# IV. 本格調查内容

### 1. 森林資源調査

# 1-1 調査対象地域とフェーズごとの調査内容

S/W協議を経て、本格調査における調査地域を要請書に記されているとおり、グワーイ森林地域14万4,000へクタール及びペンペジ森林地域5万5,100へクタール、計約20万へクタールとし、この調査地域の中に詳細調査地域約5万へクタールを設定した。詳細調査地域は、地理的な観点から人為的な影響を受けやすい地域であり、早急に森林資源情報を把握して対策を講じることが求められているという判断により、幹線道路を挟んで移住地域と隣接する林班及びルバネと移住地域の間にある林班とした(図N-1参照)。これにより、DFIDのプロジェクトは予定されている本格フェーズの実施中に本案件の成果を活用することができ、林業委員会が同地域において森林計画を策定する際に直接的に利用することが期待される。

本調査は[森林保全計画] 策定の前段である [森林資源調査] を主目的とすることとしたため、 本格調査は2つのフェーズに区分し、以下のような内容とした。

第1フェーズ:調査地域における概況調査、航空写真撮影及び土地利用植生図の作成第2フェーズ:詳細調査地域における森林資源調査、土壌調査、各主題図の作成

#### 1-2 第1フェーズの調査内容

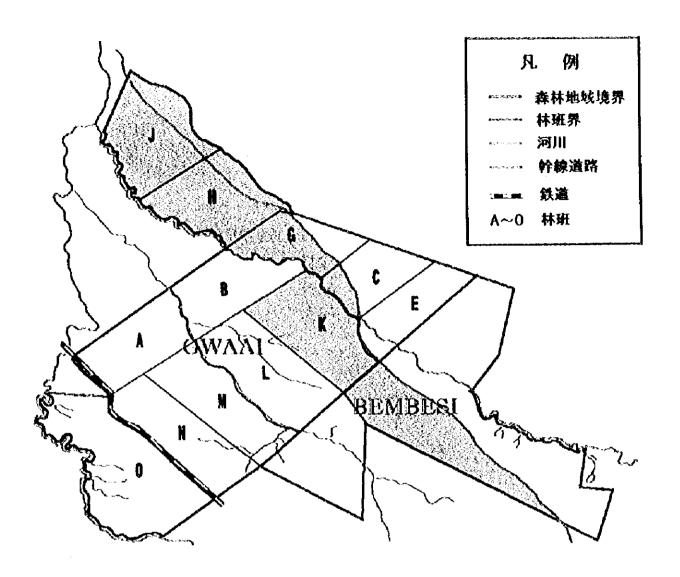
#### (1) 調査地域における概況調査

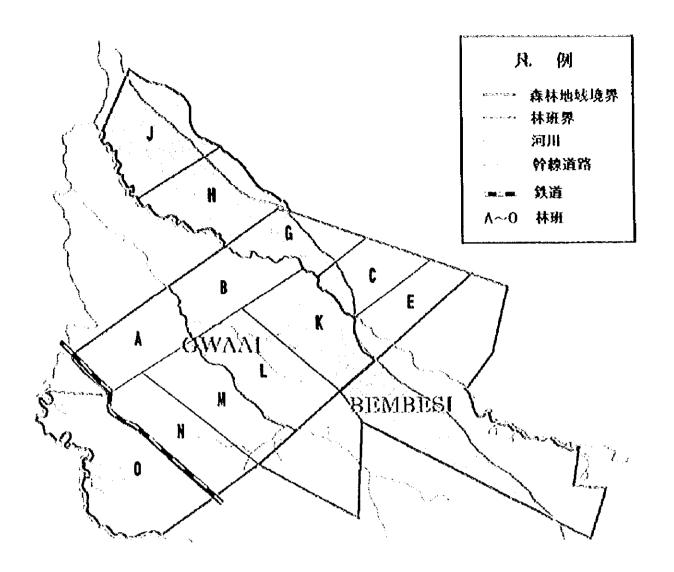
調査地域における概況調査は以下の項目とし、主に既存のデータ・情報の取りまとめ・ 分析により行い、必要に応じて現地調査を行うものとする。

- 1) 政策的枠組み:関連法令等(本報告書皿の1-2(2)参照)、林業委員会の組織(同皿の1-2(1)参照)、等
- 2) 自然条件:位置・地形、気象・水文、地理、土壌、植生、主用樹種(同Nの3-1参照)、 等
- 3) 社会・経済条件(同皿の3参照):人口、土地所有、経済活動、社会機構、等
- 4) 森林・林業関連:森林火災の現状及び対策(18)、用材・薪炭材生産、非本質林産物、管理(同間の1-3-1参照)、市場、等

注:

<sup>(</sup>i8) 林業委員会郷土資源部では、放牧の導入による可燃物の除去、すなわち牛を林内に入れ、下層植生を食べさせる 方法を森林火災防止策として導入を検討している。興味深い取り組みであり、モニターする必要があると思われる。





5) 環境関連:動植物層、土地劣化、等

#### (2) 航空写真撮影

調査地域約20万ヘクタールにつき、モノクロ縮尺2万分の1の航空写真を撮影する。

#### (3) 土地利用植生図の作成

調査地域約20万ヘクタールにつき、本調査で撮影する航空写真の判読に基づき、集落、 農耕地、森林、草地、道路などの土地利用状況を区分し、5万分の1の縮尺で作成する。

#### 1-3 第2フェーズの調査内容

#### (1) 詳細調査地域における地形図の作成

インテンシブ・エリア約5万ヘクタールを対象に縮尺2万分の1の地形図を作成し、主 題図の基図とする。

# (2) 詳細調査地域における森林資源調査

森林資源調査は、航空写真の判読及び現地調査によって行い、森林調査簿及び、上記の地形図をベースにした縮尺 2 万分の 1 の森林型図を作成する。詳細調査地域は起伏も少なく、その他の自然条件も比較的単純であり、出現の期待される樹種はそれほど多くはないものと思われる (巻末資料に「ジンバブエ国西部天然林地域主要樹種の検索表と種の記載」参照)。また、基本的には人工林、アグロフォレストリー、放牧地などはなく、森林型としては「Baikiaea 優占森林」、「Baikiaea — Brachystegia 混交森林」、「Colophospermum mopane 潅木地」、「河岸森林」といった程度の区分ができるものと思われる。これらの区分の森林につき、樹冠疎密度、樹種、樹高、胸高直径、林齢のほか、森林火災及び自然的・人為的要因による森林劣化の状況などについて調査を行う。なお、グワーイ・ベンベジ両森林地域について、Baikiaea plurijuga、Pterocarpus angolensis、Guibourtia coleosperma、の 3 樹種については、粗略ながらかつて資源調査が行われている。

#### (3) 詳細調査地域における土壌調査

土壌調査は、詳細調査地域について行い、その結果を縮尺2万分の1の地形図上に土壌 図として表す。土壌の分類基準については、今回の調査においては情報を得ていないので、 調査の実施に先立って林業委員会と打合せを行い、FAOの基準などを採用するものとす る。

#### 2. 社会経済調査

#### 2-1 社会経済調査概況

今回森林資源調査の補完調査として、グワーイ・ベンベジ両森林区のベンベジ用沿いの居住 世帯を対象に既存のFCの調査とDFIDの社会経済調査結果を収集し整理する。更に、補足 収集すべきデータとしては以下の3種が上げられる。

- (1) 当該森林区の行政所管であるルパネRDC、プビRDCで把握している世帯数、生活基 盤整備状況。
- (2) ブラワヨのIRD本部で把握している定住者の総世帯数や総人口。
- (3) 中央統計局(CSO)でマタベランド北部州の農村家計経済基礎情報を把握する。

#### 2-2 社会経済調査仕様(参考)

今回の本格調査ではJICA独自の社会経済調査は行わないが、森林保全計画を作成する とした場合の参考としてその仕様を作成したので以下に記す。

## (1) 調査の実施方針

- 1) 現在の定住者の地理的分布を把握する。
- 2) 定住者の世帯構造や生業を森林資源・非森林資源とのかかわりにおいて具体的に把握する。
- 3) 世帯の家計を中心に、家計経済基礎情報を把握する。

# (2) 調查対象世帯

- 1) 居住全世帯から地理的に南北に6クラス、川からの距離で2クラスに層別し200世帯 程度を抽出する。
- 2) 最終有効完全解答個表回収目標を 各クラス 10 サンプル、合計 120 世帯とする。

#### (3) 調查内容

- 1) PRA手法によるコミュニティー調査(3箇所で各30人程度)
  - ・生活空間構造と世帯構造
  - ・生活資源利用と管理の形態
  - ・インスティテューション (夫々の資源の利用者、管理者、慣行と取り決め)

- 2) 個別インタビューによる世帯の社会経済の主要調査項目
  - ・世帯の定住の経緯 (定住年数、移住元の地域名、出身部族)
  - ・世帯の構成 (複数世帯数、家族の年齢性別、域外就労の有無)
  - ・世帯で従事するアクテビティと家族の役割分担
  - ・家畜(種別、飼育頭数など)
  - ・農作物作物種別作付け面積
  - 森林資源の採取
  - 非森林資源の採取
  - · 生活状况

生活用水の水源、水源までの距離、水確保の役割を担う家族構成員、家庭用薪炭材の採取場所、薪炭材の採取確保を担う家族構成員、自己消費のために購入する(森林資源、作付け作物以外の)食料品の品目と入手先、基本的社会サービスの程度、年齢階層別主な病気への罹患経緯、対応処置(診療所へのアクセス)、学齢児童への初等教育の程度

#### (4) 調査手法と結果の分析まとめ

- 1) 抽出された200世帯を対象に個別インタビューを実施する。
- 2) 地理的に特徴ある3箇所を設定し、でPRA手法によって、コミュニティー生活構造、 森林資源使用と管理にかかわるインスティテューションを把握する。
- 3) 生活構造と資源利用と管理の態様から複数のコミュニティー像を構築する。
- 4) 森林資源保全管理計画策定に必要な社会経済的枠組みを提供する。

### (5) 調査期間

契約締結後4か月間とする。

## (6) 社会経済委託調査の工程と費用概算

1) ZEROやIUCNのようなローカルNGOに再委託調査した場合

NGOは一般管理費を15~30%課すが技術費は取らない。開発調査費の何割(又は何%)といった大枠予算内で提案させ随意契約を結ぶ方式がジンパブエ国では一般的。NGOはあまり詳細な項目別の内訳は提示できない。現地調査の部分は、実際には地元のジンパブエ大学の社会科学専攻の学生を組織して(以下の項目B.の第3月)、実行することが多い。

### a. 総額

人工費 10人・月×@ 30万円× 1,10~ 1,15 直接費 (旅費、日当、現地宿泊費用など)100~ 150万円程度

#### b. 工程と人・エ

- 第1月 調查準備設計(台帳作成、質問表設計) 3人月
- 第2月 PRA手法による調査 1人月(3箇所×1日/1箇所)
- 第3月 現地調査 3人月(現場調査員5人×3軒/日·人×5日/週×2.7週)
- 第4月 調査のまとめ、報告書作成 3人月

# 2) 地元に進出の欧米系現地法人コンサルに委託した場合 (Interconsultant)

提示する人工は、技術費と一般管理費込みで欧米コンサル並みの1か月150万クラスから50万ぐらいまでプロフェッショナルのランクによる幅が大きい。競争入札で価格は下がるが専門家の質も下がると見込まれる。先進国と同水準の高度なアプローチと洗練され質の高い英文報告書が期待できる。現地調査の指揮監督では先進国コンサルと同等程度のHardship Feeを要求するので日当、車両借り上げ、宿泊すべてNGOに依頼した場合よりも高くつく。

以下の項目B. の第2月、第3月の部分は、実際には地元のジンバブエ大学の社会科 学専攻の学生を組織して実行することが多い。

#### a. 概算見積り

人工費 6人・月×@ 100万円 (一般管理費+技術経費を含む) 直接費 (旅費、日当、現地宿泊費用など) 200~300万円程度

## b. 工程と人・エ

- 第1月 調查準備設計(台帳作成、質問表設計) 2人月
- 第2月 PRA手法による調査 1人月(3箇所×1日/1ヶ所)
- 第3月 現地調查 1人月(現場調查員5人×3軒/日·人×5日/週×2.7週)
- 第4月 調査のまとめ、報告書作成 2人月

#### (7) 再委託コンタクト先

#### A. IUCN-ROSA

ジンバブエ国で欧米のドナーが環境でよく使うNGO、スイス国に本部のある国際環境NGOで南部アフリカ諸国を統括する本部(ROSA)がハラレにある。ROSAの所長イェミケテレレ氏はFCのOBで社会林業ではアフリカで著名な人。住民参加型の生

物多様性保全、野生生物保護や環境一般の受託調査が得意だが、PRA手法で農村コミュニティーの社会経済構造の把握にも経験が深い。独自の行動倫理があるので単純な作業の再委託先とは考え難い。

社会調査部門はManuel Guveyaが責任者 (Email emg@iucnrosa.org.zim 電話ハラレ728266, 728267 住所 6 Lanark Road, Belgravia, POBox 745, Harare)。

#### B. ZERO

ジンバブエ国で欧米のドナーがよく使う環境NGO、南部アフリカ諸国全体に人脈ネットワークがあり本部がハラレにある。スタッフも多くなく、こじんまりとして地味だが、農村集落を対象とした様々な実態調査で多くの実績がある。

