 25.38 million to the manufacturing sub-sector.

SMALL SCALE MANUFACTURING

Small scale manufacturing covers only small establishments which use power driven machinery and employ less than ten persons. These include small scale flour mills, oil press, bakery, carpentry shops, metal and wood works.

In the secondary data collection process, those small scale manufacturing establishments were identified by number and their corresponding capital for the year 1993/94. An adjustment was also made to estimate the corresponding number for the other two years that is 1994/95 and 1995/96. All the establishments have been grouped categorically by type of activity. For example; bakery and pastry are grouped under the same category. For the detailed categorization list of the small scale manufacturing refer the annexure.

These small scale manufacturing industries have a variety of characteristics. They are small in size run by the owner acting as manager, they do not have books of accounts that articulates their expenses and revenues accounts and the like. Hence it is difficult to estimate the value added as in the case of large and small scale manufacturing industries.

The only available source of data for estimating the gross value added for the sub-sector, was the CSA survey result. According to the 1995/96(CSA) Report on Small Scale Manufacturing Industries Survey the total number of the establishments are only 155 and the value added for the sub-sector for the year 1995/96 is estimated to be Birr 2.87 million. But, however, according to the bureau of Trade, Industry and Transport of Tigray region the total population of the establishments are by far greater than what is stated in the CSA survey study document. In this case the estimated value added for the small scale manufacturing industries has been underestimated to a large extent. Besides, with proportional sample size survey undertakings by the regional accounting team the value added per institution in most establishments is realized to be underestimated. Therefore, the team eventually decided to rely on its own survey results for the estimation of the value added of the sub-sector.

Therefore; conducting small scale local type sample survey has become necessary so as to cross check the results and then make appropriate choice of sources.

Thus all types of small scale manufacturing industries were grouped in to three types of

manufacturing industries so as to take a random sample from each group representing the whole of small scale manufacturing industries. The grouping was as follows based on their dominance in the sub-sector :

- 1) flour mills
- 2) bakery and pastry
- 3) metal and wood work shop

The survey result of each establishment has been summarized as follows.

FLOUR MILLS

The estimated total number of flour mills, licensed by Trade Industry and Transport Bureau, has been established for three consecutive years from 1993/94 - 1995/96. These establishments have also been further regrouped into two. Those which are located in Mekelle, in the Zonal towns and those in the major towns are grouped as group one. The rest are grouped as others.

About 33 flour mills have been included in the sample survey. This sample size is assumed to constitute 12.9 percent of the total number of flour mills in the region. In this case, establishments were asked to respond properly to the number of working days in a month, working hours in a day, the average time taken to grind a quintal of crop or spice, monthly consumption of intermediate inputs, and so on. The detailed work of the result has been summarized in table---in the annexure.

Flour mills in the sample have been grouped according to their source of power. About 9 flour mills or 27 percent of the sample population used electric power as a sole source of energy. Other 4 flour mills reported use of both electric and diesel power generator. About 20 flour mills or 60.6 percent in the sample use diesel power generator only as their main source of energy.

Those flour mills which use electric power as the only source of energy have reported less working days in a month and less working hours in a day. The reason for this fact is that they get electric power supply by shift for five hour a day only. But those flour mills, which reported use of both energy source and those that use diesel power generator as their main sources of energy, have reported better number of working hours and working days in month.

Furthermore; every detailed expenses and consumption of intermediate inputs have been estimated for each flour mill. The average charge per quintal of crops and spice has also been compile. Flour mills have been identified by type and number of milling units. Type of milling units represent those for crops and for spice. For the details refer table----in the annexure.

According to the stratified sampling result, the gross average annual value added by each flour mills with electric power as the sole source of energy was estimated at Birr 19,658.40 for those using both source of energy the gross average annual value added is estimated at Birr 49,637.30. The estimated gross average annual value added by a flour mill which use diesel generator as sole source of energy is estimated at Birr 65,534.00. For detailed information refer table----in the annexure.

Similar to the other surveys, samples were taken from three zonal towns including Mekelle. The number of flour mills taken form each town and their sample selection has been done with maximum care to avoid any type of bias.

To estimate the gross value added by the sub-sector, flour mills have been grouped by their very location. Those, which are located in the major zonal towns including mekelle, are in group one. The rest are grouped as others.

Group one towns are:

<u>Towns</u>	<u>Number of flour mills</u>
1. Mekelle	20
2. Maychewe	7
3. Adigrat	10
4. Wokro	8
5. Axum	19
6. Adwa	14
<u>7. shire</u>	<u>20</u>
<u>Total</u>	<u>98</u>

Out of the 98 flour mills 27% of them use only electricity as their source of energy. The gross value added generated from those mills is found to be Birr 520,947.6 based on the per capita value added flour mills established by the sample survey cited above. The overall

results are summerized on table—below.

Table : Number and gross value added of flour mills(in Birr)

Group	Number of flour mills	Value added per flour mill	Total value added
1	26.5	19658	520937.0
2	12.7	49637.3	630393.7
3	58.8	65534	3853399.2
Total			5004729.9

The rest of others are:-

- 256 total number of flour mills in the region
- 98 those treated in groups
- 158 the rest of others

The value added by the rest of others has been treated using those sample flours which use diesel generator as their sole source of energy. Thus, 158 times Birr65,534.00 is equal to 10354372. The total value added Birr 5,004,729.00 plus 10,354,372.00 is equal to Birr Birr15,359,102.00

BAKERY AND PASTRY

Here too the first task done was to establish the number of establishments engaged in the activity. The total number of Bakery and Pastry, for three years form 1994/95-1995/96 with the corresponding capital has been identified. The estimated number for 1995/96 is 67. For further detailed information refer table---- in the annexure.

Similarly for lack of secondary data on the value added by the sub-sector of a sample survey was being conducted. Hence 18 bakery and pastry were taken randomly from three zonal towns and mekelle. The sample population is estimated to constitute 26.8 percent of the total population.

Each establishment according to the prepared questionnaire, was asked about the amount of flour used for bread per month, the average loaves of bread produced from one kilogram of flour or the number of cakes, the price of flour per quintal as to the year 1995/96, their consumption of other intermediate inputs such as yeast egg, powder oil etc. consumption of utilities etc. For detailed analysis refer to the sample result in the table annex.

Hence based on the above collected data from each establishment, the gross value added was indirectly treated using the production approach. The estimated average annual gross value added by each establishment is Birr79,323.48.

Thus the total value added for the sub-sector was estimated by multiplying the number of bakeries and pastries by the estimated average annual value added per establishment. In this case the total gross value added is estimated at Birr 5,314,673.20.

METAL AND WOOD WORKSHOP

For similar reason sample survey has been undertaken on the gross value added for metal and wood works. Around 23 establishments were included in the sample survey. The sample size is more than 50 percent of the total population. Because the total number of metal and wood works in the region is estimated to be 43.

During the survey establishments have been asked the average monthly sales revenue from doors, windows and other furniture, their average monthly consumption of intermediate inputs such as Angle iron, Iron sheet, electrode, paint, utilities and the average annual expenditure for minor maintenance of machinery and the like. For detail information refer table—— in the annexure.

Thus based on the above collected data and by applying the production method of estimating value added, the average annual gross value added for the year 1995/96 has been estimated. According to the sample survey result the average annual gross value added by an establishment has been estimated at Birr 39,307.56 and for the whole population at Birr 1,690,225.00.

CARPENTRY

The estimated gross value added by metal and wood workshops was used with some adjustments and assumptions to estimate value added by a carpenter. The assumption is that the carpenter mainly earn revenue from wood works. Whereas, metal and wood works generate income from both metal and wood works. Hence the carpentry is assumed to contribute half of value added by metal and wood workshops.

In the preceding discussions it was estimated that the average annual gross value added for metal and wood works is Birr39,307.56. With the above stated assumption for carpentry the estimated value added for a carpentry is Birr19,653.75. Thus multiplying this estimate by the total number of carpentries gives us the average annual gross value added for the sub-sector, i.e., Birr491,344.50.

HANDICRAFTS

Handicrafts are those which use hand tools to produce their output. The activities covered under the handicrafts are:- tailoring of cloths, production of leather products, artisanship, pottery, and other miscellaneous processing activities. Here the first thing was to know the estimated number of people engaging in handicrafts activities. Thus the number was established from the census result of CSA. Accordingly the number of people earning their livelihood from handicrafts is estimated to be 17267. Out of the total weavers, spinners, tailors and related constitute 17084 and lather, pellet and shoe makers 183.

To estimate value added by handicrafts, the average annual income per worker was being collected from one of handicrafts producers' cooperative in Mekelle. Accordingly the annual average income for the year 1988 for spinner is estimated to Birr 963.00, for weaver Birr2,985.14, for tailor Birr 2,575.14 and for embroider Birr1,428.7. This data was collected from the 1995/96 pay roll of the cooperative.

Further more, a survey has also been conducted on the incomes of artisans. This was done by taking samples from two zonal towns:- Endaselasse and Axum. Thus the survey result shows that the average annual income per artisan to be Birr3,500.00. The detailed summary of the survey result is attached in the annex.

Hence value added by handicrafts was estimated by taking the average of all average income of each and every activity. This average of average incomes is estimated to be Birr 2,290.46.

Therefore, the value added by handicrafts has been estimated by multiplying the average incomes by the total number of people engaged in handicrafts, i.e., Birr 2,290.46. Thus, the total value added for the sub-sector is estimated at Birr 39,549,373.00.

Estimation of the Gross Value added for the Sector at Constant F.C.

The above value added estimation have been at the current market prices. To avoid the effects of price change (fluctuation) in the estimation of gross value added it is essential to compute the the gross output or gross services in the given year by a selected base year price.

In the course of estimating the Gross Value Added of the sub-sector at constant factor cost a general consumers' price index (CPI) established at national level has been used as a bases to deflate the gross value added estimated at current factor cost to constant factor cost. The base year currently fixed during this particular task is 1994/95. Thus, the gross value added estimated for the sector both at current and constant factor costs are summerized in table—.

Table 29: Summary of the gross value added estimation from manufacturing both at current and constant f

	Description	GVA at Current F.C.		GVA at Constant F.C.	
		1994/95	1995/96	1994/95	1995/96
	Total Gross Value Added	73084699.71	91887967.16	73084699.71	92319840.61
1	Large and Medium scale	13206362.85	29492249.70	13206362.85	29630863.27
2	Small scale industries	59878336.86	62395717.46	59878336.86	62688977.33
	2.1.Flour mills	14833337.00	15350101.90	14833337.00	15422247.38
	Number of enterprise by group				
	Group 1	93	98	93	98
	Group 2	154	167	154	167
	Estimated value added by group				
	Group 1	4741101.00	5004729.00	4741101.00	5028251.23
	Group 2	10092236.00	10345372.00	10092236.00	10393995.25
	2.2.Bakery and Pastry				
	Number of enterprises	45	67	45	67
	Estimated value added	79323.48	79323.48	79323.48	
	Total value added	3569556.60	5314673.16	3569556.60	5339652.12
	2.3.Metal and wood works				
	Number of enterprises	38	43	38	43
	Estimated value added	39307.56	39307.56	39307.56	39492.31
	Total value added	1493687.28	1690225.08	1493687.28	1698169.14
	2.4Carpentry				
	Number of enterprises	22	25	22	25
	Estimated value added	19653.78	19653.78	19653.78	19746.15
	Total value added	432383.16	491344.50	432383.16	493653.82
	2.5Handicrafts				
	Number of workers in handicraft	17267	17267	17267	17267
	Estimated value added	2290.46	2290.46	2290.46	2301.23
	Total value added	39549372.82	39549372.82	39549372.82	39735254.87

Table—Number of Small Scale manufacturing Enterprises in Tigray Region licensed by Trade Bureau by Zone, 1993/94.

Establishment	Mekala		Southern		Eastern		Central		Western		Total	
	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's
Bakery	4	100.00	14	296.00	19	226.00	7	96.00	6	48.00	50	766.00
Pastery and Cake	12	270.00	2	11.00	2	20.00	1	15.00			17	316.00
Carpentry	12	203.90	1	3.00	7	27.00	4	32.00	1	1.20	25	267.10
Metal and Wood workshop	14	182.00			10	158.00	9	33.00	10	67.00	43	440.00
Grain mill house	21	1242.00	90	2730.00	39	1394.00	53	1567.00	37	1001.00	240	7934.00
Total	63	1997.90	107	3040.00	77	1625.00	74	1743.00	54	1117.20	375	9723.10

Table—Number of Small Scale manufacturing Enterprises in Tigray Region licensed by Trade Bureau by Zone, 1994/95.

Establishment	Mekala		Southern		Eastern		Central		Western		Total	
	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's
Bakery	4	100.00	14	296.00	19	226.00	7	96.00	6	48.00	50	766.00
Pastery and Cake	12	270.00	2	11.00	2	20.00	1	15.00			17	316.00
Carpentry	12	203.90	1	3.00	7	27.00	4	32.00	1	1.20	25	267.10
Metal and Wood workshop	14	182.00			10	158.00	9	33.00	10	67.00	43	440.00
Grain mill house	21	1242.00	90	2730.00	41	1394.00	58	1567.00	37	1001.00	247	7934.00
Total	63	1997.90	107	3040.00	79	1625.00	79	1743.00	54	1117.20	382	9723.10

Table—Number of Small Scale manufacturing Enterprises in Tigray Region licensed by Trade Bureau by Zone, 1995/96.

Establishment	Mekala		Southern		Eastern		Central		Western		Total	
	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's	Number of Establishment	Capital in 000's
Bakery	4	100.00	14	296.00	19	226.00	9	483.00	6	48.00	52	1153.00
Pastery and Cake	12	270.00	2	11.00	2	20.00	3	30.00			19	331.00
Carpentry	12	203.90	1	3.00	7	27.00	4	32.00	1	1.20	25	267.10
Metal and Wood workshop	14	182.00			10	158.00	9	33.00	10	67.00	43	440.00
Grain mill house	21	1242.00	90	2730.00	39	1394.00	53	1567.00	53	1001.00	256	7934.00
Total	63	1997.90	107	3040.00	77	1625.00	78	2145.00	70	1117.20	395	10125.10

Table 1. Summary of the estimation of Gross Value Added from Medium Scale of Manufacturing Industries.

Code of the establishments	1986				1987				1988			
	Operating Surplus	Wages & Salaries	Depreciation	Value Added	Operating Surplus	Wages & Salaries	Depreciation	Value Added	Operating Surplus	Wages & Salaries	Depreciation	Value Added
1	431451.62	64348.61 3492.00	47173.00	542973.23	2371147.61	69291.58 3552.06	47215.50	3030627.92	757742.56	123513.60 9479.41	48068.89	929625.05
2					3252605.59	259256.26 109626.58 125472.82 24156.86	2739236.47	6251100.32	4549744.40	2150442.96 681223.38 1035782.85 433436.73	16120748.00	22820935.36
3									340099.07	233056.17 216405.35 16650.82	4312.5	577467.74
4					840000.00	75700.00 64800.00 10900.00	51843.00	967543.00	560000.00	24620 16800.00 7820.00	47500	632120.00
5					93587.98	136765.64	89572.99	319926.61	589959.66	161700.24	154477.34	906137.24
6				175785.00								
7												276030
8										470516.36 63630.6 30430.01 1946.39 15222 16232.2	938068.38	1472437.34
9												208011.96
10				1639218				2637165				1669485
				2357976.23				13206362.85				29492249.69

Table 1—Survey results of the estimation of Gross Value Added from grinding mills, 1954-55.
Population Size 121
Sample Size 34

Ck	Farm Name	Monthly Average	Annual Expenditure for		Total Energy Cost	Average Monthly Labor Cost	Average Monthly Working Hours	Average Monthly Output	Average Annual Output	Average Monthly Output	Average Annual Output	Average Monthly Output	Average Annual Output	Change Per Quarter		Number of Grinding Mills for Crop	Number of Grinding Mills for grain	Total Time in Millstone per Month	No. of Mills by use with	Total Output	Total Revenue	Total Monthly Value added	This Value is Used a Quarter		Number of Workers employed		
			Crop	Grain										Crop	Grain												
1		116			208	120.31	3.01	18	20.31	790	11.26	120	8						1171.00	71.40	301.00	1092.00	1429.27	1440.00	30		4
2		400			800	41.27	3.01	18	30.00	600	14.17	170	4						1171.00	71.40	209.00	1171.00	1151.77	30		3	
3		100			200	14.25	3.01	18	41.27	600	8.23	100	7						1171.00	71.40	142.00	1171.00	1151.77	30		1	
4		470			940	131.00	3.01	18	30.31	790	14.27	190	8	70	1	1	1	1171.00	19.17	30.30	1401.00	300.00	30	113.0	11		
5		800			1600	14.25	3.01	12	41.27	600	8.23	100	4						1000.00	30.00	175.70	1000.00	1171.00	30		4	
6		700			1400	14.27	3.01	12	41.27	600	11.26	120	11						1100.00	70.00	100.00	1100.00	1171.00	30		3	
7		500			1000	14.25	3.01	18	30.00	600	11.26	120	11	40	1	1	1	1100.00	10.00	10.00	1111.00	300.00	30	113.0	3		
8		500			1000	14.25	3.01	18	30.00	600	11.26	120	11	40	1	1	1	1100.00	70.00	100.00	1100.00	1171.00	30	113.0	3		
9		700			1400	14.27	3.01	18	170.00	1100	11.26	120	11						1100.00	70.00	100.00	1100.00	1171.00	30	113.0	3	
10		120			240	14.27	3.01	18	41.27	600	8.23	100	7						1400.00	30.00	100.00	1400.00	1401.00	30	113.0	1	
11		1000	1000	1000	2000	14.25	3.01	12	100.00	1000	11.26	120	11	40	4	4	4	1171.00	40.00	170.20	1470.20	1470.20	30	113.0	10		
12		700	10000	47000	3000	4000	100.00	3.01	14.0	80.00	14.27	100	8					11 (if the option)	1171.00	170.70	700.00	4000.00	1000.00	30	113.0	10	
13		100	10000	10700	1000	1100	30.00	3.01	14.0	80.00	8.23	100	10	40	1	1	1	1171.00	40.00	40.00	1001.00	1001.00	30	113.0	1		
14		100	10000	10700	1000	1100	30.00	3.01	14.0	80.00	8.23	100	10	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1		
15		170	10000	10000	1000	1070	30.00	3.01	14.0	80.00	11.26	120	10	40	1	1	1	4 (if the option)	1171.00	40.00	40.00	1131.00	1101.00	30	113.0	1	
16		800	10000	10000	1000	1070	30.00	3.01	14.0	80.00	8.23	100	10	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1		
17		800	10000	10000	1000	1070	30.00	3.01	14.0	80.00	8.23	100	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1	
18		800	10000	10000	1000	1070	30.00	3.01	14.0	80.00	8.23	100	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1	
19		2000	27000	10000	1000	1070	30.00	3.01	14.0	80.00	11.26	120	11	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1		
20		7000	10700	10700	1000	1070	30.00	3.01	14.0	80.00	11.26	120	11	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1		
21		10000	27700	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4		
22		8000	10000	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
23		8000	10000	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
24		8000	10000	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
25		2000	27000	10000	1000	1070	30.00	3.01	14.0	80.00	11.26	120	11	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1		
26		7000	10700	10700	1000	1070	30.00	3.01	14.0	80.00	11.26	120	11	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	1		
27		10000	27700	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4		
28		8000	10000	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
29		8000	10000	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
30		8000	10000	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
31		10000	27700	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
32		10000	27700	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
33		10000	27700	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	
34		10000	27700	10000	1100	1000	300.00	3.01	14.0	80.00	4.27	30	10	40	1	1	1	4 (if the option)	1171.00	170.70	107.21	1171.00	1001.00	30	113.0	4	

123.00
3.72723

15968.58
4695.49 56348

33

Table 33—Survey results of the estimation of Gross Value Added from Metal and Woodworks, 1994/95

Population Size 43

Sample Size 23

Cod No.	Power Source Electric	Monthly Average Electric Bill	Average Monthly Exp. for Angle Iron, Iron sheet, Electrode and Paint	Average Annual Minor Maintenance costs	Average Annual Expense for Office Supplies	Total Average Annual Expense	Total Average Monthly expense	Average Monthly Expense for Utilities	Number of Workers	Average Monthly Revenue from Sales	Total Average Monthly Expense	Average Monthly Value Added
1	*	85.00	1856.00	300.00	60	360.00	30.00	22.6	1.00	6625.00	1973.60	3651.60
2	*	125.00	2094.75	360.00	40	400.00	33.33		own	4000.00	2253.08	1746.92
3	*	170.00	5133.50	2650.00	40.00	2690.00	224.17	75.00	3.00	9637.60	6602.67	4034.83
4	*	375.00	9840.00	1350.00	1000.00	2350.00	195.83	150.00	13.00	24000.00	10560.83	13439.17
5	*	175.00	16444.00	1500.00	100.00	1600.00	133.33	40.00	2.00	33000.00	16792.33	16207.67
7	*	95.00	18675.00	1200.00	100.00	1300.00	108.33	42.60	3.00	23750.00	18920.83	4829.17
8	*	150.00	3000.00	1200.00	30.00	1230.00	102.60	75.00	1.00	4055.00	3327.60	727.60
9	*	33.60	3970.00	300.00	20.00	320.00	26.67	20.00	own	4990.00	4050.17	939.83
10	*	110.00	2073.75	250.00	15.00	265.00	22.08	25.00	3.00	3160.00	2230.83	919.17
11	*	200.00	5125.00	800.00	50.00	850.00	70.83	40.00	3.00	7000.00	6435.83	1564.17
12	*	135.00	2098.00	300.00	100.00	400.00	33.33	50.00	4.00	3200.00	2316.33	883.67
13	*	52.60	1626.00	300.00	50.00	350.00	29.17	25.00	2.00	3000.00	1732.67	1267.33
14	*	50.00	584.50			0.00	0.00	4.00	own	1275.00	638.60	636.60
15	*	400.00	3932.00	1500.00	150.00	1650.00	137.60	85.00	5.00	6500.00	4554.60	1945.60
16	*	70.00	3500.00	300.00	150.00	450.00	37.60	70.00	2.00	5130.00	3677.60	1452.60
17	*	42.00	1526.00	180.00	15.00	195.00	16.25	7.00	own	2400.00	1591.25	809.75
18	*	140.00	2518.50	300.00	100.00	400.00	33.33	65.00	1.00	4050.00	2756.83	1293.17
19	*	95.00	3447.00	200.00	40.00	240.00	20.00		3.00	5100.00	3562.00	1538.00
20	*	160.00	10450.00	300.00	40.00	340.00	28.33	10.00	2.00	15000.00	10648.33	4351.67
											3275.63	
											1650918.32	

