

TECHNICAL PAPER 48

**Forestry Royalties in Tanga Region:
Paper versus Reality**

Daniel Kobb

1998

East Usambara Catchment Forest Project

TECHNICAL PAPER 48

FOREST ROYALTIES IN TANGA REGION: PAPER VERSUS REALITY

Daniel Kobb

Prepared for

**East Usambara Catchment Forest Project,
Buffer Zone Conservation & Development Program,
And Tanga Coastal Zone Project**

**Ministry of Natural Resources and Tourism,
Tanzania
Forestry and Beekeeping Division**

**Department of International Development Co-
operation, Finland
Finnish Forest and Park Service**

Tanga 1998

PREAMBLE AND ACKNOWLEDGEMENTS

In a spirit of co-operation this paper was financed by the Tanga Coastal Zone Conservation and Development Project, the Natural Resources and Buffer Zone Project and the East Usambara Catchment Forest Project. In this sense, it represents a rare effort on the part of donors to economise on scarce research or consultancy funds. The extra work of co-ordination fell largely (but not exclusively) on the East Usambara Catchment Forest Project (primarily Mr. Nashanda and Mr Johansson).

Fieldwork demanded a level and complexity of logistics rarely encountered in consultancy reports. Police and traffic co-operation was granted. Much of this work was ably handled by Mr Mburi, who accompanied me for most of the field work and travel. Research assistance was provided by Davis Joseph, Burhan Majaliwa, Amri Joho, Kyalamaka Gwambibi, Sikuthani Muya, Celina Mhina, Christina Mzoo, Barnabas Mbwana, Francis Kiondo and Clarence Mangowi. Police officials who pitched in (under difficult sleepless conditions) included Officers Sembwana, Saumi, Christian, Mziray, Ferdinand, and Meck. Foresters sharing this burden were Mbwelewa Kimweri, Zuberi Gumbo, Azza Chomora, M.C. Luwoga, Frank Mahere, Benard, Emmanuel Msofi, Peter Ndege, John Paulo and Edgar Msikari. Mr. Mrema, of the Mangrove project, and his workers provided assistance on patrol. Hospitality was extended by the Amboni Company, and in particular Bruce and Jane Fox of Mkwaja.

ABBREVIATIONS, TECHNICAL TERMS & SWAHILI WORDS

ERV, Exchequer Receipt Voucher, a Central Government Receipt

FBD, Forest and Beekeeping Division (in Ministry of Natural Resources and Tourism)

FL, Felling License, permission to cut a tree once royalties (fees) have been paid.

FRMP, Forest Resource Management Project, a World Bank financed project operating primarily in Tabora and Mwanza.

KWh, Kilowatt Hours, a unit of electricity use

m³, Cubic Metres

RNRO, Regional Natural Resource Officer.

TRC, Tanzania Railway Corporation

“Tabora” Report, series of reports by Bert Koppers on royalty collection problems in Tabora.

Tanesco, Tanzania Electricity Supply Company

Exchange Rate: \$ US 1 = 660 Tsh (Tanzanian Shillings)

TABLE OF CONTENTS

Preamble and Acknowledgements	iii
Table of Contents	v
List of Tables and Figures.....	vii
Chapter One: Introduction	18
1.1 The General Approach: Commercialism.....	20
1.2 Methodology	20
1.2.1 How was the Estimate or Target Derived?	20
1.3 Other Studies Silviculture and Tabora and a Pre-view of results	22
1.4 Layout of this report.....	23
Chapter Two: Current Revenue Collected, the Data.....	24
2.1 Quarterly Data and the Case for District Collection	24
2.2 Felling License Data: (Primary Documents).....	26
2.2.1 Daily Averages.....	27
2.2.2 Seasonality and Trends	27
2.3 ERVs: Charcoal and Fuelwood (Primary Data Set).....	27
Seasonality of ERVs	28
2.4 Summary	28
Chapter Three: Charcoal and Fuelwood	30
3.1 The Transport of Charcoal: Road Monitoring	30
3.1.1 Commercial Traffic.....	30
3.1.2 Drivers' Charcoal and Fuelwood	32
3.1.3 Buses	32
3.1.4 Bicycles.....	33
3.1.2 Summary of Charcoal and Fuelwood traffic.....	33
3.2 A map of Charcoal Sales.....	35
3.4 The Case of Mkarambati.....	37
3.5 Charcoal at Horohoro.....	38
3.6 Dar	38
3.7 ERV Data: the Possible Effect of Observation	39
3.8 Charcoal Prices: Scarcity and Taxation	39
Chapter Four: Timber	42
4.1 The Transport of Timber: Road Monitoring	42
4.2 Observing Three Random Saw-millers.....	43
4.3 Carpenters and Timber Dealers: "District Demand".....	43
4.3.1 High-Medium-Low Estimates.....	45
4.4 Data from a Day in the Forests	45
4.5 The Kenyan Border.....	45
4.5.1 An Alternative Recommendation for Horohoro; Marketing and Publicity.....	46
Chapter Five: Mangroves.....	47
5.1 Kipubmwi, Mkwaja: South of the Pangani.....	47
5.2 Moa and the Northern Coast	47
5.3 Disruption of Markets	47
5.4 Revenue Estimates	47
Chapter Six: Summary and Recommendations.....	48
6.1 Summary: Low, Medium and High Estimates Revisited.....	48
6.2 Data collection	48
6.3 Financial Administration.....	49
6.4 Checking Checkpoints and Revenue Collectors: an internal audit method	50
6.5 Sources to be exploited: some targets are derived	51

6.5.1 Charcoal and Fuelwood at Kabuku.....	51
6.5.2 Mizani and Amboni Checkpoints	52
6.5.3 Saw-millers and large timber dealers.....	53
6.5.4 Dealing with the Army.....	53
6.5.5 Smuggling in Kenya.	53
6.5.6 Carpenters	53
6.5.7 A Summary of staffing requirements.....	53
6.7. Sub-contracting: a Summary.....	53
7.7 Expenditures and Retention	54
7.8 Administration: Procedures and Documents.....	55
7.8.1 Administrative System A: the Single Cascading Checklist	55
Back-ground	57
ERV	57
Permis-sion to Extract	57
Produc-tion & Loading	57
7.8.2 Administrative System B: the Forestry “LUKU”	58
7.8.3 Deterrence	58
7.9 Legal and Policy Issues.....	59
Chapter Seven: Bibliography and Terms Of Reference.....	61
7.1 Terms of Reference	61
7.2 Conversion Factors Used	61
7.3 Bibliography	62
A.2 Calculations used in Chapter Two	57
Area.....	57
A.3 Calculations Used in Chapter Three	61
A.4 Data used in Chapter Four (Timber)	64

LIST OF TABLES AND FIGURES

Table 1 : Data Sources Used	21
Table 2: Royalty Projections in Tabora Marketing Study	23
Table 3: Average Annual Revenues from Forestry Products.....	24
Table 4: Comparison of Forestry Royalties, Pre 1996, District & Regional Sources.....	25
Table 5: Comparison of Royalty Collection in Handeni District.....	25
Table 6: Average Size of Felling Licenses (FL)	26
Table 7: Main Species in Felling Licenses	26
Table 8: Descriptive Statistics for Daily Issuing of Felling Licenses (11/11/97 to 30/8/98).....	27
Table 9: Descriptive Statistics for Daily ERV Revenue in Tsh (Charcoal & Fuelwood; 9/97 to 8/98)	27
Table 10: Comparison of Actual and Potential Revenues (Annual, Figures in Millions of Tsh) ..	28
Table 11: Revenue Estimates Based on Per Capita Estimates	29
Table 12: Daily Value of Commercial Charcoal Trade	30
Table 13: Commercial Charcoal Trade (vehicle by vehicle)	31
Table 14: Daily Commercial Fuelwood Traffic	31
Table 15: Charcoal Transported Daily by Drivers.....	32
Table 16: Forest Products Transported by Bus	32
Table 17: Charcoal & Fuelwood Transport Daily by Bicycle	33
Table 18: Annual Charcoal & Fuelwood Royalties (Millions of Tsh) Calculated at Roadblocks.	33
Table 19: Comparison of Observed Royalties Due with Royalties Paid at Roadblocks.....	34
Table 20: Observed Roadside Wholesale of Charcoal and Fuelwood by District	35
Table 21: Observed (Daily) Bags of Charcoal and Fuelwood For Sale.....	35
Table 22: Two Estimates of Bags of Charcoal Produced Daily.....	37
Table 23: Estimates of Daily Charcoal Consumption in Dar Es Salaam	38
Table 24: Comparison of US/Tanzania Electricity Prices	41
Table 25: Observed Commercial Timber Traffic.....	42
Table 26: Carpenters Daily Royalties Due	43
Table 27: Estimates of Yearly Royalty Due From Furniture Making	44
Table 28: Estimation of Trade in Carving Materials	45
Table 29: Royalty Estimates (High, Medium, Low)—all values in Millions Tsh	48
Table 30: Example of ERV Monthly Reports.....	49
Table 31: Derivation of Targets at Kabuku	51
Table 32 : Average Quarterly Expenditures (Tanga Region, Quarters Ending March & June 1998)54	
Table 33: Conversion to Round Wood over Bark.....	61
Table 34: Tons per M ³	61
Table 35: Other Conversions	62
Table 36 : Sources of Felling License Royalty	57
Table 37: Felling License Royalties by Tree Species	58
Table 38: Bags of Charcoal, by Hour, Amboni Checkpoint.....	61
Table 39: Estimated Annual Royalties Paid using Roadblock Observations.....	61
Table 40: June 1997 Sample at Bungu Checkpoint (Dar).....	62
Table 41: Electricity Prices in Tanzania	64
Table 42: Number of Carpenters And Timber Dealers Interviewed, Including Absences	65
Table 43: Type of Wood used by Carpenters	65
Figure 1: Map of Charcoal Production	36
Figure 2: Map of Felling Licenses	58
Figure 3: Daily Felling License Revenue Values	60
Figure 4: Daily ERV Values (Kabuku and Amboni).....	60

Figure 5: Nominal Charcoal Prices (Time Series).....	62
Figure 6: Dar Es Salaam Charcoal Prices	63
Figure 7: Tanga Charcoal Prices.....	63
Figure 8: CPI Price Index	63

CHAPTER ONE: INTRODUCTION

The purpose of this paper is to estimate forestry royalty potential in Tanga Region, to generate a reliable tax baseline or targeted amount to collect, and to make recommendations on how to improve the royalty collection process and procedure. In this sense, the results presented here, and related studies such as the “Tabora” reports, constitute a *first step* in increasing natural resource revenues. Of equal importance, this study documents important failures suffered during the course of three weeks of intensive fieldwork.

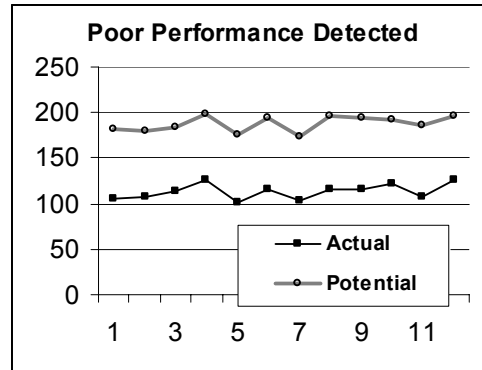
Focus is limited to four main forest products. They are:

1. Hardwood Timber, taxes of which are charged upon the felling of particular tree species. Fees vary according to the type of tree felled, but typical figures in Tanga hover about Tsh 15,000 per cubic metre. There is no royalty charged on softwood.
2. Charcoal, which is charged at the rate of Tsh 300 per bag.
3. Fuelwood, which is levied at the rate of Tsh 1,000 per stacked metre. Like charcoal, only “commercially sold” fuelwood is taxed; domestic or home use is exempt, as long as wood does not come from a Forest Reserve.
4. Mangrove Poles, which is taxed at roughly Tsh 200 per pole.

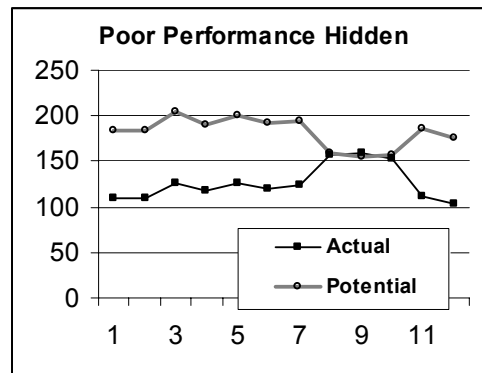
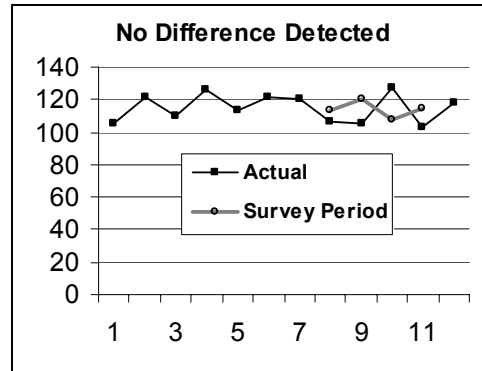
Because this paper focuses on revenue collection, it ignores three dominant sources of **deforestation**: slash and burn agriculture (visible anywhere along the Segera-Chalinze road), encroachment (settlement, often with the implicit approval of local governments in Central Government Forest Reserves) and domestic use of fuelwood. These three uses of forest products are more extensive than is the **commercial** use of charcoal, fuelwood, and timber.

Not surprisingly, the act of comparing actual and potential revenues conflicted with well-entrenched interests, amongst them the habit of foresters and checkpoint attendants to accept bribes in lieu of taxes, and transporters, saw-millers, carpenters, timber dealers and other businessmen to avoid paying these taxes. Worse still, and as is documented below, **there were concerted efforts to undermine this study from within the forest department**. In particular, foresters failed to keep the nature of this exercise confidential. Leaks were likely and collusion between foresters, and their supporters (i.e. private saw-millers, transporters and other businessmen) very probable. The timber business virtually stopped during our period of observation, only to begin again during the write-up phase of this report. Worse still several foresters blatantly and purposefully ignored directives from their superiors in the process of gaining police support for this exercise. These types of actions, for good reason, are referred to as “deliberate insubordination” in the *Tabora report*.

Comparing actual with potential revenues can in general result in three possible outcomes. These possibilities are depicted in the adjacent graphs. First, the survey can derive estimates far in excess of past or actual trends. This implies a failure to collect revenues, corruption, or inefficiency of one form or another. Second, baseline estimates can be within trend, give or take some luck. Finally, and more interesting, performing the baseline survey can itself shift the trend. This type of **data anomaly**, can on occasion itself be detected, for example when results drastically improve during the observation period (because everyone momentarily tries harder).



To pick a round figure “potential” revenues are conservatively estimated to be about 400 Million Tsh while actual revenues are estimated to be 60 Million Tsh. This gap, however, **overestimates** the amount of royalty that could and should feasibly be collected. In particular, revenue targets need to be based upon net not gross collection: that is, tax collection exercises in which the costs of collection are higher than the revenues generated should not be pursued. This is complicated by the deterrent, dynamic effect of collection: tax collection exercises undertaken today may increase future compliance. Roughly taking into account these factors, a target of 120 Million Tsh seems more reasonable.



There are several reasons why tax collection falls short of potential. Amongst them, and in no particular order:

1. **Corruption** and collusion within or between the Forestry Department and businessmen. Possible methods of corruption include:
 - Reusing licenses that have not been properly cancelled.
 - Bribing to get wood hammered and ignoring other documents.
 - Bribing to get past checkpoints.
 - Under-counting: paying for 80 cubic metres while you have felled 100 cubic metres.
 - Forgery: entering one amount on the original document (example 100 bags of charcoal) but paying for a lower amount as is written on the submitted carbon copy (example 10 bags).
 - Stealing or not returning receipt books; foresters’ use of receipt books as if they were private property.
 - Intercept collected revenues: collusion with accountants and others, for example in Dar es Salaam, not to transfer all collected funds to the Ministry.
2. A **lack of effort**, inability, or demotivation; “incompetence,” amongst certain foresters.
3. A lack of materials, such as transport (i.e. **input** constraints in the collection process). In some cases this may include illiquidity, a shortage of cash to mount tax collection exercises.
4. Difficulty in **monitoring** personnel, their intentions and abilities. In other words the “central office” cannot effectively distinguish between “deliberate” (intentional) low levels of revenue collection (bribery) and “unintentional” low levels of collection (due to inability, or lack of effort or resources at field staff). In other words corruption may be implied but is difficult to prove.
5. An institutional inflexibility preventing the allocation of **rewards and punishments through personnel** hiring, firing, and remuneration decisions. Not surprisingly, when actions are separated from consequence (a dysfunctional merit system), staff members are routinely demotivated.
6. **Poor management** or, a lack of management culture.
7. Cases where the **cost** of royalty collection is higher than the proceeds.

Some, but not all of these problems are related to or are compounded by foresters’ widespread dissatisfaction with pay (and to a lesser degree poor working conditions). Whether pay is low compared to productivity is an open question; less controversially payment is certainly low in relation to both the amount of revenues handled by foresters and to their own expectations or valuation of their work.

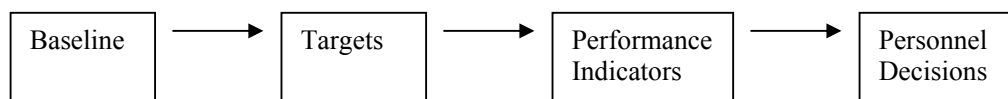
1.1 The General Approach: Commercialism

This paper takes a **marketing or commercial approach** to the problem of estimating potential revenues. Although under current legislation tax is applied at the point of production, there is no inherent reason why royalties could not be applied at the point of wholesale, transport, processing, or retail. The advantage of transport is that it forms a convenient bottleneck for observation, typically at the entry point to larger towns where most consumption takes place. Should a study of marketing channels provide a successful approach to estimating revenue collection, it should also provide a viable means of actual revenue collection.

Implicitly, a marketing approach realises it is too expensive to collect and administer many of the legally specified taxes. For example, it is standard practice to collect fuelwood in Forest Reserves. Rarely is this activity accompanied by a *time license*, as is legally required. For example, forests in public lands (“villages”) are frequently exploited for building materials and furniture. Monitoring these, and other similar situations, is uneconomic, and **therefore do not enter the calculations of this study**.

1.2 Methodology

The idea behind this study is to establish reasonable tax collection targets and to force implementers to reach these targets.¹ Schematically the theory is:



In layman’s terms, once everyone knows what they should be collecting, failure to do provides *prima-facie* evidence of either corruption or inability. The distinction between the source of failure (corruption or incompetence) is not relevant: dismissal needs to be the ultimate decision.

1.2.1 HOW WAS THE ESTIMATE OR TARGET DERIVED?

Estimates are derived on a product by product basis by focussing on both product movement (transport) and consumption. Each product produced in Tanga Region must either be consumed within the Region or exported to other areas (for example Dar, Moshi, Arusha, Kenya, Zanzibar). This study aims to produce a rough accounting of production, such as:

¹ TRA (The Tanzania Revenue Authority) also uses targets to gauge performance, but these targets were probably derived by stipulating a percentage increase on previous years’ values, rather than working through the independently observed baseline methodology of this survey.