調査部門はFannie Mtepfa女史が担当 (Email zero@harare.iafrica.com 電話/FAXハラレ 791333 住所 158 Fife Ave., Greenwood Park, POBox 5338, Harare)。

#### C. Interconsult Zimbabwe (Pvt) Ltd

黒人系のコンサルで土木計画部門が木業だが、守備範囲は広い。

Managing DirectorはMr. Leonard Magara (Email magara@primenetzw.com 電話/FAXハラレ 792870 住所 10th Floor、Megawatt House, Samora Machel Ave., POBox 4710, Harare)。

#### 3. 航空写真撮影と地上測量

#### 3-1 航空写真撮影と地上測量実施機関

測量局へのヒアリングにより、地形図作成やこれらにかかわる航空写真撮影は基本的に民間企業に委託して実施していることが明らかとなった。委託先の測量業者も十分な機材設備と技術者を保有している南アフリカの民間会社がほとんどである。また、撮影許可の取得及びネガフィルム国外持ち出しの件については、航空写真撮影計画とこれに必要な飛行計画書を作成して Civil Aviation 局より飛行許可を得ることが必要である。書類に不備がない限り許可は比較的容易に得られるとのことである。ネガフィルム持ち出しの件は測量局に申請したうえで許可を取ることが必要である。

このような点を確認したうえで本調査では南アフリカ、ヨハネスブルグの測量業者3社を訪問し情報を入手した。訪問企業は以下の3社である。

- ·Digital Topographical Mapping Services (DTM)社
- · AOC Mapping Technology #t

#### PHOTOSURVEYS <sup>↑</sup>Ł

いずれの会社も撮影用航空機、航空写真用カメラ、航空機搭載型GPS、ラボ設備、解析図化機を保有している。特に、DTM社とAOC社はSD-2000と関連する図化ソフトウエアを所有し地形図作成とデータのデジタル化への取り組みが進んでいる。これらの企業は、世銀などのプロジェクトにも実績をもっており、ジンバブエ国のみならずマラウイ国、モザンビーク国、ザンビア国、ウガンダ国などの地形図作成も実施してきている。

#### 3-2 作業工程と期間

航空写真撮影、地上基準点測量、簡易水準測量については現地再委託で実施することを計画し、このための再委託準備作業を日本で行う。次に、既存の地形図及び既設基準点測量成果を入手し図化予定地域の形状を考慮して地上基準点の配置と簡易水準測量及び航空写真撮影計画と再委託仕様書案を作成する。必要な再委託手続きを経た後、地上基準点測量を実施し、図化のための対空標識を設置する。また、簡易水準測量を実施する。次いで、撮影計画に基づいて飛行許可を得たうえで実際の航空写真撮影を行う。撮影フィルムの写真処理をした後、ネガフィルムを日本に持ち帰り図化作業を実施する。撮影、地上基準点測量及び簡易水準測量作業にかかわる技術管理については日本人専門家を配し精度管理を行うものとする。作業期間としては、乾期となる6月、7月を予定し、天候条件を考慮して多少の余裕をもって航空写真撮影に2か月、地上測量に2か月程度の期間が必要と考えられる。地形図図化作業についてはインテンシブ・エリア約5万へクタール、2万分の1図化作業として6か月程度の期間を計画すれば十分と考えられる。

# 3-3 作業仕様書と経費見積り

グワーイ・ペンペジ地区 20万ヘクタール (2,000平方キロメートル) の航空写真撮影、地上基準点測量、簡易水準測量及びインテンシブ・エリア、5万ヘクタールに対する 2万分の1図化作業のための作業項目と数量及び経費について述べる。

- 1. 調査範囲:グワーイ・ベンベジ地区計 20 万ヘクタール
- 2. 航空写真撮影縮尺:2万分の1
- 3. GPSによる地上基準点測量一式
- 4. 簡易水準測量一式
- 5. 空中三角測量一式
- 6.2万分の1地形図図化作業:500平方キロメートル
- 7. 成果品:航空写真密着プリント、地形図一式

経費については、南アフリカ3社で調査の結果、下記の情報を得た。また図化作業経費については国内経費として概算経費をあげておく。

- ・モービリゼーション:4,500ドル
- ・撮影一式 20万ヘクタール: 2万8,500ドル
- ・地上測量一式 500平方キロメートル (基準点 14点、簡易水準 140 キロメートル) : 3 万 920 ドル
- ・空中三角測量一式 (112 モデル):450万円
- ・地形図図化(2万分の1)一式;2,750万円、コンター主曲線10メートル、補助曲線5メートル

以上合計:撮影、地上測量一式:6万3,920ドル、国内図化作業一式:3,300万円

#### 3-4 調査データの既存GISへの活用

本調査においては、最終成果品としてグワーイ・ベンベジ地区全体20万ヘクタールについての土地利用・植生図が5万分の1で作成される。また、インテンシブ・エリアについては2万分の1で森林タイプ図と森林土壌図が作成される計画である。これ以外に、2万分の1地形図が作成される事となっている。

カウンターパート先におけるGISの利用状況や機材設備については既に述べたとおりであり、1通りのGIS運用技術は習得済みと考えて良い。必要な点はGISの応用面での経験を重ねることである。本調査地域には既に多数の集落が立地しており、森林資源の中・長期的保全が問題となっている地域である。

今後の森林保全計画を策定するうえで森林資源の現状や地形、土壌、河川現況、人口分布、道路現況等各種の現況データを組み合わせて、土地本来のもっている保全適性や土地利用ポテンシャルを分析するうえでGISは最適の手段といえよう。したがって、この意味から本調査結果である主題図をGISを用いて入力しデジタルデータとしてカウンターパート先のGISシステムに提供することは重要と考えられる。なお、最終成果図3面をデジタル化するための入力経費としてはディジタイジング計測一式、300万円、技術管理費一式100万円程度が必要であるう。

### 4. 環境配慮

鉱山環境観光省天然資源部環境アセスユニットがEIAを所管している。林業EIAのガイドラインが作成されており、本ガイドラインによれば、事業実施者は事業計画書を鉱山環境観光省に提出し、省はEIA実施の必要性の有無を判断することとなっている。EIAは5段階の

チェックリストを用いて実施されており、サブセクターは造林、製材・パルブ・製紙産業、天然 林経営・伐採の3分野となっている。

・チェックリスト1 主要なプロジェクト活動

・チェックリスト2 主要な環境問題

・チェックリスト3 代表的な環境影響

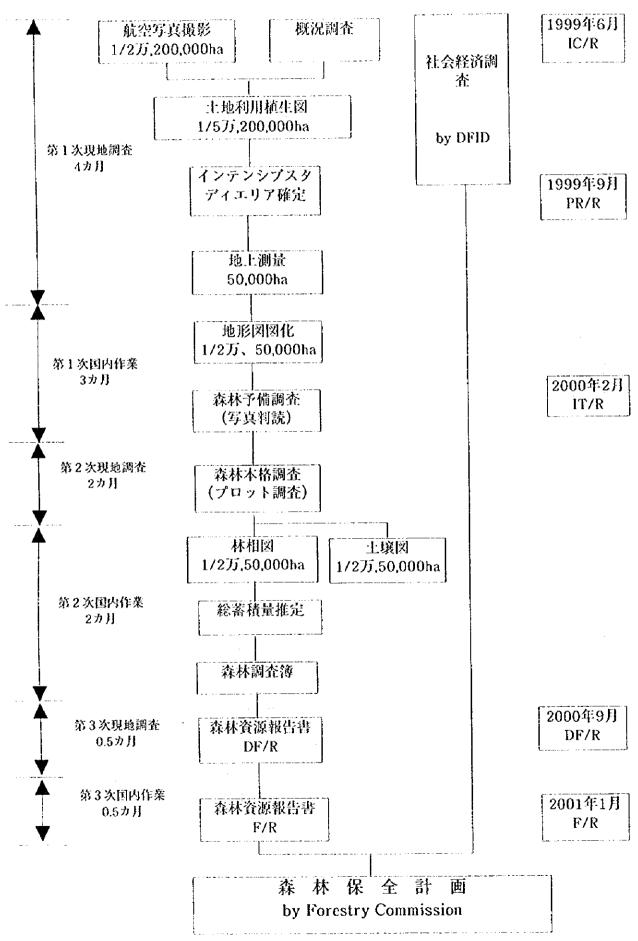
・チェックリスト4 分析方法と調査方法

・チェックリスト5 環境影響軽減方法

計画作成段階でEIAを行う必要はなく、計画作成後実行が決定した段階でEIA実施の必要性につき省の判断を仰ぐこととなる。今回の本格調査は、森林資源調査にとどまり計画まで踏み込まないこともありEIA実施の必要はない。

フェーズ I での環境条件調査は、文献また現地踏査をつうじて動植物と土壌劣化の現状を把握するのみであり、 I E E 又は E I A の実施は含んでいない。

# ジンバブエ国グワーイ・ベンベジ地区森林資源調査



# V. 調查実施体制

## 1. C/P配置、執務環境、調査用資機材

#### 1-1 C/P配置

森林資源調査実施に伴い先方は技術移転を強く要望した。森林調査、森林土壌調査及びGIS3分野のカウンターパートを配置することで合意したが、具体な氏名まで詰めることはできなかった。森林調査と森林土壌調査については、郷土資源部のグワーイ・ベンベジ森林区の担当官が配置される見込みが高いと思われる。一方、GISについては郷土資源部にC/Pがいないことから研究部内の人材を配置することが現実的と思われる。

#### 1-2 執務環境

執務室は郷土資源部が用意することをミニッツで確認した。具体なスペースまで確認はできなかったが、グワーイ森林区内の営林署内会議室を使えるよう調整することが、カウンターパートへの技術移転の意味でも理想的である。スペースは3×5メートル程度であった。本営林署は電話・無線も設置されている。

調査用車両は借り上げが可能であり、15 日以上の使用で運転手込み 4 W D 1 台の料金 (税込み) は 4,150 ジンバブエ・ドル/日 (本体 3,800 + 保険 350) であった。 1 ドル = 35.953 ジンバブエ・ドル (2 / 14 付) であるので 1 ドル = 120 円で約 1 万 4,000 円/日である。見積り聴取先は、CRAALWOOD CAR RENTAL, 158 Samoro Machel Ave. TEL 702180 ~ 2 である。

森林調査対象地はブラワヨービクトリアフォールズの舗装道路に沿っており、森林内は4W Dで走行可能な未舗装道路も整備されており、アクセスは良好である。

#### 1-3 調査用資機材

要請書では調査用車両・GIS機器・トランシーバー・事務機器・森林調査機材の記載があったが、調査用車両・GIS機器・トランシーバーは既に先方が所有しており、車両は借り上げが可能であることが確認されたため、執務室用の事務機器(パソコン・プリンタ・ファックス・コピー)と森林調査機材をミニッツに記載した。パソコン・プリンター・ソフトの現地価格を調査した。1ドル=35.953 ジンバブエ・ドル(2/14 付)で結果は以下のとおり。

- ・Acer Power 3000d, Intel Pentium P 233 MMX Processor, 32MB Ram, 3.1 Gig Hard Drive, Window 95, Acerview 14 Monitor, Acer PS / 2 mouse, Keyboard, 3年保証税 込み、5万2,175ジンパプエ・ドル (= 17万5,000円)
- · EPSON Style COLOUR 600 Printer, 1万2,900 ジンバプエ・ドル (= 4 万 3,000 円)

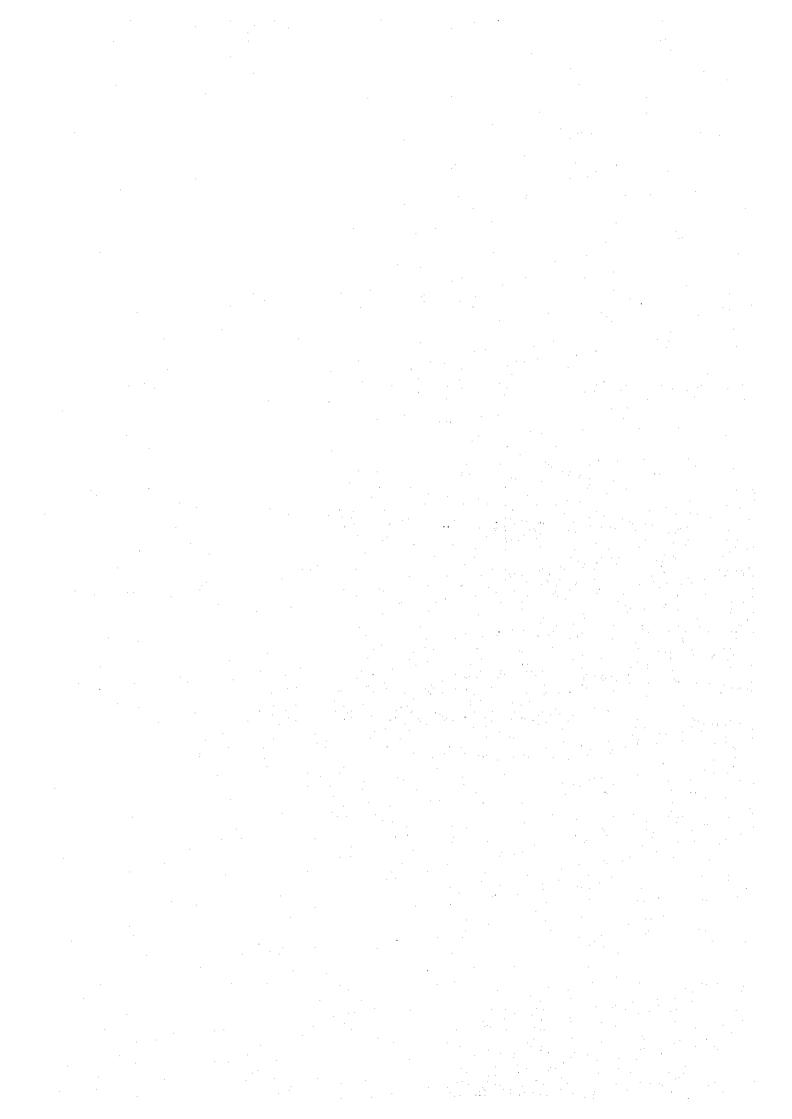
- ・Office 4万2,000 ジンバフエ・ドル (= 14万1,000円) 森林調査機材は通常の調査で使用しているもので、森林調査と土壌調査で以下の機材 を想定している。
- ・森林調査用:輪尺、ボール、テープ、直径割巻尺、水準器、測高器、成長錐、ポケット コンパス、実体鏡など 約100万円程度
- ・土壌調査用:土壌硬度計、検上杖、クリノメーター、 p H メーターなど 約 50 万円程度