34
Table 34 Sample survey result on the incomes of artisans

sample size 16

Code No.	Average number of Plough sharpened or newly Produced in a day	Average charge per sharpened		Peak period for plough workers	Cost of Intermediate input(charcole and labor)	Average No. of sickles sharpened in a day	Charge per sharpened sickles	Peak period	
			new						
1	10	5	3	8	45	2	23	1	Oct-Nov
2	10	13	3	8	75	4	18	1	Oct-Nov
3	15	10	3	8	95	6	20	1	Oct-Nov
4	10	10	3	8	54	2	17	1	Oct-Nov
5	15	15	3	8	86	4	30	1	Oct-Nov
6	10	20	3	8	100	5	20	1	Oct-Nov
7	13	15	3	8	95	5	15	1	Oct-Nov
8	15	10	3	8	90	4	10	1	Oct-Nov
9	15	10	3	8	67	3	18	1	Oct-Nov
10	18	6	1.5	6			15	0.5	Oct-Nov
11	30	3	1.5	6			30	0.5	Oct-Nov
12	20	2	1.5	6			15	0.5	Oct-Nov
13	30	10	2.5	8	75	-	40	0.5	Oct-Nov
14	16	8	2	7			15	0.5	Oct-Nov
15	15	2	2	7			15	0.5	Oct-Nov
16	15	7	7	7			20	0.5	Oct-Nov

Average working in a month	Average Monthly Revenue for sharpened and newly produced plough	Total yearly Revenue from Plough works	Total yearly Revenue from Sickle works	Total Revenue From ploug Sickle work	Yearly cost Cost of Intern. Inputs	Value added	
14	1260	1680	2940	644	3584	1890	1694
16	1440	4992	6432	576	7008	3600	3408
16	2160	3840	6000	640	6640	4560	2080
14	1260	3360	4620	476	5096	2268	2828
15	2025	6400	7425	900	8325	3870	4455
17	1530	8160	9690	680	10370	5100	5270
16	1872	5760	7632	480	8112	4560	3652
16	2160	3940	6000	320	6320	4320	2000
15	2025	3600	5625	540	6165	3015	3150
16	1296	1728	3024	240	3264	0	3264
16	2160	864	3024	480	3504	0	3504
18	1620	648	2268	270	2538	0	2538
16	3600	3840	7440	640	8080	3600	4480
14	1344	2352	3696	210	3906	0	3906
18	1620	756	2376	270	2646	0	2646
15	4725	2205	6930	300	7230	0	7230

3500.3125

Average Monthly Income per Crafts manual/woman in the year 1988 E.C

Month	Spinners	Weaving	Tailor	Enblyder	Metal Worker	
1	1106.65	1671.00	929.50	2722.75	3500.00	
2	2609.45	2897.80	1214.55	4428.50	3500.00	
3	3195.70	4453.35	1193.55	11296.15	3500.00	
4	2271.75	2892.50	980.20	6673.40	3500.00	
5	2400.85	3117.60	1398.55	5535.40	3500.00	
6	2150.40	2644.80	1227.60	3475.40	3500.00	
7	2234.70	3579.40	1153.80	5680.20	3500.00	
8	2524.90	2959.60	1207.10	8574.90	3500.00	
9	3015.05	2793.70	1625.90	8687.85	3500.00	
10	2943.65	2838.35	1438.60	7075.75	3500.00	
11	2947.90	3016.10	1608.30	5320.05	3500.00	
12	2454.40	2957.45	1474.80	6250.75	3500.00	
Total	29855.40	35821.65	15452.45	75721.10	3500.00	
No. of Workers	31.00	12.00	6.00	53.00	3500.00	
Average Income	963.08	2985.14	2575.41	1428.70	3500.00	2290.46
=====						

ELECTRICITY, GAS, AND WATER SUPPLY

Introduction

This section discusses the coverage, source of data, and method of estimation of the gross value added /GVA/ of Tigray region from Electricity, gas, and water sector. Hence the estimation of GVA at current and constant factor cost are discussed.

COVERAGE

The economic activity to be included under "Electricity" is generation and transmission of electric energy and its distribution to households and industrial, commercial and other users. In the case of gas, the economic activities are to include manufacture of gas in the gas works and distribution of manufactured and natural gas through mains to households and other users. The activity of water supply includes collection, purification and distribution of water to domestic and industrial consumers.

Electricity generation, transmission and distribution mainly for use by other economic agents from diesel is supposed to be covered in this part of estimation. But in practice due to the monopoly nature of the Ethiopian Electric Light and Power Authority /EELPA/, the major concern is to account for the activity of EELPA for the regional estimates. Electric power generated by private enterprises and municipalities are excluded from the sub-sector's estimate because of the absence of detail data. The manufacturing of gas works distribution have not yet undertaken in the region and is also excluded.

SOURCES OF DATA

With respect to the electricity sub-sector the main source of data is the Ethiopian Electric Light and Power Authority /EELPA/. With respect to the water sub-sector various sources of data can be used depending on the availability and accuracy of data. Information for Urban Centres were obtained from municipal water service agencies, Zonal water, mines and energy. Information for rural and other small towns were obtained from the "population and housing census" and the household income consumption and expenditure survey of the CSA. The CSA household income consumption and expenditure survey "provides per capita cash expenditure of water.

METHOD OF ESTIMATION

Most of the enterprises engaged in the production and distribution of Electricity and in water supply are usually either government owned or are closely regulated by government authorities . It should therefore be possible to obtain data on gross output and intermediate consumption directly from annual reports of these enterprises.

GVA at current factor cost estimate

Regarding the electricity sub-sector in the region it is possible to use either the production approach ,i.e. deducting intermediate consumption and net indirect taxes from the gross value of output , or income /cost approach , which involves the summing of compensation of employees , consumption of fixed capital and operating surplus . It is possible to prepare the sub-sector's GVA in the region using accounting records of EELPA and EELPA branch office , and other sources as the case may be . Effort has been made to provide a regional disaggregated data on revenue and expenditure .

Regarding the water sub-sector ;the method of estimation is not as easy as that of electricity sub-sector ,thus the task of preparing the estimate should be divided into two groups . First the major urban sector for which either the municipality or other government bodies are responsible for providing water and sewerage services . In this case effort has been made to get the accounts of such services which make the task of compiling the GVA estimates simplified .

The second division consists of the rural areas and the remaining /small/ urban areas which are not included in the major urban areas . For these areas , it may be possible to use the volume of water that can be supplied by safe water yielding sources, such as hand dug wells, deep wells, springs etc. for which the information regarding the number of population being served and the amount of water supplied is reported based on the established service capacity coefficient of the respective water structure . Such information may be obtained either from the zonal departments of water mines and energy . The next step is to value the production of water . In principle, the un-marketed output such as water collected for household and used by members of the household should be at the price level which is equal to the cost of production . It should be noted that the average price of water fetching service may be used to value the amount of water . This will give an estimate / it may be a rough estimate / of value added , although such valuation may not be adequate either because of the use of family labour or the use of other unprotected water which may lower the prices depending on the level of the supply of water from protected water sources .

If such direct data on inputs and outputs are not available the estimates of GVA may be prepared by using the "population and housing census provided that the population of the region is categorized as major urban rural and other urban areas and the household income consumption and expenditure survey" which provides per capita cash expenditure for rural and urban areas .

GVA at constant factor cost

In deriving the gross value added at constant factor cost for electricity sub-sector a volume index of electricity sold is first constructed and then is multiplied by the base year value added at current factor cost .

For the water sub-sector it is understood that there has been no increase in water tariff during the whole period under study . Because for most of the past three years water service run by government bodies did not show price change . Hence; the value added at constant factor cost is assumed to be the same as the value added at current factor cost .

Therefor the value added of the electricity and water supply sector is then taken to be equal to the sum of GVA of Electricity and water sub-sector . The methods used are illustrated in the following tables .

**Table 35 : Estimation of GVA from Electricity sub-sector for 1994/95-1995/96.
at Current Factor Cost**

N0.	Description	1994/95	1995/96
1	Gross income	5391740	8550611
	-Revenue from power sale and Related services	4638313	5459594
	-Other income	753426.8	3091017
2	Cost of intermediate inputs	11233057	13608836
	-Transport and perdiem	135286.1	210370.2
	-Insurance	113421.7	188628.7
	-Utilities	46929	48256
	- Cost of production	8795858	11541983
	-Other services	2141562	1619598
3	G.V.A. at CMP /1-2 /	-5841317	-5058225
4	Indirect taxes	64910.11	10067.9
5	Subsidies	0	0
6	G.V.A. at CFC / 3-4+5 /	-5906227	-5068293

N.B. The estimation GVA from electricity is negative because:

- Operating cost for the diesel power plant is high .
- The tariff for hydro , diesel and thermal is similar all over the country .
- Most of the diesel generator's have served for along period of time .

Table 36 : Estimation of GVA from Electricity sub-sector for 1994/95-1995/96.
at Constant Factor Cost

N0.	Description	1994/95	1995/96
1	Gross income	5391740	8550611
	-Revenue from power sale and Related services	4638313	5459594
	-Other income	753426.8	3091017
2	Cost of intermediate inputs	11233057	13608836
	-Transport and perdiem	135286.1	210370.2
	-Insurance	113421.7	188628.7
	-Utilities	46929	48256
	- Cost of production	8795858	11541983
	-Other services	2141562	1619598
3	G.V.A. at CMP /1-2 /	-5841317	-5058225
4	Indirect taxes	64910.11	10067.9
5	Subsidies	0	0
6	G.V.A. at CFC / 3-4+5 /	-5906227	-5068293
	Volume Index	100	124.47
	GVA at Constant Factor Cost	-5906227	-6308504

N.B. The estimation GVA from electricity is negative because:

- Operating cost for the diesel power plant is high .
- The tariff for hydro , diesel and thermal is similar all over the country .
- Most of the diesel generator's have served for along period of time .

Table 37 : Estimation of Gross Value Added from Urban Water and Sewerage Offices at Current F.C.

No.	Description	1994/95	1995/96
1	Revenue from Water Sale and Related Services	2862687.90	3934874.20
2	Other Income	180959.13	956830.60
3	Gross Income	3043647.03	4891704.80
4	Cost of Intermediate Inputs	1028289.65	1293419.71
	--- Transport and perdiem	55284.32	84338.01
	--- Utilities and Other Services	973005.33	1209081.70
	--- Insurance	0.00	0.00
5	Gross Value Added at CMP(3-4)	2015357.38	3598285.09
6	Indirect Taxes	0.00	0.00
7	Subsidies	0.00	0.00
8	GVA at Current/Constant F.C. (5-6+7)	2015357.38	3598285.09
=====			
	* Current Factor cost =Constant Factor cost		

Table 38: Estimation of water subsector GVA from Rural and other towns which are not accounted elsewhere from 1994/95-1995/96 at Constant F.C.

No.	DESCRIPTION	1994/95	1995/96
1	Population		
	-Towns	134955	140867
	-Rural	2651133	2710848
2	Per capita expenditure on water		
	-Towns	10.41	10.41
	-Rural	9.96	9.96
3	GVA at Current F.C. - /000 birr /	27810.16	28466.42
	-Towns	1404.88	1466.42
	-Rural	26405.28	27000
4	Indirect taxes	0	0
5	Subsidies	0	0
	GVA at Constant F.C. -/000 birr/	27810.16	28466.42

Construction

Coverage

The activities covered under this sector are construction and maintenance of (1) residential buildings, i.e., urban and rural dwellings, (2) non-residential, i.e., factory buildings, warehouse, office buildings, farm buildings, restaurants, hotels, garages, schools, hospitals, clinics, and buildings for religious, cultural and recreational purposes; (3) other construction works, e.g. roads, streets, sewers, bridges, parking facilities, airports, water wells, water power projects, dams and athletic fields, electric transmission lines, telephone lines, etc.; (4) construction work connected with land reclamation and improvement including afforestation and soil conservation as well as permanent crops development.

Data sources and Methods of Estimation

Residential buildings: Urban and Rural

This sector basically covers the construction in the form of rural and urban dwellings. The main sources of data relate to the number and age of rural and urban dwellings available from the Population and Housing Censuses.

1. Based on the actual figure of the rural population of October 11, 1994, back projection was made to arrive at the figure for July 1, 1994 and July 1, 1993.
2. Population density per housing unit of the initial year was calculated at zonal level in the 1994 Population and Housing Census CSA report and is used in this accounting procedure as an indirect measurement for the new dwelling constructions both in urban and rural areas.
3. Assuming that there could not be any significant change of population density per housing unit in the period under study, the population density per housing unit of the initial year was assumed to reach at the number of housing units at the required year.
4. Regarding housing conditions, for instance materials used for construction, it is assumed that the situation observed in the initial year remained constant during the study period.
5. From CSA report of the year the average lifetime and average area of a rural house was taken to be 15.1 years and 29.8 meter sq. respectively.
6. In order to estimate value added by a typical housing unit the cost of different construction activities held to build a house in the urban areas was estimated by the region's Bureau of Public Works and Urban Development engineers. In the case of an urban house residence which have a multipurpose room, kitchen and toilet is currently estimated to cost a total of Birr 18,000.00 Whereas, a rural house residence with two multipurpose rooms (locally called 'Adarash' and 'Hidmo') and kitchen is estimated to cost a total of Birr 9,000.00 in 1995/96 and in the previous year 5-10% lesser than in 1995/96. The very reason for the the low cost estimate of a rural house residence is the significant involvement of family labour in the unskilled works of the construction activities. Besides, from the estimated total cost of the rural and urban house residences labour cost is estimated to constitute 35% of the total cost.

Steps followed to arrive at the value added:

- a). First list of activities was made.
- b). Those activities which can be held in rural areas was selected (roof, wall, door and windows).
- c). Volume of work done for a 29.8 meter sq. was calculated on average basis for different types of roof and wall.
- d). Cost of labour in urban and rural areas was estimated to constitute 35% of the total cost of the housing constructions.
- e). The average labour cost for an urban house residence is estimated to be Birr 6300.00 and Birr 3150.00 for a rural house residence in 1995/96 and proportionally 5-10% lesser in the previous year.

To arrive at the value added of the housing constructions at current factor cost is to multiply the estimated number of dwelling constructions and average labour cost estimated.

Other Modern Constructions

The type of constructions that are included in this category are modern constructions other than dwellings, like schools, clinics, roads, dams, bridges and others. The sources of data for such types of constructions undertaken by the region itself is the regional Planning and Economic Development Bureau annual reports. Whereas, for the construction projects that are run by the central government the sources are the Ministry of Finance, MOPED and other ministries.

Beside to the constructions undertaken by the government, there are also construction activities that are undertaken by private enterprises and non-government organizations. The major private commercial and industrial building

constructions and public construction activities run by NGO's are tried to be included during the estimation of the gross value added from construction.

For the other construction works undertaken by the regional government labour is estimated to constitute 80% of the total cost, whereas 60% for those which undertaken by the central government. This is because there is community participation in the projects run by the regional government.

Other Rural Construction Works

This category includes construction works connected with land reclamation and improvement including afforestation and soil conservation as well as permanent crops development.

The value added ratio of rural other construction works, in the absence of any data or studies which could give some idea on the magnitude of the activity, the value added has been estimated as a ratio of 30% of the construction of rural dwellings.

Estimation of Gross Value Added from Construction at Constant F.C.

For the modern construction undertaken both at rural and urban the gross value added at constant factor cost have been derived by deflating the gross value added estimated at current factor cost by the weighted price index developed for the main construction materials, namely cement, nail, C.I.S. and paints studied by CSA at the urban and rural centres of the region.

39
 Table 39 Estimation of Gross Value Added of Construction from Central government's capital expenditure both at current and constant F.C., 1994/95-1995/96.

Exp. Code	Objectives	Estimated total cost of Capital Projects		Estimated Proportion Of labour component in the construction proje	Estimated total cost of labour component			
		1994/95	1995/96		at Current F.C.		at Constant F.C.	
					1994/95	1995/96	1994/95	1995/96
8100.00								
8101.00	Surveys, Studies	0.00	3824000.00					
8102.00	Engine and Other Technical Design	2826400.00	11012272.00					
8200.00								
8201.00	Residential Building	353900.00	2732865.00	35%	123865.00	956502.75	123865.00	877878.22
8202.00	Non-Residential Building	11193870.00	15675122.00	35%	3917854.50	5486292.70	3917854.50	5035319.44
8203.00	Earth Work and Others (Roads, Dams and Bridges)	22905700.00	48677556.00	60%	13743420.00	29206533.60	13743420.00	26805756.54
8204.00	Plant, Machinery and Equipment	279100.00	1276343.00					
8205.00	Transport Equipment (Vehicle)	1135100.00	0.00					
8206.00	Office equipment (Furniture and Fixture)	7800.00	0.00					
8207.00	Animal Purchase	0.00	0.00					
8300.00								
8301.00	Project Management and Supervision	0.00	1193050.00					
8302.00	Direct labour	692500.00	211587.00					
8303.00	Opera and Maintenance	1358100.00	12995400.00					
8304.00	Financial Costs (Commission and Interest)	122200.00	1431067.00					
8305.00	Tax	376800.00	6859612.00					
8401.00	Capital Transfer	0.00	144300.00					
	Total	41251470.00	10588874.00		17785139.50	35649329.05	17785139.50	32718954.20

Table : Estimation of Gross Value Added of Construction from regional governments capital expenditure both at current and constant F.C., 1994/95-1995/96.

Exp. Code	Objectives	Estimated total cost of Capital Projects		Estimated Proportion Of labour component in the construction proje	Estimated total cost of labour component			
		1994/95	1995/96		at Current F.C.		at Constant F.C.	
					1994/95	1995/96	1994/95	1995/96
8100.00								
8101.00	Surveys, Studies	1264159.00	618372.50					
8102.00	Engine and Other Technical Design	943062.00	1070309.00					
8200.00								
8201.00	Residential Building	5704378.92	5484755.00	35%	1996532.62	1919664.25	1996532.62	1763595.55
8202.00	Non-Residential Building	52236117.60	54291777.26	35%	18282641.16	19002122.04	18282641.16	17457249.52
8203.00	Earth Work and Others(Roads, Dams and Bridges)	52231224.96	28639744.14	80%	41784979.97	22911795.31	41784979.97	21049066.35
8204.00	Plant, Machinery and Equipment	24259770.38	40266959.08					
8205.00	Transport Equipment(Vehicle)	634987.54	4078606.90					
8206.00	Office equipment(Furniture and Fixture)	2692835.29	2797516.00					
8207.00	Animal Purchase	0.00	0.00					
8300.00								
8301.00	Project Management and Supervision	434635.75	3704501.00					
8302.00	Direct labour	1767857.00	360726.76					
8303.00	Opera and Maintenance	6064247.55	13898508.61					
8304.00	Financial Costs(Commission and Interst)	65405.25	625279.90					
8305.00	Tax	508628.00	7688636.47					
	Total	148807309.24	163525692.62		62064153.75	43833581.60	62064153.75	40269911.42

Table 41: Estimation of Gross Value Added from Private Commercial and Industrial building Constructions, and construction activities undertaken by NGO's both at Current and Constant F.C., 1994/95-1995/96.

No	Establishments	Estimated total cost of labour component at curr. f. c. (GVA)		Weight price index of construction materials	Estimated total cos of labour component at constant f.c. (GVA at con .f.c.)	
		1994/95	1995/96		1994/95	1995/96
1	Aggregate pharmaceutical Formulation unit	10395439	10395439	0.9187	10395439	9550289.81
2	Almeda Textile Factory	5142925	5142925		5142925	4724805.2
3	Sheba Tannery	4200000	4200000		4200000	3858540
4	Ethio-transe	998772	25412.45		998772	23346.42
5	Mesfin Engineering	0	17035.55		0	15650.56
6	NGO's	15082320	26826372		15082320	24645388
	Total	35819456	46607184		35819456	42818019.99

Table-42: Estimation of Gross Value Added of Rural Constructions both at current and constant cost, 1994/95-1995/96.

Description	GVA at Current F.C.		GVA at Constant F.C..	
	1994/95	1995/96	1994/95	1995/96
Rural Dwelling				
1 Population	2651133	2710848	2651133	2710848
2 No. of persons per Housing Unit(H)	4.6945308184	4.694531802	4.6945308184	4.694531802
3 Housing Stock	564728	577448	564728	577448
4 Replacement factor with average age of 15 Year and 1 month	0.0666666667	0.0666666667	0.0666666667	0.0666666667
5 Annual Replacement	37649	38497	37649	38497
6 Addition of Housing Stock	12720	13026	12720	13026
7 Gross Addition of Housing Stock	50369	51523	50369	51523
8 Construction Value added per Housing unit	2913.75	3150	2913.75	2913.75
9 Total Value added new construction	146761314.00	162295980.00	146761314.00	150123781.50
10 Value added of Repair and Maintenance (7%)*	10273291.98	11360718.60	10273291.98	10508664.71
GVA CFC	157034605.98	173656698.60	157034605.98	160632446.21

Table----: Estimation of Gross Value Added of Urban Dwelling Constructions both at Current and Constant F.C., 1994/95-1995/96.