TABLE 1: DATA SOURCES USED

<i>Final Demand/Product</i>	<i>Observation /Source</i>
EXPORTS	
Timber, Charcoal by rail to Dar or Arusha	Railway data or sample monitoring
Timber, Charcoal by trunk road to Dar/Arusha	Traffic monitoring sample
Timber, Mangroves by sea to Zanzibar/Kenya	Sea and Beach patrol sample
Timber by trunk road to Kenya	Customs data or traffic monitoring
Timber, charcoal by bicycle to Kenya	Consumption sample in Kenya
CONSUMPTION AT MAIN COMMERCIAL CENTER (TANGA)	
Timber, Charcoal by trunk road to Tanga	Traffic monitoring/sampling
Charcoal fuelwood by bicycle to Tanga	Traffic monitoring/sampling
OTHER COMMERCIAL USE	
Timber dealers, Carpenters in District Towns	Interviews on usage
Charcoal, fuelwood consumption in District Towns	Ignored
Tea Estates, Salt-boilers, etc., in non-District Towns	Ignored
Inter-village sales	Ignored
NON COMMERCIAL USE	
Household cooking, housing, brewing	Non-taxable; ignored.
TOTAL PRODUCTION	

The table above documents three general ways of performing a revenue baseline. Where the good is transported, either by rail, sea, or trunk road, it is **observed during a sample period**. For example, roadblocks are established, or railway wagons are inspected. Results from the sample period are then extrapolated on an annual or monthly basis and compared with actual revenue collections. Second, **independent data** can be used to generate comparative estimates. For example, TRC (Tanzania Railway Corporation) consignment notices can be totalled to get estimates on timber traffic. In the case of Tanga, the railway was impassable for much of the past year, though small quantities of softwood were transported from Mombo to Dar (Ilala) and Arusha.² Other independent sources include TRA (Tanzania Revenue Authority). Third, **interviewing** users of forest products can generate consumption data. Whenever more than one method is used, it is important to avoid double counting. For example, regardless of final use (saw-millers, carpenters, resale, direct home use) anything passing a checkpoint is already “accounted for.”

Of the possibilities documented in Table 1 (page **Error! Bookmark not defined.**), we performed the following:

1. Traffic was monitored for 3 days along the Arusha/Tanga/Dar trunk road. Three roadblocks were established and the existing Amboni checkpoint was observed. Originally we intended to block the Pangani-Tanga road to gauge traffic to Tanga and the Handeni-Turiani-Dumila road leading to Morogoro. We were not provided enough police assistance to monitor Pangani-Tanga, and the Turiani road was impassable during our reconnaissance of the area.³ Other minor outlets in Handeni, such as roads leading to Kiteto and Gairo were not monitored under the assumption that traffic was of second order importance.
2. Research Assistants in Korogwe, Muheza, Maramba, Mombo, Hale, Handeni, Pangani and Lushoto interviewed more than 100 carpenters and timber dealers. In order not to arouse suspicions, we posed as a fake Finnish NGO (“FinnCredit”) doing background credit research into various micro-enterprises.
3. Railroads were not monitored since they did not function for much of the previous year. TRC officials provided us with existing data on timber traffic, the only case being transport of softwood from government plantations in Mkumbara. It is possible in the past (and recent

² In particular, there were 5 consignments totalling 154 tons in 1997. These were all softwood from Greywal sawmills in Lushoto.

³ Because of the passing of the Vice President, it was repaired one week before our study.

present) that some timber was exported from Pangani (Mkalamo) and other areas, but this was not investigated.

4. Consumption of timber, used for carving was sampled across the Horohoro border in Kenya.
5. Sea traffic was investigated in Mkwaja (Southern Pangani District), and the northern coast from Tanga to Horohoro was patrolled for one day by boat.
6. The Soni (Lushoto) checkpoint was directly monitored.
7. A sample of 3 sawmills in Tanga was observed for 3 days.

In addition to this, we generated observations on the amount of charcoal and fuelwood sold on the roadside and spent one day walking through 5 representative forests.⁴

In summary: we ignored many statutory revenue sources because they are probably too expensive to collect. We were unable to monitor other sources because of a shortage of police assistance and financial limitations of this survey. To name just a few we could not set up roadblocks along the Pangani-Tanga road, along the Handeni-Turiani road, or outside Korogwe (imports to Korogwe, from Kabuku for example).

1.3 Other Studies Silviculture and Tabora and a Pre-view of results

The genesis of this study can be traced from the World Bank financed Silviculture report (where the revenue collection and institutional problems were initially spelled out) to Kopper's (1997) Tabora report in which the degree of the problem was first quantified. The problems outlined in the Silviculture (1991) report still largely exist today:

“the system of licenses and collection permits...is a cumbersome one which invites both user and administrator to short-circuit. Compliance with the licensing system is extremely time consuming and license forms are at the same time over-elaborate and inadequate....There is little point arguing the toss about whether replacement costs or residual values are the most appropriate basis on which to price standing timber, if the methods of collecting the money is so inefficient that a significant proportion of wood harvested is acquired at no price at all, save that of the wood cutter to cut...It is widely recognized that evasion of royalties and other forestry fees is widespread and that little of the money that should be collected is collected.” pages i-iii).

FRMP Tabora's marketing study, undertaken between September and December of 1996 monitored movements of timber and charcoal, by road and rail, throughout the Region. Due to the poor road network it was estimated that more than 90% of the produce was exported from the Region by rail. Inspecting wagons and consignment notes during a period of 13 days, daily royalty values were calculated to be on the order of 13 Million Tsh, while annual royalties were estimated to be between 2.5 and 3.8 Billion Shillings.⁵ Actual royalties were 35 Million Tsh, or roughly 0.9% to 1.4% of the revenue due. The table below reproduces the key results.

⁴ A second day of this was planned but cancelled due to logistical constraints.

⁵ The range is due primarily to estimates of seasonality. In particular, it was assumed that the timber production of 12 months is only transported during a period of 7 months or 210 days and that during the remaining 5 months no timber is transported due to the rainy season and the official logging ban from January to June. For the royalty rate calculation it is assumed that 90% of the timber produced is of the Tsh 20,000 royalty class (Mninga, Mkola), 5% of the Tsh 10,000 (Mtundu) and 5% of the Tsh 3,000 royalty class (Muwa), giving an average royalty rate of Tsh 18,650 per cubic metre.

TABLE 2: ROYALTY PROJECTIONS IN TABORA MARKETING STUDY

<i>Forest Product</i>	<i>High</i>	<i>Low</i>	<i>High (Tsh)</i>	<i>Low (Tsh)</i>
Timber	176,400 m3	113,400 m3	3,289,860,000	2,114,910,000
Charcoal	226,800 bags	145,800 bags	68,040,000	43,740,000
Fuelwood	480,000 m3	325,000 m3	480,000,000	325,000,000
<i>Total</i>			<i>3,837,900,000</i>	<i>2,483,650,000</i>

The details were actually more disheartening. The poor results were attributed to a lack of willingness and honesty on behalf of foresters, not to insufficient inputs or materials. The point was made that railroad stations were located no more than 800 metres from Forestry Offices. To complicate matters:

“Around an average of 15 lorries loaded with logs and timber are entering Tabora town every day, representing a royalty value of around Tsh 4,000,000. These lorries, of which 14% are state-owned vehicles, are quite visible, even to a casual observer.” (Page 17)

The Forestry department established a checkpoint at Walla Bridge on the Sikonge road, around 40 kilometres south of Tabora. To “check” on the checkpoint a 24-hour “counting post” (staffed by non-foresters) was temporarily established, roughly 20 kilometres north of the checkpoint. During the period 19/09/96 to 30/09/96 the counting post counted 85 lorries carrying 745 m3 of *Mninga* (round wood over bark) and 15 lorries carrying 1,500 bags of charcoal.⁶ During the same period the checkpoint officially recorded 35 lorries carrying 186.5 M3 *Mninga* and 9 lorries carrying 800 bags of charcoal. According to the report (page 18):

“As the counting data raised some questions about the efficiency and effectiveness of the checkpoint operations, it was decided to establish a counting post a few hundred metres south of the checkpoint, without notifying the checkpoint crew or any other FBD personnel. From the counting post the checkpoint was visible and no tracks branched off from the main road in-between the checkpoint and the counting post. The exercise was carried out for six days between 29/10/96 and 03/11/96. Whereas the counting post recorded 19 lorries carrying 184 M3 of timber and 5 trucks with a total of 500 bags of charcoal, the checkpoint only recorded 13 lorries carrying 74 M3 of timber and 2 trucks with a total of 200 bags of charcoal.”

One of the effects of the first Tabora report was that foresters learned to more carefully conceal their improprieties. For example, instead of writing “timber” on railway consignment notes, businessmen began writing “general goods.”⁷

1.4 Layout of this report

This report is highly quantitative and therefore makes inherently messy reading. In the more onerous cases, calculations are contained in the appendix and cross-referenced in this, the main body. The reader is urged to have both copies at hand (one in each if you’re really interested). In terms of layout, chapter two summarises existing data, chapter three looks at charcoal, chapter four at timber, and chapter five at mangroves. Chapter six summarises the findings and makes suggestions and recommendations while chapter seven contains the terms of reference, a bibliography and some conversion factors commonly used.

⁶ Closed lorries were recorded but not counted as carrying forest produce, though many may have.

⁷ Even from rural areas, where no “general goods” were produced.

CHAPTER TWO: CURRENT REVENUE COLLECTED, THE DATA

Deriving reliable baseline figures for comparison is the first step in identifying problems in the royalty collection mechanism. In this chapter statistics are calculated describing average collection, trends (is revenue increasing) and patterns of seasonality. Three data sources are discussed: quarterly reports (which includes timber, charcoal, confiscation, etc.) and primary data (which includes ERVs for charcoal and fuelwood and felling licenses for timber)

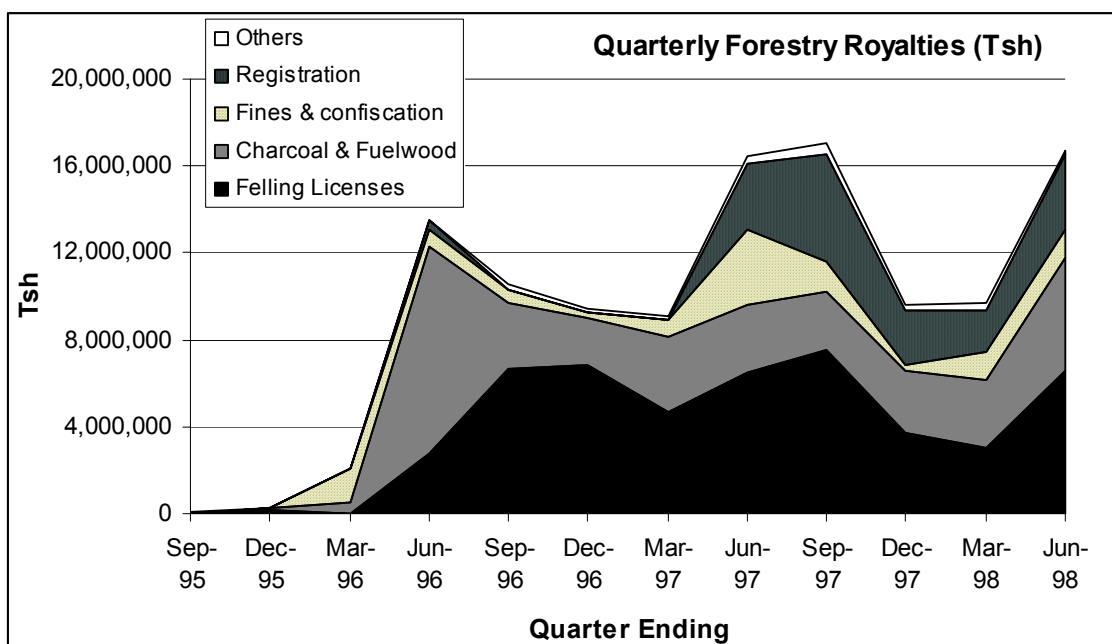
2.1 Quarterly Data and the Case for District Collection

Prior to March 1996 forestry royalties in Tanga Region were collected directly by the individual district governments and retained at that level. In April 1996, collection responsibility was transferred to the Catchment Forestry Project, who submit royalties directly to the Central Government.⁸ Currently, the Catchment Forestry Project presents its figures on a quarterly basis. The main categories used are charcoal and fuelwood, timber (from felling licenses), registration fees, fines and compensation.⁹ As can be seen in Table 3 on annual basis revenue is roughly 50 Million Tsh.¹⁰

TABLE 3: AVERAGE ANNUAL REVENUES FROM FORESTRY PRODUCTS

Revenue Source	Yearly Total	%
Felling Licenses	22,787,226	46%
Charcoal & Fuelwood	12,775,200	26%
Fines & confiscation	4,666,041	9%
Registration	7,955,000	16%
Others	1,144,418	2%
Total	49,327,884	

Note: all values in Tsh



⁸ Districts generally double tax (assess a surcharge) on forest products of roughly 25% by value. In essence, they have therefore “lost” 75% of their forestry revenues. They complain it is now more difficult to assess the surcharge.

⁹ Other data includes poles, timber grading fees, etc.

¹⁰ Calculated by taking a quarterly average from September 1996 and multiplying by four.

As can be seen in the graph above, quarterly data shows royalty collection to have skyrocketed since the institutional change. In order to see whether the change was real or due to weak reporting, District Council accounts were investigated for 1995. Table 4 (below) compares three sources of forestry data: district accounts (column 1), internal natural resource department records (column 2), and regional data collected via the RNRO and maintained by the Catchment Forest Project (column 3).

TABLE 4: COMPARISON OF FORESTRY ROYALTIES, PRE 1996, DISTRICT & REGIONAL SOURCES

<i>District/Item</i>	<i>District Audited Accounts 1995</i>	<i>District Reports (DNRO, 94/5)</i>	<i>Regional Data</i>
Handeni ("Forest Products Tax")	2.0 Million Tsh	5.9 Million Tsh	
Muheza ("Felling License Fees")	62,000 Tsh		
Korogwe ("Forest & Hunting Licenses")	0.7 Million Tsh		
Lushoto	0		
Total	About 2.8 Million Tsh		996,978 Tsh

Sources: Kobb (1996a, b, c, d).

Unfortunately, District Council accounts use a variety of terms to describe forest royalties and licenses, none of which are particularly accurate. Focussing on Handeni District, the Council uses "ushuru wa mbao na mazao misitu" (fees on timber and forest products, 1.7 Million, line item 5034 in the accounts) and "wauza kuni, mkaa barabarani" (sellers of fuelwood and charcoal on the road, Tsh 86,000, line item 8020), and "mauzo ya mazao ya misitu" (sale of forest products, 0.2 Million Tsh, line item 6004). Matters get worse: the District Council itself does not accurately assign receipts into their respective sub-categories (line items). In 1995, according to audited accounts, Tsh 15.3 Million of the total Tsh 43.1 Tsh collected by the Council was classified as "mapato mengeniyo" (other, or miscellaneous revenue). This is equivalent to 35% of total receipts. Continuing: although the District Treasurers office is, for example, only 50 Metres from the Natural Resources Office there was effort by any head of department to reconcile these reporting differences.

If the line of communication is fuzzy at a range of 50 metres, it entirely breaks down at larger distances. Letter Referenced NRT/H/A/1/24 (written by Handeni's then DNRO, and forwarded to, amongst others the RNRO), reports 1994/5 revenues and volumes. It is reproduced below with a comparison to 1997/8 (1/1/97 to 30/8/98) collections from Handeni District made by the Catchment Forest Project. The final

column (implicit royalties) calculates what the Catchment Forest Project would have collected, if average prices per m3 in Handeni's 94/5 data were used today.

Though natural resource taxation is not a contest to collect more (it should have something remotely to do with inter-temporal management of assets), a focus on volumes (rather

than royalties) does show that collection is similar (except for charcoal and fuelwood). In defence of Handeni District Council, the charcoal business along the Segera Chalinze road has undoubtedly expanded greatly in recent times.

TABLE 5: COMPARISON OF ROYALTY COLLECTION IN HANDENI DISTRICT

<i>Item</i>	<i>94/5 Handeni Records</i>		<i>97/8 Catchment Collection</i>	
	<i>Royalties</i>	<i>Volume</i>		<i>Implicit Royalties</i>
Main Products	4,748,558			5,256,346
Timber	3,861,058	1,254 m3	988 m3	3,042,046
Charcoal	56,000	2800 bags	10,794 bags	2,158,800
Fuelwood	831,500	831.5 m3	55.5 m3	55,500
Others	941,006			
Forest Cess	350,000			
Total	5,208,064			

Notes: royalty values in Tsh. Catchment data for charcoal and fuelwood includes Kabuku only. Source for Catchment Forest Project: quarterly reports

This analysis differs drastically from the conclusions would be drawn using Regional or quarterly data and therefore by gazing at the above graph.¹¹ Instead, I conclude, that the responsibility to collect (not to retain) forest royalties was probably transferred from the districts to the Catchment Forest Project based upon inaccurate data and an incomplete reporting system. In Handeni at least, volumes upon which royalties are based have changed little since the institutional transfer. What has changed are prices (royalty rates are now significantly higher) and the level of bureaucracy confronting license holders. Centralised collection inflicts delays and costs on license applicants who live far from Tanga where licensing is implemented.

2.2 Felling License Data: (Primary Documents)

Quarterly data kept by the Catchment Forest Project provides total revenues for felling license but fails to disaggregate by district, source, or type of tree. To get a better picture 243 felling licenses, issued between 27/3/96 and 23/9/98 were entered into a database. This data set was undoubtedly incomplete: there were no recorded entries from 17/4/97 to

10/11/97. Of the primary documents which could be located, saw-millers were issued 36% of the felling licenses by value, the remainder being paid for by timber dealers and private individuals. In all the, average felling license was for 13.3 m3 and roughly Tsh 178,000. Fifty-three tree species were felled, though *Mtundu*, *Muhuhu* and *Mnyasa* account for over half of all royalty. In fact, the 15 species listed in the adjacent table account for over 90% of all royalties. A more detailed list can be found in the appendix

As can be seen in the map on page 58 of the appendix and in Table 36 page 57, production is concentrated in Eastern and Western Handeni and in the Usambara Mountains North of Korogwe. Disaggregating further, production in Eastern Handeni is focused in the Mzungu/Luye area (Mgambo Ward, along the Segera-Chalinze Road around Komkonga and Kabuku, **32%** of total production). In particular, the main production areas are Luye Public Land (P/L, 14%), Chanika Kofi P/L (6%) and Chogo P/L (6%). Next in importance is Mazingara Ward, located roughly along the road from Handeni to Mkata (11%). Here production is centred in Kwachaga P/L (3%). The third major production area in Eastern Handeni is Magamba Ward, along the Handeni-Turiani road (5%). Felling in Magamba Ward is most intense in Negero P/L (2%). Western Handeni contributes 14% of the total, the two general sub-areas (Wards) being Mswaki (6%) and Kilindi (5%). Individual Public Lands include Muungano (4%), Kilindi (2%) and Lugalo (2%). The third main production area is the Usambara Mountains north of Korogwe. This area can be divided into two sub-categories, Bungu (13%) and Dindira (3%). In Bungu the main production takes place in

TABLE 6: AVERAGE SIZE OF FELLING LICENSES (FL)

	<i>A. Saw-Millers</i>	<i>B. Timber Dealers</i>	<i>All (A & B)</i>
Observations	38	205	243
Average			
Trees/FL	38.6	7.1	12.0
m3/FL	33.1	9.6	13.3
Revenue/FL	412,788	134,054	177,642

TABLE 7: MAIN SPECIES IN FELLING LICENSES

<i>Tree Type</i>	<i>% by Total Value</i>
Mtundu	22.7%
Muhuhu	20.2%
Mnyasa	14.0%
Mkingu	8.6%
Mninga	4.5%
Mkomba	3.5%
Mpingo	3.0%
Mgude	2.9%
Mvule	2.1%
Mbarika	1.9%
Mshai	1.4%
Mperamwitu	1.4%
Mringaringa	1.0%
Mninga Maji	1.0%
Mbambakofi	1.0%

¹¹ For a period of 4 months (June-September 1998) the RNRO was repeatedly requested to supply "official" regional statistics. To date these (as well as estimates on the number of carpenters, timber dealers, etc) have not been provided. Using quarterly data, and eliminating registration fees (which were not collected by the Districts in 1995) royalties collected by the District were only 6% of those collected by the Catchment Forest Project.