## 2. C/P本邦研修

先方はJICAによる森林資源調査後自力にて資源調査を行う希望を表明している。調査実施を通じて、技術移転を図ることはもちろんであるが、カウンターパート3分野のうち森林調査と森林上壌調査については本邦研修を行い、解析作業にも精通させる必要がある。GISについては、GTZの協力により人数は少ないが適当な人材と機器が研究部に存在しているので、ドラフトファイナルレポート説明時にデータの立ち上げを行い、その操作方法を教えることで十分であると判断される。

# 付属 資料

- 1. ジンバブエ国西部天然林地域主要樹種の検索表と種の記載
- 2. 学名-地方名对象表
- 3、要請書
- 4. 実施細則(S/W)
- 5. 協議議事録(M/M)
- 6. 収集資料リスト
- 7. THE GWAAI AND MBEMBESI FORESTS SETTLERS:
  A REPORT OF A PARTICIPATORY RURAL APPRAISAL(一部抜粋)



# 1. ジンパブエ国西部天然林地域主要樹種の検索表と種の記載

# 検索表 (( )内の数字は記載の番号)

1.	葉はサボテン様の多肉質、花は	录黄色の房状Euphorbia ingens(1)
	葉は多肉質でなく通常	2
2.	菜は単葉	3
	葉は複葉	5
3.	葉は対生。全縁。油点を有しなり	Combretaceae(2,3)
	葉は対生でない	4
4.	葉は全縁。刺を有しない	Diospyros spp.(4)
	葉は弱い歯状縁。刺を有する	
<b>5</b> .	葉は三出複葉	
_	葉は1対複葉	6
	葉は一回羽状複葉	7
	葉は二回羽状複葉	18
6.	小葉の葉脈は明らかな中肋を有	するGuibourtia coleosperma(11)
_	小葉の葉脈は扇状	······ Colophospermum mopane(12)
7.	奇数羽状複葉	8
	偶数羽状複葉	12
8.	小葉は鋸歯又は列縁	Kirkia acuminata(7)
	小葉は全縁	9
9.	茎を折ると乳液を滲出する	Anacardiaceae(8,9)
	茎を折っても乳液を滲出しない	
10.	大きな円錐花序で、橙黄色~鬱	<b>黄色</b> 11
_	円錐花序ではなく、薄桃~藤色	で、尊及び花柄は錆褐色Pericopsis angolensis(13)
11.	. 小葉は1~3対+先端の1枚。	小葉の先端は丸まるPterocarpus rotundifolius(14)
_	小葉は11~25 対十先端の1枚。	小葉の先端は尖るPterocarpus angolensis(15)
12	. 托葉を欠く。小葉は5~8対	Entandrophragma caudatum(10)
_	托葉を有する	13
13	. 小葉は 10 対未満	14
_	小葉は 10 対以上	17
	. 小葉は長円形で先端は丸まる	Afzelia quanzensis(16)
_	小葉は披針形	15
15	。花は長い腋生の総状花序で藤色	Baikiaea plurijuga(17)

16	花序は房状乃至総状で白色~淡緑白色	
Brachystegia spiciformis(18)	小葉は先端の1対が最も大きい。 …	16.
Julbernardia globiflora(20)	最も大きい小葉は先端の1対ではない	_
Brachystegia boehmii(19)	小薬間の薬軸の長さは小薬幅とほぼ同じ	17.
	小葉間の葉軸の長さは小葉幅の2倍以上	-
19	刺を有する	18.
20	刺を有しない	_
Acacia nigrescens(22)	羽片は2~3対、小葉は1~2対	19.
	小菜は8~10対	
Burkea africana(23)	羽片は2~3対で、小葉は 10 枚未満	20.
Erythrophleum africanum(24)	羽片は3~4対で、小葉は8~15枚	_

## 種の記載

- Euphorbia ingens (Euphorbiaceae トウダイグサ科)
   葉 (及び茎) はサボテン様の多肉性。花は緑黄色の房状、樹脂は極めて有毒で、腐食性。薬用及び漁労毒に使われる。
- Combretum fragans (Combretaceae シクンシ科)
   葉は単葉で対生。全縁。葉に油点を有しない。花は腋生の穂状花序で緑のかった黄白色。
- 3. Combretum imberbe (Combretaceae シクンシ科) 葉は単葉で対生。全縁。葉に油点を有しない。花は淡黄色の穂状。材は、暗褐色。極めて硬く、 重い。金属の導入以前は、黝などの刃に使われた。品質の高い薪材。滲出するガムは可食。灰は 歯磨き粉、白色塗料に使用される。野生動物の餌。葉、根は薬用。
- 4. Diospyros spp. (Ebenaceae カキノキ科) 葉は対生でない。単葉。全縁。花は単生の腋生で黄白色のものが多い。D. kirkii, D. lycioides, D. mespiliformis, D. natalensis, D. quiloensis, D. austro-africanaなどが分布している可能性がある。
- 5. Commiphora mosambicensis (Burseraceae カンラン科)
  モツヤクノキの仲間。3小葉からなる複葉。花は黄色がかったピンクの小さな房状で、苞葉とともに散生する。材は家庭用品に使われる。
- 6. Commiphora pyracanthoides (Burseraceae カンラン科)

単葉。弱い歯状縁。雌雄異株。刺のある低木ないし潅木で、モバネの地域に見られる。

# 7. Kirkia acuminata (Simaroubaceae 二ガキ科)

奇数羽状複葉 (6~9対十1)。小葉は鋸侑又は列縁。花は、枝分かれする腋生花序で、乳白色。 材は軽く、耐性が低い。シリカがあるため加工に難。

## 8. Lannea discolor (Anacardiaceae ウルシ科)

奇数羽状複葉 (3~5対+1)。小葉は全縁。花は乳黄色の穂状で頂生する。果実は食用。樹皮は薬用、タンニン採取、縒糸、赤色染料。根は籠作りに使われる。材は家庭用品に使われる。

# 9. Sclerocarrya castra (Anacardiaceae ウルシ科)

葉は対生でない。奇数羽状複葉 (3~7対+1)。小葉は全縁。花は中央部がピンク色のほか黄色がかった白色。枝分かれをしない花柄を有する。果実は食用、アルコール飲料。殼果の仁も食用で栄養価が高い。葉は野生動物が好み、ソウは樹皮を食する。樹皮は薬用、淡褐色染料、材は家庭用品に用いられる。

## 10. Entandrophragma caudatum (Meliaceae センダン科)

偶数羽状複葉 (5~8対)。 托葉を有しない。 花は腋生の円錐花序で、淡緑色。 Baikiaea plurijuga が優占するカラハリ砂土の特徴的な構成樹種の一つ。 赤褐色で美麗なマホガニーに似た材は、家具、飾り棚に用いられる。 樹皮は染料、 タンニンを採取する。

#### 11. Guibourtia coleosperma (Leguminosae マメ科)

2小葉からなる複葉。花は腋生乃至頂生の円錐花序で小さく、乳白色。材は美麗、柔らかく、ピンク色のかった褐色で細かい刻粒を有する。種子は煎って捣き、食用とする。仮種皮は飢饉時に食用とされる。家具用の赤色染料、薬用に使われる。

#### 12. Colophospermum mopane (Leguminosae マメ科)

2小葉からなる複葉。花は腋生の総状花序。淡緑色。材は美麗な暗赤褐色。硬く、強く、耐性。 装飾、家具用。葉は家畜、ソウの餌となる。ガの一種 Imbrasia belina の食草であり、その幼虫 は食用とされる。

#### 13. Pericopsis angolensis (Leguminosae マメ科)

奇数羽状複葉(3~6対+1)。小葉は全縁。花はピンクのかった白色乃至藤色で、萼及び花柄は錆褐色。材は美麗で、硬く、極めて耐性がある。一般用材、彫刻用に用いられ、市場名はafromosia。シロアリに強く、杭材にも使われる。樹皮、根、葉は薬用。

14. Pterocarpus rotundifolius (Leguminosae マメ科)

奇数羽状複葉 (1~3対+1)。小葉は全縁。花序は大きな円錐花序で、濃黄色。花弁は縮れる。 材は淡褐色、家庭用品に使用される。

15. Pterocarpus angolensis (Leguminosae マメ科)

奇数羽状複葉 (3~6対+1)。小葉は全縁。花は大きな円錐花序で、橙黄色。径 60cm。材は 美麗で縞模様があり赤褐色。比重 0.60、耐久性甚大。船舶、高級家具材、装飾用に用いられる。 ソウなどが葉を好む。樹皮と根は腕衛、薬用。 莢果はサル、ヒヒが好む。

16. Afzelia quanzensis (Leguminosae マメ科)

偶数羽状複葉 (5~6対) でやや垂下、小葉は鋭先形。托葉がある。花は単生で大きく、唇弁状の紅色の花弁を有する。 萼は淡緑色。 幹は通直で円柱形、径1 mの大木となる。 板根を備える。 樹皮黄色。果実は木質で、腎臓形莢。 材は赤褐色で重硬。 耐久性甚大、耐酸性大。 市場名 chamfuti。 樹皮、根は薬用。

17. Baikiaea plurijuga (Leguminosae マメ科)

偶数羽状複葉。托葉がある。花は長い腋生の総状花序で藤色。砂地。砂漠近辺で純林をなす。本 件調査地域での最重要樹種かつ優占種であり、資源量も最も多い。径 60cm にまで生長する。材 は暗赤褐色で硬く、強く、耐性がある。用材、枕木として用いられる。

18. Brachystegia spiciformis (Leguminosae マメ科)

偶数羽状複葉 (4対) で小葉の形は変化が大きい。托葉がある。新葉はピンク乃至赤色。総状花序で、淡緑白色、葯は赤い。落葉性の中一高木で材は淡赤褐色で、比重 0.70、生長輪、交錯木理がある。つき板、合板、家具等一般用材として用いられる。樹皮の繊維はロープ用。蜂蜜採取。 潅木林地に多く、いわゆるミオンボ林の主要樹種の一つ。

19. Brachystegia boehmii (Leguminosae マメ科)

偶数羽状複葉 (14~28 対)。托葉がある。新葉はピンク乃至赤色。樹皮はタンニン採取、ロープ 用。材は防腐処理の後枕木用。

20. Julbernardia globiflora (Leguminosae マメ科)

偶数羽状複葉 (6対)。托葉がある。花は房状花序で頂生し、白色。材は赤褐色。硬く、強く、 耐性があり、一般用材として用いられる。樹皮の繊維は低質ロープ。

21. Cassia abbreviata (Leguminosae マメ科)

偶数羽状複葉  $(5\sim 20\,
m 対)$ 。 托葉がある。 花は大きめで花柄があり、黄色。様々な部分が伝統薬用に使われる。

# 22. Acacia nigrescens (Leguminosae マメ科)

二回羽状複葉。羽片は $2\sim3$ 対で、各羽片に小葉は $1\sim2$ 対(類似近縁種の Acacia goetzei は 各羽片の小葉が $8\sim10$ 対)。刺を有する。花は白く穂状。葉はキリン、ソウなどが好む。樹皮は クンニンに富む。材は暗褐色で、強い。

# 23. Burkea Africana (Leguminosae マメ科)

2回羽状複葉。羽片は2~3対で、各羽片の小葉は5~9枚。花は下垂する穂状で、黄白色。材は淡褐色~赤褐色。硬く、重く、耐性があるが、穿孔虫の被害を受けやすい。樹皮を乾燥・破砕して漁労毒に用いる。根からは赤い染料が得られる。

# 24. Erythrophleum africana (Leguminosae マメ科)

2回羽状複葉。羽片は3~4対で、各羽片の小葉は8~15 枚。花は緑黄色乃至クリーム色の穂 状花序。材は赤褐色で、重く、強く、耐性があり、一般用材に用いられる。樹皮、根、葉は有毒。 樹皮は、アラビア・ゴムに匹敵する琥珀色のゴムを滲出する。