Description	GVA at Current F.C.		GVA at Constant F.A.	
	1994/95	1995/96	1994/95	1995/96
Urban Dwelling				
1 Population	463101	482502	463101	482502
2 No. of persons per Housing Unit(H)	4.0588714767	4.0588680642	4.0588714767	4.0588680642
3 Housing Stock	114096	118876	114096	118876
4 Replacement factor with average age of 15 Year and 1 month	0.0662217	0.0662217	0.0662217	0.0662217
5 Annual Replacement	7556	7872	7556	7872
6 Addition of Housing Stock	4780	4987	4780	4987
7 Gross Addition of Housing Stock	12336	12859	12336	12859
8 Value added of per housing unit	5827.50	6300.00	5827.50	5827.50
9 Value added of Housing construction	71888040.00	81011700.00	71888040.00	74935822.50
9 Value added of Repair and Maintenance (7%)*	5032162.80	5670819.00	5032162.80	5245507.58
GVA CFC	76920202.80	86682519.00	76920202.80	80181330.08

Chapter-3

Distributive Services

-Trade

-Hotels, Restuarant, Bar and Others

-Transport and Communication

TRADE

Coverage

Trade can be categorized into wholesale and retail. Unlike to the major divisions in the sub-sector the wholeseller and retailer actually buy and sell goods. Thus wholesale and retail trade are treated as supplying services rather than goods to their customers by storing and displaying a selection of goods in convenient locations and making them easily available for customers to buy.

The output of trade is measured by the total value of the trade margins realized on the goods purchased for resale. A trade margin according to the United Nations System of National Accounts (UNSNA) is defined as "the difference between the actual or imputed price realized on a good purchased for resale, the price that would have to be paid by the distributor to replace the good at the time it is sold or otherwise disposed of.

Sources of Data

In the secondary data collection process, the number of establishments engaged in trade has been established for three consecutive years(1993/94-1995/96). These establishments have also been grouped by trade category and capital.

For simplicity the establishments were grouped by their very location. Those in the major towns including Mekelle are considered to be the first group. Those towns are: 1)Mekele, 2)Maychew, 3)Adigrat, 4) Axum, 5)Indasselasse, 6) Alamata, 7)Zalaanbesa, 8)Wukro, 9) Adewa, and 10)Humera. The second group includes: 1) Abiadi, 2)Enticho, 3)Adiabun, 4)Wukro marray, 5)Sheraro, 6)Adidaro, 7)Maytsebri, 8)Slekleka, 9)Bezeta, 10) Zalanbesa, 11)Endasselasse, and 12) Sekata.

The rest are group as others.For the detailed summary refer table---- in the

annexture.

However, there is no any reliable secondary data source for the value added estimation by the sub-sector. This is because none of these establishments prepare income and loss statement and no survey has been undertaken on the incomes or value added for the sub-sector.

Thus, in the case of wholesale trade, a specific and stratified sample survey on small scale basis has been undertaken. The sample result is summarized in detail in table ----of the annexture.

In the case of retail trade, however, to undertake a sample survey was found to be difficult. Because the retail traders engage in many types of activities which are complex to administer.

The sample result

Out of the total wholesale trade category a sample survey has been undertaken on the following:- 1)grain trade, 2)wholesale trade of construction materials, 3) liquor wholesale, 4)fuel stations, and 5)coffee.

Grain trade

About 29 establishments have been taken randomly from the list of grain traders in the three zonal towns and Mekele. The number of establishments taken from each town are 8 from Mekelle, Adigrat and Axum, 9 from Shire Indaselasse.

Each wholesale establishment was asked to respond to the following questions according to the administered questionnaire:- 1) The source of wholesalers supply, 2) Amount of grain supplied in quintals, 3) Stock changes,if any and 4) The cost of loading and unloading, storage and others.

The 1995/96 average retail price and the average producers price for crops was taken from CSA survey result. Similarly transportation cost for those imported, from other regions, was estimated by taking the average distance of the supplying source. This average distance was multiplied by the freight tariff per quintal per kilometer.

Thus the trade margin of the sub-sector has been estimated by subtracting the cost of transport, loading , unloading and store rent from the total sale revenue earned by the wholesaler. Accordingly the total estimate of the sample survey is summarized in table----- of the annexure. The grain wholesale trade margin as summarized in the table, is stratified by town.

Hence the estimated gross value added by a wholesale trading establishment was found to be Birr 47,052.07. This result has been further adjusted to apply it for the total value added estimation of the sub-sector.

To estimate the total gross value added by grain trade, the following assumptions were taken into consideration:- The gross value added by those trading establishments located in Mekelle is assumed to be estimated by the average gross value added of the sample result. The reasons are:- 1) In terms of the capital share these trading establishments have 16 per cent and 41.6 per cent of the first group, 2) In terms of customers population Mekelle is the largest of all other towns.

Thus applying the full sample survey gross value added result to estimate the value added by wholesalers in Mekelle was assumed to be reasonable. Hence:- for Mekelle the value added for the sample result is obtained by multiplying the number of wholesalers by the estimated value added per trader ,i.e., Birr47,052.00 .Thus, a total of Birr5,599,188.00 gross value added is estimated

for the traders in the given category.

For those in the first group the assumed gross value added estimate is 20 per cent less than of the sample survey result. The reasons are: 1) Those towns have relatively smaller population than Mekalle, and 2) The number of wholesale trading establishments are few in number with small capital.

The estimated gross value added by those establishments is the product of the number of establishments and estimated value added per trader in the given category ,i.e, Birr37,641.60. Thus, a total value added of Birr6,286,147.00.

To estimated the gross value added by the second group towns, 50 per cent less than that of the sample survey result was taken. The reasons are:- 1) As explained earlier these towns are wereda towns with relatively less population, 2) The total amount of capital employed by each establishment is very small, and 3) The population in this towns is semi-agriculturalists and hence the need to buy food crops is assumed to be low. Thus the estimated gross value added is Birr 5,227,772.00.

The third group is called the rest of others. The establishments in this group are located in rural towns with low population. Hence, the gross value added by these establishments is estimated to be 10 per cent of the estimated gross value added by establishments included in the sample survey. The reasons are:- 1) the capital employed by the establishment is very low as compared to the others, 2) the towns are extremely rural with relatively small population pressure, and 3) the population in the area mainly depend for their livelihood on agriculture.

Table---: summary of the total value added by grain traders ,1994/95.

Mekelle	5599118
Group 1	6286147
Group 2	5227772
others	475225
Gross Value Added	17588262

LIQUOR

To estimate the value added by the sub-sector, a sample of 10 liquor wholesalers, were taken. The data on the amount of liquor supplied by these wholesalers was collected from two zonal department. That is from department of Finance and Trade.Transport. The producers price(factory gate price) has been taken from department of finance.

The estimated average expenses for utilities such as store rent, loading and unloading has been deduced from the sample result. In the case of transportation cost the estimated amount is 5.37 Birr per kilometer. This is according to the 1995/96 freight tariff estimate.

The total estimated gross value added by the sub-sector has been summarized according to the stratified sample result. Hence the average of the three top wholesalers gross value added was taken to estimate the gross value added by wholesalers in Mekelle. That is Birr 40,553.17.

The total number of wholesalers in Mekelle licensed by Trade

Bureau in the year 1995/96 is 14 multiplying this figure by the average value added estimated for the three top wholesalers gives us the gross value added for Mekelle liquor wholesalers that is Birr567,744.38.

The value added of those liquor wholesalers in the first group was estimated by the sample result average value added that is Birr 19931.7. This figure has been multiplied by the number of establishments in the group to get the gross value added Birr 1,136,106.90.

The gross value added by wholesalers in the second group was estimated by the average of the three lower value added in the sample result which is Birr4,325.9. The result should be multiplied by the number of establishments ,i.e., a total gross value added Birr155,732.40.

Thus the estimated gross value added by the sub-sector has been summarized below.

Table---:Summery of the estimations of the gross value added per establishment by group,1994/95.

Group	Number of Wholesalers	Estimated value per establishment	Total value added
Makelle	14	40553.17	567744.38
First Group	57	19931.7	1136106.9
Second Group	36	4325.9	155732.4
Gross Value added			1859583.6

For the detailed work refer table---of the Annexure.

FUEL STATION

To estimate the value added by fuel stations, the first work done was collecting data on the total amount of fuel supplied by all fuel stations in the region. This total amount for the year 1994/95 was found in a well organized way from the statistical bulletin published by Trade, Industry and Transport Bureau.

Accordingly the total amount of fuel supplied for the year 1987 is estimated to be 21826030 liters. And this amount consists of 2075320 Liter of benzene, 15277110 liters of diesel and 4473600 liters of kerosine. For the detailed summary refer to the table in the annex.

Similarly small type of survey on two zonal towns has been undertaken on the annual consumption of utilities by fuel stations. According to the survey result the annual average expenses for electric power consumption and fuel consumption to diesel generators has been estimated to be Birr1,900.32, the number of fuel stations for the year is estimated to be 23.

The estimated revenue earned by fuel stations from one liter of fuel is 3 cents. Thus the total revenue earned by all fuel station for the year under consideration is 21826030 liters (total amount of fuel supplied times three cents will give 65478090 cents this will be 654780.9 Birr total revenue). The expenses for utilities Birr1,900.32 times number of Fuel stations 23 will give total expenses for utilities by all fuel stations in the region. The total revenue earned by all fuel station Birr 654,780.90 minus total expense incurred Birr43,707.36 will give the gross value added by fuel stations.

Estimation of the Gross Value Added for the Sub-sector at Constant F.C.

The above value added estimation have been at the current market prices. To avoid the effects of price fluctuation in the estimation of gross value added it is essential to compute the gross out puts or gross services in the given year by a selected base year price.

In this particular practice a general consumers' price index(CPI) established at national level has been used as a bases to deflate the gross value added estimated at current factor cost to constant factor cost. The base year currently fixed in this particular task is 1994/95 for the reasons mentioned at the introductory part. The gross value added estimation for the sector both at current and constant factor costs are summerized in table----.

Table 46: Summary of the gross value added estimation from wholesale and retail trade both at current and constant factor costs, 1994/95-1995/96.

	Description	GVA at Current F.C.		GVA at Constant F.C.	
		1994/95	1995/96	1994/95	1995/96
	Total Gross Value Added	63100212.10	72903815.90	63100212.10	73248463.83
1	Wholesale	19233222.10	23551626.90	19233222.10	23662319.55
	1.1 Big retail trading enterprise	1450708.90	3492708.90	1450708.90	3509124.63
	1.2 Cereals, Pulses and Oilseeds trade	15880035.60	17588262.00	15880035.60	17670926.83
	Mekelle	4611096.00	5599118.00	4611096.00	5625433.85
	Group 1	7565961.00	6286147.00	7565961.00	6315691.89
	Group 2	3364218.00	5227772.00	3364218.00	5252342.53
	Others	338760.00	475225.00	338760.00	477458.56
	1.3 Fabricated Alcohol and Soft Drinks	1352511.60	1859583.00	1352511.60	1868323.04
	Mekelle	364977.00	5667744.00	364977.00	5694382.40
	Group 1	956721.60	1136107.00	956721.60	1141446.70
	Group 2	30813.00	155732.00	30813.00	156463.94
	1.5 Fuel	549966.00	611073.00	549966.00	613945.04
2	Retail	43866990.00	49352189.00	43866990.00	49584144.29

Code	Revenue from Local sales	Cost of Tras. Loading unloading	Revenue from Sales of imports	Cost of Tras. Loading unloading	Store rent Per Year	Trade Margin
1	13610.00	4080.00	21580.00	15377.00	1800.00	13933.00
2	191400.00	58480.00	97580.00	56475.00	2100.00	171925.00
3	59180.00	19430.00	46750.00	33044.00	2400.00	51056.00
4	38160.00	10120.00	57240.00	36047.00	3000.00	46233.00
5	51150.00	15400.00	197750.00	119559.00	2760.00	111181.00
6	111600.00	33600.00	235200.00	144192.00	3600.00	165408.00
7						
8	15840.00	3340.00	51000.00	36048.00	1800.00	25652.00
Mekele Avg						83626.86
9	94224.00	25331.00	53280.00	28838.00	2220.00	91115.00
10	-	-	38250.00	27036.00	1200.00	10014.00
11	6630.00	300.00	76500.00	45216.00	1440.00	36174.00
12	-	-	21250.00	12500.00	960.00	7790.00
13	11220.00	1000.00	170000.00	100480.00	3600.00	76140.00
14	4896.00	600.00	74100.00	40172.00	1800.00	36424.00
15	4896.00	400.00	34000.00	20096.00	1560.00	16840.00
16	-	-	17000.00	9648.00	own	7352.00
Adigrat Avg						35231.13
17	-	-	42500.00	22420.00	1200.00	18880.00
18	0.00	0.00	32880.00	10761.00	840.00	21279.00
19	40100.00	2400.00	0.00	0.00	1800.00	35900.00
20	40100.00	2400.00	0.00	0.00	1800.00	35900.00
21	0.00	0.00	35178.00	18021.00	0.00	17157.00
22	-	-	28050.00	21523.00	own	6527.00
23	-	-	61200.00	32284.00	1200.00	27716.00
24	38070.00	3150.00	0.00	0.00	0.00	34920.00
Axum Avg						24784.88
25	37850.00	3750.00	0.00	0.00	0.00	34100.00
26	189600.00	35000.00	0.00	0.00	0.00	154600.00
27	9900.00	300.00	6600.00	3888.00	own	12312.00
28	26400.00	1800.00	21250.00	10220.00	own	35630.00
29	15840.00	540.00	-	-	own	15300.00
Shire Avg						50388.4
Total Avg						47052.07 48507.81

Table 7: Survey results of the estimation of Gross Value Added from Grain trade, 1994/95.

Code	Revenue from Local sales	Cost of Tras. Loading unloading	Revenue from Sales of imports	Cost of Tras. Loading unloading	Store rent Per Year	Trade Margin
1	13610.00	4080.00	21580.00	15377.00	1800.00	13933.00
Teff	4620.00	644.00	18700.00	13217.00		
Sorghum	310.00	1196.00	-	-		
Barley	7360.00	2240.00	-	-		
Maize	1320.00	-	2880.00	2160.00		
2	191400.00	58480.00	97580.00	56475.00	2100.00	171925.00
Teff	159600.00	33600.00	51000.00	36048.00		
Sorghum	5400.00	2800.00				
Barley						
Maize	26400.00	22080.00				
Chickpeas	-	-	46580.00	20427.00		
3	59180.00	19430.00	46750.00	33044.00	2400.00	51056.00
Teff	36300.00	7710.00	46750.00	33044.00	2400.00	
Sorghum	22880.00	11720.00	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
4	38160.00	10120.00	57240.00	36047.00	3000.00	46233.00
Teff	31680.00	6760.00	40800.00	28838.00		
Sorghum	6480.00	3360.00	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	16440.00	7209.00		
5	51150.00	15400.00	197750.00	119559.00	2760.00	111181.00
Teff	36300.00	7700.00	122400.00	86515.00	2760.00	
Sorghum	14850.00	7700.00	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	75350.00	33044.00		
6	111600.00	33600.00	235200.00	144192.00	3600.00	165408.00
Teff	79200.00	16800.00	153000.00	108144.00	3600.00	
Sorghum	32400.00	16800.00	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	82200.00	36048.00		
7						
Vetch						
8						
Teff	15840.00	3340.00	51000.00	36048.00	1800.00	25652.00
Sorghum						
Barley						
Maize						
Chickpeas						
Mekele						83626.86
9	94224.00	25331.00	53280.00	28838.00	2220.00	91115.00
Teff	63360.00	15520.00	20400.00	14419.00	2220.00	
Sorghum	6480.00	2208.00	-	-		
Barley	22080.00	6720.00	-	-		
Maize	2304.00	883.00	-	-		
Chickpeas	-	-	32880.00	14419.00		

10						
Teff	-	-	38250.00	27036.00	1200.00	10014.00
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	-	-	-	-
11	6630.00	300.00	76500.00	45216.00	1440.00	36174.00
Teff	-	-	76500.00	45216.00	1440.00	-
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	-	-	-	-
Wheat	6630.00	300.00	-	-	-	-
12						
Teff	-	-	21250.00	12500.00	960.00	7790.00
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
13	11220.00	1000.00	170000.00	100480.00	3600.00	76140.00
Teff	-	-	170000.00	100480.00	3600.00	-
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	-	-	-	-
Wheat	11220.00	1000.00	-	-	-	-
14	4896.00	600.00	74100.00	40172.00	1800.00	36424.00
Teff	-	-	33000.00	25100.00	1800.00	-
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	41100.00	15072.00	-	-
Wheat	4896.00	600.00	-	-	-	-
15	4896.00	400.00	34000.00	20096.00	1560.00	16840.00
Teff	-	-	34000.00	20096.00	1560.00	-
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	-	-	-	-
Wheat	4896.00	400.00	-	-	-	-
16						
Teff	-	-	17000.00	9648.00	own	7352.00
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	-	-	-	-
Adigrat	-	-	-	-	-	35231.13
17						
Teff	-	-	42500.00	22420.00	1200.00	18880.00
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	-	-	-	-
18	0.00	0.00	32880.00	10761.00	840.00	21279.00
Teff	-	-	-	-	840.00	-
Sorghum	-	-	-	-	-	-
Barley	-	-	-	-	-	-
Maize	-	-	-	-	-	-
Chickpeas	-	-	32880.00	10761.00	-	-

19	40100.00	2400.00	0.00	0.00	1800.00	35900.00
Teff	39600.00	2400.00	-	-	1800.00	
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Horsebean	500.00	-	-	-		

20	40100.00	2400.00	0.00	0.00	1800.00	35900.00
Teff	39600.00	2400.00	-	-	1800.00	
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Horsebean	500.00	-	-	-		

21	0.00	0.00	35178.00	18021.00	0.00	17157.00
Teff	-	-	28050.00	14797.00	own	
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	7128.00	3224.00		

22						
Teff	-	-	28050.00	21523.00	own	6527.00
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Wheat	-	-	-	-		

23						
Teff	-	-	61200.00	32284.00	1200.00	27716.00
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Wheat	-	-	-	-		

24	38070.00	3150.00	0.00	0.00	0.00	34920.00
Teff	7260.00	150.00	-	-	own	
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Horsebean	-	-	-	-		
Sesame	30810.00	3000.00	-	-		
Axum						24784.88

25	37850.00	3750.00	0.00	0.00	0.00	34100.00
Teff	-	-	-	-	own	
Sorghum	-	-	-	-		
Barley	2300.00	150.00	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Horsebean	-	-	-	-		
Sesame	35550.00	3600.00	-	-		

26	189600.00	35000.00	0.00	0.00	0.00	154600.00
Teff	-	-	-	-	own	
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Sesame	189600.00	35000.00	-	-		

27

Teff	9900.00	300.00	6600.00	3888.00	own	12312.00
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Wheat	-	-	-	-		

28

Teff	26400.00	1800.00	21250.00	10220.00	own	35630.00
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Sesame	-	-	-	-		

29

Teff	15840.00	540.00	-	-	own	15300.00
Sorghum	-	-	-	-		
Barley	-	-	-	-		
Maize	-	-	-	-		
Chickpeas	-	-	-	-		
Wheat	-	-	-	-		
Shire						50388.4

Table 48 Value Added by Liquor Wholesalers in Tigray region, 1994/95.

Code No	Type of liquor	Amount supplied in plastic	In bottles	Average selling Price	Total Revenue from sales	Average factory gate price	Total cost of purchase	Cost of loading & unloading	cost of utilities	Store Rent	Transport cost	Total Cost	Trade Margin
1	Beer	5472	161800	2.59	419062	1.95	315510	2265.2		600 Own	10417.80	328793.00	80269.00
	Alcohol	112	1347	22	29625.2	19.75	26595.35	39.27583				26634.63	2990.57
													93259.57
2	Beer	160	3998	2.59	10354.82	1.95	7796.1	55.972		Own	902.00	8754.07	1600.75
3	Soft drink	498	11950	1.55	18522.5	1.2	14340	174.2708		600 Own	1074.00	16188.27	2334.23
4	Beer	504	12600	2.59	32634	1.95	24570	176.4		600 Own	3759.00	29105.40	3528.60
5	Soft drink	296	7095	1.55	10997.25	1.2	8514	103.4688		600 Own	850.00	10067.47	929.78
6	Beer	2464	61600	2.59	159544	1.95	120120	21560		600 Own	3973.80	146253.80	13290.20
	Mineral Wa	1648	39552	1.8				576.8				576.80	
													13290
7	Beer	1150	27600	2.59	71484	1.95	53820	402.5		600		54822.50	16661.50
8	Soft drink	13044	313056	1.55	485236.8	1.2	375667.2	4565.4		600 2400	29470.00	412702.60	72534.20
9	Beer	723	18075	2.59	46814.25	1.95	35246.25	253.05		600 3600		39699.30	7114.95
	Alcohol	300	3600	22	79200	19.75	71100	105				71205.00	7995.00
													15109.95
													19931.71 40553.17

49

Table—:Distribution of petroleum in Tigray Region in 1994/95 by Zone
in 000 liters

Type of fuel	Mekelle	Southern Zone	Eastern Zone	Central Zone	Western Zone	Total
Benzene	1350	80	303	174	169	2075
Diesel	7730	1596	2041	1539	2372	15277
Kerosine	1590	411	1323	725	425	4474
Total	10670	2087	3666	2438	2965	21826

Table—:Survey on Monthly Consumption of intermediate input
of fuel stations for the year 1995/96.

No.	Type of Fuel Station	Average Electric bill per month	Fuel for generator per month	Total per month	
1	Shell	110	226	4032	
2	Shell			Manual	
3	Shell	35	181		2590
4	Mobil	60			720
5	Agip	120			1440
6	Mobil	60			720
	Average	77	203		1900

Hotels, Restaurant, Bar & Other Drinking Places

In order to estimate the value added of the sub-sector, two approaches were adopted. The first approach was to collect secondary data and the second undertake small scale surveys. In the secondary data collection process, identifying the exact number of the establishments of each type with their corresponding capital, number of workers employed and the like. These establishments were also categorized locationally. Those establishments in the zonal capitals including Mekelle and some Wereda towns were categorized under 'group one'. The second group included those wereda towns which are believed to have better economic activities. The rest are grouped as 'others'.

The underlying criteria for such category mainly was the assumed economic performance of the towns, the number and type of establishments found in the area, the total amount of initial capital registered, total number of employees in the given establishments and others.