Mashindei P/L (6%) and Ambangulu P/L (3%) while in Dindira production is centred in Mali P/L (2%).

2.2.1 DAILY AVERAGES

On a **daily basis**, from 11/11/97 to 30/8/98, the average volume felled was 3.08 cubic metres and the average revenue collected Tsh 47,785. Of the 294 days contained in this data set, no licenses were issued on 242 days. This explains the large variation (standard deviation) described in the adjacent table.

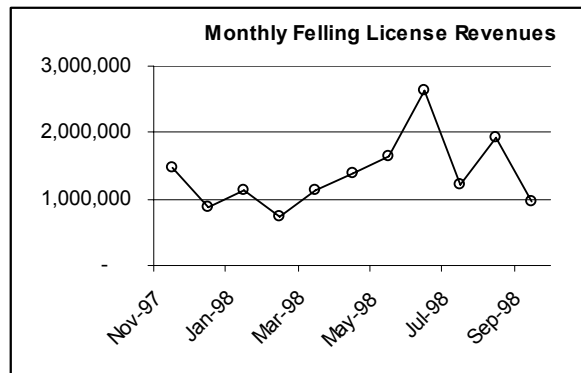
TABLE 8: DESCRIPTIVE STATISTICS FOR DAILY ISSUING OF FELLING LICENSES (11/11/97 TO 30/8/98)

	<i>N</i>	<i>Mean</i>	<i>StDev</i>	<i>Max</i>
Volume (m3)	294	3.08	7.48	45.83
Revenue (Tsh)	294	47,785	124,401	796,800

N = number of observations; *StDev* = Standard Deviation; *Max* = Maximum.

2.2.2 SEASONALITY AND TRENDS

From 11/11/97 to 30/8/98 there is no apparent increase in Felling License revenues (see the graph of daily values in the appendix, Figure 2 page 60). On a month by month basis, the period of observation, September 1998, was a slow one in terms of revenue (see the last data point on the graph entitled “Monthly Felling License Revenues”). Revenues have dipped substantially from their peak in June of 1998.



This observation is consistent either with seasonality (which is difficult to test given the limited data) or with a leakage of information that encouraged timber dealers to slow down the business. **In this data set, royalties in September 1998 were only 71% of average monthly royalties.**¹²

2.3 ERVs: Charcoal and Fuelwood (Primary Data Set)

A database was also developed which totalled ERVs by day and by location of issue.¹³ The set covers a period from

TABLE 9: DESCRIPTIVE STATISTICS FOR DAILY ERV REVENUE IN TSH (CHARCOAL & FUELWOOD; 9/97 TO 8/98)

<i>Location</i>	<i>N</i>	<i>Mean</i>	<i>%</i>	<i>StDev</i>	<i>Max</i>
Amboni	395	68,290	80.6%	48,433	277,600
Kabuku	395	9,945	11.7%	15,628	102,100
Korogwe	31	2,168	2.6%	2,637	9,300
Maramba	183	1,787	2.1%	5,571	36,600
Mashewa	41	1,427	1.7%	5,672	33,000
Moa	292	477	0.6%	1,864	15,000
Pangani	174	442	0.5%	2,141	24,000
Handeni	44	160	0.2%	416	2,100
Total		84,696			

N = number of observations; *StDev* = Standard Deviation; *Max* = Maximum. The mean, standard deviation and maximum are in Tsh.

1/9/97 to 30/9/98. In all there were 1,508 entries, since on some days stations used multiple books. As can be seen in Table 9 (above), most revenue is collected either at the Amboni Checkpoint (81%) or along the Chalinze-Segera road, by the forester at Kabuku (12%). Daily variation is quite high, as indicated by the large standard deviations and high daily maximums. In this sample of ERVs charcoal comprised roughly 96.7% of the value, fuelwood 3.3%.

¹² Dividing estimates for timber royalties by 0.71, to “take care of this seasonality” would drastically increase figures.

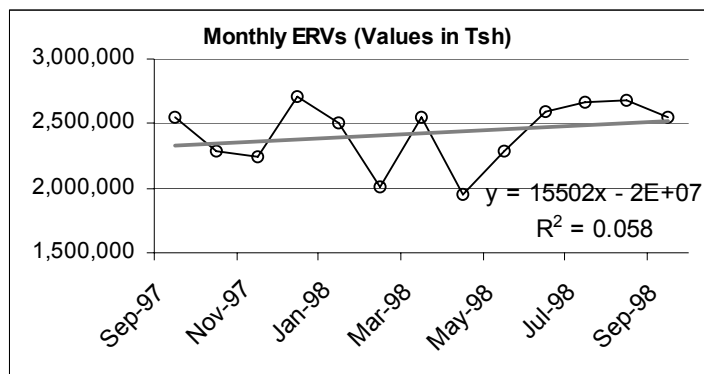
¹³ For each day the value of ERVs issued were classified as fuelwood, charcoal greater than Tsh 10,000 (probably commercial vehicles), charcoal less than 1,000 (bicycles) and charcoal between 1-10,000.

SEASONALITY OF ERVs

Monthly revenues from charcoal and fuelwood stand at roughly Tsh 2.5 Million with little seasonal variation. Daily figures are presented in the appendix (see Figure 3 page 60).

2.4 Summary

The main problem in putting together these data sets was organising and locating the individual books. There is no well kept ledger of ERVs and Felling Licenses, and there is the problem of issuing documents non-contiguously. That is, licenses may be issued in “book 2” during April, in “book 3” from May to July, and again in “book 2” in August. Many times several books are used simultaneously. This may explain some of the discrepancies in quarterly data and the primary data (ERVs and Felling Licenses) which is described in the table below. **Once documents could be located**, data was generally well kept and easy to read. There were few data entry errors.



As will be explained in the following chapters there is a large discrepancy in what is collected and what can be collected (the estimates). By mode of transportation and product, the adjacent table compares actual collection (using data from quarterly reports or primary data sources) with estimates derived during this consultancy. It should be noted that Mangroves have been excluded, it being difficult to derive reasonable compliance estimates in the short time provided for this work.

While an estimated annual revenue potential of Tsh 406 Million may seem high, it is far lower than

estimates, which would be derived based upon population and per capita consumption. For example, using a population of roughly 1.6 Million persons (in Tanga Region, based on Census figures),

TABLE 10: COMPARISON OF ACTUAL AND POTENTIAL REVENUES (ANNUAL, FIGURES IN MILLIONS OF TSH)

<i>Product</i>	<i>Estimated Revenue</i>	<i>ACTUAL COLLECTION</i>	
		<i>Quarterly Data</i>	<i>Primary Data</i>
CHARCOAL	173.6	12.9	29.9
Bicycle	24.2		
Commercial Lorries	114.0		
Buses	6.7		
Lorry Drivers	26.5		
Smuggled to Kenya	2.2		
FUELWOOD	9.9	0.7	1.0
Bicycle	6.9		
Commercial Lorries	1.4		
Buses	1.5		
Lorry Drivers	0.0		
Smuggled to Kenya	0.0		
TIMBER	222.6	21.9	16.9
Buses	7.4		
Commercial Transport	20.1		
Carpenters	135.1		
Smuggled to Kenya	60.0		
MANGROVES	N/A		
FINES & COMPENSATION (10%)	0	3.5	3.5
TOTAL	406.1	39.0	51.3
%		9.6%	12.6%

Note: All values in Millions of Tsh. Notes: Primary data sets include ERVs and Felling Licenses from 1/9/97 to 30/8/98. Quarterly reports take averages from the quarter ending September 1997 to the quarter ending June 1998.

royalties would be in excess of Tsh 1.4 Billion.¹⁴ Using this figure and estimates contained below, revenue potential is enormous.

TABLE 11: REVENUE ESTIMATES BASED ON PER CAPITA ESTIMATES

<i>Product</i>	<i>Per Capita Annual Consumption</i>	<i>Data Source</i>	<i>Royalty per unit</i>	<i>Royalties due (Millions Tsh)</i>
Charcoal	1.0 bags	KFMP Kenya	300 per bag	480
Fuelwood	1.5 m3	TFAP Tanga p 40	1,000 m3	720
Construction & Timber	0.5 m3	TFAP Tanga p 40	3,000 m3?	240
Total				1.4 Billion

Note: charcoal consumption in the KFMP document is 90 kg per person per year in urban areas, 13 kg in rural areas. Tanga Region is 18% urban (census data) and a bag of charcoal contains roughly 28 kg (Holmes, 1995).

These figures are poorly documented and over-state royalties for a few obvious reasons. First, fuelwood is taxed only if it is sold commercially or taken from Forest Reserves. Second, to estimate royalties due on wood consumption, one needs a breakdown on the type of woods used (softwood, which kind of hardwood, etc).¹⁵

¹⁴ Here's another way to look at it. Royalty per capita (if paid) would be Tsh 900 per person. If per capita incomes are \$ 120, this would account for roughly 1.1 % of expenditures.

¹⁵ Consumption levels estimated by Vehkamake (1993) are even higher. In all of the data it is unclear whether "per capita charcoal consumption levels" apply only to those using charcoal or the entire population.

CHAPTER THREE: CHARCOAL AND FUELWOOD

This chapter reports findings based on a sampling of charcoal transport, visual observations on the sale of charcoal at roadside, and consumption estimates based on reasonable household statistics. These figures are then compared with activity in Dar es Salaam, a potential (if not lucrative) market for charcoal produced in Handeni District. Finally, a price trend is established showing that there is no evidence of a charcoal or fuelwood scarcity.

3.1 The Transport of Charcoal: Road Monitoring

Like all road monitoring, the charcoal trade was observed on the following dates: 8 September, 11-12 September, and 13-14 September. On 4 September bicycles and vehicles were counted but not stopped. Calculating daily averages is complicated by the fact that on 11-12 and 13-14 September, checkpoints were not monitored for 24-hour periods. Again, we tried to alter the starting time of the monitoring process, unsure whether evening vehicles altered their activities due to our presence. Averages were therefore calculated for each hour of the day, and summed for an average 24-hour period. This methodology is illustrated in the appendix, with the case of charcoal transported past the Amboni checkpoint by bicycle (see the Appendix page 61), and **is a crucial assumption in generating our results**. Intuitively, revenues witnessed for each day cannot be totalled and divided by 3 to get daily averages since some periods of observation were closer to half a day than 24 hour periods.

Charcoal is distinguished by mode of transport, in particular into commercial use (where the vehicle is being primarily used for the transport of charcoal), “driver’s charcoal” (where the vehicle is being primarily used for business other than charcoal), buses, and bicycles. These categories are a matter of interpretation, though they are of some value. Generally speaking commercial charcoal transporters are more likely to have ERVs (and other documents) although in some cases they may be transporting less than a “driver.” To give one case in point, a 3-ton vehicle passed the Amboni checkpoint carrying 40 bags of charcoal (“commercial”) while a 50-ton container lorry passed Manga carrying 50 bags of charcoal (“driver”).

3.1.1 COMMERCIAL TRAFFIC

Roughly half the commercial charcoal traffic we observed had proper documentation and had paid some, but not all of the royalties due. Using hourly data (again since some checkpoints were not observed for a 24 hour period) the adjacent table shows, the distribution and magnitude of the commercial charcoal business (exported from Tanga Region and transported into Tanga town). On an annual basis the trade is estimated to be worth Tsh 114.0 Million.

As can be seen below, lost revenues are due to vehicles refusing to stop at the Amboni checkpoint, from undercounting on ERVs, and

TABLE 12: DAILY VALUE OF COMMERCIAL CHARCOAL TRADE

Checkpoint	OBSERVED			PAID BY ERV	
	Bags	%	Value	Bags	Value
Manga	19.67	2%	5,900	0.00	0
Mizani	168.33	16%	50,500	96.33	28,900
Bwiko	33.33	3%	10,000	33.33	10,000
Amboni	820.00	79%	246,000	408.33	122,500
Total	1041.33	100%	312,400	538.00	161,400
% Paid				51.66%	

from vehicles passing Bwiko, Manga, and Tanga, where checkpoints do not exist. The table below lists the commercial trade.

TABLE 13: COMMERCIAL CHARCOAL TRADE (VEHICLE BY VEHICLE)

<i>Location</i>	<i>Date</i>	<i>Time</i>	<i>Charcoal Observed</i>	<i>Charcoal ERV Data</i>	<i>Comment</i>
AMBONI					
TAT* (7 tons)	08/09/98	12:00 PM	150	100	Stopped
TAG* (5 tons)	08/09/98	7:00 PM	160	110	Stopped
JW* (10 Tons)	08/09/98	11:00 PM	180		Didn't Stop; Army
MZE* (7 tons)	09/09/98	5:00 AM	150	120	Stopped
TAN* (7 tons)	11/09/98	8:00 PM	140	120	Stopped
TAQ* (7 tons)	11/09/98	9:00 PM	160	110	Stopped
JW* (7 Tons)	11/09/98	12:00 PM	160		Didn't Stop; Army
TAM* (8 tons)	12/09/98	7:00 AM	150	130	Stopped
Unknown (3 tons)	12/09/98	5:00 AM	80		Didn't Stop
MIZANI					
ZNZ* (3 tons)	08/09/98	6:00 PM	60		Stopped
TZA* (3 tons)	08/09/98	7:00 PM	25	13	Stopped
MG* (7 tons)	08/09/98	8:00 PM	100	100	Stopped
MZE* (7 tons)	11/09/98	11:00 PM	100	100	Stopped
MANGA					
TZK* (3 tons)	13/09/98	12:00 PM	60		Stopped
BWIKO					
STH* (7 tons)	14/09/98	2:00 AM	100	100	Stopped
Totals			1,775	1,003	

Note: charcoal values are in bags

Several comments are in order. First, research assistants and foresters differed in their ability or inclination to question values found on ERVs. The foresters at Amboni were prone to believe ERVs understated actual load quantities, while those in Mizani took ERV quantities on face value.¹⁶ In either case, it is obvious that the Amboni checkpoint is riddled with problems, that many vehicles do not stop, that undercounting may be prevalent, and that little concrete action has been taken to rectify these problems. For example, the army and schools should have a “*kibali*” (permission) from the forestry department, to transport charcoal but the army does not. Instead, they simply “run” the checkpoint (which does not have accompanying police). Revenues not paid by the army, if our three days of observation are representative, are on the order of Tsh 15 Million per year. Finally, the daily volume specified in Table 12 (1,041 bags) differs quite substantially from the 3 day total of 1,775 bags specified in Table 13. Again,

this was due to the method of taking hourly, not daily averages.

TABLE 14: DAILY COMMERCIAL FUELWOOD TRAFFIC

<i>Fuelwood</i>	<i>Checkpoint</i>	OBSERVED		PAID		
		<i>Stacked Metres</i>	<i>%</i>	<i>Stacked Value</i>	<i>Stacked Metres</i>	<i>Value</i>
Some commercial vehicles carry both charcoal and fuelwood, though as the adjacent table shows, volumes of fuelwood are low. On an annual basis the commercial transport of fuelwood is estimated to be Tsh 1.4 Million.	Manga	0.00	0%	0	0.00	0
	Mizani	7.00	54%	2,100	4.00	1,200
	Bwiko	0.00	0%	0	0.00	0
	Amboni	6.00	46%	1,800	2.00	600
	Total	13.00	100%	3,900	6.00	1,800
	% Paid			46.15%		

Note: monetary values in Tsh per day

¹⁶ Foresters and Research Assistants were to independently fill in various data forms. Their entries generally matched, but in Manga (8/9/98) foresters counted an extra 8 bags of charcoal that were not in Research Assistants' data. These 8 bags are not included.

One irregularity of note was observed: eight metres of stacked charcoal were transported with an ERV, which was 4 days old. It is possible that this ERV had not been previously cancelled and was being reused.

3.1.2 DRIVERS' CHARCOAL AND FUELWOOD

TABLE 15: CHARCOAL TRANSPORTED DAILY BY DRIVERS

Checkpoint	AMOUNT COUNTED			AMOUNT PAID	
	Bags	%	Value	Bags	Value
Manga	138.17	57%	41,450	0	0
Mizani	50.17	21%	15,050	0	0
Bwiko	21.67	9%	6,500	0	0
Amboni	31.67	13%	9,500	19	5,700
Total	241.67	100%	72,500	19.00	5,700
% Paid	7.86%				

Drivers, especially of petrol tankers, often buy charcoal along the road and transport it to their homes or for resale in Dar es Salaam. Although many often claim the charcoal is for “personal” use, vehicles frequently transported upwards of 15-25 bags.¹⁷ The adjacent table shows the average volume of charcoal transported by drivers. In interpreting these numbers it is important to recall that Amboni, unlike Manga, Bwiko or Mizani is not a police check; traffic stops more or less on a voluntary basis only. The only royalty payments made by “drivers” were done at Amboni.

Note: all values in Tsh, all figures are on a daily average basis

On an annual basis the value of the charcoal trade carried out by drivers is estimated to be Tsh 26.5 Million; most of it, roughly 92%, is untaxed.

3.1.3 BUSES

In order not to unduly disturb traffic flow, a random sample of small and large buses was inspected at each of the checkpoints. Foresters and research checked for charcoal, fuelwood, and planks of hardwood. The results of this sampling are contained in the table below.

TABLE 16: FOREST PRODUCTS TRANSPORTED BY BUS

Checkpoint	Sample Size	Number Of Vehicles	DAILY AVERAGES		
			Bags Of Charcoal Transported	Stacked Metres of Fuelwood	Value (Tsh)
Amboni					
Small Buses	N/A	22	N/A	N/A	N/A
Large Buses	N/A	11	N/A	N/A	N/A
Manga					
Small Buses	13	20	0.54	0.00	3,231
Large Buses	9	22	0.00	0.00	0
Bwiko					
Small Buses	9	9	0.00	0.00	0
Large Buses	7	20	0.00	0.00	0
Mizani					
Small Buses	13	22	0.38	0.00	2,538
Large Buses	16	33	1.69	0.13	16,831
Total					22,600

Note: N/A = Not Available

Above, the sample size refers to the total number of vehicles interviewed at each checkpoint; the number of vehicles refers to the average number of vehicles passing per day (again, not all were

¹⁷ One 50-ton container vehicle transported 40 bags.

interviewed or checked); the bags of charcoal, metres of fuelwood and cubic meters of planks are average daily quantities within the sampling set; the final column, “value,” is derived by multiplying quantities times the royalty rates (i.e. charcoal = Tsh 300).

On a yearly basis, these revenues are equivalent to Tsh 8.2 Million (fuelwood, Tsh 1.5 Million, charcoal, Tsh 6.7 Million)

3.1.4 BICYCLES

There was heavy bicycle traffic at the Mizani (Tanga) and Amboni checkpoints. As is pointed out in the adjacent table, on an average 24-hour day basis we counted 221 bags of charcoal and 19 stacked metres of fuelwood. A bicycle was assumed to carry ¼ stacked metres of fuelwood. The adjacent table documents these figures for each checkpoint. The Pangani-Tanga road is included because this was monitored for one day during our benchmark exercise (when vehicles were not opened or inspected). On an annual basis the bicycle trade is equivalent to Tsh 31.1 Million (Tsh 6.9 Million fuelwood, Tsh 24.2 Million Charcoal).

TABLE 17: CHARCOAL & FUELWOOD TRANSPORT DAILY BY BICYCLE

<i>Checkpoint Name</i>	<i>Fuelwood (Stacked Metres)</i>	<i>Bags of Charcoal</i>	<i>Hours Observed</i>
Amboni	14	164	76
Mizani	3	48	71
Pangani	2	9	20
Bwiko	0	0	
Manga	0	0	
Total	19	221	

3.1.2 SUMMARY OF CHARCOAL AND FUELWOOD TRAFFIC

If traffic was typical during our days of observation, annual charcoal and fuelwood royalties (if collected with 100% efficiency at checkpoints) would total Tsh 176.7 Million (see the bolded entry in the table below). This table shows that 67% of the business passes Amboni, 18.7% Mizani, and 9.8% Manga (see final column). Most charcoal and fuelwood produced in Tanga Region is therefore ferried to Tanga town. Little if any supplies the Arusha market. Similarly, in terms of mode of transport, 65% of the value is commercial charcoal transport, while 15% and 14% is accounted for by charcoal transported by drivers and bicycles. Finally, charcoal dominates fuelwood, accounting for 94% of the projected possible revenues.