# 2、学名一地方名対象表

# 巻末資料2

# 学名一地方名対照表

学名	英名	ショナ語名	ンデベレ語名
Euphorbia ingens	euphorbia	mutatarimbo	umhlansiso
Combretum fragans	four-leaved bushwillow	· · · · · · · · · · · · · · · · · · ·	
Combretum imberbe	leadwood		
Commiphora mosambicensis	pepper-leaf corkwood		
Commiphora pyracanthoides	common corkwood		<u> </u>
Kirkia acuminata	bastard marula	mubvumira	umvumila
Lannea discolor	live long	mugan'acha	isigangatsha
Scierocarrya caffra	marula	mupfura	umganu
Entandrophragma caudatum	wooden banana	mupingiri	umphephama
Guibourtia colcosperma	copalwood	mucibi	
Colophospermum mopane	mopane	mupane	iphano
Pericopsis angolensis	mwanga		
Pterocarpus rotundifolius	round-leaved teak		
Pterocarpus angolensis	mukwa/ wild teak	mukwa/ mubvamaropa	umbagazi
Afzelia quanzensis	pod mahogany	mukamba/mungongoma	umkamba
Baikiaea plurijuga	Zambezi teak		
Brachystegia spiciformis	msasa	musasa	igonde
Brachystegia bochmii	mfuti		
Julbernardia globistora	munondo	munhondo	umshonkwe
Cassia abbreviata	cassia	nuremberembe	
Acacia nigrescens	knob thorn		
Burkea Africana	wild seringa	mukarati	umnondo
Erythrophleum africana	ordeal tree		

注:ショナ語名につく mu-は単数を表す接頭辞であり、複数形は mi-となる。また、果実を表す場合には ma-をつける。





# TERMS OF REFERENCE

FOR

THE STUDY ON
THE MANAGEMENT PLAN

FOR

CONSERVATION OF

INDIGENOUS FORESTS IN

THE GWAAI AND BEMBESI AREAS

1996

MINISTRY OF ENVIRONMENT
AND TOURISM

**FORESTRY COMMISSION** 





# REQUEST FOR TECHNICAL ASSISTANCE

PROJECT TITLE

STUDY OF THE MANAGEMENT PLAN FOR

CONSERVATION OF INDIGENOUS FORESTS IN

**GWAAI AND BEMBESI AREAS** 

REQUESTING AGENCY:

MINISTRY OF ENVIRONMENT AND TOURISM -

FORESTRY COMMISSION

SOURCE OF ASSISTANCE: GOVERNMENT OF JAPAN

TYPE OF ASSISTANCE : DEVELOPMENT STUDY

# 1. BACKGROUND AND JUSTIFICATION

Forests in Zimbabwe have been decreasing at a rate of between 75,000 and 100,000 ha per year. The indigenous forests of Gwaai and Bembesi, the largest in Zimbabwe, have been disappearing over the last few decades due to overgrazing, fire caused by traditional hunting practices, and illegal felling activities. Consequently, the decrease in forest area resulted in soil degradation, loss of biodiversity, diminishing value of the area for recreational use, and destruction of the water retentive functions of the forest.

The Gwaai/Shangani Dam Project, one of the biggest national projects in Zimbabwe established to provide a permanent water supply to the drought-prone North Matabeleland region, is presently under construction. Since the Gwaai and Bembesi forests are located along the river basin, there is no doubt that they will play a key role as watershed areas of the project.

In order to cope with the forest problems and for the smooth and effective implementation of the dam construction project, the government of Zimbabwe is eager to carry out the Forest Management Plan in Gwaai and Bembesi.

## 1.1 Forest Policies in the Past

Conventional methods of national accounting, which suggest that Zimbabwe's forest resources contribute about 3% of the gross domestic product (GDP), greatly understate the many indirect ways in which indigenous woodlands and trees contribute to the improvement of food security, generation of rural income, agricultural productivity, and environmental protection.

Forest, agricultural and other land use policies in Zimbabwe have failed in the past to take into account these indirect contributions of the forest resources to the national economy. Uses, benefits, and values have been consistently understated and consequently, the conservation and management of these resources have been given a very low priority in government development plans. Partly because of this, indigenous forests formerly covering some 23 million ha or about 60% of Zimbabwe's land use (even now the Government has not grasped how much of the forests have been reduced and to what extent forest quality has deteriorated) are being wastefully exploited, and their potential for contributing to sustainable agriculture and environmental protection largely ignored.

Population increase in the rural area will continue to place pressures on this diminishing woodland area. A sustainable future for forests resources will, therefore, depend on making better use of a limited resource base. A balanced government forest conservation and development strategy that gives very high priority to the conservation and management of existing woodlands, as well as to the development and improved productivity of agroforestry farming systems, is needed.

## 1.2 FOREST IN ZIMBABWE

At present there is no generally accepted inventory of the current extent of indigenous forests, let alone a map. This lack of up-to-date and precise data in some respects is a major impediment to policy formulation and planning.

However, there is little doubt that, at the present time, both the extent and the quality of woodland and forest in Zimbabwe falls far short of the potential cover a few decades ago. This is due to a long history of deforestation which has progressively opened up the land for agriculture. Unfortunately, the extent and rate of this process is not precisely known, even though the intense debate about the environment in Zimbabwe might suggest otherwise.

It is estimated that between 75,000 and 100,000 ha were cleared annually, largely for cultivation, with a commensurate provision of fuelwood. According to these sources, annual losses amounted to 1.5% of the total woodland area. FAO estimated that in 1963, 60% of Tribal Trust Lands were wooded, although other estimates put the proportion at 30% in 1978. These two estimates, made fifteen years apart, suggest a significant annual rate of decrease. Again lack of reliable inventories suggest that these data are little more than estimates.

In general, it is said that the indigenous forests of Zimbabwe cover over 12 million ha of land. Ninety (90) percent of these forests is under communal or private ownership, while the rest, which mainly consists of Forest Land, National Parks, and Safari Parks, is State owned.

Forest land in Zimbabwe is primarily divided into two (2) categories. One is Commercial Forest Land located in the eastern part of Zimbabwe, e.g., Stapleford, Erin, Ngungunyana. Pines and Eucalyptus are planted for the constant production of laminated timber, trusses and poles in these areas.

The other category is the <u>Indigenous Forest Land</u> in the western part of Zimbabwe, e.g., Gwaai, Bembesi, Lake Alice, Mzola. These forest lands are managed by the Forestry Commission for conservation of indigenous woodland species and wildlife, and watershed protection.

The destruction of these indigenous forests lands will have national and global external impacts: diminish the value of the area for recreational use, loss of biodiversity, and climatic impacts. On the other hand, the Government should grant felling concession to timber companies and permit hunting in some parts of these areas.

## 1.3 STUDY AREA

## Gwaai Forest Land

## (Outline)

Gwaai forest land was the first forest land identified for protection as a demarcated forest land in 1923, and was gazetted in 1930. It is the largest of the demarcated forest land with an area of 144,000 ha. It is situated in Lupane District, about 140 km north west of Bulawayo. (See attached sheet No. 1)

The exploitation of timber in this forest land started during the 1920's. Large portions of teak were harvested during this time. After the 1970's, demand for indigenous hardwood species increased including mukwa, a favourable species in the furniture manufacturing industry.

A wide variety of wildlife is found in the Gwaai Forest including the endangered rhino, elephants migrating from other forests. Game species found in the area are eland, kudu, zebra, impala, monkey, ostrich and buffalo.

# (Administration)

There is a central administration responsible for the officers in nine forest lands. These officers collect and submit information on fire, squatters, and wildlife to the central administration for analysis.

The office is supported by 10 permanent employees, 26 casual workers engaged in fire fighting and the repair of fences, boreholes, and game water supplies.

## BEMBESI FOREST LAND

### (Outline)

Bembesi was gazetted in 1941. Until then, subsistence farming was the main activity in the forest, while some areas were used for livestock grazing.

Bembesi Forest Land is located in Bubi District, 116km north west of Bulawayo. It is estimated to cover an area of 55,100 ha and is bordered by the Gwaai Forest Land to the west.

Hunting is the main economic activity in the forest as well as the sale of thatch grass and firewood. The hunting quota for Bembesi has been traditionally combined with the Gwaai Forest Land because only a small portion of the Bembesi Forest is used for expeditions.

# (Administration)

Administration offices and the staff's quarters are situated on the Gwaai side near the border of the two forest lands. The forest is managed by a forester who reports to the central office. Four (4) permanent employees and several casual workers are responsible for fire protection and facilities maintenance.

## 1.4 JUSTIFICATION

The Gwaai and Bembesi Forest Lands are considered to belong in the same category. They are highly valuable to the Indigenous Resources Division of the Forestry Commission because of their abundance in fauna and flora.

During the liberation war in the 1970's, refugees who had been displaced by the civil turmoil started to settle down as permanent residents. They began to clear the forest and cultivate the land. Trees were cut to build houses, fence fields against wildlife, and for firewood. They used the woodlands for cattle grazing and extracted a range of minor forest products.

Forest fires occur frequently, mostly due to squatter activities. More specifically 65% is caused by poachers, 5% is attributed to controlled burning, 10% to wild fires not properly put out, 15% to cultivation practices, and 5% to public road users in 1994/95.

Fire has become a major threat to the survival of the forests. Due to the continual occurrence of these fires, fire fighting has become a major operation in two forest lands. The fire records in the Gwaai and Bembesi Forest Land is given below:

Unit: Hectares

YEAR	AREA BURNT IN GWAAI	AREA BURNT IN BEMBESI	
1990/1991	6,736 ha	2,542 ha	
1991/1992	5,220 ha	5,528 ha	
1992/1993	759 ha	2,100 ha	
1993/1994	7,000 ha	7,194 ha	
TOTAL	19,715 ha	17,364 ha	

All in all, twenty fire outbreaks were reported in all forest lands in 1994/1995. The outbreak burnt a total area of 39,922 ha in 1994/1995 compared to 60,115 ha in 1993/1994. The 1994/1995 figure is low due to severe drought. The burnt

area is estimated at 40% of the total cleared forest area per year.

The forest is patrolled at irregular intervals as a safety precaution against fires. However, this measure is not approximately planned due to lack of the latest large scale topographic maps and forest inventory. Moreover, insufficient fire extinguishers, communication equipment and uncompleted fire crossing barriers will not speed up fire fighting activities. The table below shows the kind of fire fighting equipment used by the officers.

TOOLS	QUANTITY	CONDITION
Shovels	30	Good
Axes	30	15 with handles good
Hoes	5	Good
Water Containers	4 x 200litres	Good

In order to prevent fires for the conservation of the indigenous forests in Gwaai and Bembesi, the Forestry Commission has decided to allocate small parts of the state forests for the construction of a settlement for squatters residing in these forests. The Squatter Relocation Plan is to move all squatters in different parts of forests to designated relocation areas. Their movement will be completed by the end of 1996.

Furthermore, the Government of Zimbabwe is considering the construction of a dam near the Gwaai forest land to resolve problems in the drought-prone Matabeleland region. The feasibility study on the project is currently ongoing.

It is undeniable that the decrease in the Gwaai and Bembesi forest land has resulted in soil degradation and the destruction of the water retention functions of the forests. It shall also significantly affect the dam construction project.

Accordingly, with its sustainable management plan to protect the abundant indigenous forests from fires and illegal deforestation, this project will not only contribute to the conservation of the natural environment but also to the improvement of agricultural production and the standard of living in the Matabeleland region, where water shortage problems seriously predominate.

## 2. OBJECTIVES OF THE STUDY

The long term objective of the study is to improve the regeneration of indigenous forests in Gwaai and Bembesi by preventing fires and illegal felling activities. Preserving the balance of the fragile relationship between forestry and the

inhabitants is crucial. For this purpose, the following specific objectives shall be achieved:

- 2.1 Preparation of an adequate database (forest inventory) and maps (forest classification maps) by utilizing GIS (Geographic Information System), based on the latest aerial photographs of the area.
- 2.2 Formulation of strategic and comprehensive guidelines for the management of the indigenous forests in Gwaai and Bembesi.
- 2.3 Formulation of a pilot regional implementation plan for fire prevention in indigenous forests.
- 2.4 Recommendation of the appropriate equipment for fire fighting.
- 2.5 Reduction of the environmental degradation of the study area in order to proceed with the dam construction project without hesitation.
- 2.6 Monitoring and protecting wildlife in the study area.
- 2.7 Assisting the counterpart in testing and formulation policy framework as well as operational procedures for the implementation of forest management programs, including fire prevention in other areas.
- 2.8 Provision of new technologies and a sustainable system for indigenous forest that will be used during theoretical and on-the-job training activities for the staff of the Forest Commission and other technical agencies.

# SCOPE OF WORKS

- 3.1 The study covers the Gwaai and Bembesi Forest lands in Zimbabwe. The total area is estimated at 200,000 ha.
- 3.2 The study shall be carried out as follows:
  - a) Study on Present Conditions
  - 1) Aerial photography at a scale of 1/20,000 shall be carried out on the entire Gwaai and Bembesi area in Matebeleland North.
  - ii) Data collection, field survey, and identification of wildlife and sites seriously damaged from outbreaks of fire and illegal felling activities, and formulation of basic development plans.
  - Preparation of land use and vegetation maps, forest type images, and forest inventory using aerial photographs and remote sensing

data covering the study area.

- iv) Establishment of GIS covering the study area.
- v) Survey on squatter's awareness concerning environmental problems in the study area.
- vi) Study on traditional hunting practices, causes of fires, soil conservation, fuelwood supplies, and vacant lots inhabited by squatters in the study area.
- b) Selection of an Intensive Area
- Selection of an intensive area of approximately 500km² based on the results of the present study.
- ii) Production of a topographic map of the intensive area at a scale of 1/20,000 by means of ground control survey and aerial photogrammetry.
- iii) Recommendation of a reforestation plan suited to the ecosystem of vacant sites in the intensive area.
- iv) Formulation of guidelines or the management of indigenous forests including fire prevention in the study area.
- v) Formulation of a regional implementation plan for the sustainable management of indigenous forests in the intensive area. The implementation plan will be included as follows:-
  - Cost estimation of equipment and facilities for fire fighting.
  - Implementation schedule plan
  - Financial plan

# 3.3 Transfer of Technology

During the course of the study, technology transfer and training programs will be provided to the counterpart experts in the following fields:-

- Mapping and GIS techniques to monitor the status of indigenous forests.
- Field survey and investigation on topography and silviculture.
- Planning for the management of indigenous forests.