Accordingly, thus, those towns under the above category are listed

Group one

- | | |
|----------------|--------------|
| 1. Makelle | 6. Alamatta |
| 2. Maychew | 7. Zalambesa |
| 3. Adigrat | 8. Wukro |
| 4. Axum | 9. Adewa |
| 5. Endasselase | 10. Humera |

Group two

- | | |
|---------------|----------------|
| 1. Abiadi | 8. Selekleka |
| 2. Enticho | 9. Bezet |
| 3. Adiabun | 10. Zalambesa |
| 4. Wukromaray | 11. Endabaguna |
| 5. Sheraro | 12. Senkata |
| 6. Adidaro | |
| 7. Maytsebri | |

The rest were grouped as 'others'.

Another next task done, in the secondary data collection process, was establishing the number of hotels, restaurant, bars, snack bars, and 'Miess' house. Data concerning the number of bars & 'Miess' houses with their corresponding capital were collected from the bureau of Industry, trade and Transport. The main data source, for such detailed and well organized data, was the annual statistical bulletin published by the Bureau. This data was made fit for the purpose of the study with some sort of restructuring & refining works. Thus, data on bars and 'Miess' houses, have been organized by town, wereda and capital for the last three fiscal years that is from 1993/94-1995/96. For further details refer the annexure.

The secondary data source for hotels, restaurant, snack bars and pension as to their number, the people they employ and the amount of initial capital registered is the region's Bureau of Culture, Tourism, and Information.

Unlike the establishments in the other production or service sectors the income accounting or value added estimation of the establishments in the given sub-sector have never been sufficiently assessed in either of the income survey studies. In such a case, it was found to be helpful in the collect primary data on the incomes of some establishments by conducting local type small scale sample surveys with the help of relevant questionnaires designed for this specific objective.

The next step was limiting the sample sizes and their distribution. Accordingly, those Zonal towns including Mekelle were assumed to be representative for the following main reasons.

- towns where most hotels, restaurants, snack bars have resided;
- towns where there is better performance, specifically in the service sector, and higher population size than others.

This fact can even be more confirmed by looking into the tax revenue collected from the sub-sector in comparison to the other to other medium and small towns;

- towns where there is a dominant investment spectrum in the sub-sector & etc....

On the basis of the above assumed facts, samples were selected from the given list of establishments through systematic random sampling technique. The number and type of respondents were taken with care to avoid any bias. As to the number of respondents, they were almost taken equally from each town. The selection of respondents and the interviewing work has been done in collaboration with experts from the zonal Departments of Trade, Industry, and Transport. In Mekelle town the Bureau has also assigned expertise for this purpose. Similar help was made by the Bureau of Culture, Tourism and Information for Tigray region.

The questionnaire, which was administered for the survey was designed with care avoid duplication and redundancy. Besides, it mainly treated the value added estimation through the production approach. That is each unit of establishment was asked the type of services provided, the frequency and amount of liquor purchased from wholesalers; the monthly consumption of sugar for tea, milk and coffee; consumption of other utilities,

Hotels

The total number of hotels, in the region as a whole and for the years 1993/94-1995/96, has been summarized by capital, number of workers employed & zone. The total number of hotels for the year 1995/96 is estimated to be 421. The estimated number of the establishments in each respective year has been the ground for the value added estimation in sub-sector.

In the case of hotels, the total sample size taken is 41. This amount is estimated to constitute almost 9.7 percent of the population. The share of each survey area in the sample is more or less proportional. As to the hotels, 14 establishments have been taken from Mekelle, 9 from Adigrat, 8 from Axum and 10 from Shire.

When one looks at the distribution of hotels, 88 out of the total or 21 percent are located in Mekelle, the rest 79 percent are located in the Zonal towns and major wereda towns.

As shown in table—of the annexure, establishments have been sorted out in accordance to the main source of their earnings. Those which earn from services of two activities are categorized as group one, whereas with three activities group two and so on.

The Sample Result

Hotels

The total number of hotels in the region for the years 1993/94-1995/96, has been summarized by capital, number of workers employed & their distribution by zone. The estimated number of establishments in each respective year is to be the ground for the value added estimation in every activity.

In this case out of the 421 hotels estimated to operate in the region in 1995/96 a fairly distributed 41 hotels (9.7% of the total population) were taken as a sample for the study. The share of each survey area in the sample is more or less equal. As to hotels, 14 establishments have been taken from Mekelle, 9 from Adigrat, 8 from Axum and 10 from Shire.

When one looks at the distribution of hotels, 88 out of the total or 21 percent are located in Mekelle, the rest 79 percent are located in the Zonal towns and major woreda towns. Hence it was found not necessary to use the location category in the value added estimation of hotels. The effect of such categorical treatment was very insignificant, in the case of hotels, in bringing about discrepancies.

All the detailed works of the survey result has been summarized in tables—, —&— in the annexure. As have been shown in the tables, establishments have been sorted out in accordance to the main source of their earnings. Those which earn from services of two activities are categorized as group one, whereas those earning from three activities as group two & so on.

Accordingly, three establishment or 7.5 percent of the sample population earn their revenue mainly from sales of liquor and bed rent. The estimated average annual value added in the group is Birr 26,264.00.

Eight establishments or 20 percent of the sample population run three activities sales of liquor, alcohol and bed rent. The estimated average annual value added by this group is Birr 18,690.48.

In group three establishments running four activities that is with one more than group two. Hotels in this group are supposed to prepare food. The average annual value added by the group is estimated to be Birr 33,943.00. This group constitute 15 percent of the sample population.

The other establishments have been categorized as group four and group five. The former runs one more additional activity than group three. It prepares tea, coffee, and milk. The number of establishments fallen within this category are 9 and constitute 22.5 percent of the sample population.

The estimated annual average value added by the group is Birr 49,485. The latter in turn runs all types of activities such as sales of beer & soft drink, alcohol, tea, food & bed rent. The total number of establishments, out of the sample population, the group constituted 35 percent. The average annual value added by the group is estimated to be Birr 49,692.00.

Since the sample result is believed to be representative, it is found reasonable to group the actual number of hotels in accordance with the sample group results. Other alternatives, such as, location category was not sound enough to be applicable. Hence hotels have been grouped into five category corresponding to the sample group results. The summary of the survey result is shown in the following table.

Table—:Summary of the value added estimation by groupe of establishment,1994/95.

	Number of hotels	Estimated value added per establishment(Birr)	Total value added(Birr)
1	31	26,264.00	814,184.00
2	84	18,690.00	1,573,698.00
3	63	33,943.00	2,141,803.00
4	95	49,485.00	4,686,229.00
5	147	49,692.00	7,304,724.00
		Gross Value Added	16,520,638.00

For further details of the survey results refer tables—, —&— in the annexure.

PENSION

Pensions can earn revenue from provision of different services. Such as from sales of soft drinks, mineral water, bed rent and others. But, without some knowledge of thier performance, it is difficult to estimate the exact share of each activity. However; one may guess thier main source of revenue to come from bed rent. Thus the average annual value added by pension has been estimated on the basis of the mentioned assumption. This is to mean that the main source of revenue is assumed to come from bed rent only.

The next step was to establish the total number of pension for the years 1993/94-1995/96. About 66 pensions were estimated to be operational in the year 1995/96. Out of the total, 28 or 42 percent have been resided in Mekelle. This fact indicates that most of the establishments to be located in the major towns of the region. Hence they are equally treated by the average hotels earning from bed rent. Similarly, thier intermediate consumption is estimated with some adjustement by the average expense for hotels.

The estimated average annual revenue earned by hotels from bed rent, according to the survey result, for the year 1995/96 is Birr 14,554.30. And the estimated consumption of utilities and other intermediate inputs is Birr 3,197.16. Hence the value added from bed rent by hotels is estimated at Birr 11,357.14.

The gross value added by pension is, thus, estimated by multiplying the value added from bed rent in hotels to the number of pensions. The total number of pensions in the region is estimated to be 66 and their gross value added is estimated at Birr 749,571.24. Further details of the work are summarized in table---of the annexure.

RESTAURANT

Similarly a sample survey was conducted on restaurants to estimate value added by them. Samples were taken randomly from three zonal towns and Mekelle. A total number of 18 restaurants, which constitute 6.9 percent of the population, have been included in the survey.

Each establishment was asked, according to the administered questionnaire, to respond the number of meals prepared per day both fast and non fast; their consumption of intermediate inputs and other utilities. For example; some of the intermediate inputs are flour, butter, edible oil, onion, potato, etc. Under utilities consumption of energy, water and others are included.

According to the survey result the average annual gross value added by an establishment is estimated to be Birr 26,534.51. Multiplying this value by the total number of restaurants which were functional in the year 1995/96 gives us the gross value added in that year.

The total number of establishments for three years 1993/94-1995/96 has been identified. And is being listed in detailed in table--- of the annexure. Hence the total number of restaurants, in the region as a whole and for the year 1995/96, is estimated to be 262. Therefore; the gross value added by restaurant is estimated at Birr 6,952,041.60.

SNACK BARS

The activities of snack bars are similar with that of restaurants. But what makes them different is they did not prepare lunch and dinner meals. However; their earnings from sales of breakfast meals, tea, milk and coffee is assumed to be far better than hotels and bars.

Based on the estimations of the owners of the establishments and the zonal departments of Industry, Trade and Transport, the value added by snack bars was deduced from the combined result of corresponding earnings from restaurants and bars. The assumptions are:

- a) snack bars can get one third revenue of restaurants from sales of breakfast meals
- b) snack bars, can also earn two times the revenue earned from tea by bars

The total number of snack bars has been established for three years 1993/94-1995/96. The total number of snack bars for the year 1995/96 is estimated to be 564. Out of which , 248 snackbars or 44 percent are in Mekelle. The rest are located in the zonal towns and some woreda towns. Thus, the estimated value added from the snackbars in the region is estimated at Birr5,517,916.60.

BARS

In this case 43 establishments have been taken in a random sample from the three zonal towns and Mekelle. This sample size is estimated to be 3 percent of the total population.

The data collected from each establishment included in the sample survey has been summarized in atabular form. According to this result the randomly selected establishments are grouped into five groups referring to the activities they run.

Those in group one are mainly dependant on the sales of beer and soft drink. The estimated average annual value added for this group, in the year 1995/96 was Birr3,444.00. Establishments in group two, however; earn far more better than group one. They have one more additional earning from sales of mineral water. The average annual value added for the group is estimated at Birr 6,972.00.

Establishments in group three are still far more better than group two. The group earns additional revenue from sales of alcohol. Moreover; their revenue from sales of liquor in general is much higher than the two former groups. Thus the average annual value added by the group is estimated at Birr 11,379.00.

Establishments in group four in turn have better earning from sales of liquor and tea. This group is relatively better earner than the above three groups. The group assumed to contribute an average annual value added of Birr 14,187.50.

The total number of bars in the region have been grouped into four categories to estimate the value added with the stratified results of the sample survey. This category or grouping is based on as explained earlier, their location. In the first group bars are those which are found in Mekalle, second group are the zonal towns and some major wereda towns, third group minor rural towns and the rest are grouped as others.

Accordingly, the value added by first group was estimated using the sample value added by establishment in group four, i.e. Birr14,187.50 per bar. For the second group the value added was estimated with that of group three in the sample which is Birr 11,397.00 per bar. for the third group with that of group two which is Birr 6,972.00 per bar. For the others with that of group one which is Birr 3,444.00.

Table—:Summary of the value added estimation by group of establishment ,1995/96.

Group	Total number of bars	value added per bar	Total value added
1st	217	14187.5	3078687.5
2nd	538	11379	6121902
3rd	504	6972	3513888
Others	256	3444	881664
Total (Gross value added)			13596142

Another group which has to be treated under the sub sector is the preparation of local drinks called 'Miess'. Accordingly the total number of establishments, licensed by Trade Bureau for the year 1995/96, are estimated to be 666.

These establishments earn their revenue only from sales of 'Miess'. Thus it was assumed reasonable to estimate the gross value added by 'Miess' house with the sample result of bars in group one. This group as explained earlier earns its revenue from sales of beer and alcohol only. The estimated gross value added for the group is the smallest of all other groups; which is Birr 3,444.00. Hence, the gross value added by miess house is estimated to be Birr 2,293,704.00.

Table 53—Summary of the gross value added estimation from hotels, bars, restaurants, snackbars and 'Mless' houses both at current and constant factor costs, 1994/95-1995/96.

	Description	GVA at Current F.C.		GVA at Constant F.C.	
		1994/95	1995/96	1994/95	1995/96
	Total Gross Value Added	24901118.56	28686354.62	24901118.56	28821180.49
1	Hotels				
	Number of enterprise by group	322	421	322	421
	Group 1	24	31	24	31
	Group 2	64	84	64	84
	Group 3	48	63	48	63
	Group 4	73	93	73	93
	Group 5	113	147	113	147
	Estimated value added by group				
	Group 1	26264.04	26264.04	26264.04	26387.48
	Group 2	18690.48	18690.48	18690.48	18778.33
	Group 3	33943.32	33943.32	33943.32	34102.85
	Group 4	49485.36	49485.36	49485.36	49717.94
	Group 5	49692.00	49692.00	49692.00	49925.55
	Total value added	178075.20	178075.20	178075.20	178912.15
	Group 1	630336.96	814185.24	630336.96	818011.91
	Group 2	1196190.72	1570000.32	1196190.72	1577379.32
	Group 3	1629279.36	2138429.16	1629279.36	2148479.78
	Group 4	3612431.28	4602138.48	3612431.28	4623768.53
	Group 5	5615196.00	7304724.00	5615196.00	7339056.20
2	Bars				
	Number of enterprises				
	Group 1	154	217	154	217
	Group 2	492	538	492	538
	Group 3	469	504	469	504
	Others	237	256	237	256
	Estimated value added by group				
	Group 1	14845.80	14845.80	14845.80	14915.58
	Group 2	11379.00	11379.00	11379.00	11432.48
	Group 3	6983.16	6983.16	6983.16	7015.98
	Others	3444.00	3444.00	3444.00	3460.19
	Total value added	11976051.24	13744617.24	11976051.24	13809216.94
	Group 1	2286253.20	3221538.60	2286253.20	3236679.83
	Group 2	5598468.00	6121902.00	5598468.00	6150674.94
	Group 3	3275102.04	3519512.64	3275102.04	3536054.35
	Others	816228.00	881664.00	816228.00	885807.82
3	Restaurant				
	Number of enterprises	218	262	218	262
	Estimated value added by establishment	26534.51	26534.51	26534.51	26659.22
	Total value added	5784523.18	6952041.62	5784523.18	6984716.22
4	Snack bars				
	Number of enterprises	511	564	511	564
	Estimated value added by establishment	9783.54	9783.54	9783.54	9829.52
	Total value added	4999388.94	5517916.56	4999388.94	5543850.77
5	'Mless House'				
	Number of enterprises	570	666	570	666
	Estimated value added by establishment	3444.00	3444.00	3444.00	3460.19
	Total value added	1963080.00	2293704.00	1963080.00	2304484.41

Hotels

Code No.	Beer	Soft Drinks	Mineral Water	Alcohol	Tea	Food	Bar Rent	Average Monthly Revenue	Average Monthly Expense	Average Monthly Value Added	Average Monthly Expense for utilities	Average Monthly Expense for detergent	Number of Beds	Remark	
32		324.00						900.00	1224.00	85.00	1139.00	55.00	30.00	10.00	
40	482.00	66.00	485.00					2400.00	3414.00	310.00	3104.00	200.00	110.00	19.00	
21	204.00	216.00	504.00					1470.00	2394.00	160.00	2234.00	100.00	60.00	22.00	
23	300.00	324.00	84.00					630.00	1338.00	110.00	1228.00	70.00	40.00	6.00	
	322.00	202.00	358.00					1500.00	2352.00	193.33	2165.67	123.33	70.00	15.67	ERR
15	922.50	54.00	84.00	45.00				900.00	2005.50	200.00	1805.50	140.00	60.00	10.00	
18	255.00	216.00	84.00	180.00				720.00	1815.00	95.00	1720.00	40.00	55.00	7.00	360.00
22	102.00	48.00	84.00	45.00				750.00	1029.00	110.00	919.00	60.00	50.00	12.00	
27	285.00	182.00	84.00	90.00				1500.00	2091.00	190.00	1901.00	130.00	60.00	9.00	
29	337.50	216.00	252.00	30.00				630.00	1690.50	190.00	1500.50	120.00	70.00	5.00	225.00
33	100.00	324.00		45.00				495.00	964.00	112.00	852.00	62.00	50.00	6.00	
34	129.00	81.00	210.00	30.00				1440.00	1890.00	210.00	1680.00	150.00	60.00	11.00	
37	438.00	93.00	216.30	60.00				1440.00	2247.30	165.00	2082.30	125.00	40.00	12.00	
	317.38	149.25	144.90	65.83				984.38	1716.54	159.00	1557.54	103.38	55.63	9.00	
9	255.00	48.00	84.00			1042.86		1500.00	2929.86	360.00	2569.86	300.00	60.00	10.00	
10	513.00	324.00	336.00	180.00		1042.86		1300.00	3695.86	420.00	3275.86	350.00	70.00	8.00	
24	153.00	182.00	198.00	45.00		1042.86		360.00	2410.86	160.00	2250.86	100.00	60.00	5.00	450.00
26	307.50	182.00	252.00	90.00		1042.86		1080.00	2934.36	160.00	2774.36	100.00	60.00	8.00	
36	153.00	108.00	84.00	45.00		1042.86		450.00	1882.86	125.00	1757.86	100.00	25.00	4.00	
41	307.50	478.00	252.00	112.50		1042.86		2400.00	4592.86	250.00	4342.86	150.00	100.00	14.00	
	281.50	213.67	201.00	94.50		1042.86		1181.67	3074.44	245.83	2828.61	183.33	62.50	8.17	
3	930.00	324.00	504.00	90.00	513.57			2400.00	4761.57	400.00	4361.57	300.00	100.00	15.00	
4	432.00	138.00	72.00	150.00	513.57			1890.00	3195.57	310.00	2885.57	240.00	70.00	15.00	
6	309.00	114.00	174.30		513.57			3825.00	4935.87	450.00	4485.87	300.00	150.00	28.00	
7	381.00	182.00	252.00	180.00	513.57			2520.00	4248.57	290.00	3958.57	200.00	90.00	25.00	360.00
13	815.00	432.00	504.00	150.00	513.57			720.00	2934.57	400.00	2534.57	300.00	100.00	5.00	
25	922.40	324.00	504.00	45.00	513.57			2760.00	5068.97	550.00	4518.97	400.00	150.00	17.00	
30	513.00	216.00	336.00	45.00	513.57			4050.00	5673.57	450.00	5223.57	350.00	100.00	27.00	
31	1230.00	648.00	684.00	60.00	513.57			2100.00	5235.57	500.00	4735.57	400.00	100.00	17.00	
38	498.00	498.00	151.20		513.57			3000.00	4609.77	200.00	4409.77	100.00	100.00	17.00	
	630.18	316.00	353.60	102.86	513.57			2585.00	4518.23	394.44	4123.78	287.78	106.67	18.44	360.00
1	1020.00	432.00	672.00		513.57	1042.86		1500.00	5540.43	260.00	5280.43	200.00	60.00	10.00	360.00
2	714.00	216.00	336.00	90.00	513.57	1042.86		900.00	3812.43	420.00	3392.43	300.00	120.00	5.00	
5	2480.00	648.00	1008.00		513.57	1042.86		1400.00	7432.43	490.00	6942.43	350.00	140.00	14.00	360.00
8	237.00	216.00	336.00		513.57	1042.86		600.00	3575.43	310.00	3265.43	250.00	60.00	4.00	630.00
11	264.00	279.00	429.00	45.00	513.57	1042.86		1620.00	4193.43	460.00	3733.43	400.00	60.00	12.00	
12	255.00	162.00	252.00	45.00	513.57	1042.86		1260.00	3530.43	400.00	3130.43	280.00	120.00	14.00	
14	420.00	216.00	336.00		513.57	1042.86		1530.00	4058.43	430.00	3628.43	350.00	80.00	8.00	
17	922.50	54.00	84.00	45.00	513.57	1042.86		1470.00	4131.93	355.00	3776.93	300.00	55.00	12.00	
18	915.00	324.00	252.00	45.00	513.57	1042.86		300.00	3412.43	410.00	3002.43	350.00	60.00	13.00	
19	204.00	108.00	84.00	90.00	513.57	1042.86		450.00	2492.43	350.00	2142.43	300.00	50.00	5.00	
20	513.00	216.00	168.00	45.00	513.57	1042.86		3000.00	5498.43	540.00	4958.43	440.00	100.00	20.00	
28	922.50	324.00	252.00	90.00	513.57	1042.86		420.00	4014.93	180.00	3834.93	120.00	60.00	4.00	450.00
35	1230.00	324.00	504.00	180.00	513.57	1042.86		2100.00	5694.43	225.00	5469.43	160.00	85.00	14.00	
39	482.00	68.00	102.00	60.00	513.57	1042.86		3300.00	5546.43	330.00	5216.43	180.00	150.00	22.00	
	752.79	256.07	343.93	73.50	513.57	1042.86		1417.66	4509.57	368.57	4141.00	284.29	84.29	11.21	
	635.11	239.88	289.51	81.75	513.57	1042.86		1548.29	3520.66	295.66	3225.00	217.61	78.05	12.22	

38700.00

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Bed Rent
20.00

Restaurant

Code No.	Average Number of Meals Sold in a Month				Monthly Expenses for non fast Meals				Monthly expenses for Fast Meals					Average Monthly Revenue From Sales of		Average Monthly cost of Intermediate Inputs for		Number of Months Food Preparations Under go for		Annual Value added by both fast and non fast meals
	Non fast food		Fast Meals		Water & electric/Tv/T	Other Utilities	Total	Oil & Other			Total	Non fast food	Fast food	Non fast food	Fast food	Non fast food	Fast food			
	Sold in a day	From value of	Sold in a day	From value of				Spline	Utilities	Tv/T								Total		
1	30	4815.00	20	1800	2310	369	405	190	3274	270	110	275	655	4815	1800	3274	655	7	5	28959.84
2	30	4815.00	15	1350	2310	369	405	230	3314	270	110	206	586	4815	1350	3314	586	7	5	26774.84
3	150	24075.00	30	2700	6930	8200	1650	2100	18880	710	380	405	1495	24075	2700	18880	1495	7	5	84837.84
4	50	8025.00	30	2700	3485	1430	825	680	6400	540	390	412	1342	8025	2700	6400	1342	7	5	30612.84
5	50	8025.00	30	2700	3485	1320	825	570	6180	610	342	412	1364	8025	2700	6180	1364	7	5	25775.00
6	20	3000.00	20	1800	1155	360	450	80	2045	340	50	450	840	3000	1800	2045	840	7	5	17665.00
7	20	3000.00	15	1350	1155	360	275	100	1890	350	50	275	675	3000	1350	1890	675	7	5	17325.00
8	60	9000.00	40	3600	3485	1200	825	560	6050	750	280	550	1580	9000	3600	6050	1580	7	5	36930.00
9	40	6000.00	30	2700	2310	1300	550	470	4630	620	352	412	1384	6000	2700	4630	1384	7	5	22350.00
10	60	9000.00	30	2700	4810	1100	825	350	6885	580	200	412	1192	9000	2700	6885	1192	7	5	28525.00
11	10	1500.00	5	450	788	220	137.5	40	1165.5	100	20	68.75	188.75	1500	450	1165.5	188.75	7	5	9827.75
12	30	4500.00	15	1350	2310	530	412	280	3532	280	140	206	626	4500	1350	3532	626	7	5	16576.00
13	20	3000.00	7	630	1155	350	275	160	1940	120	60	115.5	295.5	3000	630	1940	295.5	7	5	15272.50
14	20	3000.00	10	900	1155	350	275	142	1922	170	70	137.5	377.5	3000	900	1922	377.5	7	5	16336.50
15	100	18050.00	50	4500	6930	1350	1375	160	9815	400	180	825	1405	16050	4500	9815	1405	7	5	65300.00
16	30	4500.00	15	1350	2310	360	343.75	115	3128.75	150	57	220	427	4500	1350	3128.75	427	7	5	20393.75
17	30	4500.00	15	1350	2310	360	343.75	115	3128.75	150	50	220	420	4500	1350	3128.75	420	7	5	20428.75
18	40	6000.00	30	2700	3485	500	550	212	4727	450	110	412.5	972.5	6000	2700	4727	972.5	7	5	23728.50

26634.61

Table—Survey results of the estimation of Gross Value Added from Bars, 1994/95.