TABLE 18: ANNUAL CHARCOAL & FUELWOOD ROYALTIES (MILLIONS OF TSH) CALCULATED AT ROADBLOCKS

<i>Site</i>	BICYCLES		COMMERCIAL		DRIVERS		BUSES		COLUMN SUM	
	<i>Char.</i>	<i>F. Wood</i>	<i>Char.</i>	<i>F. Wood</i>	<i>Char.</i>	<i>F. Wood</i>	<i>Char.</i>	<i>F. Wood</i>	<i>Total</i>	<i>%</i>
Amboni	18.0	5.1	89.8	2.2	3.5	0.0	0.0	0.0	118.5	67.1%
Mizani	5.3	1.1	18.4	2.6	5.5	0.0	0.2	0.0	33.1	18.7%
Pangani	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.0%
Bwiko	0.0	0.0	3.7	0.0	2.4	0.0	0.0	0.0	6.0	3.4%
Manga	0.0	0.0	2.2	0.0	15.1	0.0	0.1	0.0	17.3	9.8%
Total	24.2	6.9	114.0	4.7	26.5	0.0	0.3	0.0	176.7	100.0%
	13.7%	3.9%	64.5%	2.7%	15.0%	0.0%	0.2%	0.0%		

Notes: “Char” = Charcoal; “F.Wood” = Fuelwood. All values in Millions of Tsh, for example 18 Million Tsh of Charcoal royalties are estimated to pass the Amboni checkpoint (see second column, second row)

A similar table can be derived showing royalties actually **paid** on products passing our observation point. This can be seen in the appendix (see Table 39, page 61). The table below, compares estimated royalties due at roadblocks with royalties paid at roadblocks (again, during our 3 days of observation). The key points highlighted below is that roughly 49% of the royalties due at roadblocks

were paid (see final column, final row). The amount paid was equivalent to 86.3 Million Tsh annually (last row, second to the last column), compared with actual annual figures of roughly Tsh 31 Million. **Not surprisingly, the act of observation and monitoring increased compliance. In terms of charcoal and fuelwood one can say full observation and monitoring will increase revenues by roughly Tsh 55 Million, while another Tsh 88 Million is lost due to smuggling (unwillingness to pay royalties even when observed).**

Furthermore, 51% of commercial vehicles and 79% of bicyclists paid their royalties, though this is largely a result of the correlation of means of transport and the location of roadblocks. For example, most bicyclists passed Amboni where they had to pay rather than Mizani where they do not pay. Payment at Amboni, despite the existence of a checkpoint is only 74% (during our observation), while Mizani, the second most lucrative spot is 36%. The large payment at Bwiko is mostly the result of one commercial charcoal transporter paying royalty on 100 bags from Mkata. These trends are summarised below.

TABLE 19: COMPARISON OF OBSERVED ROYALTIES DUE WITH ROYALTIES PAID AT ROADBLOCKS

<i>Description</i>	<i>CHARCOAL</i>			<i>FUELWOOD</i>			<i>TOTAL</i>		
	<i>Observed</i>	<i>Paid</i>	<i>%</i>	<i>Observed</i>	<i>Paid</i>	<i>%</i>	<i>Observed</i>	<i>Paid</i>	<i>%</i>
TRANSPORT TYPE									
Bicycles	24.2	18.0	74.2%	6.9	5.1	73.7%	31.1	23.1	74.1%
Commercial	114.0	59.0	51.7%	4.7	2.2	46.1%	118.8	61.2	51.5%
Drivers	26.5	2.1	7.9%	0.0	0.0		26.5	2.1	7.9%
Buses	0.3	0.0	0.0%	0.0	0.0	100.0%	0.3	0.0	13.8%
<i>Total</i>	<i>165.0</i>	<i>79.0</i>	<i>47.9%</i>	<i>11.7</i>	<i>7.3</i>	<i>62.6%</i>	<i>176.7</i>	<i>86.4</i>	<i>48.9%</i>
LOCATION									
Amboni	111.2	64.8	58.2%	7.3	5.84	80.0%	118.5	70.6	59.6%
Mizani	29.4	10.5	35.9%	3.7	1.50	40.7%	33.1	12.1	36.4%
Pangani	1.0	0.0	0.0%	0.7	0.00	0.0%	1.7	0.0	0.0%
Bwiko	6.0	3.7	61.4%	0.0	0.00		6.0	3.7	61.4%
Manga	17.3	0.0	0.0%	0.0	0.00		17.3	0.0	0.0%
<i>Total</i>	<i>165.0</i>	<i>79.0</i>	<i>47.9%</i>	<i>11.7</i>	<i>7.3</i>	<i>62.6%</i>	<i>176.7</i>	<i>86.3</i>	<i>48.9%</i>

Note: Pangani includes bicycles only. All values in Millions of Tsh per year. Total is the sum of charcoal and fuelwood.

While these projections may seem high, there are other reasons to believe they are actually low. For example:

1. There were probably leaks within the forestry department tipping off businessmen to “lay low” until the observation period was completed.
2. Transporters could visually observe us observing them, for example when entering the region, and could therefore change their itinerary. For this reason, we altered the starting time of the observation period, hoping to catch them unaware.

Finally, we intercepted, on average 1,284 bags of charcoal per day coming into Tanga town. On a per-capital basis, this translates into 0.00535 bags of charcoal per person per day.¹⁸

¹⁸ This figure will be used later.

3.2 A map of Charcoal Sales

While charcoal production is difficult to monitor, the charcoal wholesale market is evident for all to see. To name just a few, the President, Prime Minister, or Minister of Natural Resources and Tourism merely has to count bags of charcoal along the Chalinze-Segera road to get an idea of the size of the trade.

The map on the following page gives an idea of the distribution of roadside sale, while the adjacent table quantifies this activity. Table 21 (below) gives a site-by-site counting of charcoal and fuelwood. These show there are three main production areas: from Kwedikwazu south to Manga (55% by value), from Mandera (at the border of Handeni and Korogwe) south along the trunk road to Kabuku (though mostly centered around Segera/Mandera; 22 %) and the Maramba Area (15%)

TABLE 20: OBSERVED ROADSIDE WHOLESAL OF CHARCOAL AND FUELWOOD BY DISTRICT

District	Charcoal		Fuelwood	
	(Bags)	%	(Stacked Metres)	%
Handeni	1,010	77%	88	86%
Muheza	249	19%	13	13%
Korogwe	47	4%	1	1%
Pangani	2	0%	0	0%
Total	1,308	100%	102	100%

Dates: 6-11/6/98, 23/8/98, 1/10/98

TABLE 21: OBSERVED (DAILY) BAGS OF CHARCOAL AND FUELWOOD FOR SALE

Location	Charcoal (bags)	Fuelwood (metres)	Value (Tsh)	% of total
FROM KWEDIKWAZU TO MANGA (EAST HANDENI)	661	75	273,300	55.28%
Kwedikwazu South	55	0	16,500	3.34%
Kisaza	66	1	20,800	4.21%
Kitumbi North	125	2	39,500	7.99%
Kitumbi Town	54	0	16,200	3.28%
Kitumbi South	199	66	125,700	25.42%
Mbweni	59	6	23,700	4.79%
Tengwe	32	0	9,600	1.94%
Manga North	71	0	21,300	4.31%
FROM MANDERA TO SEGERA TO KABUKU (E. HANDENI)	324	9	106,200	21.48%
Mandera	107	0	32,100	6.49%
Milikumi-Mandera	56	0	16,800	3.40%
Segera-Mailikumi	70	8	29,000	5.87%
North Kwedizinga	37	0	11,100	2.25%
Kwedizinga	24	1	8,200	1.66%
Kwamaganga	20	0	6,000	1.21%
North Kabuku	7	0	2,100	0.42%
Kabuku	3	0	900	0.18%
MARAMBA AREA (MUHEZA)	235	8	78,500	15.88%
Pangarawe	23	5	11,900	2.41%
Gombero	131	0	39,300	7.95%
Jihiri & North	12	0	3,600	0.73%
Maramba Town	6	3	4,800	0.97%
Mgambo	22	0	6,600	1.33%
Daluni	41	0	12,300	2.49%
KOROGWE-HANDENI ROAD (HANDENI)	36	5	15,800	3.20%
MUHEZA-TANGA ROAD	14	5	9,200	1.86%
BWIKO AREA (KOROGWE)	30	0	9,000	1.82%
HANDENI (SUWA & POZA)	6	0	1,800	0.36%
PANGANI	2	0	600	0.12%
Total	1,308	102	494,400	100.00%

Note: E. Handeni = East Handeni

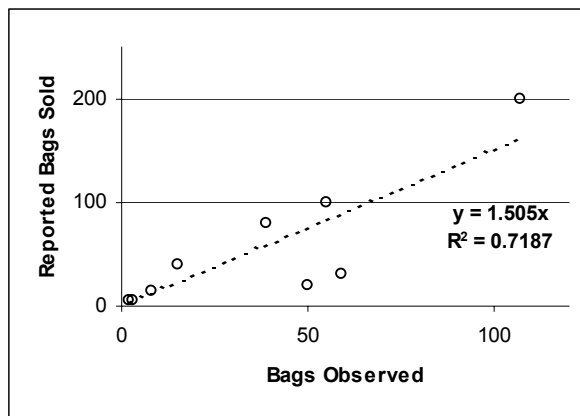
FIGURE 1: MAP OF CHARCOAL PRODUCTION

Original Image Missing

Knowing the relationship between production, wholesale (which is observable) and final consumption (which we hoped to gauge through observation at roadblocks) is a more difficult matter. We initially tried to gauge the turnover at roadside; in other words, if 10 bags are visibly for sale, how many are actually sold during the day? It is possible that charcoal observed on the roadside includes inventory, and therefore over-estimates daily sales; it is also possible that what is seen at roadside is just the tip of the iceberg. There is obviously charcoal in people’s homes, in the forest, and in the kiln. In some cases, buyers purchase from roadside wholesalers, in others they place orders and the charcoal is out of site. There are at least two ways to try to link roadside quantities to actual daily sales:

1. Take a sampling of charcoal sold, and find out when it was produced (i.e. today, yesterday, etc). This will give an ageing profile of the charcoal.
2. Ask directly how much on average is sold per day at a sampling of sites and relate it to the observed amount at the roadside.

Both methods rely upon the interviewee’s honesty, which was influenced in our case by our vehicle (which proclaimed East Usambara Forest Catchment Project, “*msitu ni uhai*”, etc), and by the usual fears of taxation. After a couple trips we were well known in the area and further questioning was not possible. I chose to ask about average amounts sold, which in retrospect may have been the more difficult method. Many entrepreneurs may not think in terms of averages, and the question is more direct than asking when particular bags were produced. Notwithstanding, the adjacent graph compares observations (how much charcoal was at roadside) with reported sales figures.



The graph shows that according to respondents they sold roughly 50% more than was offered. If one takes this seriously the expected volumes sold in Maramba would be 352 and East Handeni 1,477. Assuming all Amboni charcoal comes from Maramba, and all Mizani, Bwiko, and Manga charcoal from East Handeni, our roadblock information can be compared with an estimate based on visual observation of wholesale. There is a large discrepancy in these figures.

TABLE 22: TWO ESTIMATES OF BAGS OF CHARCOAL PRODUCED DAILY

Source	Roadblocks	Roadside Counting & interviews
Maramba	1,023	352
East Handeni	482	1,477

3.4 The Case of Mkarambati

Charcoal is produced from (amongst others) *acacia*, *chejo* and *mkarambati* species. Mkarambati provides an interesting case in point. If felled for timber the royalty rate is 25,000 Tsh per m³. Figures in Holmes (1995) imply a bag of charcoal is equivalent to 0.17 m³ roundwood over bark while the “Tanga Regional TFAP” (page 27) puts the same figure at 0.12 m³. Therefore, if 1 m³ of mkarambati is used to produce charcoal it will fetch the government between Tsh 1,700-2,500 in royalties as opposed to Tsh 25,000 if used as timber. It is **recommended**, that some species be banned for charcoal use.

3.5 Charcoal at Horohoro

Tanga Region may be a major supplier of charcoal to Mombasa. At the Horohoro border we saw 20 bags, but this is likely the tip of the iceberg. Twenty bags per day is equivalent to roughly Tsh 2.2 Million per year. Estimates of 5 times this value are also reasonable. (see section 4.5 for a discussion of the Kenyan border)

3.6 Dar

Surprisingly little charcoal from Tanga crossed our roadblock at Manga. This implies Dar is supplied from other Regions. We interviewed one District Forester (from Ilala) posted at the Morogoro road (Bungu) checkpoint on the outskirts of Dar.¹⁹ Although he had no recent data on charcoal movement from Tanga, data from June 1997 (when the source of the forest product was last recorded in his books) shows that Tanga makes up only 1.3% of the Dar es Salaam market (see appendix Table 40 page 62). Assuming for now this figure is accurate, and using a very conservative estimate of a demand of 17,000+ bags per day, this would imply that Tanga should be supplying 223 bags per day. At Manga we counted 158 bags per day so these figures are reconcilable.

Dar es Salaam is the major consumption area for charcoal in Tanzania. Most of this charcoal is untaxed, and this represents the most severe revenue problem for the Ministry. The Tanga data can be used to make reliable estimates for Dar.

At roadblocks we counted the equivalent of 0.00535 bags per person per day entering Tanga town. If Tanga consumption levels prevailed in Dar, royalties for Dar would be Tsh 1.27 Billion per year.²⁰ This corresponds closely to the “very conservative estimate” in the adjacent table. In any case, a figure of Tsh 1.3 to 1.9 Billion (as predicted, for charcoal alone in Dar es Salaam), would be more than the total royalties collected on all forest products nation-wide (Tsh 1.1 Billion from July 1997 to May 1998, Forestry and Bee-keeping Division, 1998, page 3).

TABLE 23: ESTIMATES OF DAILY CHARCOAL CONSUMPTION IN DAR ES SALAAM

	<i>Conservative</i>	<i>Very Conservative</i>
Population	2,145,134	
Persons per household	5	6
Households	429,027	357,522
% of households using charcoal	60%	50%
Households using charcoal	257,416	178,761
Days a bag will last a family	15	15
Bags of Charcoal per day (Bags per person per day)	17,161 0.0080	11,917 0.0056
Revenue Due per Year (billions)	1.9	1.3

Sources: population for 1996 estimates found in Planning Commission data and assumed to increase 5% per year (probably a gross underestimation). Others are guesses based on interviews

Although this is not a study about Dar es Salaam several key points are in order:

1. The Bungu checkpoint suffers from the same problems, as does the Amboni Checkpoint, though seemingly to a worse degree. Bungu is not a roadblock and only “volunteers” stop. All covered

¹⁹ There are 8 natural resource checkpoints in Dar: Bungu (Morogoro Road), Book (Bagamoyo Road), Gong la Moot (along Pug Road to Kisarawe), Mbagala (along the southern road to Kilwa/Rufiji), Kigamboni Ferry, the port, and at each of the two railheads. It was estimated that 40% of the charcoal passes Bungu, 5% Boko and Gongo la Mboto, and 55% Mbagala.

²⁰ Taking the population of Dar and multiplying it by .00535 bags per person per day. However: one would of course expect Tanga consumption to be lower. For example, Tanga municipal is roughly 20% rural (Planning Commission, 1996 data) so one would expect more fuelwood use than in Dar.

vehicles carrying forest products simply pass by. Buses and petrol tankers are not stopped (only commercial vehicles are). Army vehicles pass with virtual impunity. Conservative estimates for three days in September showed 13, 14, and 22 vehicles passing untaxed (refusing to stop). FBD has been aware of this problem for years without taking action. Checkpoint personnel are demoralised.

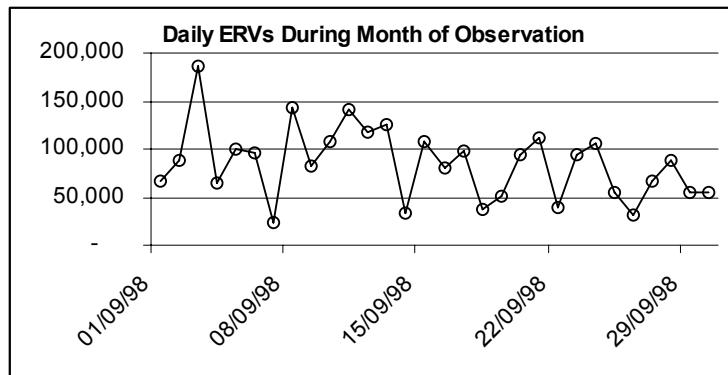
2. Do these estimates make intuitive sense? If consumption is 17,000 bags per day, and 40% of this passes Bungu, this is equivalent to 2 commercial vehicles per hour, conservatively carrying 100 bags.²¹ Observation confirms the likelihood of this figure.
3. The solutions recommended for Tanga (establish targets or privatise collection) apply as well to Dar.

From a pure net tax collection perspective, if FBD could recall all its foresters but perhaps 50 and effectively seal off the charcoal trade in Dar, its finances would be vastly improved.

3.7 ERV Data: the Possible Effect of Observation

Actual ERV collection jumped noticeably during the four days of our observation. Improved compliance during observation or supervision of course implies slacked compliance during “normal” times. In fact, our four days of observation in September were the four highest collection days during that month (pick the four

highest points on the adjacent graph). On purely probabilistic grounds the chances of selecting the 4 highest figures on 4 draws from a set of 31 is extremely unlikely; roughly 1 in 31,456.²² During these 4 days, the average daily value of ERVs issued was Tsh 149,033 while on days in which we were not observing the average was Tsh 74,969. **In short, the act of observation**



(on-the-spot supervision) typically raises revenues (see Kobb and Mpelumbe, 1997)--similar increases might be expected were the Project Manager, or some other superior officer to spend more time observing.

3.8 Charcoal Prices: Scarcity and Taxation

The Tanzania Forestry Action Plan was formulated “to address the problem of deforestation and the opportunity of forest-based sustainable development” (TFAP, 1994, page 1). A logical starting point is to ask, “are forest products becoming scarce?” The best indicator of scarcity is price, with growing prices reflecting growing scarcity.²³

The Consumer Price Index (CPI) maintained by the Tanzania Bureau of Statistics, maintains a record of quarterly charcoal prices in each of Tanzania’s major cities. Nominal trends of charcoal prices are

²¹ Assuming constant traffic flow over a 24-hour period.

²² Calculated as $4/31 \times 3/30 \times 2/29 \times 1/28$

²³ Technically, the best indicator would be the real price of resources *in situ*. Where property rights exist and are attenuated, price is composed of two elements: extraction costs and “user costs.” Intuitively, user costs are the “cost of waiting.” When forest stands are owned, there is no extraction as long as growth in stumpage value exceeds the interest rate times the value of felling. There is in fact no private motive to replant and manage since others could reap the benefits. Since forests in Tanzania are poorly regulated, forests are essentially **open access**, with no user costs involved.

graphed in the Appendix, page 62; these show increased prices, but the movement is distorted by inflation. More relevant is the “real price” or “relative price,” where the price of charcoal is compared with other indicators such as wage rates or the general price level (the price of all other goods).

Figure 5 through Figure 7 (see the appendix page 63) graph the quarterly price trend of charcoal prices in Dar and Tanga as well as the CPI (consumer price index). Using Ordinary Least Squares these show the quarterly increases to be 5.56%, 5.37%, and 5.66% respectively. By inspection these rates of increase are virtually identical. Perhaps the best way to show whether charcoal prices are increasing is to graph the real value in quarterly terms and then to do a statistical test on whether the slope is not equal to zero. Using MiniTab (a statistical software package) the regression of Dar prices shows that the slope is not significantly different than zero ($t = -1.04$, $p = .308$). It is also the wrong sign (showing a slight price decrease. The same can be said of the Tanga data ($t = -1.2$ $p = 2.47$). These graphs appear on the right.