The above transfer of technology will be carried out in the form of an onthe-job training and seminars over the course of the study. Overseas training will also be included in the program.

### 4. EXPECTED EFFECTS OF THE PROJECTS

- 4.1 Improvement of forest information by providing the latest inventory and maps.
- 4.2 Improvement of monitoring and evaluation system for the indigenous forest by GIS.
- 4.3 Improvement of local agencies' capability to carry out conservation programs.
- 4.4 Improvement in the conservation and management of degraded forests that will provide a protective cover for the environmental stability of the watershed.
- 4.5 Improvement of watershed conditions along with the improvement of soil and water conservation conditions based on a sound land use management.
- 4.6 Improvement in the ecology of natural forests through improvements in silvicultural practices, and the re-establishment of bare forests through afforestation.
- 4.7 Increase in ground water re-charge and favourable water conditions in the dry season.

### 5. STUDY RESULTS

The following results shall be submitted to the Government of Zimbabwe:-

- 5.1 Guideline for the management of indigenous forests in Gwaai and Bembesi.
- 5.2 Regional implementation plans for indigenous forests in the intensive area.
- 5.3 Aerial photographs covering approximately 200,000 ha of the study area at a scale of 1/20,000.
  - Negative films
  - Contact prints

- 5.4 Maps at a scale of 1/10,000, covering 500km² of the intensive area.
  - Topographic maps
  - Forest maps
- 5.5 Interpretation of satellite images and aerial photographs of the study area
  - False colour image (1/250,000)
  - Land use and forest type image (1/250,000)
  - Registers
- 5.6 Geographical data in the study area for GIS

# STUDY SCHEDULE

The period required for the study is estimated at 18 months in total.

# 7. EXPERTS REQUIRED FOR THE STUDY

The following experts and engineers shall be required for the execution of the study:-

Team Leader
Forest Management Specialist
Fire Prevention Expert
Afforestation Expert
Soil and Land Use Expert
Socioeconomist
Topographic Survey Expert
GIS Specialist
Environmentalist

The required manpower input will be 80 men/months in total/.

### 8. STUDY INPUT

The following equipment brought into Zimbabwe by the Study Team shall be donated to the Government of Zimbabwe after the completion of the study.

# a) Equipment for field survey

- . Four wheel drive vehicles
- Transceivers
- Small survey equipment

# b) Equipment for GIS

- Personal computer
- Digitizer
- Scanner
- Printer
- GIS software

# c) Equipment for Administration

- Personal computer
- Printer
- Fax machine
- Copy machine

The Government of Zimbabwe through the Forestry Commission will provide the following:

a) Counterpart Personnel

A team leader and at least two other counterpart personnel will be provided for the project.

b) Office Accommodation:

Office accommodation will be provided in the existing office structure

The total project cost estimate are as follows:

ITEM		JAICA US	G.O.Z (FC) Z\$
1. (a) Technical Assistance (b) Equipment for field survey (c) Equipment for CIS (d) Equipment for Administration (e) Running expenses for items at (d)		U\$3, 000,000	
2. (a) (b)	Counterpart Personnel (Salaries and allowances) Office Accommodation		600,000 404,000
TOTALS		<u>U\$3,000.000</u>	1,004,000

# 9. UNDERTAKING OF THE GOVERNMENT OF ZIMBABWE

In order to smoothly and efficiently conduct the study, the Government of Zimbabwe shall take the necessary measures:-

- 9.1 Secure the safety of the Study Team.
- 9.2 Permit the members of the Study Team to enter, leave and sojourn in Zimbabwe during the conduct of the works, and exempt them from alien registration requirements and consular fees.
- 9.3 Exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into Zimbabwe for the conduct of the Study.
- 9.4 Exempt the Study Team from income tax and charges of any kind imposed on or in connection with any wages or allowances paid to the members of the Study Team for their services in connection with the conduct of the Study.
- 9.5 Provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in Zimbabwe from Japan in connection with the conduct of the Study.

- 9.6 Secure permission or entry into private properties or restricted areas for the conduct of the Study.
- 9.7 Secure permission for the Study Team to take all data, documents, maps, aerial photographs and necessary materials related to the Study out of Zimbabwe.
- 9.8 Provide medical services as needed; the expenses will be chargeable to the members of the Study Team.
- 9.9 Secure clearance for the use of communication facilities including transceivers
- 9.10 Provide the Study Team with the following in co-operation with other agencies concerned, if necessary:
  - a) required data, information and materials, including existing maps related to the Study.
  - b) counterpart personnel
  - c) suitable office with necessary equipment
  - d) credentials or identification cards

The Forestry Commission shall act as the counterpart agency of the Japanese Study Team and also as co-ordination body in relation with other relevant governmental and non-governmental organisations for smooth implementation of the Study.

The Government of Zimbabwe assures the provision of the matters specified herein for the smooth conduct of the Development Study by the Japanese Study.

	Signed:
	Titled:
Date:	

#### 4. 実施細則(S/W)

# THE SCOPE OF WORK FOR

# THE FOREST SURVEY IN THE GWAAI AND BEMBESI AREAS IN

# THE REPUBLIC OF ZIMBABWE

# AGREED UPON BETWEEN

# MINISTRY OF MINES, ENVIRONMENT AND TOURISM

## AND

# JAPAN INTERNATIONAL COOPERATION AGENCY

HARARE, 18 FEBRUARY 1999

Mr. C. Chipato

Permanent Secretary

Ministry of Mines, Environment and Tourism

The Republic of Zimbabwe

Mr. Hiroyuki HATORI

Leader,

Preparatory Study Team,

Japan International Cooperation Agency

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#### I. INTRODUCTION

In response to the request of the Government of the Republic of Zimbabwe (hereinafter referred to as "GOZ"), the Government of Japan (hereinafter referred to as "GOJ") has decided to conduct the Forest Survey in the Gwaai and Bembesi Areas (hereinafter referred to as "the Survey"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the GOJ, will undertake the Survey in close cooperation with the authorities concerned of the GOZ.

The present document sets forth the Scope of Work with regard to the Survey.

#### II. OBJECTIVES OF THE STUDY

The objectives of the Study are;

- 1. to conduct the Forest Survey in the Gwaai and Bembesi Areas, contributing to conservation of indigenous forest; and
- 2. to carry out, in the course of the Survey, technology transfer to counterpart personnel of Zimbabwe.

#### III. SCOPE OF THE SURVEY

#### 1. Survey Area

The Survey area shall cover Gwaai Forest Land with an area of 144,000 hectares and Bembesi Forest Land with an area of 55,100 hectares, with a total area of approximately 200,000 hectares as reflected in ANNEX I of this Memorandum.

#### 2. Intensive Area

The Intensive Area will be selected, next to the settlements area, with a total area of approximately 50,000 hectares based on the first field survey as reflected in ANNEX I of the Memorandum.

#### 3. Outline of the Survey

In order to achieve the above objectives, the Survey will consist of two (2) phases and will cover the following items -

- 1. Phase I
- 1-1. to collect the relevant existing data and information, through field survey on the following-
- (1) policy framework including-
- (a) laws and regulation
- (b) administration of Forestry Commission
- (c) any other relevant data and information.

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- (2) natural conditions including-(a) location and topography; (b) meteorology and hydrology; (c) geology; (d) soils: (e) vegetation; (f) tree species; and (g) any other relevant natural conditions. (3) socio-economic conditions including-(a) population; (b) land; (c) economic activities; (d) social organization; and (e) any other relevant socio-economic conditions. (4) forestry conditions including-(a) forest fire; (b) timber and fuelwood; (c) non timber forest products; (d) management; (e) market; and (f) any other relevant forestry issues. (5) environmental aspects-(a) flora and fauna; (b) land degradation; (c) any other relevant environmental issues. 1-2. Phase 1 of the survey will involve-(a) taking monochromatic aerial photograph at scale 1/20,000 of the entire Gwaai and Bembesi area
  - with an area of approximately 200,000 hectares;
  - (b) the preparation of a landuse and vegetation map at scale 1/50,000 for the survey area; and
  - (c) the selection the intensive area with an area of approximately 50,000 hectares.
  - 2. Phase II of the survey will involve-
  - (a) the preparation of a topographic map at scale 1/20,000 for the intensive area;

- (b) the carrying out of forest inventory survey and the preparation of a forest type map at scale 1/20,000 and forest inventory book for the intensive area; and
- (c) forest soil survey and preparation of a forest soil map at scale 1/20,000 for the intensive area.

#### IV. SURVEY SCHEDULE

The Survey will be carried out in accordance with Annex II to this Memorandum of Understanding.

#### V. REPORTS

JICA shall prepare and submit to the GOZ the following reports-

- 1. Twenty (20) copies of the Inception Report in the English language at the commencement of the first phase in Zimbabwe;
- 2. Twenty (20) copies of the Progress Report in the English language at the end of the first phase in Zimbabwe:
- 3. Twenties copies of the Interim Report in English language at the commencement of the second phase in Zimbabwe;
- 4. Twenties (20) copies of the Draft Final Report in English language at the commencement of the third phase in Zimbabwe. The GOZ will provide JICA with its comments on the Draft Final Report within one (1) month after receipt of the Draft Final Report;
- 5. Fifty (50) copies of the Final Report in the English language within a period of two months after receipt of GOZ's comments on the Draft Final Report; and
- 6. In addition to the following documents shall be submitted to the GOZ with relevant reports-
- (1) Monochromatic aerial photographs of the survey area (scale: 1/20,000, 1 set);
- (a) Negative films; and
- (b) Contact prints.
- (2) Map in the form of original, second original and blue print of the following shall be submitted-
- (a) Land use and vegetation map for the survey area (scale: 1/50,000);
- (b) Topographic map for the intensive area (scale: 1/20,000);
- (c) Forest type map for the intensive area (scale: 1/20,000); and
- (d) Forest soil map for the intensive area (scale: 1/20,000).

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#### VI. UNDERTAKING OF THE GOVERNMENT OF ZIMBABWE

- 1. To facilitate smooth conduct of the Survey, the GOZ shall take necessary measures;
- 1-1, to secure the safety of the Japanese survey team,
- 1-2. to permit the members of the Japanese survey team to enter, leave and sojourn in Zimbabwe for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
- 1-3. to exempt the members of the Japanese survey team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into Zimbabwe for the conduct of the Survey,
- 1-4. to exempt the members of the Japanese survey team from income tax and charges of any kind imposed on or in connection with any emoluments of allowances paid to the members of the Japanese survey team for their services in connection with the implementation of the Survey,
- 1-5. to provide necessary facilities to the Japanese survey team for the remittance as well as utilization of the funds introduced into Zimbabwe from Japan in connection with the implementation of the Survey,
- 1-6. to secure permission for entry into private properties or restricted areas for the implementation of the Survey,
- 1-7. to secure permission for the Japanese survey team to take all data and documents (Including photographs and maps) related to the Survey out of Zimbabwe to Japan and
- 1-8, to provide medical services as needed. Its expense will be chargeable on the members of the Japanese survey team.
- 2. The GOZ shall bear claims, if any arises, against the members of the Japanese survey team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Survey, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese survey team.
- 3. The Forestry Commission shall act as the coordinating body in relation with other governmental organizations and non-governmental organizations concerned for smooth implementation of the Survey.
- 4. The GOZ shall, at it's own expenses, provide the Japanese survey team with the following, in cooperation with other organizations concerned;
- 4-1. available data and information related to the Survey
- 4-2. counterpart personnel
- 4-3. suitable office spaces with necessary equipment and furniture in Bulawayo, and
- 4-4. credentials or identification cards

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#### VII. UNDERTAKING OF JICA

For the implementation of the Survey, JICA shall take the following measures;

- 1. to dispatch, at its own expense, the Japanese survey team to Zimbabwe, and
- 2. to pursue technology transfer to the Zimbabwe counterpart personnel in the course of the Survey.

#### VIII. CONSULTATION

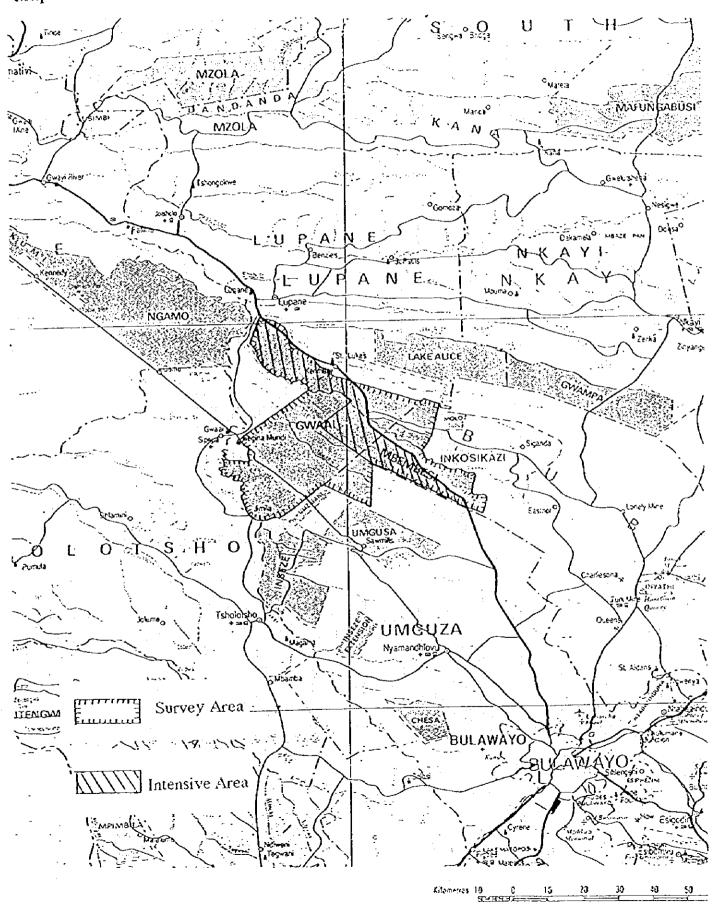
JICA and Forestry Commission shall consult with each other in respect of any matter that may arise from or in connection with the Survey.