Population Size
Sample Size 43

Cod No.	Monthly Average Service Margin from Sales of						Total Average Monthly Revenue	Average Monthly Expense For Utilities	Average Monthly expense For Detergents	Number of Beds	Gross Value of Services
	Beer	Soft drink	Mineral Water	Alcohol	Tea	Bed rent					
13	307.50	-	-	45.00	-	-	352.50	20.00	5.00	-	327.50
33	204.00	67.50	-	-	-	-	271.50	20.00	5.00	-	246.50
	511.50	67.50	0.00	45.00	0.00	0.00	624.00	40.00	10.00	0.00	574.00
										Average	287.00
1	630.00	108.00	33.00	-	-	-	771.00	60.00	6.00	-	705.00
2	650.00	324.00	168.00	-	-	-	1142.00	90.00	10.00	-	1042.00
22	307.50	324.00	100.80	-	-	-	732.30	25.00	10.00	-	697.30
32	184.50	67.50	42.00	-	-	-	294.00	20.00	10.00	-	264.00
19	184.50	64.80	-	45.00	-	-	294.30	50.00	10.00	-	234.30
34	204.00	150.00	-	-	-	240.00	594.00	30.00	15.00	3	549.00
	2160.50	1038.30	343.80	45.00	0.00	240.00	3827.60	275.00	61.00	-	3491.60
										Average	581.93
3	922.50	81.00	126.00	60.00	-	-	1189.50	45.00	6.00	-	1138.50
4	922.50	162.00	252.00	192.90	-	-	1529.40	60.00	15.00	-	1454.40
6	615.00	324.00	252.00	90.00	-	-	1281.00	40.00	10.00	-	1231.00
7	307.50	108.00	168.00	90.00	-	-	673.50	35.00	8.00	-	630.50
8	465.00	162.00	252.00	45.00	-	-	924.00	40.00	10.00	-	874.00
9	337.50	195.00	102.00	45.00	-	-	679.50	50.00	8.00	-	621.50
10	462.00	108.00	63.00	45.00	-	-	678.00	30.00	5.00	-	643.00
20	615.00	162.00	105.00	30.00	-	-	912.00	70.00	10.00	-	832.00
35	615.00	324.00	30.00	90.00	-	-	1059.00	40.00	10.00	-	1009.00
37	153.00	108.00	63.00	45.00	-	-	369.00	25.00	8.00	-	336.00
12	307.50	324.00	63.00	-	-	420.00	1114.50	30.00	10.00	5	1074.50
17	945.60	216.00	168.00	-	-	300.00	1629.60	70.00	25.00	5	1534.60
	6668.10	2274.00	1644.00	732.90	0.00	720.00	12039.00	535.00	125.00	-	11379.00
										Average	948.25
14	369.00	324.00	201.60	90.00	255.00	-	1239.60	90.00	10.00	-	1139.60
15	307.50	324.00	100.80	45.00	450.00	-	1227.30	100.00	10.00	-	1117.30
5	1230.00	648.00	504.00	60.00	1020.00	-	3462.00	380.00	50.00	-	3032.00
18	615.00	64.80	-	30.00	480.00	300.00	1489.80	155.00	50.00	3	1284.80
21	185.00	195.00	100.80	45.00	390.00	-	915.80	90.00	10.00	-	815.80
23	615.00	162.00	252.00	45.00	120.00	-	1194.00	100.00	30.00	-	1064.00
26	207.00	81.00	100.80	-	60.00	540.00	988.80	80.00	20.00	6	888.80
27	455.00	64.80	50.40	60.00	-	360.00	990.20	60.00	15.00	4	915.20
28	307.50	162.00	100.80	-	120.00	720.00	1410.30	100.00	30.00	8	1280.30
30	204.00	108.00	-	180.00	120.00	150.00	762.00	60.00	15.00	2	687.00
31	102.00	108.00	-	45.00	121.20	360.00	736.20	40.00	20.00	5	676.20
36	1230.00	324.00	504.00	60.00	-	630.00	2748.00	100.00	30.00	7	2618.00
38	123.00	67.50	504.00	30.00	120.00	-	844.50	50.00	15.00	-	779.50
39	98.40	108.00	42.00	120.00	82.50	-	450.90	40.00	10.00	-	400.90
40	324.00	108.00	100.50	45.00	-	450.00	1027.50	60.00	20.00	7	947.50
42	922.50	162.00	105.00	45.00	-	300.00	1534.50	65.00	25.00	4	1444.50
43	184.50	135.00	105.00	60.00	-	600.00	1084.50	50.00	27.00	10	1007.50
	7479.40	3146.10	2771.70	960.00	3338.70	4410.00	22105.90	1620.00	387.00	-	20098.90
										Average	1182.29
11	307.50	162.00	100.80	180.00	49.50	420.00	1219.80	85.00	15.00	5	1119.80
16	615.00	64.80	100.80	45.00	285.00	450.00	1560.60	150.00	50.00	5	1360.60
24	307.50	324.00	504.00	45.00	240.00	540.00	1960.50	200.00	60.00	8	1700.50
25	307.50	162.00	252.00	45.00	120.00	180.00	1066.50	100.00	20.00	3	946.50
29	204.00	324.00	168.00	150.00	1020.00	300.00	2166.00	250.00	50.00	4	1866.00
41	98.50	67.50	21.00	45.00	82.50	150.00	464.50	25.00	10.00	3	429.50
	1840.00	1104.30	1146.60	510.00	1797.00	2040.00	8437.90	810.00	205.00	-	7422.90
											1237.15
	25136.60	9770.70	6747.30	2515.80	3338.70	6330.00	53839.10	3240.00	759.00	-	49840.10
											513.57
											999.22

Table—Number of Service Rendering Enterprises in Tigray Region licensed by Tourism Bureau by Zone, Capital and Number of Workers, 1992/94.

Establishment	Mekala			Southern			Eastern			Central			Western			
	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Workers	Capital	Number of establishment	Number of Workers	Capital	Number of establishment
Bar	179		1001.80	298		802960.00	371		1266000.00	248		1052610.00	348		735780.00	1438
Hotel	78	225	487800.00	70	210.00	455000.00	84	192.00	418000.00	23	69.00	130000.00	12	36.00	84500.00	244
Restaurant	38	105	70000.00	82	124.00	124000.00	18	48.00	30000.00	12	36.00	42000.00	8	18.00	24000.00	128
Wine Houses	88		105200.00	347			115		180080.00	30		60280.00	13		14100.00	870
Snackbar	211	633	318500.00	88	265.00	127000.00	88	178.00	126000.00	13	26.00	36000.00	9	18.00	27000.00	406
Paradise	18	18	80000.00	8	8.00	25000.00	4	4.00	20000.00	8	8.00	35000.00	4	4.00	22000.00	34
Total	881		1060201.80	884		1623960.00	697		2038060.00	332		1364870.00	388		907380.00	2822

Table—Number of Service Rendering Enterprises in Tigray Region licensed by Tourism Bureau by Zone, Capital and Number of Workers, 1994/95.

Establishment	Mekala			Southern			Eastern			Central			Western			Total Number		
	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Workers	Capital	Number of establishment	Number of Workers	Capital	Number of establishment	Number of Capital Workers	
Bar	171		1001.80	298		802960.00	298		1266000.00	238		1052610.00	332		735780.00	1336	0	3948322
Hotel	84	264	2045800.00	80	320	1032500.00	84	336	132500.00	80	200	156000.00	24	94	78000.00	322	1214	3444600
Restaurant	49	120	14000.00	112	336	58000.00	19	87	12000.00	38	105	40000.00	12	36	14000.00	218	684	138000
Wine Houses	84		105200.00	338			88		180080.00	28		60280.00	8		14100.00	811	0	368610
Snackbar	238	708	30000.00	110	330	27000.00	110	330	13500.00	33	99	33000.00	22	66	19000.00	811	1633	122800
Paradise	23	45	35000.00	7	14	15000.00	8	10	5000.00	10	20	20000.00	8	16	20000.00	83	106	95000
Total	808	1136	2230701.80	848	1000	2025460.00	600	733	1809060.00	381	424	1370670.00	406	212	80680.00	2881		

Table—Number of Service Rendering Enterprises in Tigray Region licensed by Tourism Bureau by Zone, Capital and Number of Workers, 1995/96.

Type of Establishment	Mekala			Southern			Eastern			Central			Western			Total Number		
	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Worker	Capital	Number of establishment	Number of Workers	Capital	Number of establishment	Number of Workers	Capital	Number of establishment	Number of Capital Workers	
Bar	217		1001.80	438		586003.00	199		606500.00	220		596754.00	441		871830.00	1818	0	2431789
Hotel	88	440	12012500.00	88	425	132500.00	92	480	2039000.00	84	270	119500.00	13	52	32200.00	332	1647	14336700
Restaurant	30	200	20000.00	136	544	48000.00	22	88	26000.00	41	164	28000.00	13	52	32000.00	262	1048	154000
Wine Houses	87		105200.00	348		349700.00	68		110780.00	23		33448.00	10		10400.00	806	0	809608
Snackbar	248	1044	118000.00	132	396	86000.00	119	358	13500.00	42	126	50000.00	23	69	41500.00	864	1993	311000
Paradise	28	58	45000.00	13	26	30000.00	8	10	18000.00	12	24	20000.00	8	16	2369.00	86	132	116369
Total	888			1182			508			382			808			2248		

TRANSPORT AND COMMUNICATION

The aim of this section is to discuss an overview of the coverage, sources of data, and method of estimation of Gross value added of the Transport and communication sector for the Tigray region as part of the total Gross Domestic Product of the region. The supra regional nature of most of the activities of Transport and communication sector creates a major measurement problem. It is difficult to identify easily and adequately measure the level of GVA originating in the region.

This section gives more emphasis to the various approaches (methods) of estimation to be used in each sub-sector depending on the availability of the required data which are kept by the region.

The Economic activities that are treated under the Transport and Communication sector in the Ethiopian national accounts sense include:

- 1) Road Transport -passenger and freight transport,
- 2) Railways Transport
- 3) Water Transport
- 4) Air Transport, and
- 5) Communications.

However, the activities of the sector discussed for the purpose of the estimation of the regions' income accounting include only:

- 1) Road Transport, and
- 2) Communication service.

The activities of Railways Transport and Water Transport are not included in the regional income account estimate, because these activities are not undertaken in the region. Besides, because of the supra-regional nature of Air Transport it is not currently included in the regions' income account estimate.

The coverage, sources of data and method of estimation of the sub-sectors are discussed as follows.

1) Road Transport

This sub-sector covers road Transport activities undertaken on a commercial basis. It includes urban and inter urban passenger transport services, freight transport services, and the transport services of pack animals and horse driven carts.

Sources of Data

The main sources of information for estimating each of the sub-sectors' Regional Gross value added are the Regional Bureau of Industry, Trade, and Transport, Private Passenger and freight transport associations operating in the region, Analytical Report of the 1994 Population and Housing census, The Rural House holds income and expenditure survey. The service coefficient like an average capacity, and load factor, average distance covered per day, average working days per year, and an average fare per passenger-km / freight ton /km already established to estimate the GVA of transport sub-sector are compiled based on the information collected from the private and public owned relevant transport associations, such as Walia, Yekatit, Gureza, and Weini passenger transport associations, Selam freight association and Trans-Ethiopia freight Company.

The methods adopted to collect the necessary information were questionnaire type and interview. Questionnaires were dispatched for the organized transport associations, and interviewing were also made both to the organized and non-organized passenger and freight transports. In the meantime, the method of estimation to be followed is dependent upon the available information. A practical method of estimation which is designed to fit the data at hand is discussed in the following section.

Method of estimation

Current factor cost estimates

i) Passenger and Freight Transport

Estimation of Gross Value added at current factor cost of passenger and freight transport can be made either production approach, ie, by deducting cost of intermediate inputs (such as fuel, tyre, lubricant, repair and maintenance, insurance, etc) and indirect taxes (net subsidy) from the gross value of output, or by income/cost approach, ie, summing up compensation of employees, consumption of fixed capital and operating surplus.

Gross output is equal to the sum of revenue earned from the provision of passenger and freight transport service, commission income from coordination and other income. But there is lack of relevant data to estimate value added from this sub-sector. In this case the possible alternative method could be independent data by individual owners or owners' associations to get parameters such as number of vehicles, average load capacity, and average load factor, average working days/year, average distance covered per day in km/miles, average charge per passenger-km or per freight ton-km by type and size of vehicle. Once these parameters have been prepared, the gross value of service (output) can be derived by multiplying the total passenger-km and freight ton-km performed by average tariff per passenger-km and per freight ton-km. Then the value added at current factor cost of intermediate inputs and net indirect taxes from the gross value of services as suggested above.

Regarding intermediate consumption, special sample survey for benchmark survey may be needed to obtain data on the cost structure of services provided by large and small private companies/owner's associations that do not establish accounts in the region. In practice, it is not possible to cover all enterprises/associations to get the estimates of the intermediate consumption. In such cases we were forced to use the national ratio of intermediate consumption to gross value of service.

ii) Taxis and Horse Driven Carts

In this type of transport it is difficult to find organized information such as profit and loss accounts or organized reports on various parameters.

The parameters needed in this case are: annual average salary of drivers and or assistant drivers, as the case may be, for each type of transport service, annual average provision for consumption of fixed capital for each type of transport and the annual average operating surplus that could be generated by each type of transport. The sum of total salaries, consumption of fixed capital and operating surplus will give gross value added at current factor cost.

Another approach that may be used in estimating the value added from this type of transport activities is the production approach and this method of estimation regarding performance parameters such as distance covered in an accounting period, average load capacity and/or load factor, average working day per year, total passenger-km, average charge per passenger km; and ratios of intermediate consumption to gross value of services. To obtain the passenger-km like in the case large, medium and small buses, it is necessary to have the distance covered per year in km/miles, (average working days per year multiplied by average distance covered per day in km/miles). Multiplying the total distance covered per year by the total distance covered per year by the number of vehicles gives vehicle-km. The product of the total vehicle-km and load factor will give total passenger-km. Finally, the total passenger-km multiplied by average fare per passenger-km gives the gross value of service by taxi transport services. The same procedure may be applied for the horse driven cart transport services depending on the availability of relevant data.

Regarding the cost of intermediate inputs of the taxi transport and driven carts it is possible to establish a ratio of intermediate consumption to the gross value of service on the basis of small type studies to be carried out at regional.

iii) Pack Animal transport

Pack animal transport service may have a considerable contribution to the gross domestic product of the Tigray region, particularly, in the rural areas. However, due to lack of relevant data, there is a problem of estimation of GVA from this transport service. In the absence of any other data, the "Rural Income Consumption and expenditure survey" conducted by the CSA in 1994 has been used as the only source of information in this regard. The per capita cash expenditure on animal transport in rural has been taken as 50% of the per capita expenditure of modern transport service (established through the mentioned survey) multiplied by the rural population of the region.

could give the gross value added of output . Regarding the cost of intermediate inputs it is possible to establish a ratio of intermediate inputs to the gross value of service .

Constant Factor Cost Estimate

The estimates at constant factor cost may be derived by extrapolation method , ie , first by constructing a weighted volum index for each type of transport service , and then multiplying it by the base year value added to obtain value added at constant factor cost .

2) Communication

The communication sub-sector is composed of postal , telegraph , telephone , radio , and television transmission services .

Sources of data

For the estimation of the income account of the region the possible sources of data are the brach offices of the Ethiopian Postal service Agency and the Ethiopian Telecommunication Authority in lthe region .

Method od Estimation

The gross value of output is equal to the sum of revenue earned from telephone , telegram , telex , and radio and television transmission services ; and installing and repairing of customers' equipmesnt in the case of telecommunication services and the sum of revenue earned from sales of stamps , international mlail , postage meter machine , box rental and key sales , money order and postal order commission , parcel post receipts envelope aand package sales and newspaper sales commission .

Two alternative methods can be applied for the preparation of GVA at current factor cost for this slub-sector . It could be arrived at by deducting cost of intermediate inputs and indirect taxes from the gross vaalue of output or it could be obtained as the sum of wages and salaries operating surplus and depreciation.

In order to prepare the constant factor cost estimate , first the volume of services provided has to be identified for each type of communication service . Once their volume indicators are identified weighted volum indices will be then constructed . The weights are to be established on the basis of the share of each type of service in the total gross value of output in the base year . The weighted volum indices so derived are multiplied by the base year value added to obtain the constant factor cost estimates for subsequent years . The number of urbaan and inter-urban telephone calls, the number of international telephone calls, and the number of telegram and telex mesages can serve as volume indicators with regard to telecommunication services . While for the postal services the number of domestic and international mails handled can be used as volume indicators / The eatimation of gross value added of each sub- sector are indicated below /

1) Passenger Transport

i) Big buses

Assumptions for parameters to be used :

- a) an average capacity of 60 passenger (seats) and
load factor of 60 passengers (100 %)
- b) an average distance covered per day 221 km
- c) an average working days per year 245
- d) average distance covered per year 54145 km
- e) an average fare of 7.23 cents /passenger .

<u>No</u>	<u>Description</u>	<u>1994 /95</u>	<u>1995/96</u>
1	Number of vehicles	12	16
2	Total Vehicle -km (1 * d)	649740	866320
3	Total passenger- km (2 * a)	38984400	51979200
4	Gross value of service (3 * e)	2818572	3758096
5	Cost of Intermediate inputs (57 % of GVA)	1606586	2142115
6	Gross value added (4-5)	1211986	1615981

ii) Medium and small buses

Assumptions :

- a) an average capacity of 15 passenger seats , and a load factor of 12 passenger s (90 %)
- b) an average distance covered per day 86 km .
- c) an average Working days per year 226
- d) an average distance covered per year 19 436 km
- e) an average fare of 11 cents / passenger /km

No	Description	1994/95	1995/96
1	Number of Vehicles	228	278
2	Total vehicle - km (1 * d)	4431408	5403208
3	Total passenger -km (2 * a)	53176896	64838496
4	Gross Value of service (3 * e)	5849457	7132235
5	Cost of intermediate inputs (57 % of GVA)	3334191	4065374
6	Goss Value added / 4-5 /	2515266	3066861

iii) Taxis

Assumption :

- a) an average capacity of 12 passengers and
a load factor of 9 passengers (75 %)
- b) average working days per year 302
- c) an average distance covered per day 60 km
- d) an average distance covered per year (b * c) = 18120 km
- e) an average fare of 17 cents / passenger /km .