Summary

People need to eat. Since they prefer cooked food, and since income and population in Tanzania is increasing, there is a high demand for energy. The predominant form of energy is charcoal and fuelwood, the alternatives, kerosene, gas and electricity being very expensive. Interviewees at Tanesco in Tanga estimated that an electric cooker consumes 300 Kilowatt Hours (KWh) of electricity per month. Using current electricity prices (raised in April 1998) the electricity cost of running an electric cooker would be Tsh 14,500 per month, while the cost of charcoal would be roughly Tsh 6,000 per month (i.e. consumption of 2 bags per family).

Secondly, Tanzanian electricity prices are high, and largely subsidised by industry. In the US, electricity price goes down with usage, rather than up. Therefore, one finds industrial prices in Tanzania more than six times US rates (see Table 24).²⁴

Although deforestation is widespread, an analysis of charcoal prices does not indicate a scarcity or even reason for alarm. In short, there are “too many” trees in Tanzania, so there is no real incentive to either economise or (re) plant. Only when prices go up will farmers respond in this way. Similarly, consumers will continue to rely on charcoal and fuelwood, as long as their costs are significantly below those of alternative energy forms.

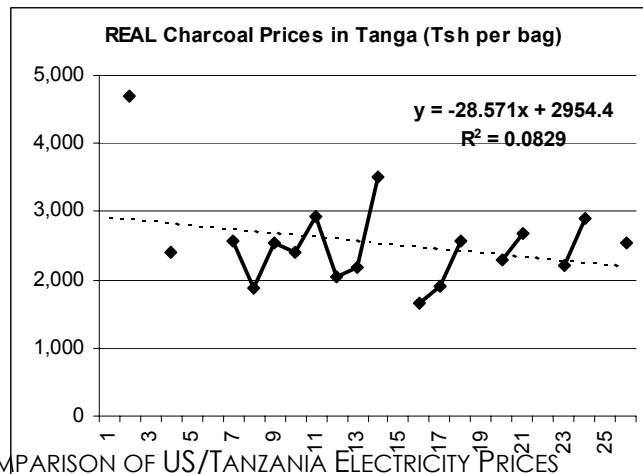
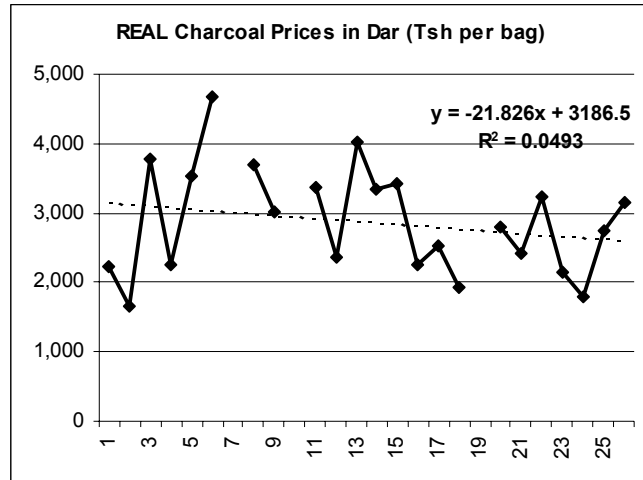


TABLE 24: COMPARISON OF US/TANZANIA ELECTRICITY PRICES

	Residential	Industrial	% Higher
Tanzania		199 Tsh/KWh	531%
< 600 KWh/month	53 Tsh/KWh		
1500 KWh/month	86 Tsh/KWh		54%
USA	56 Tsh/KWh	31 Tsh/KWh	

Notes: US rates are 1995 from Joskow (1997, page 126). The Tanzanian rate “<600 KWh” assumes 90% of the electricity using residential population uses 300 KWh/month and the remaining 10% uses 600 KWh. 1500 KWh in Tanzania would cost 86 Tsh/KWh, this usage more corresponds to US consumption levels.

²⁴ No wonder businesses complain about competitiveness.

CHAPTER FOUR: TIMBER

Timber consumption is estimated in three ways: by monitoring traffic into Tanga town and out of Tanga Region; by interviewing carpenters and timber dealers in the district towns; and, by investigating timber smuggling at the Kenya border. These are discussed in turn

4.1 The Transport of Timber: Road Monitoring

Road monitoring was designed to capture timber being “imported” to Tanga town and exported to Dar es Salaam or Arusha. During the three days of observation, the only illegal timber movement witnessed was 0.097 m³ of planks travelling by bus and intercepted at Manga.²⁵ Applying a rate of Tsh 13,800 per cubic metres, this translates into yearly royalties of Tsh 7.4 Million.²⁶ The table below documents the legal timber trade encountered during our period of observation.

TABLE 25: OBSERVED COMMERCIAL TIMBER TRAFFIC

<i>Observation Point</i>	<i>Date</i>	<i>Time</i>	<i>Source</i>	<i>Load</i>	<i>Royalties Paid</i>
Manga					
TZ* (30 tons)	08/09/98	5:00 PM	Lungoza	121 logs (60.8 m ³)	None
TZ* (10 tons)	08/09/98	7:00 PM	Mkumbara	600 Chipboards	None
TA* (7 tons)	09/09/98	2:00 AM	Mkumbara	300 planks (10.2 m ³) pine	None
TZA* (10 tons)	11/09/98	12:00 PM	Lushoto	6.4 m ³ pine/cypress planks	None
TZ* (10 tons)	12/09/98	4:00 AM	Rombo	15 m ³ pine	None
TAU* (10 tons)	14/09/98	5:00 AM	Rombo	10 m ³ Cypress	None
ARQ* (30 tons)	14/09/98	7:00 AM	Arusha	670 pieces of plywood	None
TZE* (18 tons)	14/09/98	8:00 AM	Moshi	23 m ³ pine	None
Mizani					
TZ* (7 tons)	13/09/98	11:00 PM	Lushoto	267 planks cypress	None
TZ* (7 tons)	13/09/98	11:00 PM	Lushoto	300 planks	None
TZF* (7 tons)	13/09/98	11:00 PM	Lushoto	360 planks	None
TZF* (9 tons)	14/09/98	1:00 AM	Mkata	9 Logs Mtundu (5 m³)	466,995
TZE* (6 tons)	14/09/98	3:00 AM	Kabuku	10 logs Mtundu (6 m³)	466,995
TAS* (10 tons)	14/09/98	5:00 AM	Lushoto	184 planks (7 m ³) softwood	None
Bwiko					
TAU* (10 tons)	13/09/98	12:00 PM	Rombo	10 m ³ Cypress	None
TZF* (10 tons)	14/09/98	8:00 AM	Rombo	10 m ³ Cypress	None

There are two obvious problems with these results. First, foresters’ likely colluded with timber dealers and saw millers thus killing the business. Secondly, roads were monitored for a very short time, so figures have a large degree of uncertainty associated with them. Regardless, and using the data above, average daily timber royalties coming from Tanga Region is calculated to be Tsh 55,000 (11m³ Mtundu × Tsh 15,000 per m³ ÷ 3 days). On a yearly basis this is equivalent to Tsh 20.1 Million Tsh, while actual Felling Licenses collected from 11/11/97 to 30/8/98 are equivalent, on a yearly basis

²⁵ The 17 planks were 2 inches by 6 inches by 12 feet. This gives 0.0283 m³ per plank, which was converted to round wood over bark by the conversion factor of 1.82 (see Table 33 in the appendix, page **Error!**

Bookmark not defined., which comes from Holmes, 1994), giving 0.0515m³. As an aside, calculation errors probably result in large revenue losses within the Forestry Sector (see Koppers, 1997, for a good discussion of this). Forty-two buses per day passed Manga and 25 were sampled during the 3-day observation period. We assumed the above mentioned timber came from Tanga Region (since the bus came from Tanga town).

²⁶ Tsh 13,800 per m³ is the average royalty collected from 11/11/97 to 30/8/98.

to Tsh 16.9 Million (Felling License Database). Given small sample sizes, these figures are certainly within the bounds of error.

4.2 Observing Three Random Saw-millers

Suspecting collusion between foresters and businessmen, 3 saw-millers in Tanga were observed (spied upon around the clock) for a period of three days (25-27 September). This exercise was established without the knowledge of the foresters in the Catchment Forestry Project; it failed miserably.

The exercise began on a Friday morning. Research assistants kept a safe distance from the sites, rotated shifts and milled around in order not to arouse suspicion. They were nevertheless recognised by a passing Forestry Department vehicle, and shortly thereafter questioned by a department official. This official (from Tanga, accompanied by two others) entered the site of one of the most active saw-millers. On the second day of the “stakeout” the same saw-miller was visited by a forester from Muheza district.

During the three days of observation no deliveries were made. If felling licenses are any indication, this lack of business is quite typical of sawmills. In the period 11/11/97 to 30/8/98 only 12 Felling Licenses were issued to saw-mills and these totalled roughly 4 Million Tsh (173 m³). Assuming 3 active businesses, saw-miller’s daily consumption of hardwood is only 0.20 m³ (round wood over bark). In other words, **the average saw-miller pays daily royalties on the equivalent of 3.8 planks each of 1 inch × 12 inches × 12 feet.**²⁷ This is hardly enough to keep a business in operation.

4.3 Carpenters and Timber Dealers: “District Demand”

Research assistants contacted 108 carpenters and timber dealers in Handeni, Lushoto, Soni, Muheza, Maramba, Hale, Mombo and Korogwe. Twenty of these were either absent, or refused to be interviewed.²⁸ Each was asked to provide a list (verbally) of what he produced during the previous week. For example, if a

TABLE 26: CARPENTERS DAILY ROYALTIES DUE

Location	N	Mean Daily	St Dev	Min	Max
CARPENTERS					
Hale	5	2,552	1,857	894	5,013
Handeni	15	3,126	1,235	566	5,271
Korogwe	8	7,409	14,426	0	42,455
Lushoto	12	3,650	3,719	0	11,001
Maramba	5	46	102	0	229
Mombo	8	1,117	3,160	0	8,938
Muheza	8	5,638	5,154	0	15,103
Pangani	7	4,025	4,378	702	13,493
Soni	7	562	810	0	2,063
Regional Total	75	249,103			
TIMBER DEALERS					
Hale	1	0		0	0
Handeni	3	275	476	0	825
Korogwe	3	229	198	0	344
Lushoto	2	0	0	0	0
Mombo	2	0	0	0	0
Pangani	1	268		268	268
Regional Total	12	1,781			

Note: StDev= Standard Deviation, Min = Minimum, Max = Maximum. All values in Tsh

²⁷ This is an important calculation. The 173 cubic metres was totalled from individual Felling Licences. The total was then divided by 294 days (11/11/97 to 30/8/98) and by 3 (the number of saw-millers). This results in 0.2 m³ roundwood over bark. Divide by 1.82 to convert to planks.

²⁸ A description of the data set is provided in the appendix Table 42 page **Error! Bookmark not defined.** One interview in Korogwe was dropped, it being almost half the size of all other carpenters combined.

carpenter made 4 chairs he was asked how many planks he used (including their dimension and type).²⁹ In addition to carpenters, we interviewed 12 timber dealers. In this case, all sales concerning furniture were ignored so as not to double count timber dealers and carpenters. In essence, only building sales were tabulated. Table 26 shows our results by location.

The figures make intuitive sense, but may be a little high. The 75 carpenters interviewed used timber having an associated daily royalty value of Tsh 249,103. The average carpentry shop therefore used .25 m³ (round wood over bark) per day or roughly 5 planks of size 1 inch × 12 inches × 12 feet. In addition, the table gives maximum and minimum daily uses (many of them zero since carpenters frequently worked with softwoods or untaxed species such as *Mfenesi* or *Mvuje*, especially in Maramba).³⁰ Most wood is being used ultimately for furniture (not building materials) as is evidenced in the higher figures for carpenters vis-à-vis timber dealers.

Although each plank was not traced to a particular forest, mentions of particular forests as supply sources may be instructive. In Lushoto, timber came from Shume, Magamba and Kwembago, in Korogwe from Bungu, Lewa, Lushoto, Ambugulu and Rwengela, in Mombo from Shume, in Muheza from Amani, Mkuzi, “Jeshini” and Bombani, in Pangani from Mwera, in Hale from Pangani Falls, Mwera-Msibugwe, and Potwe, and in Soni from Magilla, Bumbuli, and Kwesine.³¹ This geography may account for usage by species, which can be found in the appendix Table 43 page 65.

Revenue Estimates

Table 26 shows that the 12 timber dealers interviewed for this survey consume, in total, wood products with an average daily royalty value of Tsh 1,781. Similarly, the 75 carpenters interviewed for this survey consume wood products totalling with an average daily royalty of Tsh 249,103. These figures, which on an annual basis are equivalent to Tsh 92 Million, fail however to account for two types of businesses:

1. those whom we contacted, but were either absent or unwilling.
2. those whom we did not contact, especially in more remote areas.

District officials were asked to provide a list of all known carpenters and timber

TABLE 27: ESTIMATES OF YEARLY ROYALTY DUE FROM FURNITURE MAKING

<i>Location</i>	<i>Our Data</i>	<i>Known</i>	<i>Mean Daily</i>	<i>Total Royalties Due per year</i>
CARPENTERS				
Hale	5	5	2,552	4,657,764
Handeni	21	21	3,126	23,958,651
Korogwe	10	15	7,409	40,563,953
Lushoto	12	12	3,650	15,987,700
Maramba	6	6	46	100,381
Mombo	9	9	1,117	3,670,165
Muheza	12	12	5,638	24,695,716
Pangani	13	13	4,025	19,097,482
Soni	7	7	562	1,436,697
<i>Regional Total</i>	94	100		134,168,509
TIMBER DEALERS				
Hale	1	1	0	0
Handeni	3	3	275	301,142
Korogwe	3	7	229	585,553
Lushoto	2	2	0	0
Mombo	3	3	0	0
Pangani	1	1	268	97,871
<i>Regional Total</i>	13	17		984,566
GRAND TOTAL				135,153,076

Notes: “Our Data” are the number of businesses we managed to contact. “Known” includes businesses reported by the districts (Korogwe only). “Daily mean” is the royalty due per day based on figures of usage supplied in interviews. Yearly royalties multiplies “known” × “daily mean” × 365

²⁹ In mixed English/Swahili, our interview form is provided in the appendix, page 63.

³⁰ Unfortunately, Research Assistants assigned to Handeni only gave “Handeni” and “Lushoto” as responses. In Maramba, all wood came either from Lushoto, or “Maramba.”

³¹ Research assistants in Handeni did not ask this question properly.

dealers however compliance with this request (except for Korogwe) was half-hearted. It is clear that foresters, excepting major sawmills and dealers, simply don't know much about the wood processing industry in their districts. This is especially true of the more remote ward towns and villages. For example, Pangani and Korogwe provided lists that included their district towns only. Muheza, as was the case in all instances, refused to comply in any fashion.³² Old data is also not accessible; previously, at Regional level, there must have been a listing of carpenters and timber dealers having business licenses.³³ Given the current restructuring at Regional level, we gave up on finding this data through the RNRO. Table 27 derives annual levels by using daily averages for each location and multiplies it by the known number of timber dealers and carpenters: the implicit assumption is that businesses that were absent or unwilling are no different than those interviewed.

4.3.1 HIGH-MEDIUM-LOW ESTIMATES

Interview responses are inherently unreliable and an estimate of annual revenues of Tsh 135 Million strikes me as slightly high.³⁴ A more reasonable lower bound would take 25% of this figure (Tsh 33.8 Million) and an upper bound 150% (Tsh 203 Million). Regardless, figures suggest the need to more closely monitor and patrol carpenters and timber dealers. Monitoring is difficult, however, because felling licenses are non-transferable and indivisible. It is common to pay the forester "a bit" to get wood hammered, the only sign a carpenter's wood is legal.

4.4 Data from a Day in the Forests

We intended to monitor 10 forests, but due to logistical constraints we visited Luye P/L (East Handeni), Boja and Kibubu Masaika P/L (Pangani), Mashindei P/L (Korogwe), Kisima Gonja Forest (Lushoto) and Kwatango and Misozwe Forests in Muheza. No illegal cutting was reported in interviews in Lushoto, Korogwe, and Muheza. In Pangani one informant estimated illegal cutting to be 120 planks per month. In Luye, we posed as timber buyers and confirmed 77 illegally cut planks.

If anything can be concluded from visiting individual forests, it is that forests are far away and expensive to monitor, and that foresters differ widely in their abilities to use informants to access valuable information.

4.5 The Kenyan Border

Forests in Northern Tanga Region (between Daluni and Horohoro) supply the Mombasa tourist market with raw materials for carving.³⁵ Logs of *Mkarambati* are shuttled by

TABLE 28: ESTIMATION OF TRADE IN CARVING MATERIALS

	<i>Low</i>	<i>Medium</i>	<i>High</i>
<i>ESTIMATION BY LOOKING AT BICYCLISTS</i>			
Bicycles per day	60	120	300
Logs carried	4	4	4
Volume per log	0.0127	0.0127	0.0127
Royalty per m3	26,750	26,750	26,750
Yearly Royalty	29,683,315	59,366,631	148,416,577
<i>ESTIMATION BY LOOKING AT CARVERS</i>			
Number Carvers	500	1000	1500
Logs used/day	0.5	0.5	0.75
Volume per log	0.0127	0.0127	0.0127
Royalty per m3	26,750	26,750	26,750
Yearly Royalty	30,920,120	61,840,240	139,140,541

Notes: royalty figures in Tsh. Volumes calculated using a radius of 5 inches and length of 1 metre.

³² This is especially disturbing since Muheza is heavily financed by the Coastal Zone Conservation and Development Project, who also co-financed this survey.

³³ This data would be kept by the Regional Trade Officer.

³⁴ On the other hand we excluded most carpenters at Division, Ward and Village level. Tanga was supposed to be accounted for in traffic movements of timber (which were not detected)

³⁵ The sources are Mavovo, Mwanyumba, and Mwakijembe Public Lands.

bicycle across the Tanga Border to the Kenyan town of Jua Kali (500 metres from the Horohoro border).³⁶ From Jua Kali the unvarnished and unpolished carvings are transported by road to Mombasa for finishing and sale.

Jua Kali contains an enormous colony of carvers and estimates on the size of the illegal business vary significantly. My best estimate is that roughly 60 Million Tsh of royalty is due per year. As can be seen in Table 28 (see the “medium estimate”) this corresponds to 60 bicycles ferrying 4 logs twice per day or 1000 carvers using ½ log per day. Based on interviews, it was assumed that 95% of the logs are *Mkarambati* and 5% are *Mpingo*. These figures seem reasonable; we estimated 1000 carvers at the main camp, and heard of a second camp, also quite large.³⁷ Upper and lower bounds are put at roughly 25 Million and 125 Million Tsh respectively. One interviewee claimed up to a total of 3,500 carvers.

4.5.1 AN ALTERNATIVE RECOMMENDATION FOR HOROHORO; MARKETING AND PUBLICITY

In the spirit of this study, this problem can be tackled using a marketing rather than production emphasis. Start with curio sellers in Mombasa where the marketing channel narrows rather than with bicyclists and carvers.³⁸ Carvers will ultimately move their business in response to taxation whereas the Mombasa market is fixed.

Tourists will certainly be sad to hear they are buying carvings made of smuggled forest produce, which results in indiscriminate deforestation.³⁹ Should the business be made public, via brochures, posters, articles in flight magazines and others, sellers in Mombasa would certainly suffer. There is, I believe, room to “pressure” (blackmail) businesses in Mombasa into paying monthly fees to the Forestry Department in Tanga, especially, if the action is taken through the East Usambara Catchment Forest Project. Shops could be issued documents showing them to be environmentally friendly, while those refusing could be mentioned in brochures. If payment is made from curio shop owners, they are of course entitled to some services, for example reforestation to ensure a steady long-term supply of materials.