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# Map of the Survey Area

Annex I



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# TENTATIVE SCHEDULE

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(Remarks)

Draft Final Report Inception Report Progress Report Interim Report Final Report Ic/R P/R Iv/R Df/R 6/R

Comments of Df/R by Zimbabwe side

#### 5. 協議議事録(M/M)

# MINUTES OF MEETING ON SCOPE OF WORK FOR

# THE FOREST SURVEY IN THE GWAAI AND BEMBESI AREAS

IN

#### THE REPUBLIC OF ZIMBABWE

The preparatory study team (hereinaster referred to as "the Team") organized by the Japan International Cooperation Agency (hereinaster referred to as "JICA") headed by Mr.Hiroyuki HATORI visited the Republic of Zimbabwe from February 8 to 19, 1999 for the purpose of discussing and confirming the Scope of Work for the Forest Survey in the Gwaai and Bembesi Areas in the Republic of Zimbabwe (hereinaster referred to as "the Survey").

The Team had a series of discussions with officials of the Forestry Commission (hereinafter referred to as "FC") and other organizations on the Scope of Work for the Survey. The list of participants in the meetings is attached as Annex.

As a result of the discussions, FC and the Team agreed upon the Scope of Work for the Survey.

The main issues discussed by the both sides in relation to the Scope of Work for the Survey are shown in the documents attached hereto.

Harare, 18 February, 1999

Mr. P. Kariwo

Acting General Manager

Forestry Commission

The Republic of Zimbabwe

Mr. Hiroyuki HATORI

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Leader

Preparatory Study Team

Japan International Cooperation Agency

#### Attached Document

#### 1. Change of the Scope

FC requested to change the initial scope, that is to prepare the forest management plan for conservation, to conduct the forest survey, focusing on the technical matters, excluded planning. FC explained that the shared forest management project was being implemented by DFID focusing on the social matters, and that the both activities of JICA and DFID would be overlapped and it would be difficult to coordinate two donors in the same area if JICA conducted the Study on the Forest Conservation Plan included social economic survey. FC promised to prepare forest conservation plan for themselves using the outputs of both organizations, JICA and DFID.

The Team insisted that FC should have informed the change in advance, but understanded the justification and accepted to conduct the forest survey.

#### 2. Steering Committee

Both sides agreed to establish the Steering Committee for smooth conduct of the Survey, composed of the representative of FC Head Quarter, FC Bulawayo Office, JICA Survey Team and DFID. Acting General Manager of FC was appointed as chairman. It is expected that this Committee will meet when JICA Survey Team comes to explain the reports.

## 3. Counterpart personnel

FC promised to assign the counterpart personnel in following area and to take a necessary budget measure such as a travel allowance for conducting the Survey;

- Forest Inventory
- Forest Soil Survey
- GIS

#### 4. Survey Equipment

FC requested JICA through the Team to consider setting up necessary equipment for conducting the Survey such as;

- One (1) set of Personal Computer and Printer
- One (1) set of Fax Machine
- One (1) set of Photocopy Machine
- Field Survey Equipment

The Team promised to convey the request to the Government of Japan.

#### 5. Office accommodation

FC prepared an office for the JICA Survey Team with necessary furniture and stationery inside FC

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#### Bulawayo Office.

#### 6. Taking out aerial photographs and positive film to Japan

FC promised to take necessary measures and arrangements to take out them to Japan for conducting the Study.

#### 7. Counterpart Training in Japan

FC requested the counterpart training in Japan.

#### 8. Opening the Final Report to the public

Both sides agreed that the Final Report would be open to the public.

#### 9. Digital Data

FC requested JICA through the Team to consider offering digital data of the thematic maps such as landuse and vegetation map, forest type map and forest soil map in order that FC could utilize it to the existing GIS system for the purpose of forest management.

#### 10. Technical Transfer

Both sides agreed that following technical items would be transferred to the counterparts through on the job training in the course of the Survey;

- Forest Inventory Survey
- Forest Soil Survey
- GIS interpretation

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#### **ANNEX**

#### LIST OF PARTICIPANTS

#### ZIMBABWE SIDE

(Forestry Commission)

Mr. P. Kariwo Acting General Manager

Dr. E. Shumba Coordinator State Activities

Mr. C. Phiri Projects Coordinator

Dr. D. Gwaze Policy Coordinator

Mr. M.F. Piloto Corporate Planner- State

Mr. D. Kwesha Mapping and Inventory Officer

(Forestry Commission in Blawayo)

Mr. C. Mutsiwegota Manager, Indigenous Resources Division

Mr. John Mudekwe DFID Project Manager

#### JAPANESE SIDE

(Preparatory Study Team)

Mr. Hiroyuki HATORI Leader / Forest Management

Mr. Tetsuya KAMIJO Coordinator

Mr. Hiroyuki KAWANO Rural Forestry

Mr. Noboru IKENISHI Remote Sensing / Geographical Information System

Mr. Hayao TESHIMA Socio-Economist

( JICA Zimbabwe Office )

Mr. Tomohiro SEKI

R M

#### 6、収集資料リスト

- (1) Repubic of Zimbabwe, Forest Act. Revised Edition, 1996
- (2) Republic of Zimbabwe, Communal Land Act, Revised Edition, 1996
- (3) Republic of Zimbabwe, Natural Resources Act. Revised Edition, 1996
- (4) Republic of Zimbabwe, Second Five-Year National Development Plan 1991-1995, 1991
- (5) Government of Zimbabwe, Zimbabwe Programme for Economic and Social Transformation 1996-2000, 1996
- (6) Calvin Nhira et.al., James Mayers ed., <u>Contesting Inequality in Access to</u>
  Forests, Zimbabwe, 1998
- (7) Indigenous Resources Division, Forestry Commission, <u>Annual Report 1994-1995</u>, 1996
- (8) Indigenous Resources Division, Forestry Commission, <u>Annual Report 1995-1996</u>, 1997
- (9) Indigenous Resources Division, Forestry Commission, <u>Annual Report 1996-1997</u>, 1998 未入手、ただし森林委員会書庫にてオリジナル確認済み
- (10) Zimbabwe Forestry Commission & SAREC-SIDA, <u>Sustainable Management of Indigenous</u> <u>Forests in the Dry Tropics</u>, Proceedings of an International Conference, Kadoma, Zimbabwe, 1996
- (11) Jeanette Clarke, compiled, <u>Building on Indigenous Natural Resource Management</u>
  : <u>Forestry Practices in Zimbabwe Communal Lands</u>, Forestry Coumission, 1994
- (12) Frank Matose, <u>The Gwaai and Moembesi Forest Settlers: A Report of a Participatory</u>
  Rural Appraisal (一部分のみ)
- (13) GTZ/ Forest Commission, Woody Cover Map (1:1,000,000)
- (14) Zimbabwe Forest Commission, <u>The Ecology and Management of Indigenous Forests in South Africa</u>, 1993
- (15) Forestry Commission, Growing Fruit Trees, 1995
- (16) Braam van Wyk et Piet van Wyk, <u>Field Guide to Trees of Southern Africa</u>, South Africa, 1997

7.	THE GWAAI AND M BEMBESI FORESTS SETTLERS: A REPORT OF A PARTICIPATORY RURAL APPRAISAL (一部抜粋)
	THE GWAAI AND MBEMBESI FORESTS SETTLERS: A REPORT OF A PARTICIPATORY RURAL APPRAISAL
	By
	Matose, F. Mukwekwerere, M. Maruzane, D. Nabane, N. and Hobane, P. A.

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#### Acknowledgements

We would like to thank the Gwaai Forester, Mr C. Mashingaidze for making all the preparations for the village workshops and participating in some of them.

We would also like to acknowledge the generosity of the people of Northern boundary, St Elizabeth, St Mathias, Mafa, Somgoro and Ilihlo areas for giving us portions of their valuable time and for being so forthright in the workshops.

#### Introduction

This report presents findings from a one week study carried out in six areas located in the Gwaai/Mbembesi Forest reserve. The focus of the study was on resource use and management from the period before the area was gazetted a forest reserve to date. The research was carried out by a team of researchers from the Forestry Commission and the Centre for Applied Social Sciences at the University of Zimbabwe.

#### Background

The Forestry Commission through the Indigenous Resources Division (IRD) is experiencing problems from its former tenants within the Mbembesi river valley. Since the IRD embarked on relocation of former tenants from one part of the forest to the other in 1993, resistance has been encountered on that part of the community in Gwaai/Mbembesi forests. Following a series of joint planning workshops between the IRD and the Research and Development in 1996, the need to embark on socioeconomic studies to establish the nature of issues surrounding forest dwelling communities was identified. A preliminary study was conducted earlier with leadership of the communities in January/February 1996. The study only explored a few issues which required follow-up.

#### Objectives of the study

- 1. To generate data on the histories of people living within the demarcated forest areas.
- 2. To investigate the institutional arrangements governing access to the forests and how these have evolved over time.
- 3. To identify the range of forest resources used by households living within the forest area.
- 4. To assess the role forests play to households (forest dwelling) economies.

#### Methods for data collection

The study was carried out between the 16th and the 24th of July 1996. A day was spent in each of the following areas: Northern boundary, St Elizabeth, St Mathias, Mafa, Somgoro, and Ilihlo. Northern boundary and St Elizabeth are located on the eastern side of the main Victoria Falls road, while the other four are located to the west of the same road. The bulk of the forest area is on the western side of the Victoria Falls road.

Participatory Rural Appraisal techniques were used for data collection. In each locality, the tools that were used were group discussions, social/resource maps, and linkage diagrams.

#### Group discussions

Group discussions were used for generating data on the history of the people living in the study area. In the process, historical time lines were drawn. These were used to establish the histories of people living in the forest area in relation to resource use and management. Emphasis was on institutional arrangements governing resource use over time. However, general problems and possible solutions were also discussed. The discussions were generally led by elderly community members, with younger people contributing for latter periods.

#### Social/Resource maps

After discussing the history of their areas, participants were asked to draw maps of their villages. They were required to show the location of their homes in relation to the various resources that they utilize. In order to ensure fair contribution by both men and women in the map drawing exercise, the groups were separated. The maps also detailed other infrastructure like roads, schools and stores in the area. Furthermore, the maps showed the number of people living in each homestead (Table 1, on Annex 1). Initially, the research team had envisaged that the villagers would indicate when each homestead was established, and where it originally came from. However this was found to be sensitive as the villagers refused to give such information. They all insisted that they have always been resident in the area. Only the women from Northern boundary gave this information. As a result the exercise was abandoned.

#### Linkage diagrams

Linkage diagrams were used to establish sources of income for women and men. The various income sources were ranked by scoring to establish their relative importance to household economy. In addition, pair-wise ranking of the sources of income was done to substantiate and qualify the ranks from the linkage diagrams.

#### Historical profiles of forest settlers

#### Governance prior to the gazetting of forest reserves

Traditionally, there was a headman (Induna), uM'lisa and kraal heads (Sobhukus). These were responsible for allocation of land and settling disputes. Resource use was regulated by locally derived regulations. These regulations varied by type of resource. For example, trees were only cut for immediate use or in the process of clearing fields. Thatching grass was collected during the dry season when it had ripened to ensure its availability the following year. Medicine from trees was obtained from bark and roots. Trees were not felled for medicine. Some trees were not used for firewood as it was believed that using them would bring bad luck to the household. In some cases trees were not used for firewood because they did not make good fire. Trees not used for firewood include ichithanuzi, umvagazi, umqhobampunzi, umphafa, umgoma, umtshibi, umkamba, ibhanda and umnyelenyele (see Annex 2, for botanical names of trees).

#### General Uses of Trees

People obtained a wide range of benefits from trees.

- 1. Wood for carving household items such as:
  - a) mortars from unmondo
  - b) plates and milk containers from umganu and umvagazi
  - c) pestles from iphane trees
  - d) stools and amathala from umvagazi, umnondo, umganu and umgalanyeza.
- 2. Fencing (ukubiya) poles and branches. Trees that were mainly used for fencing fields, kraals and izihonqo² were: umangwe, umkhaya, isinga, iphane, ithetshane, umkusu, iwohlo, umphafa, and igagu.
- 3. Firewood. Examples of trees used for firewood are, umkusu, iphane, igonde, and ithetshane.
- 4. Sledges were made from igonde, umvagazi, and umkusu
- 5. Poles for hut construction (intungo) were cut from iphane and umangwe
- 6. Bark for fibre was obtained from igonde and itshabela
- 7. Shade in fields and at homes was from umkusu and ithetshane
- 8. Medicine was got from shrubs and trees like, isihaqa, unyawutshana, ikhalimela, umathanjana, intolwane, umvagazi and ihlwili.
- 9. Fruits were from trees like umsosobiyana, umviyo, umqokolo, uxakuxaku, umtshwankela, amagwadi.