No	Description	1994/95	1995/96
1	Number of vehicles	38	63
2	Total vehicle- km (1 * d)	688560	1141560
3	Total passenge -km (2 * a)	6197040	10274040
4	Gross value of service (3 * e)	1053497	1746587
5	Cost of intermediate inputs (57 % of GVA)	600493	995555
6	Gross value added (4-5)	453004	751032

2) Freight Transport Service

Assumptions :

- a) an average capacity of 100 quintals and a load factor of 75 % (75 quintals)
- b) average working days per year 263 km
- c) average distance per day 149 km
- d) an average distance covered per year 39187 km
- e) an average charge of 5.4 cents /quintal /km

No	Description	1994/95	1995/96
1	Number of Vehicles	406	433
2	Total vehicle -km (1 * d)	15909922	16967971
3	Total quintal -km (2 * a)	1193244150	1272597825
4	Gross value of service (3 * e)	64435184	68720283
5	Cost of intermediate inputs / 63 % of GVA /	40594166	43293778
6	Gross value added	23841018	25426505

Table ____ Estimation of value added from Driven Carts of two and 4 wheels for freight

No	Description	1994/95	1995/96
1	Number of carts	169	189
2	average working days	240	240
3	Revenue earned per day	18.5	18.5
4	Gross value of service	750360	839160
5	Cost of intermediate inputs / 25 % of GVS /	187590	209790
6	Gross value added /4-5 /	562770	629370

Table — Estimation of value added from animal transport

No	Description	1994/95	1995/96
1	Rural population	265133	2710848
2	Average per capital expenditure / 50 % of average per capita expenditure of modern transport /	0.975	0.975
3	Gross value of service	2584855	2643077
4	Cost of intermediate inputs / 10 % of GVS /	258486	264308
5	Gross value added / 4-5 /	2326369	2378769

Table — ESTIMATION OF GROSS VALUE ADDED FROM TELECOMMUNICATION SUB-SECTOR

NO	DESCRIPTION	1994/95	1995/96
	REVENUE		
1.1	Revenue from urban & Inter urban calls	3356023	5352034
1.2	Revenue from international calls	767461	1161913
1.3	Revenue from telex messages	18263	11189
1.4	Revenue from installation tele. Box	370844	441814
1.5	Revenue from other sources	53621	124572
1.6	Revenue from Rent	387816	773010
1.7	Revenue from Move	12981	84642
1.8	Revenue from Telegram traffic		
	-Domestic	34336	48839
	- International	27039	39607
2	Gross value of output / 1.1 + ...1.8 /	5028386	8037620
3	Cost of intermediate inputs	626278	1008012
	- Transport and perdiem	48496	86398
	- Insurance	243206	248204
	- Utilities and other services	334576	673410
4	Gross value added / 2-3 /	4402106	7029608
5	Indirect taxes	0	0
6	Subsidies	0	0
7	Gross value added at CFC / 4-5+6 /	4402106	7029608

Table — ESTIMATION OF VALUE ADDED FROM POST OFFICES
SUB-SECTOR

NO	DESCRIPTION	1994/95	1995/96
1	Total revenue	192615	259406
	- sales of postal stamps, carton envelop & post card	149341	187589
	-Ems service	3275	17860
	- Post box rental and key sales	24490	31862
	- Parcel post Receipts	7602	9729
	- Money order , postal order revenue stampe and paper commission	5734	5844
	- Other revenue sources	2173	6522
2	Cost of intermediate inputs	57876	47654
	- Transport and perdiem	19528	24456
	- Insurance	-	-
	- Utilities and other services	38348	23198
3	Gross value added at CMP /1-2 /	134739	211752
4	Indirect taxes	-	-
5	Subsidies	-	-
6	Gross value added at CFC /4-5+6 /	134739	211752

Table— Gross domestic product from Transport and communication sector in thosand birr

No.	Sub-sector	VA per vehicle or carts in 1994/95.	VA per passenger or quintal km in 1994/95.	1994/95	1995/96.
1	Road Transport				
	1.1 Freight transport		0.0199799 Br	23841	25426
	1.2 Passenger transport				
	A) Big buses		0.0310888 Br	1212	1616
	B) Medium and small buses		0.0473006 Br	2515.3	3067
	C) Taxes	11921 Br		453	751
	D) Driving carts	3330 Br		563	629
	1.3 Animal transport			2326	2380
2	Telecommunication				
	2.1 Telecommunication			4402	7285
	- volume index			100	165.5
	2.2 Postal service			134.7	180.5
	- Volume index			100	134
3	Gross value added at CFC			35422	41367.5

Chapter-4

Other Services

- Banking and Insurance**
- Real Estate and Ownership of Dwellings**
- Public Administration and Defence**
- Education**
- Health**
- Domestic Services**
- Other Services**

BANKING AND INSURANCE

COVERAGE

The actual coverage of this sector is limited to the activities of The Commercial Bank of Ethiopia , The Construction and Business Bank , The Development Bank , Debit Credit and Saving Bank ,and The Ethiopian Insurance Corporation and Africa Insurance Company .Excluded from the sector are all employee organised saving and credit associations and informed credit and insurance institutions such as Ekub (revolving fund) Edir (traditional insurance fund) and pension fund for which no reliable sources of information are available . The contribution to GVA of these excluded activities are likely to be small.

SOURCE OF DATA

The main sources of data are The Commercial Bank of Ethiopia ,Construction and Business Bank, the Development Bank , Debit Credit and Saving Bank ,and The Ethiopian Insurance Corporation and Africa Insurance Company . It should therefore be possible to obtain data on gross output and intermediate consumption directly from annual reports of the institutions engaged in the sector which include income and expenditure statements .

METHOD OF ESTIMATION

PROCEDURES OF ESTIMATION

This is one of the institutional sectors whose operations extend beyond the boundaries of Tigray Regional state and spread over the country as a whole. Relevant records are not generally maintained by the authorities concerned according to state boundaries . In this circumstance the estimate of the gross domestic product has to be by the method of allocation of the National total by regions on the basis of relevant indicators . The factor share approach or the distribution of the different factor payments between regions appears to be the most convenient method here . If such direct data of allocation method are not available , the estimate of gross domestic product may be prepared by using the production or an income approach .

The gross output of banks and similar financial institutions is taken to be equal to the sum of (1) Actual service charges and (2) Imputed service charges. The banking sector renders services to their customers and in return customers are charged a nominal amount which is substantially lower than the expenses . If the banks are treated as any other enterprise, their income will be limited to the nominal service charges which would mean that the banks have a negative operating surplus . To circumvent this difficulty , SNA recommends that an imputed service charge is equated to the excess of property income received on loans and other investments made from the deposits they hold over the interest they pay on these deposits . The property income they receive as a result of investing their own funds should not be included in the imputed service charges through in practice it may be necessary to include all property incomes received in the calculations .

In the case of insurance sub -sector , the gross output consists of only the charge of services of insuring . The premia charge by insurance companies consists of payment for the service of insuring , a payment for the risk of insuring (in case of casualty insurance) and also a substantial amount of saving allocated to the house hold sector in case of life insurance . In ascertaining the gross value of services rendered to separate out the charge for service of insuring from other components of premium

In the case of casualty insurance insurance , the payment for risk is taken to be equal to the claims paid . Hence the service charge is equal to the difference between the premiums received and claims paid . In the case of life insurance, the service charge is considered to be equivalent to the excess of receipts on account of premia annuities less re-insurance over the payments on account of claims , surrenders, annuities less re-insurance and net addition to life fund in respect of the net increase in accruing liabilities these net additions to life fund represents the saving of the house-hold sector .

The estimates of GVA are there after obtained by deducting intermediate inputs from the gross output.

ESTIMATES OF GVA AT CURRENT FACTOR COST

With respect to the banking sub-sector, gross output is estimated as the sum of actual and imputed service charges. Actual charges for service rendered are categorised in the income and expenditure statements as exchange commission, other commission and other income. The other income component usually includes revenues earned from gains on sales of fixed assets and foreign exchange dealings and is adjusted by subtracting these items. The imputed service charge is derived by first adjusting the total interest and discount earned by banks to exclude their interest earned on foreign deposits and investment (as this is part of factor incomes originating in the rest of the world and hence, not part of domestic product) and then deducting interest paid to depositors from the adjusted total interest and discount earned.

Once gross output has been estimated in this manner, the GVA of banks is obtained by deducting cost of intermediate inputs from their gross output or as the sum of factor costs inclusive of depreciation. In the income and expenditure statement of banks cost of intermediate inputs are covered under the category of expenditure "other expenses". This item is also adjusted to exclude outlays like bad debts expense, donations and contributions, loss on foreign exchange dealings, various allowances (employee benefits) overtime payments, etc. as they are not part of cost of intermediate inputs.

With respect to the insurance sub-sector the gross output is estimated as the difference between premium income earned / net of premium income ceded to reinsurers) and claims paid / net claims ceded to reinsurance / less the change in the provision for unexpired risks / in the case of non-life insurance /, and the change in the life fund adjusted to exclude interest income assignable to the life fund (in the case of life insurance) plus net commission income earned.

The GVA of the insurance sub-sector is then obtained by deducting from the gross output the cost of intermediate inputs which are made up of outlays on office rent, communication and utility, fuel, cleaning materials, office supplies, repair and maintenance of fixed assets, travel and per diem legal audit and consultation fees, entertainment, membership and subscription bank service charge and publicity. It is also derived as the sum of compensation of employees, depreciation and operating surplus.

Estimates of GVA at constant factor cost

The ideal approach to be adopted to derive GVA at constant factor cost would be to use movements in the volume of services rendered. Banks provide various kinds of services such as lending money, providing a safe means of saving, safeguarding money and other valuables, providing advisory service, etc. there are practical problems of finding suitable volume measures as it is hardly possible to break the output of banks into quantity and price component and deciding what weights to be attached to each of the services rendered by banks. With all these problems attempts has been made to apply some of the volume of indicators at the regional level. The amount of loans and deposits could be considered as a volume activity for banking sub-sector. In deriving the gross value added at constant factor cost for banking sub-sector a volume index of loans and deposits is first constructed and then is multiplied by the base year gross value added at current factor cost.

The preparation of estimates of GVA at constant factor cost for insurance sub-sector will be based of movements in the volume of output. The output of insurance consists of the number of insurance policies of different kinds, values which are taken out in an accounting period, insurance premiums paid by type in an accounting period, and premiums net of claims. There will be problems in measuring insurance output which is similar the problems already noted for banking. Attempts where made to apply some of the volume indicators indicated above to arrive at the constant factor cost in the regional estimate. In this case a volume index of net premium is first constructed and then is multiplied by the base year value added at current factor cost. Details has been presented in the following tables.

**Table 61 : Estimation of Gross Value Added from Banking, 1994/95-1995/96.
at Current Factor Cost.**

No	Item	1994/95	1995/96
1.	Actual service charge(a+b)	2162939.90	2949199.00
	a. Commision Earned	889073.00	1288174.00
	b. Other Income Earned	1273866.90	1661025.00
2.	Imputed Service Charge(a-b)	9423190.30	22649665.00
	a. Interest on Earned	37392310.30	46105765.00
	b. Interest Paid	27969120.00	23456100.00
3.	Gross Value of output(1+2)	11586130.20	25598864.00
4.	Intermediate Consumption(a+b)	1005907.50	1563367.30
	a. General Expense	1005907.50	1563367.30
	b. Commission Expense	0.00	0.00
5.	Gross Value Added(CMP)(3-4)	10580222.70	24035496.70
6	Indirect taxes	0.00	0.00
7	Subsidies	0.00	0.00
	GVA at CFC/5-6+7/	10580222.70	24035496.70

Table 62: Estimation of Gross Value Added from Insurance
at current factor cost, 1994/95-1995/96.

No	Description	1994/95	1995/96
1	Gross Premium	4517212.53	6216687.82
2	Premium Ceded	10916.00	332477.00
3	Net premium(1-2)	4506296.53	5884210.82
4	Gross Claims paid	2634279.44	4991272.07
5	Claims recovered	0.00	0.00
6	Net Claims(4-5)	2634279.44	4991272.07
7	Change in Unexpired risks	527943.00	837459.00
8	Change in Life Fund	0.00	0.00
9	Interest on Life Fund	0.00	0.00
10	Inputed Service charge(3-6-7-8+9)	1344074.09	55479.75
11	Reinsurance Commission Income	2891489.30	2676810.99
12	Gross Value of Output (10+11)	4235563.39	2732290.74
13	Cost of intermediate inputs(a+b)	122438.01	249816.60
	a. Adm. and General expense	97752.26	211338.04
	b. Commission expense	24685.75	38478.56
14	GDP at CMP(12-13)	4113125.38	2482474.14
15	Indirect taxes	0.00	0.00
16	GDP at CFC(14-15)	4113125.38	2482474.14

Table 63 : Gross Value Added of Banking and Insurance at Current and Constant factor cost, 1994/95-1995/96.

	at current factor cost			at constant factor cost		
Year	Banking	Insurance	Total	Banking	Insurance	Total
1994/95	10580223	4113125	14693348	10580223	4113125	14693348
1995/96	24035497	2482474	26517971	13828351	5371742	19200093

Real Estate and Ownership of Dwellings:

Coverage:

This sub-sector covers the services of real estate agents such as brokers that facilitate the renting and occupation or sales of houses, multi-stories building, hotels, development of lots of land etc. In addition the services of houses and buildings for business or living purposes are also part of this sector. Commissions payments and rents arising from dealings between owners of buildings and houses are supposed to be covered in this sector. The services of owner occupied houses also included in this sector.

Data Sources and Methods of Estimation:

The 1994 Population and Housing Census provided vital information on the housing stock and average number of persons per household/housing unit. It also indicates the distribution of houses in urban towns by type of ownership for rented houses in major urban centres of the region.

Based on the actual figures for rural and urban population of October 11, 1994, back projection was made to indicate the fiscal year (July 1 to June 30), hence the July 1994 projection was made. For rural areas information on average rent was obtained from Household Income and Consumption Survey of 1995/96.

To estimate the gross value added from Real Estate and Ownership of dwellings at current market price, we multiply the average rent for urban and rural houses by each category of housing stock. In the above indicated source the amount of house rent both in rural and urban areas is the same. Therefore, the gross value added both at current and constant factor costs is the same.

Table---:Estimation of Value Added from Real Estate and Ownership of Dwellings,1994/95-1995/96.

No.	Description	GVA at Current F.C.		GVA at Constant F.C.	
		1994/95	1995/96	1994/95	1995/96
1	Population	3114234	3193350	3114234	3193350
	Rural	2651133	2710848	2651133	2710848
	Urban	463101	482502	463101	482502
2	Average House hold Size				
	Rural	4.69453	4.69453	4.69453	4.69453
	Urban	4.05887147665	4.0588680642	4.0588714767	4.0588680642
3	Housing Stock				
	Rural	678824	696324	678824	696324
	Urban	564728	577448	564728	577448
	Urban	114096	118876	114096	118876
4	Average Annual Rent per housing unit				
	Rural	139.07	139.07	139.07	139.07
	Urban	423.24	423.24	423.24	423.24
5	Gross Rent(4x3)				
	Rural	126824082.69	130616081.02	126824082.69	130616081.02
	Rural	78534091.65	80303002.78	78534091.65	80303002.78
	Urban	48289991.04	50313078.24	48289991.04	50313078.24
6	Cost of intermediate inputs				
	Rural(2% of Annual Rent)	6399680.94	6637367.88	6399680.94	6637367.88
	Rural	1570681.83	1606060.06	1570681.83	1606060.06
	Urban(10% of Annual Rent)	4828999.10	5031307.82	4828999.10	5031307.82
7	GDP CFC(5-6)				
	Rural	120424401.75	123978713.14	120424401.75	123978713.14
	Rural	76963409.82	78696942.72	76963409.82	78696942.72
	Urban	43460991.94	45281770.42	43460991.94	45281770.42

Public Administration and Defence

Coverage:

Public administration and defence sector covers the activities of 40 level of regional administrative organs, 11 Regional Bureaus, excluding the activity of education and health as they are treated separately , in addition 3 Offices, 3 Commissions and the Prison administration. And it also include the activity of the 38 municipalities.

Source of data

The main sources of Data for estimating the gross output and Gross value added of public Administration and Defence at Regional level are the Annual Revenue and Budget statement prepared by the Regional Finance Bureau, the Regional Planning and Economic Development Bureau and the Revenue and Expenditure statements of Makelle and other 37 municipalities.

Method of estimation

According to the (UNSNA) the gross output of public Administration and defence services is equal to the cost incurred in providing different services to the community such as maintaining law and order, security, defence etc. via Various regulatory institutions.

The producers of government services by their vary nature don't sell to the community those common services which can not otherwise be conveniently and economically provided by other units. Their activities therefore differ substantially in character, cost structure and source of finance from the activities of industries and other sector whose main objective is profit maximization.

The estimation of real output is no where more difficult than that of public administration and Defence as no identifiable physical output is available as most of these services are intrinsically different from all other services. These services tend to be provided to the community as a whole as distinct from specific

individuals or group of individuals and the consumption of these services can not generally be measured by observing the number of individuals so affected. Because of this the convention has been adopted to estimate the real output of public Administration and Defence by reference to real inputs, and the method adopted for the estimation is expenditure approach. In this regard gross output of producers of government services (Regional Government Organs), since it is not largely meant for sale but for self use on behalf of the public, is in turn equal to the cost of producing it which is made up of intermediate consumption (purchase of goods and non-factor services on current account) compensation of employees, indirect tax paid if any and consumption of fixed capital (Depreciation).

Since the accounts of various Regional government organs don't include provision for depreciation of equipment and buildings and outlays on indirect taxes, the gross output or consumption expenditure is estimated as the sum of purchases of goods and non-factor services less sales of goods and services and outlays on compensation of employees (wages and salaries and other employees benefit) for all government organs excluding education and Health.

In order to get start with the estimation of Regional Government Final Consumption Expenditure, hence, Gross value added of public administration and Defence the following steps are to be followed:

1. The starting point is the total ordinary (Recurrent) expenditure of regional government which is Available in the regional Finance Bureau. Once this data is collected the following items need to be deducted as they are not part of a final consumption expenditure.
 - a. Outlays on the Capital nature.
 - b. Outlays on subsidies;
 - c. Grants and other transfers to (non-profit institutions, and abroad).
 - d. Outlays on pension payments (actual payment to past employees.).
2. From the capital budget of regional government certain items which are considered to be part of recurrent expenditure rather than capital expenditure are reclassified as part of recurrent expenditure and hence final consumption expenditure

3. From the municipalities revenue and expenditure statement the portion destined to personal service (wages and salaries and other employees benefit) which constitute part of gross value added.

4. With respect to Defence the information needed for the estimation of gross output and gross value added is not currently available at regional and central level. due to data limitation the current, Estimation of the Tigray Region Public Administration and Defence sector dose not include Defence.

Once these adjustments are made to reconcile budgetary practice with regional accounting requirement the regional government portion of Public Administration and Defence sector gross value added at C.F.C is simply made up of outlays on compensation of employees (personal services) alone. It is also necessary to make an addition during the estimation the (6% imputed pension contribution) made by the regional government for the pension fund in order to provide future entitlement of existing employees.

As outlined above the estimation of the regional government final consumption expenditure and gross value added for public Administration and defence sector has been done for two consecutive years (1994/95, 1995/96) at current factor cost.

ESTIMATION AT CONSTANT FACTOR COST

The estimation of the Gross value added of Public Administration and Defence sector at Constant factor cost can be obtained by two alternative methods.

The first choice is the **Deflation** method which is based in a paasche -type index of wage rates in which each wage category is weighted by it share in the total wage (compensation of employees) in the current year.

The second choice is the **Extrapolation** method which exercise in extrapolating the base year Value Added figure by an employment index , for which changes in the number of employees each grades (skill category) are weighted by that grade share in the compensation of employees in the base year .

The choice between Deflation and Extrapolation will depend largely on data availability . In the actual computation of the Tigray Region Gross Value added of public administration sector at constant factor cost, the deflation method is preferred than the extrapolation due to data availability on the number of employees by wage category at regional level.

The first step followed in order to construct the wage index was, establish the total number of employees of the Region by wage category from Civil Service Bureau, and those who are not under Civil Service Bureau, such as SAERT Commission, Justice Bureau and Rural road construction, the needed data on the number of employees by wage category have been established from the respective offices for the years 1994/95 & 1995/96.

Once the wage index is established for the year 1995/96, by multiplying the base year value added (GVA1994/95) by the wage index, can arrive at Gross Value added of the sector at constant factor cost.

The compilation sheet on the estimation procedure and all the data used for estimation of the Public Administration sector Gross Value Added at Current and Constant Factor cost are provided in annexure tables.