This is a riskier but more co-operative way, which I believe is worth a try.

³⁶ Bicyclists are often armed with either axes or machetes, the routes are many, and they are difficult to stop.

³⁷ Carvers recognised one of us, a forester, and started informing others. We left early.

³⁸ To provide another example: when cattle are rustled from Mkwaja, they are pursued in Zanzibar not the open seas.

³⁹ Tourists tend to romanticise and picture stands of pristine forest not “scrub” (miombo woodlands), but this is a minor detail.

CHAPTER FIVE: MANGROVES

5.1 Kipumbwi, Mkwaja: South of the Pangani

Investigations into the smuggling of mangroves or timber by sea from Southern Pangani began in Kipumbwi where the Tanga Coastal Zone Project assists Navy Patrols.⁴⁰ Interviewees routinely pushed us further south; in Kipumbwi they blamed villagers in Mkwaja; in Mkwaja they blamed villagers in Mbuyuni; in Mbuyuni they blamed villagers in Bagamoyo District. Having reached Mbuyuni (“Kitopi”), we walked along a mangrove strand just north of the village, escorted by an elder from the Village Council. After half an hour, he announced “as you can see, the mangroves are in great shape.” After insisting on going a bit further, we found roughly 40 poles drying for “domestic use.”⁴¹

In Mbuyuni (and probably other villages), the process of getting approval for domestic use of mangrove poles is rather cumbersome, often involving a long and expensive trip to the nearest forester. The Village Chairman at Mbuyuni therefore allows villagers to use poles, once they request permission.

5.2 Moa and the Northern Coast

Mangroves are better seen by boat than by foot. I accompanied the Mangrove Conservation Project on a patrol North of Moa. On that day we confiscated 100 poles, indicating that cutting is probably widespread.

5.3 Disruption of Markets

Mangrove patrols are costly to operate, and unlikely to generate enough income through confiscated poles to pay the costs of petrol and allowances. By foot, it would be difficult for villagers to undertake patrols, since forests are a good distance from population centres. Therefore, delegation to villagers, may not work. Generally speaking, the commercial business is likely to take place far from the village itself. One solution is to disrupt the market for poles, as was done in the past by confiscating poles at the Border town in Kenya. The same would apply for Zanzibar or Pemba.

5.4 Revenue Estimates

Since patrols do not cover costs (they are largely a deterrent), revenue estimates are hampered by the question of how often these patrols should be undertaken. After all, 100 poles at 200 shillings each are still only Tsh 20,000. According to quarterly reports, average revenue is Tsh 560,000 per quarter, a figure, which seems quite reasonable.

⁴⁰ The amount of timber smuggled by sea in 1998 was likely to be low since the road from Kwamsisi (the production area) was out for much of the year. We caught pit-sawyers and witnessed illegal felling near the villager of Poza in June of 1998. Reportedly, this timber is exported by sea from near Mkwaja.

⁴¹ At this point our guide insisted that we turn back because he hadn't brought his shoes. We complied.

CHAPTER SIX: SUMMARY AND RECOMMENDATIONS

6.1 Summary: Low, Medium and High Estimates Revisited.

There exists a large gap between forest royalties that are actually collected, forest royalties that could be collected, and money that is ultimately banked. One hope of this consultancy was that the results would imply the solution to these financial problems. To a degree this is true. While the table below summarises potential revenues in Tanga Region, it has little to say about the feasibility of collecting these royalties. Because results are sensitive to a very small sample size and incompleteness of the data (we depended on only 3 **partial** days of observation), estimates are given as low, medium, and high scenarios. To recall, the medium scenario was derived largely from the traffic observation period.

TABLE 29: ROYALTY ESTIMATES (HIGH, MEDIUM, LOW)—ALL VALUES IN MILLIONS TSH

<i>Product</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Assumption</i>
Charcoal	98.2	173.6	268.0	High is based observed road sales
Bicycle	24.2	24.2		
Commercial Lorries	59.0	114.0		Low is the amount paid during observation
Buses	2.0	6.7		Low is just an estimate
Lorry Drivers	13.0	26.5		Low is 50% of sample (observed)
Smuggled to Kenya	0.0	2.2	11.0	Medium = 20 bags/day, high 100/day
Fuelwood	4.9	9.9		
Bicycle	3.5	6.9		Low = 50% observed (medium)
Commercial Lorries	0.7	1.4		Low = 50% observed (medium)
Buses	0.8	1.5		Low = 50% observed (medium)
Lorry Drivers	0.0	0.0		Low = 50% observed (medium)
Smuggled to Kenya	0.0	0.0		
Timber	83.9	222.6	370.1	
Buses	0.0	7.4	7.4	Low = zero, medium from observation
Commercial Transport	20.1	20.1	20.1	
Carpenters	33.8	135.1	202.7	Low = 25% of interviews, high 150%
Smuggled to Kenya	30.0	60.0	140.0	See Table 28 page 45
Mangroves	0	0	0	High cost of collection, ignored
Fines & Compensation	0	0	0	Ignored
Total	187.0	406.1	638.1	

Focussing on the “low” estimate, and ignoring royalties collected on timber used by carpenters (difficult to collect) and smuggling to Kenya (will take time to cut off this business), a low and I believe reasonable estimate of collectable royalties is Tsh 123 Million.

Having derived these figures, what should we do with them?

6.2 Data collection

Efficient royalty collection is founded upon accurate data collection and organisation; without reliable figures, monitoring is simply not possible. Similarly, without reliable figures with which to base judgements, decision-making becomes little more than crisis management. As this report has tried to

point out there are large data discrepancies between ERV books and Quarterly reports, and between figures at the District, Catchment Forest Office, and the Region. This intransparency has contributed to the following:

1. An on-going tug of war between the districts and the Catchment Forest Project over whom should collect and retain revenues. Such efforts on behalf of government officials—volunteering to do additional work—is really quite rare in Tanzania; it is hard not to take this state of affairs as an indication that special interests have been placed at stake. Furthermore, it is evident that the Region used the District’s poor reporting to flagrantly misrepresent their efforts, to under-report district collection and to “seize their assets” (the right of royalty collection). In the end, the districts own inability to collect and present data went a long way in undermining their own case.
2. An inability to monitor results within the Catchment Forest Project, to allocate resources in an efficient way, and to prevent cases of internal theft and fraud.

6.3 Financial Administration

Corruption is widespread in Tanzania, the nation recently being ranked as the fourth most corrupt country in the world (by the much-respected NGO, Transparency International). What Transparency International does not do is describe the nature of this corruption: in Tanzania corruption involves many individuals and institutions and in principal may affect **every financial transaction**. It is not feasible to check that amounts indicated by all recipients and payees are always equivalent, there being many transactions along the chain of transfers from the field, to the central office, to the accounts department, to the bank, to the Ministry and to the treasury (and then back again). In-depth monitoring would be far too costly, and would allocate even more revenues away from tangible services and into administration.

The following are **recommended**:

1. A private accountant should be employed each month to independently check on the bookkeeping and accounting of the Catchment Forest Project and to present summary figures at a *monthly revenue meeting*. If recent events are indicative, auditing probably pays for itself in preventing revenue from being diverted. His or her contract should stipulate that the accountant derives figures independently of the revenue section. While sub-contracting financial services may at first seem far fetched, the Catchment Project sub-contracts most activities, from preparing food at seminars to repairing cars at private garages.
2. The monthly meeting should be attended by the Project Manager, the external accountant, revenue collectors from the most lucrative areas (Amboni, Kabuku, Horohoro, Mizani), the Revenue Officer, the Project’s own accountant and at most 1 or 2 others (i.e. the “team” should be limited to about 8-10 persons).
3. Every month all ERV books from the main collection areas need to be recalled, totalled, and summarised by location.⁴² Other locations (like Handeni, Pangani, etc.) should report on a quarterly or bi-annual basis. A simple table, prepared by the Revenue Officer will suffice:

TABLE 30: EXAMPLE OF ERV MONTHLY REPORTS

<i>Place</i>	<i>Book Series</i>	<i>Receipts Issued</i>	<i>Value</i>
Amboni	08900001 to 08900200	All	560,000
	07800601 to 07800800	601 to 705	490,000
Kabuku	06666201 to 0666400	300 to 385	120,000
Mizani	Etc...		

⁴² If other “busy” checkpoints or sources of revenue arise they should also report monthly, for example Mizani or Horohoro.

This table can then be used to present a simple graph of the monthly trends for each major collection point and then ultimately this data needs to be incorporated into the quarterly reports. The revenue officer should report on the number of ERV books outstanding, and any trends in revenue collection. In each meeting the following need to be presented:

- 3.1. Each revenue collector presents the amount he/she has collected (for comparison with others' calculations).
- 3.2. The project accountant presents the amount of money he/she has banked and transferred to the Ministry (during the month).
- 3.3. The project manager presents data on the amount of money received by the Ministry (i.e. gets a report from the Ministry, where possible).
- 3.4. The project manager compares actual collection with **targeted collection**, as derived and discussed below.
- 3.5. A private accountant presents a brief report on the state of accounting and record keeping (was it done according to accepted standards of accounting and financial memorandum).
- 3.6. Sadly, failure to accurately report is not routinely taken as grounds for termination within the Tanzanian Civil Service. The Project Manager, based on these figures, should decide whether the Ministry needs to send an auditor and whether certain staff members should be terminated for failure to report accurately and adequately.

6.4 Checking Checkpoints and Revenue Collectors: an internal audit method

To repeat: problems exist with monitoring transactions at every link of the collection chain. Perhaps the hardest transaction to monitor is the actual collection of revenues at field level. It may be difficult to differentiate corruption from lack of effort, incompetence, or inadequate financial support in the collection process. This report has attempted to spell out some possible methodologies for establishing collection targets, which aim at “tightening” the current system and “plugging the leaks”⁴³. In particular, methods include:

1. Publicly observing the collection process (witness the actual physical collection) and compare collection during the observed period with overall collection averages (here is where accurate data is needed).
2. Switch revenue collectors: have the “central office” collect revenue for a period of time and compare their collection with average collection figures. Or: rotate teams and compare their performance.
3. Independently count traffic at points “down-stream” from checkpoints, as was done in Tabora.
4. Sample actual receipts and compare duplicates with originals: confiscate 20-30 original receipts at Kabuku and Amboni after traffic has passed.
5. Observe activity at sawmills and large timber dealers.

It is **recommended** that:

1. An internal investigative team be formed, or that a private institution (such as an accounting firm or auctioneer) be employed to carry out periodic investigations.
2. Results be presented during monthly revenue team meetings.
3. All monitoring of saw-millers be done by “outsiders,” since there is most certainly a collusive relationship between revenue collectors and larger businesses.
4. Revenue collectors be informed that a process of investigation is underway (this may increase revenues slightly, through deterrence).

⁴³ A good report is Mwanga District Council, 1998.

- Whenever large discrepancies exist, relevant staff members be terminated. This is probably within the contractual discretion of the Project Manager, since responsibilities must certainly include something concerning “competent revenue collection.”

6.5 Sources to be exploited: some targets are derived

This study has identified the following areas as having a large and unrealised revenue potential: Kabuku, Mizani, Amboni, Saw-millers and large timber dealers, the Army, and Horohoro (smuggling in Kenya). Kabuku, Mizani and Amboni share some similarities; in each case actual revenue collected is far lower than projections. The solutions proposed are therefore similar: establish targets with some incentive structure for employees to perform. If targets are not met, terminate the employee’s contract, and sub-contract to a private revenue collector. Each area is discussed in turn.

6.5.1 CHARCOAL AND FUELWOOD AT KABUKU

Daily charcoal royalties at Kabuku are roughly 10% of the volume calculated during 3 days of roadblock observation.

Average actual royalties per day are roughly 31 bags; this, while over 1,000 bags are visibly for sale along the roadside. The adjacent table summarises the comparison.

TABLE 31: DERIVATION OF TARGETS AT KABUKU

<i>Source</i>	<i>Estimates from Study</i>	<i>Actual</i>
1. Charcoal		
1.a Commercial	148 bags/day	
1.b Drivers	188 bags/day	
1.c Total (1.a + 1.b)	336 bags/day	31.4 bags/day
1.d Yearly Revenue	36,828,500 Tsh	
2. Fuelwood (5%) of charcoal	1,841,425 Tsh	
3. Total (1.d + 2)	38,669,925 Tsh	3,629,925 Tsh
4. Tsh Collected Per Day	105,945 Tsh	9,945

It is **recommended** that:

- For administrative purposes, the jurisdiction of “Kabuku” be considered to stretch from Manga to Mandela (just outside Korogwe).
- An additional forest officer be employed at Kitumbi. It is probably best to switch someone from Mashewa, Moa or elsewhere that is not as crucial in terms of revenue collection.
- The Kabuku/Kitumbi post be provided a motorcycle. This can either be hired from a private individual (until the office builds up cash) or obtained on a hire purchase basis from EUCFP (if they agree).
- A collection target of slightly above 50% of the value above be established for the area in the first year. This works out to Tsh 20 Million on *charcoal and fuelwood alone* (i.e. from ERVs not Felling Licenses, registration, etc.)
- The target is increased in the future (it is definitely very low).
- The head office rent a lorry on a daily basis, once or twice a month to patrol the Manga-Mandela corridor, confiscating charcoal along the way. The proceeds of the confiscation should be included in the calculation of the “target.”
- A “letter of agreement” be signed between the project manager and the two revenue collectors in Eastern Handeni which specifies the target and agrees upon the “central office’s” input (i.e. x patrols per month, repair of motorcycle every y kilometres, etc).
- The revenue collectors be fired should the targets not be reached.
- The contract be terminated should the “head office” not supply the relevant inputs.
- At the end of the year, the revenue collectors get a reward (accounted for as “posho”) equal to 50% of all revenues above the specified target.

6.5.2 MIZANI AND AMBONI CHECKPOINTS

Mizani is of strategic importance for three reasons. First, roughly 5.3 Million Tsh of Charcoal is transported past Mizani, by bicycle per year. This is more than current collection of charcoal from Kabuku. Second, charcoal “exported” from Kabuku is likely to pass this route; without a checkpoint there is no effective way of monitoring commercial traffic from Eastern Handeni. Third, the checkpoint can be used to monitor large timber dealers and saw-millers in Tanga.⁴⁴

This survey estimated that Tsh 33.1 Million worth of charcoal passes Mizani each year. Much of this comes from Kabuku.

It is **recommended** that a checkpoint be established at Mizani. Even if police were employed at Tsh 30,000 per day this would cost only Tsh 11 Million per year. However, and if past action is indicative, the Catchment Forest Project cannot afford to operate this checkpoint; otherwise, such a checkpoint would have been in existence long ago. One solution is to sub-contract: to sell off the right to collect revenues at Mizani for a fixed monthly fee. The procedure is generally:

1. Establish a temporary 24 hour checkpoint at Mizani. Do this during 6 random days over the period of two months.
2. Analyse the results of this exercise and combine it with estimations from this report.
3. Bids are then tendered for a private sector operator to collect revenue on behalf of the forest department. Bidders should have access to all documents and estimations. Advertising needs to be widespread to attract the most competent and reliable sub-contractor.
4. Contracts are signed between the bidder (private collector) and Catchment Forest Project, with collateral taken should monthly deposits not be made.

To take a concrete example, the market at Mwanga town, when administered by council employees brought in Tsh 220,000 per month. Costs of administration were roughly 80,000 Tsh per month. During the period of observation by the “central office,” monthly revenue was Tsh 450,000. A private bidder agreed to collect revenue for Tsh 290,000 per month, thus gaining the council Tsh 150,000 per month (Mwanga District Council 1998) in net revenues.

Mizani is more complicated because of double counting. Again, much of Mizani’s royalties come from Handeni (charcoal and timber) and Korogwe (Felling Licenses from Bungu and Dindira). If this area were to be privatised who would collect the revenue? It is suggested that a certain fee could be paid to the contractor on all illegal uses of receipts he/she uncovers. For example, the contractor should seize all original ERVs and compare them to the duplicates in Tanga. For example, if the duplicate reads Tsh 10,000 and the original Tsh 30,000, the contractor be remunerated 5 times the difference ($5 \times 20,000$). Similarly, an administration fee, for example Tsh 200 per transaction, could accompany all legal transactions. Therefore, the contractor is paid both for actual revenue collection, and for administration and reconciliation.

This discussion makes privatising revenue collection sound easier than it actually is. The process is actually quite slow, the idea itself being an alien way of viewing the world. In either case, visits to Korogwe and Mwanga District Councils, where privatisation is under way, are strongly recommended.

The Amboni checkpoint, excluding the army’s share, has a revenue potential of at least 60 Million Tsh per year (the **adjusted amount paid** during our observation).⁴⁵ The same procedure is

⁴⁴ It would probably not be worth it for unscrupulous sawmillers to incur the extra costs of using the Muheza-Pangani road instead (as long as it is not made of tarmac) to avoid a proposed Mizani checkpoint.

⁴⁵ Again, based on hourly observations, not daily averages.

recommended as Kabuku: establish targets, monitor if targets are met, reward for surpassing targets, fire and privatise in case of failure.

6.5.3 SAW-MILLERS AND LARGE TIMBER DEALERS

As calculated earlier, average daily use of hardwood is 3.8 planks per saw-miller. One needs to be highly suspicious of these levels, there being a large potential for under-statement. It is **recommended** that, under the guidance of the project manager, an independent accountant check the stock registers of large saw-millers and timber dealers in Tanga on a sub-contractual basis.⁴⁶ His or her figures need to be reconciled with Felling Licenses. I suspect closer independent monitoring (and subsequent action based upon these results) will lead to increased voluntary compliance.

6.5.4 DEALING WITH THE ARMY

On average, during our three days of observation army vehicles transported roughly 260 bags per day past the Amboni checkpoint without paying royalty. On an annual basis the Ministry is “losing” Tsh 28 Million.⁴⁷ It is **recommended** that the problem with the army be dealt with via the newspapers, rather than by attempting to stop vehicles. That is, take some photographs, notify *The Express*, and supply information in the hope that the problem will be solved “amicably” through the proper political channels.⁴⁸

6.5.5 SMUGGLING IN KENYA.

Tanga region certainly supplies Mombasa with carving materials; with Kenya’s ban on charcoal a fair amount of charcoal must also cross borders. While there is nothing in principal wrong with cross-border negotiations, such co-operation tends to be slow and time consuming. As was outlined on page 46, a more **marketing/public relation’s** solution may be more effective.⁴⁹ A staff member needs to be based in Mwakajembe.

6.5.6 CARPENTERS

Data on carpenters was derived from interviews and is therefore less reliable than observations of road traffic. Nevertheless, a large deal of illegal felling is implicated. The periodic confiscation of unhammered wood is recommended, again using a hired lorry.

6.5.7 A SUMMARY OF STAFFING REQUIREMENTS

Areas with a high revenue potential are Amboni, Horohoro, Mizani and Kabuku. Staff assignments need to reflect this distribution, and staff members should be moved from more remote sites such as Mashewa.

6.7. Sub-contracting: a Summary

⁴⁶ Stock registers are legally supposed to be kept, but this provision of the Forestry Amendments is generally ignored.

⁴⁷ It depends whether the vehicles (public) are transporting charcoal for private or public reasons. If the charcoal is being used by the army (a government institution) the tax merely transfers money from one government hand to another.

⁴⁸ As with smuggling in Kenya, I am suggesting less “forceful means” to resolve the problem. This is not the way problems are routinely handled.

⁴⁹ For example, perhaps strong environmental NGO in Mombasa could be contacted. The problem should be publicised as one of “deforestation” not smuggling and tax evasion).