#### Uses of Animals

The area had a number of animal and bird species from which people obtained meat, skins, feathers and bones. There were organised hunting expeditions which were led by prominent hunters. Meat from such expedition was shared out to all members of the community. However,

<sup>&</sup>lt;sup>1</sup> This is a wooden structure that is used for drying utensils

<sup>&</sup>lt;sup>2</sup> This is a structure build to store unprocessed agricultural produce.

not all animals were hunted. For example, eland and pangolin were viewed as animals for kings. Some animals were killed and eaten during the rain making ceremony.

#### Demarcation the Forest Areas

It was not clear from the community's perspective when the forest area was dermacated. However, the community felt the impact of this demarcation around 1939. During this period, villagers recall that there was a white forester, popularly known as "Ngokho" (he spoke Xhosa and frequently used the term 'Ngokho'). His coming does not seem to have caused a lot of discontent as his stated main interest was trees and their conservation. It is said that he asked for community participation in conservation initiatives through responsible utilization of trees. He asked the villagers not to cut umkusu, umvagazi, umtshibi, umgoma and umkamba.

"Ngokho" employed locals to make a number of fire lines in the forest eg. bhodabhoda (border line), 8 miles etc. The locals were also required to make fireguards around their fields and homes. In addition, community members were required to offer voluntary assistance to put out bush fires. Hunting of game in the forest was prohibited. However, villagers were allowed to trap and utilize problem animals in their fields.

A levy of ten shillings was made payable to Forestry Commission in addition to a head tax of two pounds paid to the local authority. Access to the forest was not restricted but villagers were not allowed to use whips to drop fruits. Parents or guardians were tasked with ensuring that children did not take matches, axes or dogs into the forest when herding cattle. The villagers had no qualms with these restrictions as they saw them working towards the safety of their children. For example, dogs might provoke dangerous animals such as buffalo and put the young boys into trouble. Goat rearing was prohibited as they were seen as environmentally destructive due to their browsing nature. Around the 1940's, forest dwellers were issued with permits for settling on the land. The locals understood these to be giving them all rights to occupy the land. They were required to pay an annual fee for the permit.

Apparently relations between the Forestry Commission and the local communities began souring around the 1960's to the late 1970's when Farquer became the forester. He is said to have increased the permit fee to \$10,00 and evicted offsprings of permit holders. Assisting with running forest affairs during this time was McConnach, an agriculturalist, who recommended that the number of households in the area be reduced to 72. Some people who could not afford the new fee opted out of the forest area. Another group that left was composed of permit holders who felt that they were too old to remain on their own after their male offsprings had been evicted. They chose to go and seek land in reserves where they could continue to live in proximity with their children.

When the liberation war intensified, the Forestry Commission was unable to enforce its regulations through its absence from the forest areas. As a result, some people who had moved out of the forest area returned.

In the early 1980's, the permit fee was raised to \$30,00. Eventually, Forest Commission refused to accept levies but instead granted grazing rights for 25 cents per head per month. All settlers were asked to move out of the forest area. In 1987, homes of none permit holders were burnt down by the Forestry Commission. This was a way of forcing people to vacate the forest area. In response to this, communities formed the Gwaai/Mbembesi Residents Association. The Association appealed to politicians and non-governmental organisations (namely the Catholic Commission for Peace and Justice) to intervene. During this period, villagers were denied the utilization of all resources on Forest land. However, they were required to obtain permits to cut poles and thatching grass from Forest areas.

#### 1994 to 1996

Some people who had settled on nearby resettlement areas bordering the forests and those who had been forced out of the forest areas since the 1970s were resettled by the Forestry Commission on forest land to the east of the Victoria Falls road. Those who refused to comply with the relocation programme and continued to occupy land on the western side are now living in perpetual fear and induced pressure from Forestry Commission. For example, foresters and forest managers continuously tell them to move out and not invest in development of the area. In some areas, the Commission has cut out their water supply. The Commission is allegedly refusing to give permits to villagers to cut poles and thatching grass. Relations between the two parties have soured to a point that villagers have resorted to taking their plight to political authorities within and outside the area. There is no longer any reference to the previous permit arrangement which gave some members the authority to reside on forest land during the colonial era. In some parts of the Gwaai forest, the Forestry Commission has granted grazing leases to both forest dwellers and outsiders at a rate of \$6,00 per hectare per annum. This has reduced the amount of grazing area available to local communities. Most forest dwellers cannot afford such rents and as a result the scheme has been taken up by rich non locals.

#### **Evolution of Institutional Arrangements**

#### Early colonial period: before Forestry Commission arrival

Communities living within the forests had institutional structures that were similar to those in communal areas. There was a chief and sub-chiefs who controlled the utilization of natural resources, especially trees and wildlife. There were some tree species like umphafa, ichithanuzi, umqhobampunzi, umnyelenyele and ibhanda which were not used because of certain cultural beliefs. Likewise, eland, pangolin, elephant and buffalo; the last through fear, were not hunted due to cultural beliefs. Species utilization through cultural beliefs is still practised.

#### Colonial Period: 1939 to early 1970s

With the dermacation of the Gwaai and Mbembesi Forest Area, resource use regulations were put in place by the Forestry Commission. The following tree species were not allowed to be cut, mukwa, teak, umtshibi, umngoma and red pod mahogany (umkamba). Local people were fined for cutting the above species. During the early part of forest occupation, local communities were permitted to hunt animals that would have 'strayed' into their fields or into the 8-mile line zone. Around the early 1960's, forest dwellers were prohibited access to wildlife resources. This included problem animals to which they previously had access.

Permits were issued for cutting poles for construction, even from upland woodlands. Permits indicated the period for cutting and if it expired before one finished, they would go to notify the forester and be allowed to complete their task.

#### Post Independence: 1980s to 1996

Because of the increase in tension and conflict between forest residents and the Forestry Commission, most of the regulations were enforced more strictly than in the colonial period. Permits were issued for collecting various products as in the previous period. During the 1980s the system of sharing bundles of grass cut between local people and the Forestry Commission was introduced. Trapping of small game like springhare was also banned. Hunting of problem animals was restricted to the Department of National Parks and Wild Life Management (DNPWLM). However, it is alleged that DNPWLM personnel never turn up when they are needed by the villagers.

#### Current: Eastern side of the Victoria Falls Road

Residential and agricultural plots were pegged in 1994. There are no written agreements indicating the allocation of these plots to forest residents. This has made the residents feel insecure. Insecurity is heightened by historical events like the burning down of homes belonging to non permit holders in the 1980s as part of Forestry Commission's strategy to deal with illegal settlers. Even those who were settled legally and previously had permits are now being asked to relocate with no mention of compensation. There are allegations that the Forestry Commissions is arguing that the communities used forestry resources to build their homes therefore there is no need for any compensation.

Residents on the eastern side of the forest area are allowed to access various forest resources, namely timber for construction, thatching grass and firewood. For the last two, once a permit has been issued by a forestry official at Forest Hill, resources are shared (50-50) between the Forestry Commission and the collector. If a villager cuts 20 bundles of thatching grass, 10 are ceded to the Forestry Commission. For firewood cut for commercial purposes, the codes are shared 50-50 as well. For construction timber, permits are issued for purposes of monitoring resource use. Construction timber is sourced from both residential and upland woodland areas (eguswini).

Grazing is limited to the areas shown on the maps drawn by the villagers (see Annex 3). The villagers would have wanted access to grazing on the western side of the Victoria Falls road but access is restricted by the Veterinary control fence. During the wet season, villagers restrict grazing to the upland areas, while in the dry season, the riverine area is opened up. These practices are instituted by the sobhukus.

# Current: Western side of the Victoria Falls Road

Relative to the eastern side, resource use regulations are stricter and tougher for villagers living in this area. Since 1994, villagers are no longer given permits to access resources for consumption because of the deterioration of relations with the Forestry Commission. Even boreholes for watering their livestock are sometimes closed or are not repaired when they break down. This is done so as to force the villagers to move out of the Forest Reserve. Villagers depend on resources from within the riverine (Mbembesi River) area for their needs. These include, thatching grass, timber for construction, and firewood. The riverine area is bounded on the north by the Stanley line and on the south by the 'O.Riley' line. Sometimes forest guards arrest people for cutting trees from within this area. Women said they still managed to get thatching grass from the Insuza vlei once they get permits from Forestry officials. The grass is shared with the Forestry Commission.

Before 1994, resources were accessed through permits from the foresters and the areas of access were greater. For villagers to the east of the Somgoro road, they could go as far as the 8-mile line, while for those to the west, could go beyond the Stanley line. Forest dwellers also have their own arrangements for grazing livestock. The riverine area is accessed after the rainy season, while the upland forest areas are grazed during the rainy season.

## Social/Resource Maps

Maps drawn by forest dwellers are attached as Annex 3. These maps depict both the residential set up and location of resources that are used by villagers. In addition the maps contain some information on numbers of people residing in each homestead<sup>3</sup>. The section below briefly describes the social/resource maps. Areas with a similar set up have been combined.

### Northern Boundary

The Population for Northern boundary adds up to 497 from 55 homesteads. Homesteads in the Northern boundary area are located in a linear pattern. This is because the stands were pegged by the Forestry Commission in 1994. There is a fence which runs on the northern side of the village.

<sup>&</sup>lt;sup>3</sup>The term homestead is used because it was found that there is more than one household in each unit. This is partly due to the fact that young couples do not have pieces of land where they can build their own homes. Thus they have to live with their parents.

The fence demarcates the boundary between Northern boundary and the resettlement areas.

Residents from the Northern boundary get the following resources and infrastructure from the resettlement area; water (there are no boreholes in the village), dip tank, mud for building huts, store, grinding mill and school. Women from Northern boundary pointed out that they 'steal' thatching grass from the resettlement area because they are not allowed to cut grass from there.

Northern boundary residents get the following resources around their residential area; firewood, indigenous fruit and some bit of grazing. Grazing area to the west of the residential area provide villagers with the following resources, firewood, poles for construction, and indigenous fruits like umviyo, umthunduluka, umnswantsha, umsosobiyana, umtshibi, umphafa (eaten by children only), and ubhuzu.

#### St. Elizabeth

The St. Elizabeth social/resource map did not have detail on household numbers and population because the research team had decided to omit this part of the exercise as a result of its sensitivity. Villagers identified four major areas where they get forest products. These are, the residential area (including fields), grazing areas on the southern side of the village, riverine area (along the Mbembesi river) and on the western side of the Victoria Falls road.

From the residential area, villagers get the following resources, firewood (not much), and poles from mopane trees, indigenous fruits like umkhemeswane, umtshwankela, uxakuxaku and umviyo. Individuals control use of resources in this area except for the five trees (listed earlier) restricted by the Forestry Commission. Villagers indicated that from the grazing areas, they get the following resources, poles, firewood and some fruits. Forestry Commission controls the use of resources in this area. There is wildlife in this area but villagers are not allowed to hunt.

The riverine area has the following resources, poles, firewood and grazing. Sobukus set regulations on the use of resources in this area, although the Forestry Commission restricts cutting of certain tree species. For example, grazing is not allowed in this area during the rainy season. The area is only utilised for grazing during the dry season.

On the western side of the Victoria Falls road, villagers have access to resources like finits, for example, umsosobiyana, umthunduluka, umviyo, umtshibi and amagwadi; poles for construction, and thatching grass. For thatching grass and poles, villagers have to get permits from the forestry officials.

# St. Mathias, Mafa, and Somgoro areas

These three areas were combined because they have more or less similar setups. St. Mathias has 71 homesteads with a population of 742 people. Mafa village has 55 homesteads with 562 people. The third village, Somgoro has 67 homesteads with 680 people.

Three major areas were identified for resource utilization by people from the three villages. These are, the area between O. Riley and 8 mile lines; around residential areas; and near Mbembesi River. Resources that people get from the area between O. Riley and 8 mile lines include the following, thatching grass, broom grass, poles for construction, wildfruits, grazing, firewood, paddocks for grazing leases and fibre for ropes. The Forestry Commission control use of resources from this area and is no longer giving villagers permits to utilize these resources. It is said the Forestry Commission is using this strategy so as to force villagers to move out of the forest area.

Around the residential area, villagers get, less firewood than from the O.Riley and 8-mile area, drinking water, although it has become very scarce in recent years, fruits, but there is less diversity, and *ilala* palm for making mats and baskets. In the past, villagers had some control over these resources. Presently use of these resources is controlled by the Forestry Commission.

From Mbembesi river area, villagers get the following resources, clay soil for building huts, sand and stones for construction, water for people and livestock and fish for relish. The Forestry Commission also controls the use of these resources.

#### Ilihlo

Ilihlo consists of 89 homesteads with a population of 907 people. The map for Ilihlo shows 4 areas with resources that the community utilizes. These are the purchase areas (small-scale farms), Mbembesi River, around the homesteads and beyond Border line.

From the purchase areas, forest dwellers get resources like grinding mills, transport, secondary school, cattle pen (for cattle sales), clinic, thatching grass and water. Villagers have to pay for thatching grass and water. Water is fetched from these sources mainly during the dry season. The amount one pays is determined by the plot owners. There are no fixed charges. Resource use regulations are set by the plot owners. Thus, they vary from plot to plot. Villagers who break the rules are sent to police.