Table 65 Estimation of Public Administration and Defence Sector Gross Value Added at constant factor cost

Items	1994/95	1995/96
1. Ordinary Budget Allocated		
1.1 Gross Value of Output	68926708.00	74854051.00
1.1.1 Wages and Salaries	48872928.00	54044084.00
1.1.2 Goods and Services	12510402.00	19068119.00
1.1.3 Motor vehicles and Equipment	6505478.00	703366.00
1.1.4 Police Uniform	1037900.00	1038482.00
2. Ordinary Budget Unallocated Portion(Grants and Contribution)		
2.1 Gross Value of Output	16098029.00	4409786.00
2.1.1 Wages and Salaries	0.00	0.00
2.1.2 Goods and Services	0.00	0.00
2.2 Other Current Trasfers	16098029.00	4409786.00
2.2.1 Non-profit Institutions	15803764.00	4401165
2.2.2 Household	294265.00	8621.00
2.2.3 Abroad		
3. External Assistance		
3.1 Gross Value of Output	N.A	N.A
3.1.1 Wages and Salaries	N.A	N.A
3.1.2 Goods and Services	N.A	N.A
3.1.3 Transfers	N.A	N.A
4. Recurrent Expenditure from Capital Budget		
4.1 Gross Value of Output	7886190.55	17922948.74
4.1.1 Wages and Salaries	1427564.75	3872208.76
4.1.2 Goods and Services	6458625.80	14050739.98
5. Mekele and other Mnicipalities		
5.1 Gross Value of Output	3851784.55	5539885.55
5.1.1 Wages and Salaries	1673475.74	2560335.06
5.1.2 Goods and Services	2178308.81	2979550.49
Less Sales and Charges		
6. Imputed pension Contribution(Municipality)	39528.30	53950.65
7. Regional Government Consumption Expenditures (Gross)	73121305.10	96575037.29
7.1 Wages and Salaries	51973968.49	60476627.82
7.2 Goods and Services	21147336.61	36098409.47
Less Sales and Charges	10129341.15	18072000.00
8. Regional Government Consumption Expenditures(Net)	62991963.95	78503037.29
9. Imputed pension Contribution(Government)	2932375.68	3242645.04
10. Gross Value Added From Public Adminstration at Current Factor Cost	54945872.47	63773223.51
11. Real Gross Value Added from public Administration		
11.1 Price Index	100	115.77
11.2 Gross value Added at Constant Factor Cost (at 1994/95 Price)	54945872.47	63610836.55

Source: Bureau of Finance, Bureau of Planning and Economic Development, Mekelle Municipality and Zonal Public Work Urban Develpent Offices

Table 66 REGIONAL GOVERNMENT REVENUE FROM SALES AND CHARGES

REVENUE CODE DESCRIPTION	Actual Revenue	
	1994/95	1995/96
CHARGES AND FEES	7127995.76	13919000.00
1403 Registration Transfer of Property	13948.00	10000.00
1404 Private Firearm licence Fee	216676.60	493000.00
1405 Work permit	1800911.12	1830000.00
1406 Court Fines	1016285.91	1152000.00
1407 Court Fee	6424.96	11000.00
1408 Advertising Licence Fee	2060924.27	8593000.00
1410 Fore. Lic. Fcon	55.00	0.00
1411 Hunting Licence Fee	1834924.10	1696000.00
1412 Fish Licence Fee	175982.41	134000.00
1413 Business Lic. Fee	1863.39	0.00
1419 Mines Pro. Lic. Fee		0.00
1423 Coffee Trade Lic. Fee		
SALES OF GOODS AND SERVICES	4351870.99	4153000.00
1505 Gold and Metals		0.00
1506 Newspaper and Magazine	6486.60	5000.00
1507 Other government Publications	60.00	2000.00
1508 Advertizing	1775.00	235000.00
1509 Farms Products	229511.39	24000.00
1510 Veterinary Service	43727.94	441000.00
1512 Medicines and Medical Services	427497.56	1828000.00
1513 Medical Examination and Treatment	1630782.47	489000.00
1517 Printed Forms	462018.15	115000.00
1519 Prision Administration Revenue	48.00	1000.00
1520 Agricultural Research Institute	124437.60	0.00
1523 Forestry Product	1023.00	310000.00
1533 Road Transport Authority	73977.68	703000.00
Total Revenue from Sales and Charges	11479866.75	18072000.00

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 Source: Bureau of Finance

Table 67 Recurrent Expenditure of Regional Government

Exp. Code	1994/95	1995/96
6100 Personal Service	98603529.00	110825656.00
6101 Civil Salaries	88100921.00	94986266.00
6102 Civil Allowances	584421.00	490222.00
6103 Police Salary	5542413.00	8831494.00
6104 Police Allowance	4375774.00	6517674.00
6200 Non-personal Service	11289175.00	16802418.00
6201 Public Utilities Service	942538	1225552.00
6202 Trans. allowances and Per.	3071826.00	4358285.00
6203 Printing and Advertising	2157972.00	3579232.00
6204 Repairs and maintenance P	2256481.00	692701.00
6205 Repairs and maintenance M	1257797.00	1675481.00
6206 Rent for building	851324.00	914952
6207 Tax	9991	3468258.00
6210 Miscellaneous cont Services	741246.00	887957.00
6300 Material Supplies	19671673.00	18955070.00
6301 Food stuff	4390904.00	4436804.00
6302 Medical Supplies	8925471.00	7133432.00
6303 Education Supplies	1285768.00	1141935.00
6304 Uniforms and Cloths	2294721.00	2891687.00
6305 Petrol and Lubricants	1014484.00	1485084.00
6306 Office Supplies	1147485.00	1356642.00
6307 Other Material and Supplies	612840.00	509486.00
6400 Grants and Contribution	20163203.00	8358927.00
6401 Grants to individuals	374194.00	140197.00
6402 Grants to institutions	19789009.00	8218730.00
6500 Motorvehicle and Equipment	7740287.00	1139685.00
6501 Purchase of Motor Vehicles	5257678.00	0.00
6502 Purchase of Equipment	2482609.00	1139685.00
Total	157467867.00	156081756.00

Source: Regional Finance Bureau

Table 68 Recurrent Expenditure of Regional Public Administration
(Excluding Education & health)

Exp. Code	1994/95	1995/96
6100 Personal Service	48819148.00	54044084.00
6101 Civil Salaries	38685272.00	38558567.00
6102 Civil Allowances	215689.00	136349.00
6103 Police Salary	5542413.00	8831494.00
6104 Police Allowance	4375774.00	6517674.00
6200 Non-personal Service	5665055.00	11529618.00
6201 Public Utilities Service	516483	776532.00
6202 Trans. allowances and Per.	2290950.00	3610384.00
6203 Printing and Advertising	597713.00	1074249.00
6204 Repairs and maintenance P	452007.00	260222.00
6205 Repairs and maintenance M	848349.00	1306855.00
6206 Rent for building	334690.00	380334
6207 Tax	9991	3468258.00
6210 Miscellaneous cont Services	614872.00	652784.00
6300 Material Supplies	7883247.00	8576983.00
6301 Food stuff	2196440.00	2527485.00
6302 Medical Supplies	2276272.00	1343479.00
6303 Education Supplies	29193.00	33569.00
6304 Uniforms and Cloths	1661004.00	2213353.00
6305 Petrol and Lubricants	601521.00	1117826.00
6306 Office Supplies	929784.00	1126665.00
6307 Other Material and Supplies	189033.00	214606.00
6400 Grants and Contribution	16098029.00	4409786.00
6401 Grants to individuals	294265.00	8621.00
6402 Grants to institutions	15803764.00	4401165.00
6500 Motorvehicle and Equipment	6505478.00	703366.00
6501 Purchase of Motor Vehicles	5257678.00	0.00
6502 Purchase of Equipment	1247800.00	703366.00
Total	84970957.00	79263837.00

Source: Regional Finance Bureau

Table 69 Total Capital Expenditure of Regional Government

Exp. Code	1994/95	1995/96
8100	2207221.00	1688681.50
8101 Surveys, Studies	1264159.00	618372.50
8102 Engine. and Other Tecncal Design	943062.00	1070309.00
8200	137759314.69	135559358.4
8201 Residential Building	5704378.92	5484755.00
8202 Non-Residential Building	52236117.60	54291777.26
8203 Earth Work and Other(Roads, Dams and Bridges)	52231224.96	28639744.14
8204 Plant, Machinery and Equipment	24259770.38	40266959.08
8205 Transport Equipment(Vehicle)	634987.54	4078606.90
8206 Office Equipment(Furniture and fixiture)	2692835.29	2797516.00
8207 Animal Purchase	0.00	0.00
8300	8840773.55	26277652.74
8301 Project 'Magt and Supervis	434635.75	3704501.00
8302 Direst Labor	1767857.00	360726.76
8303 Opera and Maitenance	6064247.55	13898508.61
8304 Finacial costs(Commission and Intrest)	65405.25	625279.90
8305 Tax	508628.00	7688636.47
Total	148807309.24	163525692.6

Source: Planning and Economic Development Bureau

Table 70 Capital Expenditure of Regional Government Excluding Education and Health

Exp. Code	1994/95	1995/96
8100	1673374	1382881.5
8101 Surveys, Studies	730312.00	340122.50
8102 Engine. and Other Technical Design	943062.00	1042759.00
8200	81104192.77	82959502.38
8201 Residential Building	5373796.00	5416155.00
8202 Non-Residential Building	11901090.60	16801532.26
8203 Earth Work and Other(Roads, Dams and Bridges)	52226334.96	28639744.14
8204 Plant, Machinery and Equipment	9427483.38	27817916.08
8205 Transport Equipment(Vehicle)	634987.54	4078606.90
8206 Office Equipment(Furniture and fixture)	1540500.29	205548.00
8207 Animal Purchase	0.00	0.00
8300	7886190.55	17922948.74
8301 Project Magt and Supervis	434635.75	3511482.00
8302 Direct Labor	992929.00	360726.76
8303 Opera and Maitenance	5884592.55	12276423.61
8304 Finacial costs(Commission and Intrest)	65405.25	122279.90
8305 Tax	508628.00	1652036.47
Total*	90663757.32	102265332.62

Source: Regional Planning and Economic Development Bureau
 Recurrent Expenditure from Capital Budget(Personal Services)

Table 71 Total Municipality Expenditure

No	Type of Expenditure	1994/95	1995/96
1	Salary	1553808.09	2557723.06
2	Office Furniture and Equipment	265199.75	319308.75
3	Stationeries	286445.69	237898.28
4	Printing	49274.84	144548.39
5	Post and Telephone	60542.73	85849.01
6	Per diem	181594.15	227544.69
7	Maintenance of road	0.00	20000.60
8	Ring road feasibility study	85984.00	74955.00
9	Fire Brigade Inputs	119266.55	0.00
10	Fuel, Oil and Gas	371021.95	636122.60
12	Water pump installation and Maintenance	0.00	12946.20
13	purchase of water pump and other equi.	134026.00	42026.40
14	Electric Motor Installation	0.00	0.00
15	Purchase of Various Electric Equipment	33185.61	165196.76
16	Sanitation Expenditure	132460.47	104182.95
17	Charity Fund	15731.67	26932.70
18	Public Ceremonies and Anniversary expe	194569.59	100623.59
19	Compensation for property	513451.60	94644.52
20	Contingencies	94451.04	242063.51
21	Maintenance of goods	104097.11	386766.32
22	Insurance	176490.86	105661.67
23	Matirial Rent	4488.00	0.00
24	Purchase of Vehicles	1002854.32	789254.00
25	Purchase of Materials(goods)	18988.16	259001.93
26	Water and Electricity	267246.40	346071.93
27	Clothing and Uniforms	108984.63	72201.61
28	House Rent	27788.00	8772.05
29	Other Expences	27387.45	36992.43
30	Sport	270737.50	196415.08
31	Pension contribution(6%)	114978.85	53950.65
32	Debt management	67415.00	60951.00
33	Vehicle Maintenance	480330.93	551261.27
34	Bridge construction	226127.00	1135680.93
35	House, bridge and square construction	1458640.39	2586613.57
36	Lote land Distribution	0.00	15421.80
37	Ambulance Maintenance	1959.85	40000.00
38	Road maintenance	72510.00	0.00
39	Squer Electric work	45674.40	176.48
41	Municipality Office Construction (maintenance)	176675.60	22409.50
42	Income tax	7998.32	14607.02
43	Varios Services	6757.00	0.00
44	Oprating Cost	28207.00	19480.00
45	Tar transport Cost	0.00	0.00
46	Salary for Kindergarten teachers	119667.65	2912.00
47	Census	51042.48	0.00
48	Abattoir Construction and Purches of matiriales	97979.87	32699.00
49	House, bridge, Square, road maintenance	593233.50	336089.59
50	Hall Construction	105778.55	147706.97
51	Fence construction for Livestock Market	16314.40	3000.00
52	kindergarten Construction	45552.15	64788.20
53	Master plan	1999.70	123183.95
54	Public toilet construction	45689.50	76585.50
55	Contribution to Read Cross	21416.50	28787.62
56	kebele expenditure	21450.00	37325.00
Total		9907474.8	12647334.08

EDUCATION

Coverage

The education sector covers the activities of all government private mission and community educational institutions of all types. At regional level this sector specifically cover kindergartens, primary, junior and senior secondary schools , Technical and vocational schools special schools (blind and deaf) Makelle Business Collage and Makalle University College which are government educational institutions and in addition non-government schools such as those run by (catholic church including Don Bosco Technical schools which follows the curriculum of the ministry of education.

Sources of Date

The sources of data for estimating the education sector gross out put and gross value added are the Regional Finance Bureau annual budgetary revenue and expenditure reports, the Regional Education Bureau and for the higher education Mekele Business College and Makalle University College.

For non-government educational institutions the sources of data are Adigrat Catholic Church and Adwa and Mekele Don Bosco Technical schools.

Method of Estimation

In Tigray Region as most of the education services are provided by the government the method of estimation is similar to the one adapted for Public Administration and Defence where in the gross value added consist only of compensation of employees. The method of estimation adopted is the expenditure approach.

Estimates of the Gross Value added at Current Factor Cost

At regional level the gross output of government educational institutions is derived from the Regional Finance Bureau annual revenue and expenditure report as the sum of outlays on personal services and goods and services, which is equal to the sum of total ordinary budget allocated to the regional education Bureau from domestic sources and Mekelle Business college and Mekelle University Collage. In addition outlays that appear in the capital budget of the said institutions but are reclassified as recurrent expenditure are also included.

The estimation procedure for the gross value added of government educational institution as outlines so far for public administration and Defence sector is then taken to be equal to the sum of outlays on personal services. And it also include the imputed pension contribution made by the government to the pension fund for the actual employees of the public education sector.

With respect to Non government educational institutions (those run by the catholic church.) efforts have been made in order to collect data on the number of students and teachers number of educational institutions by ownership and their financial statements. But the data obtained from these institutions indicate that this educational institutions by their very nature their objective is not profit maximization for the service they render to the community. By this reason these non-governmental institutions don't have financial statement or operating surplus.

In the absence of such information their gross output is estimated on the basis of the sum of outlays on personal services and goods and service. Therefor the current estimation of the gross value added of non-government educational institutions is then taken to be equal to the sum of outlays on personal services only.

Once the estimates of gross value added for the government and non-government educational institutions is compiled separately, summing up the results can arrive to the gross value added of education sector at current factor cost.

Estimates of the Gross Value Added at Constant Factor Cost

The estimation of the Education sector Real Gross value added can be obtained by the extrapolation method which consist in using the combined weighted quality and quantity indices.

The weighted quality sub-indices are relative total cost per student at different at different level of schooling.

For the estimation purpose the indices are constructed separately for government, non-government and higher education. For government educational institutions the indices are constructed by first computing a weighted quantity sub-index of the number of students in Primary, Junior secondary and Senior schools. And for the quality sub-index the inverse of the student teachers ratio for the different level of schooling is constructed . Finally the tow indices are added and averaged to provide a composite index of quantity and quality.

For non- government schools and Higher education a composite quantity and quality index is also derived in the same manner as government educational institutions.

Once constructed the composite index for government, non-government and higher educational institutions, by multiplying the base year value added of government schools by composite index for government schools, the base year value added for non-government schools by the composite index for non-government schools and the value added of higher education institutions by the composite index for higher education and summing up the results can arrive at the Education sector Gross value added at Constant factor cost.

The estimation procedure and the basic data used for the estimation of education sector Gross value added at current and constant factor cost is illustrate in the annexure tables.

Table 72 Estimation of Tigray Region Education Sector Value added at Current Factor Cost

Items	1995/96	1996/97
Government Education		
A. Administration and gen. services		
1. Personal services	2792714.00	2955888.00
2. Non-personal services	1974745.00	2170878.00
3. Supplies (consumable)	148543.00	314297.00
4. Grants and Contributions	276855.00	282813.00
5. Purchase of vehicles & Equip.	355612.00	200000.00
B. Primary Schools	36959.00	8900.00
Public Education	30690563.00	34781033.00
1. Personal services	27521624.00	32163604.00
2. Non-personal services	2035518.00	1981313.00
3. Supplies (consumable)	860801.00	506118.00
4. Grants and Contributions	20072.00	0.00
5. Purchase of vehicles & Equip.	252548.00	149908.00
Non-Government Education (Catholic Charche)	558802.00	750718.00
1. Personal services	329336.00	351907.00
2. Non-personal services	229468.00	308811.00
3. Supplies (consumable)	0.00	0.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	0.00	0.00
C. Junior Secondary Schools	4309134.00	4635250.00
1. Personal services	3409184.00	3904952.00
2. Non-personal services	462324.00	398586.00
3. Supplies (consumable)	240398.00	231716.00
4. Grants and Contributions	0.00	99996.00
5. Purchase of vehicles & Equip.	197228.00	0.00
D. Senior Secondary Schools	4256250.00	4449036.00
1. Personal services	3272430.00	3563700.00
2. Non-personal services	585965.00	416280
3. Supplies (consumable)	241485.00	414719.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	156370.00	54337.00
E. Technical Schools	490330.00	539480.00
1. Personal services	256660.00	312110.00
2. Non-personal services	27129.00	41831.00
3. Supplies (consumable)	180674.00	185539.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	15867.00	0.00
Private technical school (Don Bosco)	253200.00	532323.00
1. Personal services	253200.00	361920.00
2. Non-personal services	0.00	170403.00
3. Supplies (consumable)	0.00	0.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	0.00	0.00
F. TTP's for Primary Schools	1295420.00	1284659.00
1. Personal services	320284.00	355420.00
2. Non-personal services	522046.00	511806.00
3. Supplies (consumable)	433895.00	404137.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	13195.00	13200.00
G. Adult and non formal Education	1203528.00	964399.00
1. Personal services	6256.00	7855.00
2. Non-personal services	26274.00	257392.00
3. Supplies (consumable)	13520.00	2500.00
4. Grants and Contributions	1157478.00	696652.00
5. Purchase of vehicles & Equip.	0.00	0.00
H. School Communication Material	164747.00	295472.00
1. Personal services	163762.00	295472.00
2. Non-personal services	0.00	0.00
3. Supplies (consumable)	985.00	0.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	0.00	0.00
I. Special Education	310180.00	294264.00
1. Personal services	272104.00	259083.00
2. Non-personal services	13175.00	13567.00
3. Supplies (consumable)	24901.00	21814.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	0.00	0.00
J. Regular Education	142987.00	153417.00
1. Personal services	58014.00	54272.00
2. Non-personal services	17725.00	10390.00
3. Supplies (consumable)	42523.00	63155.00
4. Grants and Contributions	19629.00	25600.00
5. Purchase of vehicles & Equip.	5098.00	0.00

K. Building and Maintenance Works	132552.00	133094.00
1. Personal services	132552.00	131628.00
2. Non-personal services	0.00	0.00
3. Supplies (consumable)	0.00	0.00
4. Grants and Contributions	0.00	1466.00
5. Purchase of vehicles & Equip.	0.00	0.00
L. Mekele Business Collage	1384958.58	1403211.79
1. Personal services	610618.04	700240.50
2. Non-personal services	188277.41	221603.01
3. Supplies (consumable)	478358.84	456403.21
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	98504.27	15875.07
J. Arid University Collage	968300.00	1018500.00
1. Personal services	500700.00	521100.00
2. Non-personal services	106500.00	123500.00
3. Supplies (consumable)	307700.00	322500.00
4. Grants and Contributions	0.00	0.00
5. Purchase of vehicles & Equip.	51400.00	51400.00
K. Imputed pension Contribution	2311447.98	2667499.23
I. Education Sector Gross Value Added at C. F.C	41418117.02	47839646.73

Source: Bureau of Finance

Table 73 ESTIMATION OF EDUCATION SECTOR GROSS VALUE ADDED AT CONSTANT FACTOR COST

No	Items	Weights	1994/95	1995/96
1	Number of students			
	1.1. Primary Schools			
	Government		277564	298737
	Non-Government		273181	294361
	1.2. Junior Secondary Schools			
	Government		4383	4376
	Non-Government		17138	16851
	1.3. Senior Secondary Schools			
	Government		16069	15846
	Non-Government		1069	1005
	1.4. Student in Vocational & technical schools		13615	15529
	1.5. Student in teachers Training Institutes		13541	15404
	1.6. Students in Spacial Schools		74	118
	1.7. Students in Higher Education		148	156
	1.7.1 Mekelle University College		550	550
	1.7.2 Mekelle Busines College		48	60
			1275	991
			73	118
			1202	873
2	Number of teachers			
	2.1. primary School			
	Government		5485	5399
	Non-Government		5387	5297
	2.2 Junior Secondary Schools			
	Government		98	102
	Non-Government		422	412
	2.3. Senior Secondary Schools			
	Government		398	389
	Non-Government		24	23
	2.4. Teachers in Vocational & technical schools		462	514
	2.5. Teachers in teachers Training Institutes		442	487
	2.6. Teachers in Spacial Schools		20	27
	2.7. Teachers in Higher Education		21	25
	2.7.1 Mekelle University College		23	22
	2.7.2 Mekelle Busines College		6	6
			60	68
			27	30
			33	36
3	Student: Teacher Ratio			
	3.1. Primary Schools			
	Government		50.7111565	54.5214
	Non-Government		44.7248898	42.902
	3.2. Junior Secondary School			
	Government		40.3743719	40.7352185
	Non-Government		44.5416667	43.6066522
	3.3. Senior Secondary School			
	Government		30.6357466	31.6303901
	Non-Government		3.7	4.2962963
4	Volume Index			
	4.1. Government Schools			
	4.1.1 Primary school Students	1.18	1	1.07753101
	4.1.2 Primary school teachers		0	
	4.1.3 Junior school Students	2.92	1	0.96612235
	4.1.4 Junor school teachers		0	
	4.1.5 Senior school Students	2.88	1	1.13758216
	4.1.6 Senior school teachers		0	
	WEIGHTED QUANTITY SUB- INDEX		1	1.0641
5	Student : Teacher Ratio			
	5.1. Government Schools			
	5.1.1 Primary school		1	1.0751362
	5.1.2 Junior school		1	1.00893752
	5.1.3 Senior school		1	1.03246676
	5.1.4 Inverse of 5.1.1	6.07	1	0.93011472
	5.1.5 Inverse of 5.1.2	10.04	1	0.99114165
	5.1.6 Inverse of 5.1.3	7.32	1	0.96855418
	WEIGHTED QUALITY SUB- INDEX		1	1.04348
	COMPOSITE INDEX (QUNTTY + QUALITY)/2		1	1.05379
6	Gross Value Added of public education at Constant factor cost		38777332.9	40863185.8
7	Volume Index			
	7.1. Non-Government Schools			

	7.1.1 Primary school Students	1.72	1	0.96840292
	7.1.2 Primary school teachers		0	
	7.1.3 Junior school Students	1.02	1	0.94013006
	7.1.4 Junior school teachers		0	
	7.1.5 Senior school Students	1.71	1	1.56756757
	7.1.6 Senior school teachers		0	
	WEIGHTED QUANTITY SUB-INDEX		1	1.34
8	Student : Teacher Ratio			
	8.1. Non-Government Schools			
	8.1.1 Primary school		1	0.95925074
	8.1.2 Junior school		1	0.98100622
	8.1.3 Senior school		1	1.16116116
	8.1.4 Inverse of 8.1.1	2.08	1	1.0424803
	8.1.5 Inverse of 8.1.2	0.79	1	1.01936153
	8.1.6 Inverse of 8.1.3	1.02	1	0.8612069
	WEIGHTED QUALITY SUB-INDEX		1	0.99025
	COMPOSITE INDEX (QUANTITY + QUALITY)/2		1	1.11825
9	Gross Value Added of Non-Government Schools at Constant Factor cost		329336	368279.942
10	Volume Index			
	10.1 Higher Education			
	10.1.1 Mekele University College Students	1.02	1	1.01644
	10.1.2 Mekele University College Teachers		0	
	10.1.3 Mekele Busines College Students	1.61	1	0.72628
	10.1.4 Mekele Busines College Teachers		0	
	WEIGHTED QUANTITY SUB-INDEX		1	1.071513
11	Student: Teacher Ratio			
	11.1 Higher Education			
	11.1.1 Mekele University College		1	1.454794
	11.1.2 Mekele Busines College		1	0.665765
	11.1.3 Invers of 11.1.1	10.9	1	0.6873825
	11.1.4 Invers of 11.1.2	11.14	1	1.50203
	WEIGHTED QUALITY SUB-INDEX		1	1.099142
	COMPOSITE INDEX (QUANTITY + QUALITY)/2		1	1.0853
12	Gross Value Added Higher Education at Constant factor cost		1120518.04	1216128.77
13	Imputed pension Contribution		2311447.98	2667499.23
14	Education sector Gross Value Added at Constant factor cost		41418116.9	45115073.6