This paper takes a slightly different view than Tabora, where an executive agency is proposed to take care of problems with revenue collection. I have dealt with the revenue problems as a contracting/human resources problem (as has Tabora), where low collections are due primarily to poor financial management (starting with data collection), lack of effort, and in some cases dishonesty. As long as civil servants are considered as **life time employees**, despite obviously poor performance and the routine and flagrant flouting of financial rules and regulations, there is little hope of improving the revenue collection situation.

From a Ministerial point of view, the target/contract perspective needs to be extended further: it is recommended that employment of the Project Manager and Revenue Officer be contingent upon reaching specified revenue targets. For example, taking the “low” estimate provided above (in table), and subtracting revenue due on smuggled goods and carpenters, a reasonable target would be Tsh 120 Million (roughly twice the current collection). Again, an incentive bonus should be paid equal to half of all revenue above this target.

7.7 Expenditures and Retention

An oft-repeated rationale for taxing natural resources is to encourage “sustainable use.” Despite this, little proactive management is occurring at forest level (according to foresters posted there). Most expenditure comprises administration and tax collection, with patrol and enforcement largely focussing on revenue collection.

A major expenditure constraint is the current system of retention. One quarter of all revenues is supposed to be transferred back to the Catchment Forest Project but as the adjacent table shows the actual figure is a bit (though not significantly) lower. Furthermore, the “retention rule” may inhibit exploiting “new” sources of revenue. If the running costs of monitoring and collecting, for example in establishing a checkpoint in Mizani, is greater than 25% of the additional revenues it is expected to bring in, the endeavour does not pay from the perspective of the Catchment Forest Project. It will not have the cash to implement this new revenue source. As outlined above, “privatisation” may eliminate the retention problem, but the Catchment Forest Project will not be collecting the statutory royalty amounts (i.e. it receives a monthly fee, not Tsh 300 per bag of charcoal).

TABLE 32 : AVERAGE QUARTERLY EXPENDITURES (TANGA REGION, QUARTERS ENDING MARCH & JUNE 1998)

<i>Item</i>	<i>Amount (Tsh)</i>	<i>%</i>
Expenditures	13,567,032	100%
Rev Collection	1,934,778	14%
Patrol & Enforcement	5,014,327	37%
PRA	4,216,823	31%
Administration	2,401,104	18%
Revenue Collected	13,228,061	
Retention	2,200,000	
as a % of revenue	17%	

Retention is of course a “rule of thumb,” and while it does create constraints at district or regional level, it is not the most binding constraint.⁵⁰ If one believes in targets, contracts and accountability, retention needs to be placed within this context. Under this scenario, the current retention system needs to be completely reversed. Once local institutions, such as the Tanga Catchment Forest Project become accountable for reaching particular collection targets they need to have the freedom to realign staff as it sees fit.

Though this is a huge leap of faith, the following is **recommended**:

1. A revenue target of Tsh 120 Million be established for the Tanga Catchment Forest Project.
2. The Project pay all expenses from this revenue (staff, equipment, etc.)
3. 30 Million Tsh (25%) be transferred to the Ministry as its retention.

⁵⁰ Therefore I have accorded it very little space.

4. 50% of all revenues collected over and above the 120 Million target be retained by the Catchment Forest Project, with the remainder being transferred to the Ministry.
5. Failure to reach targets in overall revenue or in the amount transferred results in the termination of employment of the Project Manager and Revenue Collector.

Having revenue targets established for sub-institutions within the current FBD structure has other implications that need to be considered:

1. There must be an institutional separation of “conservation” and “production” (revenue collection). The revenue arm should not be paying for or interfering with conservation.
2. Instead, conservation should be paid by a transfer of funds from the Ministry. These funds come from the “retention” scheme, whereby 25% of fees collected by the “production arm” are transferred to the Ministry.
3. **The old system, where districts largely collected and Catchment Forest Projects largely conserved achieved this separation, and should be returned.**

{ } targets on a district level...

7.8 Administration: Procedures and Documents

The current system of ERVs, Felling Licenses, Transit Passes, and External Transit Passes, though not routinely followed in Tanga, is more bureaucratic than the old system. Unfortunately, it adds little in the way of control. Similarly, forcing all Felling Licenses to be issued in Tanga is more bureaucratic than a system in which licenses were issued locally, at district level. If anything, extra bureaucracy is likely to encourage more shortcuts, and therefore reduce compliance. Where the system is hierarchical with ERVs being “covered” by Felling Licenses, Felling Licenses being “covered” by Transit Passes, and Transit Passes being covered by External Transit Passes, a transporter merely needs to flash his external transit pass and claim the other documents are elsewhere. Secondly, the current system focuses regulation on production, not marketing. Since stock registers are not kept nor monitored and since there is no way to ensure that hammer marking is not being paid for directly by cutters and buyers, the current system fails to regulate saw-millers and timber dealers. If hammered, all wood has to do is reach sawmills and timber dealers; there it has entered a “safe haven.” Underlying felling licenses are no longer traceable, because sources and dates of production cannot be differentiated from within a given stack of planks.

Administratively, the following key components are recommended for a new royalty monitoring system:

1. A minimum number of forms: at most 1 or 2.
2. A focus on transport and marketing, not production. As this survey has shown, much of what is currently paid is commercial: in general what is harvested must eventually be sold.
3. The prepayment of fees.
4. Competing monitoring bodies.
5. An effective deterrent be established through a system of fines.

Two systems having these qualities are outlined below.

7.8.1 ADMINISTRATIVE SYSTEM A: THE SINGLE CASCADING CHECKLIST

This system aggregates current forms into a single, solitary, simple checklist. Each important activity is signed and stamped by the relevant and responsible forestry officer.

Four points should be evident in the prototype form contained below:

1. The key is line 5, which gives the form its transportation basis. For example, a 7 ton lorry will pay a royalty fee based upon a nation-wide capacity assumption: for example, Tsh 200,000 for Class A timber in a 7 ton lorry, Tsh 45,000 for charcoal in a 10 ton lorry, and so forth. As is, the owner of a 10 ton lorry can apply for licenses of 10 bags of charcoal although its capacity may be 15 times higher.
2. Each transport transaction will require that the form be filled out as 7 or 8 copies (or 7 or 8 times): when the officer permitting the extraction signs the form, he retains a copy but the other copies continue down the line (they *cascade*); when the officer at the production site witnesses the extraction he retains a copy; when the checkpoint officer witnesses the transportation of a product, he retains a copy; when the ultimate purchaser of the product is delivered the goods, he is transferred the document. Ultimately, all forms are reconciled.
3. The officer's signature is a "contract," "I witness..." Failure to uphold the contract results in termination of employment.
4. Officer's downstream are offered rewards for finding inconsistencies upstream

An example is contained on the next page.

Forestry Royalty Application: *(One product per Form)*

Data & Information	Signature of Officer	Stamp of Officer
<p>Back-ground</p> <p>1. Applicants Name:</p> <p>2. Registration Certificate Number</p> <p>3. Forest Product</p> <p style="padding-left: 20px;">(example Charcoal, Mninga, Mkora)</p> <p>4. Source of Product</p> <p>5. Mode of Transport (check one)</p> <p style="padding-left: 20px;"><input type="checkbox"/> 7 ton lorry: (x m³, y bags)</p> <p style="padding-left: 20px;"><input type="checkbox"/> 10 ton lorry (x m³, y bags)</p> <p style="padding-left: 20px;"><input type="checkbox"/> CL railway wagon (x m³, y bags)</p> <p style="padding-left: 20px;"><input type="checkbox"/> CLB railway wagon (x m³, y bags)</p> <p>6. Vehicle Registration Number</p> <p>7. Checkpoints to Pass</p> <p style="padding-left: 20px;">7.a</p> <p style="padding-left: 20px;">7.b</p> <p style="padding-left: 20px;">7.c</p> <p style="padding-left: 20px;">7.d</p> <p>8. Final Recipient of Product</p>	<p>.....</p> <p>I certify that the applicant has a valid Registration Certificate Number and orders than he or she must pass the checkpoints specified in item 7.</p>	<p>.....</p>
<p>ERV</p> <p>9 ERV Number</p> <p>10. Date Paid</p> <p>11. Place of Payment (i.e. District)</p> <p>12. Amount Paid (Tsh)</p>	<p>.....</p> <p>I certify that the applicant has paid</p>	<p>.....</p>
<p>Permis- sion to Extract</p> <p><u>What:</u> the forest product specified in line 3 from the source specified in line 4 having the amount corresponding to line 5 and to pass the locations specified in lines 7</p>	<p>.....</p> <p>I permit the above agreed upon extraction and production</p>	<p>.....</p>
<p>Produc- tion & Loading</p> <p>13. <u>Form of Product</u> <u>Amount:</u></p> <p style="padding-left: 20px;"><input type="checkbox"/> planks</p> <p style="padding-left: 20px;"><input type="checkbox"/> sleepers</p> <p style="padding-left: 20px;"><input type="checkbox"/> logs (m³)</p> <p style="padding-left: 20px;"><input type="checkbox"/> bags</p>	<p>.....</p> <p>I witnessed the product in line 3 being loaded onto the vehicle on line 6 in the amounts specified in line 13.</p>	<p>.....</p>
<p>Check- point & Export</p> <p>Checkpoint 7.a</p> <p>Checkpoint 7.b</p> <p>Checkpoint 7.c</p> <p>Checkpoint 7.d</p> <p>Officer Approving Export</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>We witnessed the product in line 3 being transported by the vehicle on line 6 in the amounts specified in line 13.</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>Final Destinat ion</p>	<p>.....</p> <p>Signature of person in line 8</p>	<p>.....</p>

The above system requires several well positioned and functional checkpoints, and much intra regional and district co-operation (for example charcoal going from Kabuku to Dar, might pass checkpoints in Chalinze, Bungu, etc). It seems a bit costly.

7.8.2 ADMINISTRATIVE SYSTEM B: THE FORESTRY "LUKU"

Because of non-repayment of debt, and because of high administrative costs, electricity in Dar es Salaam is currently sold on a **prepayment** basis, through a "LUKU Card." Forestry royalties can be administered in a similar way. Royalties could be paid on a flat "time license" basis according to means of transport. Cards would entitle the transporter to one day of "7 ton charcoal transport" or one day of "7 ton timber transport" and would have fixed expiration dates and times: for example, Tsh 200,000 for a 7 ton lorry of Class "A" timber. Unlike the scheme above, this is somewhat prone to double taxation. For example, transporter "B" ferries logs from a production site to a saw-miller. He pays for his "Royalty LUKU." The saw-miller must transport planks (in a 10 ton lorry, for example) to the railroad station, he pays for his "Royalty LUKU." Businesswoman "C" loads the railway wagon (she pays for her LUKU") and sends the load to Dar es Salaam. Businessman "D" receives the load, puts it on a 10 ton lorry and delivers it to a go-down for retail. He pays his "LUKU." Laminated Royalty LUKU cards should be fully transferable.

LUKU takes care of commercial lorry transport, but the system needs to apply as well to bicycles, carts (*mkokoteni*), private individuals and drivers of petrol tankers, containers, etc. Concerning these, I would **recommend**:

1. Bicycles and Carts pay a monthly or weekly LUKU fee, and get a "LUKU sticker."
2. The transport of 2 or fewer bags of charcoal by motorised vehicle be tax free.
3. Transporters of 2 or more bags of charcoal by motorised vehicle (for example petrol tankers etc) pay the same rate as a 3 ton lorry.

The LUKU system focuses entirely on transport; **opening or closing areas for seasons** (or other periods of time) become FBD's decision variable to control felling and encourage conservation (i.e. the "conservation arm").

7.8.3 DETERRENCE

In any successful tax system compliance is largely voluntary. The current forestry laws permit the confiscation of vehicles and loads when proper documentation cannot be produced. Because this action is rarely followed, illegal felling and transport continues.

Quiz: Transporter "A" owns a 3 ton Canter valued at Tsh 6 Million. He transports 80 bags of charcoal per day from Kabuku to Tanga. These are valued at 3,000 Tsh per bag. If the forestry department stops his vehicle his load is confiscated. On average he suspects he will be caught by a patrol once every 20 days. The tax on a bag of charcoal is Tsh 300. Transporter A is morally neutral, all decisions he makes are done on a strictly business basis: that is, are they be profitable? Should Transporter "A" pay the Tsh 300 royalty on charcoal?

Answer: "A" wants to minimise costs. If he pays the royalty, the daily cost will be Tsh 24,000 (300 Tsh per bag × 80 bags). Since he expects to be caught once every 20 days, his daily probability of being caught is 0.05. When caught his loss will be Tsh 240,000 (the value of his load). He should therefore expect on a daily basis to lose Tsh 12,000 (Tsh 240,000 × 0.05). Morally neutral "A" will therefore avoid the tax: the combination of the size of penalty and probability of having the penalty applied (the deterrent effect of the fine) is too low.

Since revenue collectors do not have the means to frequently patrol, penalties need to be increased to create an effective deterrent. If one is serious about tax collection, then not only

illegal loads but the means of transporting these illegal loads should be confiscated. Furthermore, the confiscation business should be liberalised to allow for **competing monitoring bodies**. Under this scheme monitoring needs to be made into a profitable activity in its own right. Large rewards (the fruits of confiscation) are needed to remove monitoring from the influence of petty bribery.⁵¹ Competing, authorised monitoring agents could include registered auctioneers, TRA (Tanzania Revenue Authority), Traffic and Customs Police, TRC (Tanzania Railroad Corporation), the anti-poaching unit (wildlife department), and the Forestry Department.

Under the current system there would need to be a way of dividing the LUKU proceeds between the Ministry, Region, and district.⁵² LUKU can only be run on a pan-territorial (national) basis.

To summarise: a transporter pays a fixed “LUKU” rate to ferry his load(s). Along the way are competing confiscation units. The deterrent of confiscation (confiscator takes means of transport) creates an incentive to voluntarily comply. LUKU proceeds are divided up between the Ministry (in charge of administering conservation) and the districts (in charge of selling LUKU cards and catching offenders).

7.9 Legal and Policy Issues

This chapter has looked at:

1. Who should carry out the various function of the Forestry Department (an institutional analysis)
2. How should the revenue collection function be carried out (what procedures, documents, and financial control should be in place).
3. How can performance be monitored (what incentives, rewards and punishments, are necessary).

Unfortunately, these three issues should not be viewed in isolation; they are intimately related.⁵³

Theory is quite specific about the effects of open access land ownership on conservation; an area in which no attenuated property rights exist will be “over-fished.” Over-exploitation is mitigated however by the development of informal management rules and organisations (example, Sethi and Somanathan, 1996). These institutions often take time to develop, and since population pressures are relatively new (in many areas in Tanzania), informal means are largely absent. In fact, most relationships at local level are characterised by distrust rather than co-operation (Scheinman and Mabrook, 1996). Generally speaking, property rights increase conservation because actions today will affect the owner tomorrow (there is a user cost); unfortunately the costs of establishing property rights, especially in frontier or marginal areas, may outweigh the benefits.

The current system of taxation is not in any serious way related to management; it is largely a revenue earner. Worse still, the costs of collecting these taxes are high compared to revenues. This is due both to inefficiency in the collection process and in the sparse geography of the collection catchments. There is currently no system of evaluation, where the Ministry says “royalties in location “A” are worth chasing, but royalties in location “B” are not. I have therefore argued for a complete separation of the following functions:

⁵¹ Ways around the system include counterfeiting or forging LUKU cards, or falsifying dates (forgery). This can be eliminated by allowing monitoring institutions to place their stamps, with dates, on the back of the card following an inspection.

⁵² Unless bodies could put a surcharge on the “LUKU.” Again, charcoal is taxed many times. For example, on its way to Tanga from Maramba it passes the Pangarawe checkpoint (Muheza) to pay 75 Tsh to Muheza District council. When it reaches the Amboni checkpoint it pays 100 Tsh to Tanga Municipality and 300 Tsh to the Central Government. This multiple taxation also creates an overlap on who should collect the Central Government tax. Transporters stopped by foresters in Maramba say, “we’ll pay in Amboni.”

⁵³ On one hand, they need to be mentioned. On the other a 1½ month consultancy is not the best forum.

1. Conservation: this applies largely to areas of biodiversity and catchment value, but also to productive areas which become “closed” (even seasonally). As the analysis of charcoal prices indicated, there appears no scarcity of wood products, so closing areas should be quite rare. As in the proposed new Forestry Legislation, villages will be sub-contracted to manage local areas. Tree planting and boundary demarcation would fall under this arm.
2. Management of Plantations and old growth forests: the Ministry gets the “rent” of these very productive areas.
3. Revenue Collection: two basic systems were outlined. If the current system is retained, I have recommended a procedure of targets and contracts, and an alteration in the shares currently retained at each level. An alternative, the LUKU system, makes all revenue collection transport focussed. Since transporters prepay, revenue collectors merely enforce. Competing monitoring bodies are encouraged and a system of effective deterrence is needed. This is surely a long-shot.

CHAPTER SEVEN: BIBLIOGRAPHY AND TERMS OF REFERENCE

7.1 Terms of Reference

The objectives of the study were to:

1. Estimate the amount and royalty value of the forestry products which presently are traded illegally or legally in Tanga Region by tax and product categories and area (districts).
2. Assess the relevance and effectiveness of the present methods for collecting forestry revenue including the trends in the means for and the amount collected over the past five years.
3. Review the present government financing into the forestry sector in Tanga Region, especially in light of the past performance in revenue collection.
4. Propose means of improving the efficiency of forestry revenue collection, including ways of streamlining the structure of taxed products and providing incentives for more effective capture of forestry royalty.
5. Assess the possibility for the establishment of a local forestry retention scheme to support Local authorities.

7.2 Conversion Factors Used

Conversion factors used in the course of this report are found in the following tables, which are based on Holmes (1995, page 514)

TABLE 33: CONVERSION TO ROUND WOOD OVER BARK

<i>Product</i>	<i>Unit</i>	<i>m³ round wood</i>
Charcoal	Metric ton	6
Coniferous Sawn Wood	m ³	1.67
Broad Leafed Sawn Wood	m ³	1.82
Sleepers	m ³	1.82
Plywood and Blackwood	m ³	2.30

TABLE 34: TONS PER M³

<i>Product</i>	<i>General</i>	<i>Coniferous</i>	<i>Broad Leaves</i>
Logs		.700	.730
Fuelwood	.725	.625	.750
Sawn wood		.550	.700
Sleepers	.780		
Plywood	.650		

Other values, not found in the above source, used in this study are:

TABLE 35: OTHER CONVERSIONS

<i>Item</i>	<i>Value</i>
1 inch	2.54 centimetre
1 foot	12 inches
Volume of fuelwood in stacked metres carried per bicycle	0.25

7.3 Bibliography

- Bank of Tanzania.** "Economic Bulletin, for the quarter ended 31st March 1995," 1995. (and various other issues).
- Berck, Peter.** 1995. "Empirical Consequences of the Hotelling Principal," in *The Handbook of Environmental Economics*, (edited by Daniel Bromley), Basil Blackwell Ltd., Oxford, UK.
- Conrad, Jon, M.** 1995. "Bioeconomic Models of the Fishery," in *The Handbook of Environmental Economics*, (edited by Daniel Bromley), Basil Blackwell Ltd., Oxford, UK.
- Forestry and Beekeeping Division.** 1998. "Proposed Action Plan for Improvement of Revenue Collection."
- Holmes, John.** 1995. "Natural Forest Handbook for Tanzania." Sokoine University.
- Jaskow, Paul, L.** 1997. "Restructuring, Competition and Regulatory Reform in the US Electricity Sector," *Journal of Economic Perspectives*, Volume 11, Number 3 page 119-138.
- KFMP, 1994.** "The Use of Forests to meet Human Needs," KFMP Forest Department, Nairobi.
- Kobb, Daniel and Mpelumbe, George,** 1997. "Summary of Findings: Revenues in 5 District Councils in Northern Tanzania," Village Development Programme and NRBZ.
- Kobb, Daniel and Mpelumbe, George,** 1996. "Revenue collection in Muheza District," Village Development Programme.
- Kobb, Daniel and Mpelumbe, George,** 1996. "Revenue collection in Korogwe District," Village Development Programme.
- Kobb, Daniel and Mpelumbe, George,** 1996. "Revenue collection in Handeni District," Natural Resource and Buffer Zone Programme.
- Kobb, Daniel and Mpelumbe, George,** 1996. "Revenue collection in Lushoto District," Natural Resource and Buffer Zone Programme.
- Koppers, Bert,** 1997. "Production and Marketing of Forest Products in Tabora Region." Forest Resource Management Project.
- Ministry of Tourism, Natural Resources and Environment.** 1994. "Tanzania Forestry Action Plan."
- Montgomery, Claire and Adams, D.M.** 1995. "Optimal Timber Management Policies," in *The Handbook of Environmental Economics*, (edited by Daniel Bromley), Basil Blackwell Ltd., Oxford, UK.

Mwanga District Council, 1998. "Taarifa ya uchunguzi wa ukusanyaji wa mapato katika baadhi ya vyanzo vya mapato ya halmashauri."

Scheinman, David and Aisha Mabrook, "The Traditional Management of Coastal Resources," Tanga Coastal Zone Conservation and Development Programme, June 1996.

Sethi, Rajiv and Somanathan, E., 1996. "The evolution of Social Norms in Common Property Resource Use," *American Economic Review*, Volume 86, Number 4, pages 766-788.

Silviculture Ltd, "Forest Revenue Collection in Tanzania," World Bank, Tanzania, August 1991.

TFAP (Tanga) 1990. "Tanga Region TFAP (draft)."

The Planning Commission and Regional Commissioner's Office Tanga. undated. "Tanga Region Socio Economic Profile."

Vehkamäki, Seppo, 1993. "Tanzanian Forestry Sector in the Economic Context." TFAP Working Paper 1/93.

World Bank. 1996. "Staff Appraisal Report: National Agricultural Extension Project Phase II." Washington, D.C.

**Appendix of Maps,
Calculations and Figures for:**

**"Forestry Royalties in Tanga Region:
Paper versus Reality"**

**by
Daniel Kobb**

October 1998

A.2 Calculations used in Chapter Two

TABLE 36: SOURCES OF FELLING LICENSE ROYALTY

AREA	Source	%
East Handeni (55%)	<i>Mgambo (Komkonga/Kabuku/Mzundu Area)</i>	32.26%
	Luye P/L	14.16%
	Chanika Kofi P/L	5.87%
	Chogo P/L	4.81%
	Kabuku Ndani P/L	1.94%
	Kwamnondole P/L	1.82%
	Kitumbi, Komkonga P/L	1.30%
	<i>Mazingara (Handeni-Mkata Road)</i>	11.16%
	Kwachaga P/L	3.10%
	Mkata P/L	2.74%
	Kwedibawe P/L	2.43%
	Mazingara P/L	1.67%
	Suwa, Kwemsanga, Handeni Town P/L	2.04%
	<i>Magamba (Handeni-Turiani Road)</i>	5.30%
	Negero P/L	2.04%
	Madebe P/L	1.82%
	Kangata, Vulala Kimbe P/L	1.44%
	<i>Sindeni & Kwamatuku (Korogwe-Handeni Road)</i>	4.46%
	<i>Segera-Korogwe Road</i>	2.74%
<i>Kwamsisi (Poza, Genda Genda P/L): Near Pangani</i>	1.46%	
Korogwe Usambaras (16%)	<i>Bungu</i>	12.96%
	Mashindei P/L	5.90%
	Ambangulu P/L	2.59%
	Tamota P/L	2.01%
	Lutindi P/L	1.14%
	Ngulu, Manka, & Vugiri P/L	1.32%
	<i>Dindira</i>	3.27%
	Mali P/L	2.44%
	2 others	0.83%
	West Handeni (14%)	<i>Mswaki</i>
Muongano P/L		3.69%
Mswaki P/L		1.47%
Mkonde P/L		0.36%
<i>Kilindi</i>		5.17%
Kilindi P/L		1.68%
Lulago P/L		1.61%
Tamota P/L		1.53%
Lwande P/L		0.36%
<i>Mgera (Kwediboma, Mgera, Pagwi, Songe)</i>		2.50%
East Usambaras (8%)	Kiwanda P/L	1.94%
	10 others in East Usambara	2.41%
	Maramba/Magoma (Kizara & 8 Others P/L)	3.17%
	<i>Bozo-Muheza Road (Masaika, Madanga & 2 others)</i>	2.27%
	<i>Mwera: Mtango, Maji Meupe and 8 others</i>	2.56%
Others (2%)	<i>Mombo South</i>	1.16%
	<i>Tanga Municipal</i>	0.43%
	<i>Muheza-Hale Road</i>	0.51%
	<i>North Coast (Moa, etc. in Muheza District)</i>	0.28%

FIGURE 2: MAP OF FELLING LICENSES

Original Image Missing

TABLE 37: FELLING LICENSE ROYALTIES BY TREE SPECIES

<i>Tree Type</i>	<i>% by Total Value</i>	<i>Average Royalty Per Harvest</i>	<i>Average Number Of Trees per harvest</i>	<i>Average Cubic Metres Harvested</i>	<i>m3 per tree harvested</i>
Mtundu	22.7%	264,298	18.7	24.5	1.31
Muhuhu	20.2%	363,694	36.3	16.3	0.45
Mnyasa	14.0%	215,237	3.1	9.6	3.08
Mkingu	8.6%	56,220	3.6	5.0	1.39
Mninga	4.5%	78,275	4.3	3.5	0.82
Mkomba	3.5%	107,799	4.9	5.3	1.07
Mpingo	3.0%	260,500	19.0	4.6	0.24
Mgude	2.9%	178,502	34.3	45.2	1.32
Mvule	2.1%	114,295	1.5	5.5	3.68
Mbarika	1.9%	74,104	2.1	12.8	6.13
Mshai	1.4%	62,564	0.7	5.8	8.22
Mperamwitu	1.4%	301,975	28.0	6.0	0.22
Mringaringa	1.0%	106,745	2.5	10.8	4.31
Mninga Maji	1.0%	140,908	3.7	5.6	1.54
Mbambakofi	1.0%	46,066	1.1	2.1	1.88
Mkenge	0.9%	75,936	2.6	7.7	2.95
Myasa	0.8%	357,960	8.0	17.9	2.24
Muhuh	0.7%	303,000	40.0	12.1	0.30
Mvinjepori	0.7%	50,417	2.2	2.7	1.23
Mkarambati	0.6%	245,800	18.0	9.8	0.55
Msandarusi	0.6%	60,363	6.5	6.1	0.93
Wantona	0.5%	236,150	3.0	9.4	3.15
Msaraka	0.5%	76,847	10.0	3.8	0.38
Mhuhu	0.5%	230,500	25.0	9.3	0.37
Mperamwiti	0.4%	180,000	0.0	3.0	
Mngongo	0.4%	89,010	15.0	29.7	1.98
Mtunu	0.4%	159,170	14.0	15.9	1.14
Mkangazi	0.4%	155,320	3.0	7.8	2.59
Mnofi	0.3%	30,165	12.4	8.1	0.65
Mkuti	0.3%	37,680	1.0	11.5	11.47
Mkulwi	0.3%	18,167	2.3	2.9	1.29
Mtondoro	0.3%	15,114	2.7	3.7	1.38
Miovu	0.3%	64,608	3.0	8.1	2.69
Mkarati	0.2%	81,480	5.0	16.3	3.26
Mikula	0.2%	74,200	2.0	3.7	1.86
Msufipori	0.2%	67,350	5.0	13.5	2.69
Mbambakori	0.1%	60,600	4.0	2.4	0.61
Mitondoro	0.1%	14,460	3.0	3.9	1.32
Mbaruka	0.1%	48,200	0.0	9.6	
Mningamaji	0.1%	46,200	2.0	2.3	1.16
Msambo	0.1%	42,000	3.0	5.2	1.72
Mbukwe	0.1%	41,994	3.0	14.0	4.66
Mkora	0.1%	37,500	2.0	1.9	0.94
Miyombo	0.1%	35,360	4.0	3.5	0.89
Tondoro	0.1%	33,780	3.0	3.4	1.13
Mkingo	0.1%	30,000		2.2	
MsufiMwitu	0.1%	24,035	4.0	4.8	1.20
Mkula	0.1%	22,400	1.0	1.1	1.12
Mitindoro	0.0%	16,080	3.0	5.4	1.79
Mzambarau	0.0%	15,940	0.0	0.8	
MsofiPori	0.0%	14,880	2.0	3.0	1.49
Mningapori	0.0%	11,820	1.0	0.5	0.52
Mnyanya	0.0%	6,800	2.0	1.4	0.68

FIGURE 2: DAILY FELLING LICENSE REVENUE VALUES

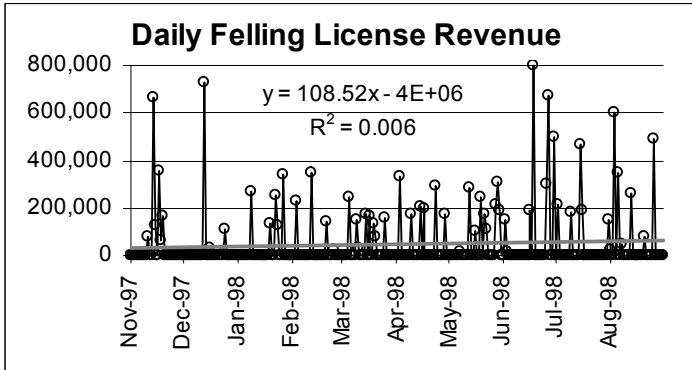
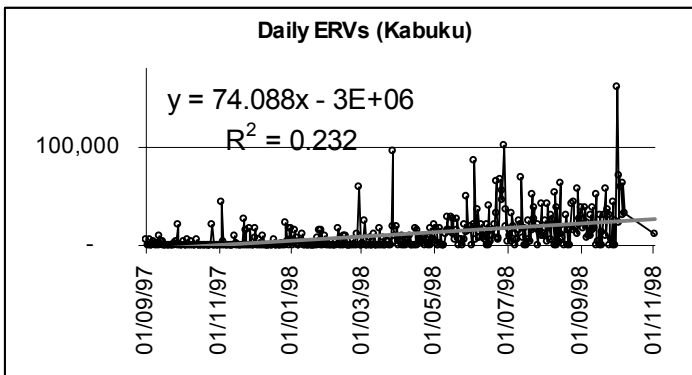
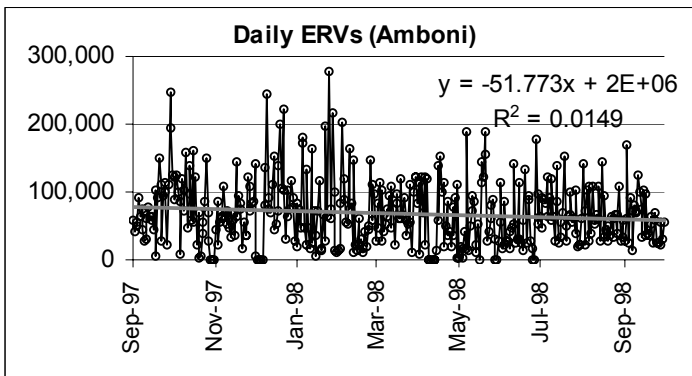


FIGURE 3: DAILY ERV VALUES (KABUKU AND AMBONI)



A.3 Calculations Used in Chapter Three

TABLE 38: BAGS OF CHARCOAL, BY HOUR, AMBONI CHECKPOINT

<i>Time</i>	<i>04/09/98</i>	<i>08/09/98</i>	<i>11/09/98</i>	<i>13/09/98</i>	<i>Average</i>
1	0	0	0	0	0.00
2	0	0	0	0	0.00
3	0	0	0	0	0.00
4	0	0	0	0	0.00
5	5	5	0	0	2.50
6	5	2	0	6	3.25
7	12	31	10	19	18.00
8	48	40	3	50	35.25
9	39	14	17	25	23.75
10	41	36	37		38.00
11	4	13	17		11.33
12	0	7			3.50
13	0	7			3.50
14	0	0			0.00
15	19	3			11.00
16	11	2			6.50
17	2	3			2.50
18	1	7			4.00
19	0	2			1.00
20	0	0	0		0.00
21	0	0	0		0.00
22	0	0	0	0	0.00
23	0	0	0	0	0.00
24	0	0	0	0	0.00
Total	187	172	84	100	164
<i>Total Hours Watched</i>	<i>24</i>	<i>24</i>	<i>16</i>	<i>12</i>	

TABLE 39: ESTIMATED ANNUAL ROYALTIES PAID USING ROADBLOCK OBSERVATIONS

<i>Site</i>	BICYCLES		COMMERCIAL		DRIVERS		BUSES		ROW SUM	
	<i>Char</i>	<i>F. Wood</i>	<i>Char</i>	<i>F. Wood</i>	<i>Char</i>	<i>F. Wood</i>	<i>Char.</i>	<i>F. Wood</i>	<i>Total</i>	<i>%</i>
Amboni	18.0	5.1	44.7	0.7	2.1	0.0	0.0	0.0	70.6	81.8%
Mizani	0.0	0.0	10.5	1.5	0.0	0.0	0.0	0.0	12.1	14.0%
Pangani	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
Bwiko	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	3.7	4.3%
Manga	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
Total	18.0	5.1	59.0	2.2	2.1	0.0	0.0	0.0	86.3	100.0%
	20.8%	5.9%	68.3%	2.5%	2.4%	0.0%	0.0%	0.1%		

Note: All values in Millions of Tsh per year. Char = Charcoal; F. Wood = Fuelwood.

TABLE 40: JUNE 1997 SAMPLE AT BUNGU CHECKPOINT (DAR)

Source	Bags	%
Kabuku (Handeni)	198	3.27%
Mzenga (Kisarawe)	1990	32.85%
Lugoba (Bagamoyo)	1290	21.29%
Kibaha	890	14.69%
Gwata (Kibaha)	880	14.53%
Ubena (Morogoro)	810	13.37%
Monthly Total	6,058	100.00%
Daily Average	201.9	3.33%
Kabuku if 40% of Dar		1.31%

Notes: Bags of Charcoal recorded

FIGURE 4: NOMINAL CHARCOAL PRICES (TIME SERIES)

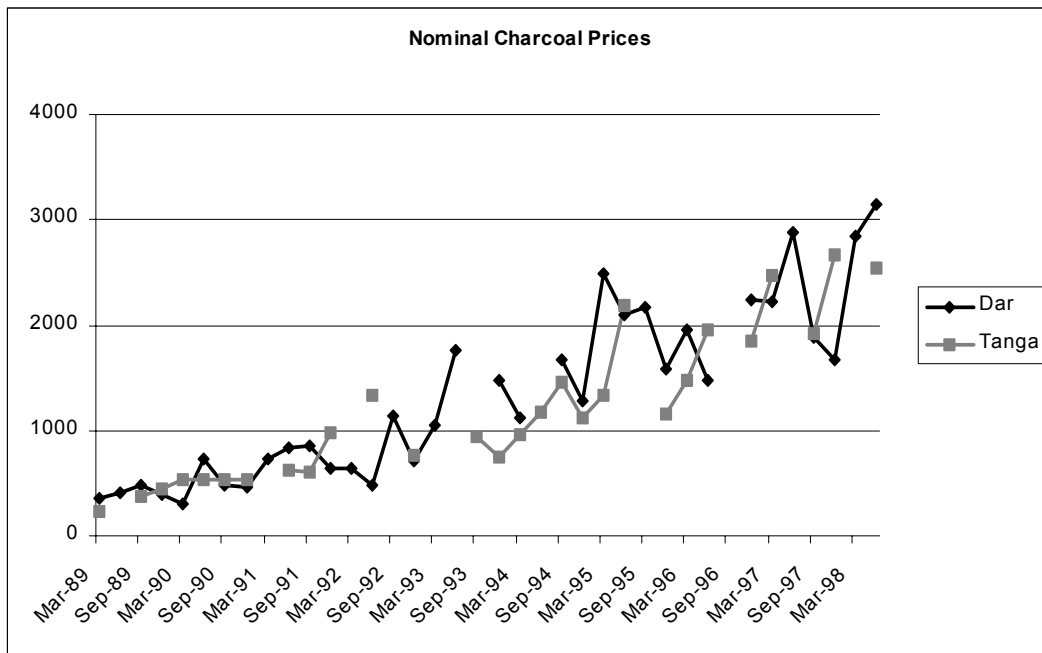


FIGURE 5: DAR ES SALAAM CHARCOAL PRICES

Original Image Missing

FIGURE 6: TANGA CHARCOAL PRICES

Original Image Missing

FIGURE 7: CPI PRICE INDEX

Original Image Missing

TABLE 41: ELECTRICITY PRICES IN TANZANIA

Usage	Rate (Tsh/KWh)	Flat Fee
0-100	28.8	200
101-500	46.5	750
501-2500	106.2	2,000
2500+	198.6	

A.4 Data used in Chapter Four (Timber)

Interview Form for Carpenters

Introduction

1. Jina langu ni _____
2. Natoka mradi moja inaitwa FINCREDIT, tuko Dar es Salaam. FINCREDIT iko chini ya balozi ya Finland.
3. Kule Dar es Salaam mradi yetu inasaidia biashara ndogo ndogo, kwa mfano fundi seremala na mama Ntilie na mikopo.
4. Mradi yetu haijanza Mkoa wa Tanga, kwa hiyo tuko hapa kwa siku 2 au 3 kufanya utafiti kidogo kuhusu biashara mbali mbali.
5. Tuna maswali kuhusu biashara yako na uzoefo yako na mikopo.

Background (fill in yourself)

Tarehe: _____

Location of Business: _____ (example Makora, Tanga)

Jina lako _____

Interview of Businessman/woman

Jina Yake au Jina ya biashara au Jina ya kikundi _____

Umeanza biashara lini? _____

Tunaomba historia kidogo ya biashara yako: (sikiliza usiandika)

Wiki iliopita, kwa siku saba, umetengenza nini (angalia kwa biashara yake):

Type of Wood	Product	Number of Planks	Size	Where got wood
Mninga	2 chairs	1	1X12X12	Mtongi Forest, Manga
Etc.				

Umewahi kupata mkopo (eleza):

What problems do you have in your business? _____

End

TABLE 42: NUMBER OF CARPENTERS AND TIMBER DEALERS INTERVIEWED, INCLUDING ABSENCES

<i>Location</i>	TIMBER DEALERS			CARPENTERS		
	<i>Total</i>	<i>Present</i>	<i>Absent</i>	<i>Total</i>	<i>Present</i>	<i>Absent</i>
Hale	1	1	0	5	5	0
Handeni	3	3	0	21	15	6
Korogwe	3	3	0	10	9	1
Lushoto	2	2	0	12	12	0
Maramba	0	0	0	6	5	1
Mombo	3	2	1	9	8	1
Muheza	0	0	0	12	8	4
Pangani	1	1	0	13	7	6
Soni	0	0	0	7	7	0
Totals	13	12	1	95	76	19

TABLE 43: TYPE OF WOOD USED BY CARPENTERS

<i>Location</i>	<i>Type Of Wood</i>	<i>%</i>
Hale	Mkomba	67%
	Mkingu	29%
	Mvule & Mshai	4%
Handeni	Mninga	59%
	Mkingu	39%
	Mtundu & Mkomba	2%
Korogwe	Mvule	60%
	Mnyasa	30%
	Mkangazi	10%
Lushoto	Camphor	92%
	Mnyasa	7%
	Cedar	1%
Maramba	Mshai	100%
Mombo	Mvule	50%
	Mkomba	31%
	Mkangazi & Mninga	19%
Muheza	Mkingu	58%
	Mnyasa	39%
	Mvule	3%
Pangani	Mbambakofi	74%
	Mvule	15%
	Mkingu	10%
Soni	Mnofi	1%
	Camphor	83%
	Mkingu	17%