5501	Motor vehicles and Equipment	0.00	0.00
5501	Purchase of Motor Vehicles	577283.00	235435.00
5502	Purchase of Equipment		

Total 47233216.00 51607626.00

Table 75 Pension Contribution for Education Sector

No	Imputed Pension Contribution	1994/95	1995/96
1	Administration and General Services	118484.70	130792.68
2	Primary School	1651297.44	1929816.24
3	Junior Secondary School	204551.04	234297.12
4	Senior "	196345.80	213822.00
5	Technical School	15999.60	18726.60
6	TTT's for primary School	19577.04	21325.56
7	Adult and non formal education	375.36	471.30
8	School Communication Material	9825.72	17728.32
9	Spacial Education	16326.24	15544.98
10	Regular Education	3480.84	3256.32
11	Building and Maintenance	7953.12	7897.68
12	Mekele Busines College	37189.08	42554.43
13	Mekele University College	30042.00	31266.00
Total		2311447.98	2667499.23

Table 76 Mekele University College

Code	1994/95	1995/96
6100	500700.00	521100.00
6101	497800.00	504300.00
6102	2900.00	16800.00
6103	0.00	0.00
6104	0.00	0.00
6200	106500.00	123500.00
6201	25000.00	25000.00
6202	25000.00	2500.00
6203	14500.00	14500.00
6204	30000.00	30000.00
6205	10000.00	27000.00
6206	0.00	0.00
6207	0.00	0.00
6210	2000.00	2000.00
6300	307700.00	322500.00
6301	120000.00	120000.00
6302	6000.00	6000.00
6303	125000.00	125000.00
6304	17700.00	20700.00
6305	12000.00	23800.00
6306	15000.00	15000.00
6307	12000.00	12000.00
6400	0.00	0.00
6401	0.00	0.00
6402	0.00	0.00
6500	51400.00	51400.00
6501	0.00	0.00
6502	51400.00	51400.00
Total	966300.00	1018500.00

Source: Mekele University College

Table 77 Mekele Business College

Exp. Code	9194/95	1995/96
6100	619818.04	709240.50
6101	619818.04	709240.50
6102	0.00	0.00
6200	188277.41	221603.01
6201	78477.20	68716.89
6202	46931.20	46877.81
6203	6117.07	2586.99
6204	19845.45	6774.00
6205	30033.09	90868.97
6206	140.00	1485.50
6207	6733.40	4292.85
6210	0.00	0.00
6300	478358.84	456493.21
6301	248045.27	299745.60
6302	19461.16	13825.55
6303	75804.16	66350.35
6304	32454.75	30102.76
6305	31418.65	20237.98
6306	47102.43	14573.71
6307	24072.42	11657.26
6400	0.00	0.00
6401	0.00	0.00
6402	0.00	0.00
6500	98504.27	15875.07
6501	0.00	0.00
6502	98504.27	15875.07
Total	1384958.56	1403211.79

Source: Mekele Business College

Number of Students and Teachers

Public Schools

Number of Students	1994/94	1995/95
Primary school	273181	294361
Junior Sec School	16069	15846
Senior Sec School	13541	15404

Number of Teachers

Primary school	5387	5297
Junior Sec School	398	389
Senior Sec School	442	487
Total	6227	6173

Student Teacher Ratio

Primary school	51	56
Junior Sec School	40	41
Senior Sec School	31	32

Non-Government School

Number of Students	1994/95	1995/95
Primary school	4383	4376
Junior Sec School	1069	1005
Senior Sec School	74	116

Number of Teachers

Primary school	98	102
Junior Sec School	24	23
Senior Sec School	20	27
Total	142	152

Total Regional

Number of Students	1994/95	1995/96
Primary school	277564	298737
Junior Sec School	17138	16851
Senior Sec School	13615	15520

Number of Teachers

Primary school	5387	5297
Junior Sec School	398	389
Senior Sec School	442	487
Total	6227	6173

HEALTH SERVICE

Coverage

This sector covers the provision of medical, surgical, dental and other health services. It includes specifically hospital, sanatoria, health center, clinics and similar institutions irrespective of whether they are publicly or privately run and the services of traditional medical practitioners.

Sources of Data

At regional level the main sources of data for estimating gross output and gross value added are the regional Finance Bureau, the Ministry of Health and the regional health bureau. With regard to non-government health services no data are available at regional level.

Method of Estimation

As mentioned in the education sector, in the region most of the health services are also provided by the government. The estimation of gross value added consists only of compensation of employees and for the estimation purpose expenditure approach is adopted also for the public health sector.

The estimates for the non-government health services will consist of compensation of employees as well as operating surplus. But as far as health services provided by missionary and privately practicing physicians and other medical practitioners are concerned no appropriate source of information that can give an indication of the magnitude involved either physically or financially have been found at regional level. Because of this limitation the non-government health institutions gross value added is not included in the current estimation of the regional health sector gross value added.

Estimation of the Gross Value Added at Current Factor Cost

The regional public health sector gross output and gross value added is derived from the regional Finance Bureau budgetary data. The gross output can be first derived as the sum of the total ordinary budget of the regional public health outlays that appear in the capital budget but are reclassified as recurrent expenditure and the recurrent expenditure from external assistance less outlays on current transfers to (non-profit institutions and households) and purchase of motor vehicles and equipment's. Similarly, the value added can be derived as the sum of wages and salaries and employees benefits (outlays on personal services) including the imputed pension contribution made by the government to the pension fund for the actual employees of the regional public health sector.

In the case of the recurrent expenditure from external assistance an attempt has been made in order to reallocate the proportion that the central government contribute for the region in the form of program support from external assistance sources but that obtained from Ministry of Health is not sufficient to give reliable and accurate information in this respect. Do to this limitation and in order to avoid double counting at central and regional level it has been judged prudent not to include the external assistance portion in the current estimation of the regional health sector gross value added.

Estimation of the Gross Value added at constant factor cost

—For the estimation of the Gross Value added of Public health sector at constant Factor cost, the deflation method has been adopted. As outlined in Public administration sector the first step was establish the total number of employees of Public health by wage category, and then construct the wage index for the years 1994/95 & 1995/96. And finally deflate the current GVA estimate with the wage index (Price indices).

The estimation procedure and the basic data used for the estimation of the regional health sector gross value added at current and at constant factor cost are illustrated in the annexure tables.

Table 78 ESTIMATION OF HEALTH SECTOR GROSS VALUE ADDED AT CFC

No	ITEMS	1987	1988
1	Health bureau ordinary budget	26627179.00	26297231.00
	1.1-Personal services	12304213.00	13538890.00
	1.2-Non-personal services	1783057.00	1356248.00
	1.3-Materials & Supplies	9472836.00	8265776.00
	1.4-Motor Vehicles & Equipment	554690.00	209884.00
	1.5-Grants & Contributions	2512383.00	2925427.00
2	Health Bureau (recurrent expenditure from capital budget)	332362.00	600004.00
	2.1-Personal services	192707.00	150419.00
	2.2-Non-personal services	139655.00	440585.00
3	Health Bureau (Recurrent expenditure from external assistance)	0.00	0.00
	2.1-Personal services	0.00	0.00
	2.2-Non-personal services	0.00	0.00
4	Gross output of Public Health	24630720.78	27203721.76
	4.1-Personal services	12496920.00	16328719.00
	4.2-Non-personal services	11395548.00	10062609.00
5	Imputed pension Contribution	738252.78	812393.76
6	Gross value added of public Health at CFC	13235172.78	14511708.76

Source: Bureau of Finance & Ministry of Health

Table 79 ESTIMATION OF HEALTH SECTOR GVA AT CONSTANT FACTOR COST

No.	Items	Year	
		1994/95	1995/96
1	Gross output of public Health	24630720.8	27203721.8
	1.1. Personal Services	12496920.00	16328719.00
	1.2. Imputed pension Contribution	738252.78	812393.76
	1.3. Non-personal Services	11395548.00	10062609.00
2	GVA of public Health at current factor cost	13235172.78	17141112.76
	2.1. Personal Services	12496920.00	16328719.00
	2.2. Imputed pension contribution	738252.78	812393.76
3	Price Index	100	107.3027
4	GVA of Public Health at Constant factor cos	13235172.78	14201697.74

Table 80 Summary of Recurrent Expenditure of Regional Health Bureau

Exp. Code	1994/95	1995/96
6100 Personal Service	12380766.00	13553592.00
6101 Civil Salaries	12182726.00	13370387.00
6102 Civil Allowances	198040.00	183205.00
6103 Police Salary	0.00	0.00
6104 Police Allowance	0.00	0.00
6200 Non-personal Service	1785439.00	1356248.00
6201 Public Utilities Service	350075.00	349697.00
6202 Trans. allowances and Per.	231443.00	284997.00
6203 Printing and Advertising	275952.00	309013.00
6204 Repairs and maintenance P	788658.00	210250.00
6205 Repairs and maintenance M	102513.00	121192.00
6206 Rent for building	22884.00	52171.00
6207 Tax	0.00	0.00
6210 Miscellaneous cont Services	13914.00	28928.00
6300 Material Supplies	9472389.00	8265776.00
6301 Food stuff	1539893.00	1386962.00
6302 Medical Supplies	6627631.00	5739991.00
6303 Education Supplies	62365.00	30767.00
6304 Uniforms and Cloths	471605.00	499782.00
6305 Petrol and Lubricants	310370.00	198259.00
6306 Office Supplies	144682.00	138215.00
6307 Other Material and Supplies	315843.00	271800.00
6400 Grants and Contribution	2512385.00	2925427.00
6401 Grants to individuals	60300.00	104400.00
6402 Grants to institutions	2452085.00	2821027.00
6500 Motorvehicle and Equipment	557546.00	209884.00
6501 Purchase of Motor Vehicles	0.00	0.00
6502 Purchase of Equipment	557546.00	209884.00
Total	26708525.00	26310927.00

Source: Bureau of Finance

Table 80 Regional Health Bureau Capital Expenditure

Exp. Code	1994/95	1995/96
8101 Surveys, Studies	330000.00	0.00
8102 Engine. and Other Tecncal Design	0.00	27550.00
8201 Residential Building	0.00	0.00
8202 Non-Residential Building	20670714.00	19550745.00
8203 Earth Work and Other(Roads, Dams and Bridges)	4890.00	0.00
8204 Plant, Machinery and Equipment	418300.00	3298943.00
8205 Transport Equipment(Vehicle)	0.00	0.00
8206 Office Equipment(Furniture and fixiture)	992347.00	1591968.00
8207 Animal Purchase	0.00	0.00
8301 Project 'Magt and Supervision	0.00	159419.00
8302 Direst Labor	192707.00	0.00
8303 Operation and Maitenance	139655.00	440585.00
8304 Finacial costs(Commission and Intrest)	0.00	0.00
8305 Tax	0.00	0.00
8401	0.00	0.00
Total	22748613.00	25069210.00

Source: Planing and Economic development Bureau

DOMESTIC SERVICES

Coverage:

The domestic services sector cover the services provided by household employees such as maids, cooks, laundresses, baby sitters, watchmen (guards) and other housekeeping services workers. These are services rendered by one households to another.

Sources of data

The main sources of data to estimate the number of workers and the salary of maid servants for the sector are the 1994 Population and Housing census and the Average Retail price of goods and services in selected Urban centers and Rural areas.

Method of Estimation

The output of domestic services of household is equal to the compensation of employees only. No intermediate consumption or consumption of fixed capital is involved in the production of this services. Hence the method to be followed for the estimation of value added is to use the number of persons engaged in domestic services and average earnings (in Cash & in kind) per person.

In order to start with the estimation of the gross value added of domestic services, it is necessary first to obtain the number of persons engaged in this activities and the average earning per person. For the estimation of the number of maids and related housekeeping services

the 1994 Population and Housing census, provide data on the number of persons engaged in this activities. Once the number of workers are obtained for the bench mark year 1994/95 the number of workers for other years before and after 1994 can be derived by assuming that the employment in the sector has been growing at the same rate as growth rate of the economically active Population in the region. On the basis of this assumption for the actual estimation of the regional domestic services gross value added, the following steps has been followed.

Firstly in order to establish the number of workers in this sector, the 1994 Population and Housing Census has been useful in providing the economically active population out of the total population and the proportion of the number of domestic workers out of economically active population. Once the number of workers was established for the bench mark year for Urban centers and Rural Areas, the next step was applying the bench mark year proportion to the total population of the region for the years 1995/96. Taking in consideration the assumption that the proportion of the economically active population out of the total population and the number of domestic workers out of economically population are unchanged over years.

After establishing the number of Domestic workers for the years 1994/95 & 1995/96 by Urban centers and Rural areas, the next step was estimate the average earning per person by urban centers and rural areas. In this regard it has been found necessary to estimate Average earning per person for the two consecutive years.

The C.S.A Average Retail price of goods and services in selected urban centers and rural areas is the main source of data for the Average earning per person on a monthly basis. Therefore, it has been necessary first to average the

monthly wages for each urban centers and rural areas to obtain the yearly wages for all the year.

Unlikely for rural areas the average wage obtained from the sources^{is} only for the year (1994/95), due to this limitation for the other year 1995/96 the Average wages paid to Domestic servants in rural areas is taken at the 1994/95 price.

Once the number of domestic workers and the average earning per person per annum is established, the gross value added of Domestic services at C.F.C, is made up by multiplying the number of domestic servants by the average earning per person for the two consecutive years. With respect to the wages in kind no data is available at regional level, due to lack of information the wages paid in kind (mainly in food) is not included in the current estimation.

To obtain estimates at constant price the number of persons employed for each year may be multiplied by the base year (1994/95) earning per worker.

The estimates of GVA of Domestic services at current and constant factor price and the data used are presented in annexure table.

Table 82 Estimation of Gross Value Added from Domestic Services

No	Description	1994/95	1995/96
1	Population		
	Rural	3114234	3193350
	Urban	2651133	2710848
		463101	482502
2	Economically Active Population out of total population (in percent)		
	Rural	50.66	50.66
	Urban	28.73	28.73
3	Economically Active Population out of total population		
	Rural	1476113	1511938
	Urban	1343064	1373316
		133049	138623
4	Domestic Servants out of Economically Active Population (in percent)		
	Rural	0.11	0.11
	Urban	3.43	3.43
5	Domestic Servants out of Economically Active Population		
	Rural	6041	6265
	Urban	1477	1511
		4564	4755
6	Monthly Wages Paid to Domestic Servants		
	Rural*		
	Urban	28.28	28.28
		41.25	41.94
7	Annual Wages Paid to Domestic Servants		
	Rural*		
	Urban	339.12	339.12
		495.00	503.28
8	Wages in Kind		
	Rural	0.00	0.00
	Urban	N.A	N.A
		N.A	N.A
9	Value Added at Current Factor Cost		
	Rural	2759976.88	2905267.73
	Urban	501005.84	512290.66
		2258971.04	2392977.06
10	Value Added at constant Factor cost (at 1994/95 price)		
	Rural	2759976.884	2865898.291
	Urban	501005.84	512290.6637
		2258971.04	2353607.627

Source: Average retail price of goods and services in Urban centers (1994/95 & 1995/96)
The 1994 Population & Housing Census (for tigray region)

* Average monthly wage paid to domestic Servant in rural area is taken at the 1994/95 average wage paid for the study period due to lack of data

OTHER SERVICES

Coverage:

The other services sector includes all services of individuals, institutions and organisations not covered under the previously treated industrial classification (ISIC) activity groups listed below specifically covered under the sector are:

- a. Business services, e.g. legal, accounting, data processing, advertising etc.
- b. Machinery and equipment rental and leasing services
- c. Welfare institutions, e.g. the Read Cross, Orphanages, home for the disabled, etc.
- d. Business, Professional and Labour associations.
- e. Religious Organisations.
- f. Political, Civic and Fraternal organisations.
- g. Recreational and cultural services, e.g. cinemas, theatre's,
- h. Personal and household services like repair of household and personal effects, laundries and beauty saloons, etc.
- i. Resident employees of International and other extra-territorial bodies, e.g. offices of U.N. agencies, the O.A.U. etc.
- j. Local and foreign NGOs, other non-profit making organisations including development organisations.

Source of data

The main sources of data which would enable estimation of the gross value added of the other services sector are, the 1994 Population and Housing Census which provide the number of workers in other services sector out of economically active population, establishment surveys and labour force surveys which provide data on the number of establishment classified as other services and in addition the number of persons engaged, the output, wages and the value added of the sector. However, at present most of this information's are not available in the Region. A comprehensive survey on a Census or sample basis has to be conducted on the number of establishments, number of persons engaged, output, wages inputs and value added of the sector at Regional level.

Method of Estimation

The method generally followed for the estimation of value added for different categories of services at current and constant factor cost is similar to the one adopted for domestic services where gross value added consist, in multiplying the total number of persons engaged in these services by corresponding value added earning per person. But unfortunately, in the current estimation of the gross value added of these sector the only source of data relating to the whole region, is the 1994 Population and Housing Census which provide only the total number of workers in other services out of economically active population. There are no sample surveys or Census conducted on other services sector which could have

Table 83 GROSS VALUE ADDED OF OTHER SERVICES SECTOR

No	Type of services	Number		Annual Income	
		1994/95	1995/96	1994/95	1995/96
1	accountants				
2	Lawyers	26	25	64440.00	76968.00
3	Auditors				
4	Barbershop	55	55	170294.00	177434.60
5	Beauty Saloons	28	35	79809.00	104912.02
6	Brokers				
7	Travel Agents				
8	Photographers	42	60	297156.45	347619.60
9	Film(cinemas)		1		72000.00
10	Computer Center	2	2	450000.00	510000.00
11	Traditional Medical Practitioners				
12	Traditional Berth Atendants				
13	Driving Schools	25	33	82500.00	108900.00
14	Typing schools	5	4	17947.50	6211.00
15	Clearing and Forwading Agentes				
16	Shoe cleaning and other streer services				
17	Laundries	5	5	58828.00	43779.00
18	Singers and dancers	1	3	40000.00	82000.00
19	Consaltnts				
20	Engineering design and drafts men	2	2	100000.00	185000.00
21	Political, civic and Fraternal Organization				
22	Religious Organization				
23	Welfaer Organizations such as red cross, Orphanage and home for siabled				
24	Repair of household and personal effects				
25	Resideent employee of international and other extra -teritorial bodies				
26	Local and foreign NGOs other nonprofit making Organizatons including dvelopmente association				
TOTAL				1360974.95	1714824.22

Conclusion and Recommendations

At the top of the task's requirements of varied specialised studies in many areas of the sectors of the economy, it has been done in situations of data base problems, lack of co-ordinated information system and other problems. But in view of continuing the task regularly the team has put the following concluding remarks and recommendations.

The years considered in this accounting task are only 1994/95-1995/96 and with the estimation of RGDP in the specified period it has been difficult to put a remark on the progress of the economy but the contribution of each activity in the economy to the region's GDP and the region's GDP to the national economy.

If the task is to meet its broad and specific objectives it needs to be undertaken on continuous basis and the nature of the task has to be thoroughly understood and efforts be made to give due consideration to the following points :

1. **Organisation of Regional Accounting Units**: If the task is to be undertaken on continuous basis a regular units has to be established at regional and zonal levels in all major sectoral bureaux which regularly collect and organise a comprehensive and successiveness of data of all the production and service sectors. After setting clearly the relationship and co-ordination of each unit an integrated information system can be established. In this way, the task can be done in a more facilitated way. Besides, the necessary short and long term trainings be arranged for the units as there are very few expertise trained in regional economic accounting in the region.
2. **Developing awareness on the proper handling of the accounting system in the society** : In order to keep a quality and regular flow of data all bodies (whether governmental, non-governmental, private, and others) responsible for data provision and dissemination need to be sufficiently aware of the objective and vitality of the system so that every one feels responsible for the proper handling of data, for the provision and exchange of information. In this case, seminars and workshops be prepared on the field to develop this awareness. This is believed to have a contribution in improving the existing poor information system.
3. **Fulfilment of data gap** : It has been repeatedly mentioned that in many activities of the economy the task requires varied regionally developed specialised studies. In this particular task for the reason of lacking sufficient regionally developed studies and their requirement of skill ahead of the Bureau and the study team, in minimum cases, to fill the data gaps of some areas we are forced to consider national norms. This by itself might influence the quality of data and proper estimation of the RGDP. Therefore, in areas where there are data gaps studies has to be initiated at regional level.
4. Finally, the team recommends the initiation of the study of **sub-sectors with supra-regional characteristics**. In this case, all the necessary push has to made by the regional government to enable estimate the contribution of sub-sectors like air transport and defence(national army) to the regions' GDP.



This first phase report was compiled by an Ad-hoc technical team of The Bureau of planning and Economic Development for Tigray region comprising the following experts:

- 1) Ato Sebhatu G/egziabher co-ordinator
- 2) >> Kidane G/mariam member
- 3) >> Johnny Berhanu >>
- 4) >> Yemane Youseph >>
- 5) Mrs Abrehet Franchesco >>
- 6) Ato Mekonen G/medhen >>

It is also important to note that during the course of the study the last three experts, because of various reasons, withdrew from the team at the mid of the task.

This first phase report was compiled by an Ad Hoc Technical team of The Board of Economic and Economic Development for the region concerning the following aspects:

- 1) Also Technical Committee membership
- 1) >> Member Committee member
- 2) >> Johnny Graham
- 4) >> Yonnie Young
- 5) Mrs. Annie Johnson
- 6) Also Technical Committee

It is also pertinent to state that during the course of the study it is for these aspects, however, it is not necessary to state that the report is the work of the team.

POLITICAL MAP OF TIGRAY



Key

- INTERNATIONAL BOUNDARY
- x-x- REGIONAL BOUNDARY
- ZONAL BOUNDARY
- WEREDA BOUNDARY

Nota

Alignment of all boundaries is approximate

Prepared by- Planning & Economic Development Bureau
Physical Planning Department