Mbembesi river and the surrounding areas provide villagers with domestic water and water for livestock; river sand for bricks and house construction, stones for construction, grazing, firewood, fencing material (branches), mopane poles, and wildfruits like umhagawawe. For cutting branches to fence fields, villagers have to get permits from the forester. For cattle grazing, the community sets its own regulations. For instance, cattle are not allowed to graze in this area during the rainy season.

The following resources are got from the area around homesteads, mud for building huts, ilala (palm) for making mats and baskets, poles for construction, and wildfruits like amakhemeswane. However, villagers need permits from the forester for cutting trees for construction and fencing fields. The forester also expects villagers to monitor tree cutting near their homes and also put out bush fires. The Forestry Commission has regulations on pet and livestock ownership. Only two dogs may be kept in any given homestead. Keeping of goats is forbidden because of their

browsing nature. However, villages keep them against forestry regulations. From the border line and beyond, villagers get the following resources: thatching grass, grazing, poles and wildfruit like *umviyo*. However, the area is currently being leasedfor grazing, resulting in restricted access.

#### Income sources

This section presents findings on the income sources. Income generating activities for all study sites are summarised in Table 1.

Table 1. Sources of income for the six areas

Income source	Northern boundary	St Elizabeth	St Mathias	Mafa	Somgoro	llihlo
crops	+2 -1	-2	+3 -2	+1 -2	+1 -1	+2 - 2
livestock	+1 -1	-1	+1 -1	+5 -1	+2 - 2	+ 1 - 1
Wooderaft	-5				-5	- 4
black smiths	-4			<u> </u>		-4
beer brewing	+3	-3	+2 -4	+4 -4	+6	
thatching grass			+2	+3		+6
women's clubs			+4	+2		
ilala crafts			+6	+8		+3
vegetables			+5	+2	+4	+ 5
firewood			-5			
remittances			-3	+7 -3	4	- 4
wild fruits		-4			+ 5	
milk			+5		+3	
brooms			+5			+6
hired labour	-3	-4	į	-4	- 3	+6
knit/shoe repair					+5	+ 4

Key; += women

- = men

1-7 = rank of income sources; I means ranked as highest and 7 least income source

Livestock, crop and beer sales were highly ranked in all the study villages. These were said to be the largest income contributors to the household economy. Livestock sale was cited as the highest income generator in all the areas save for Mafa and Somgoro. Crop sales were ranked second, while beer was given the third position. Livestock, mainly cattle are sold to Cold Storage Commission and private buyers. Small livestock like goats and chickens are mainly sold locally.

Although crop production is mainly for subsistence in most years, produce is also sold during times of dire need. For example parents sometimes sell agricultural produce so as to raise school fees for children. Crops are sold locally and to private buyers. People rarely sell to the Grain Marketing Board (GMB) due to the cumbersome process involved in obtaining cards. Another reason given for not marketing agricultural produce through the G.M.B. was that farmers are not given instant cash.

Forest products have also become partly commercialised. Firewood and indigenous fruits are finding their way to urban markets. However, only a few individuals reported selling fruits. Most people in these areas shun the trade in wild fruits and they attribute the occurrence of droughts to such practices.

There are some women's clubs in the villages. These operate along the lines of 'savings clubs'. Each member of the club is paid in turn by each and every member of the club. This is done on a monthly basis and the process revolves monthly around members of the group.

In all areas except Northern boundary where there is an acute shortage of water, women sell vegetables (both fresh and dried). Sale of vegetables is seasonal. Most vegetables are sold during the dry season when relish is most scarce.

Women also reported selling crafts from reeds and ilala (palms) locally. Occasionally, women also hire out their labour to other villagers. This is in the form of working in other people's fields during peak agricultural periods.

Some men in the Northern boundary and Ilihlo areas are involved in tin and blacksmithing. The smiths were found to be less than three in each of the mentioned sites. Men also generate income through selling wooden crafts. Examples of these are yokes, benches, axe and hoe handles, mortars and pestles. Men are said to be hiring out their labour locally too. Hired out labour is mainly for building, thatching huts and pole/firewood cutting.

# Settlers' problems and possible solutions

The section discusses problems that villagers experience and their own suggestions for possible solutions. A major problem cited by the villagers was that of strained relationships between forest dwellers and the Forestry Commission. Threats of relocation for villagers on the western side of the Victoria Falls road are hindering any major infra structural developments. There is so much insecurity and fear among the villagers. This has been aggravated by the absence of any formal

agreements between the two parties regarding settlement in the Forest area. Villagers suggested that there is need for the Forestry Commission to allow them continued residence in the area because of their historical link to the forests.

The Forestry Commission is continuously encroaching on the settlement area and taking up their traditional grazing areas. This has partly been through the recently introduced grazing leases. Some grazing areas are leased out to private individuals, majority of whom are not from the local area. This has restricted the villagers' access to resources like firewood, bark fibre for rope, and indigenous fruits that people have all along been utilizing. The people renting grazing areas pay \$6,00 per annum per hectare. Villagers claim that they were neither consulted nor given an option to participate in the scheme. Besides, most of the villagers would not have afforded the rental and do not have large herds of cattle to justify them having leases. It was suggested that the Forestry Commission should maintain the original 8 mile and Stanley line boundaries. Villagers also noted that the Forestry Commission should directly consult them on such and other related issues.

Villagers are not directly benefitting from the income generated by the Forestry Commission through wildlife sales and other forest products especially harvested timber. Lack of benefits from wildlife sales is compounded by the fact that forest dwellers still experience problems of crop damage by wildlife like elephants, spring hares and waterbucks. There is no problem animal control (PAC) which is the responsibility of the DNPWLM. Villagers therefore want to benefit from these resources since they bear the costs of living with wildlife. It was suggested that during the colonial period villagers were allowed to do their own PAC by setting up snares in fields. Villagers also suggested that they want to benefit from timber concessions because they participated in the conservation of the trees by not cutting them.

There are poor relations between the forestry extension officers and the villagers. This has led to poor communication between the two parties. Because the foresters employ a paramilitary strategy in controlling utilization of resources by villagers, they are not in a position to discuss problems those forest dwellers are experiencing.

Lack of local institutions to deal with problems has also contributed to the absence of dialogue between the forest dwellers and the Forestry Commission. The recently formed Residents Association has not yet developed a strong base to air villagers 'problems. Thus, villagers have to depend on hearsay with regards their future residence in the forest area.

Employment opportunities are now very limited as compared to the period before independence. This is mainly for unskilled labour. The Forestry Commission employs people from other Districts instead of employing the locals. This has increased the villagers' hostility towards the Forestry Commission and its Forestry Protection Unit (FPU).

Villagers suggested that they are "hidden" from government and donors. They are denied any assistance from such institutions because of Forestry Commission regulations that prohibit infra structural development on forest land. This has left villagers with poor schools and no health

#### facilities.

The forest dwellers suggested that they want their area to be demarcated into a communal area. If this happens, villagers would have some rights to land and resources like thatching grass without the Forestry Commission's interference. Forest dwellers have been denied certain benefits that people in communal areas enjoy. For instance, they do not have access to AGRITEX extension services, drought relief, and non-governmental organisation assistance. This would also bring to an end the harassment they are experiencing from the Forestry Commission.

Water was cited as a major problem in the area. To illustrate the extent of the problem, one member of the residents association took the researchers to one well in the Mafa area which was more than 5 metres deep. It was reported that a child fell into this unprotected well earlier in the year. This well had been dug by World Vision but had to be abandoned before completion because the Forestry Commission intervened. Water for livestock is also a major problem. In Mafa area, the Forestry Commission has since cut off water supply for livestock to the area as a way of forcing the villagers to move out of the area. This has worsened the water problem.

#### Discussion

The study revealed that there is a lot of insecurity amongst the villagers. The degree of insecurity differs between villagers on the eastern side of the Victoria Falls road and those on the western side. There is less insecurity on the eastern side because plots were pegged and allocated to the villagers by the Forestry Commission. Despite this fact, there is no formal lease agreement between the two parties. History of relocation even after having been given plots and the Breaching of contracts by the Forestry Commission has led to this insecurity. At the time of the study, conditions of tenancy were not understood, due to lack of communication on tenure issues between the Forestry Commission and the villagers.

Villagers on the western side are even more insecure. This is because since 1994, there have been receiving threats of relocation from the Forestry Commission. They are no longer given any permits to harvest forest products like poles and thatching grass. Investment in infra structural development is restricted by the Forestry Commission. This insecurity was illustratively expressed by saying, 'sesihlala siquthile njengenyamazana' (we now live in fear like wild animals). This shows a high degree of insecurity.

Relocation of people on the Western side of the Victoria Falls road would be very costly especially for the villagers. Villagers would have to reestablish their homes. Some of the villagers are now too old to build new homes. Since this area is classified as a red zone by the Veterinary service, villagers would not be able to move with their cattle. This would force villagers to get rid of their cattle. Most of them may not be able to buy livestock again. Besides people's social ties may also be affected as they may not settle under the same social structures after relocation. There is therefore need to take such issues into consideration.

The villagers' economy is largely dependent on agriculture and livestock production. Land on the western side of the Victoria Falls road has richer soils and is more productive. The suggested site of relocation on the eastern side of the Victoria Falls road has poor soils. Besides fields will be smaller because of population pressure. There would also be limited grazing areas. Access to forest products needed for the day to day livelihood sustenance would be very limited.

#### Conclusion

Poor communication between the Forestry Commission and the forest dwellers seems to be the cause of all problems. Right from the time the area was demarcated a forest reserve, villagers did not understand implications of the tenancy scheme. The Forestry Commission should come up with a clear policy on the issue of forest dwellers. The current hostility emanating from poor relations between the two parties is detrimental to the conservation of resources as people now "poach" in retaliation.

#### Recommendations

The following are only tentative given that this is the second set of insights where there is need to conduct more in-depth studies and a survey, using questionnaires. Thus, the recommendations should be taken in the light of this reality.

1. There are a number of options that the IRD could pursue in improving the current situation regarding forest dwellers:

Option one: Relocation of villagers to the eastern side of the Falls road, but this would be costly to both the Forestry Commission and the villagers. In order to move people, there would be need to put up sufficient infrastructures to act as incentives for them to move. On the community side, movement to the east would meet with very stiff resistance as arable vleis are already being utilised.

Option two: Recognition of the presence of forest villagers on the western part of the Gwaai Forest Area. This would mean giving up parts of the forest area where villagers are already settled. However, this would require formalisation, in the form of long-term leases, and incorporation of villagers' ideas regarding future land allocation and inheritance. This option would entail the confinement of villagers to within the Mbembesi riverine area and possibly giving up land up to the 8 mile line, for the localities of St. Mathias, Mafa and Somgoro. For the locality, of Ilihlo, this would mean for the Mbembesi river up to the Stanley line. This option would be least costly to implement for the latter locality, given the fact that villagers are not in the middle of the forest, unlike the former three localities.

Option three: co-management of forest resources with villagers. This may involve setting up of community resource monitors and capacity building. Communities expressed the

willingness to work the FC to conserve resources but at the present moment they are discouraged by the denial of access rights to a variety of resources. This option requires a long term investment to the process.

- 2. Regarding the eastern side settlers, there is need to clearly define the villagers rights to land and forest resources in the form of agreements. Formalisation would result in greater security of tenure for the settlers and allow them to have infra structural development in the designated settlement area such as educational and health facilities, as well as access to AGRITEX. Circumstances surrounding settlers to the east of the Falls road appear the simpler ones to solve in the short-term.
- 3. Grazing leases issued to outsiders are also worsening the relations with settlers on the west as they are limiting their livestock access, which requires some careful consideration of how to handle them.

ANNEX 1

## Human population of the study areas (July, 1996)

	Northern Boundary	St. Elizabeth	St. Mathias	Mafa	Somgoro	Ilihlo
Number of homesteads*	55	**	71	55	67	89
Population***	497	**	742	562	680	907

<sup>\*</sup> the term homestead is used as it was found that there were more than one household at each homestead. This was attributed to the fact that young couples are not allocated separate land from their parents.

<sup>\*\*</sup> Data for St. Elizabeth was not collected.

<sup>\*\*\*</sup> Population refers to all the people in the particular locality/area, that is, children, young couples with their own households and the parents with the original permit to the land.

#### Appendix 2: Botanical names for local tree species

Ichithamuzi Lonenhocarpus capassa
Umvagazi Pterocarpus angolensis
Umphafa Ziziphus mucronata
Umgoma Shynziophyton rautenaii
Umtshibi Guibortia coleosperma
Umkamba Afzelia quanzensis

Umqhobampunzi Pseudolachnostylis maprouneifolia

Ibhanda Loncocarpus capassa

Umnyelenyele Ochna pulchra
Umnondo Julbernadia globiflora
Umganu Sclerocarya birrea
Umangwe Terminalia sericea
Umkhaya Acacia negrescens

Isinga Acacia karoo

Colophospermum mopane *lphane* Combretum hereroense Ithetshane Dichrostachys cinerea Igagu Brachystegia speciformis Igonde Brachystegia boehmii Itshabela Dicoma anomala 1khalimela Elephantorriza goetzei Intolwane Baikea plurijuga Umkusu Umsosoviyana Grewia occidentalis

Umviyo Vangueria infausta
Umqokolo Dovyalis caffra
Umxakuxaku Azanza garckeana

UmtshwankelaVitex payosUmthundulukaXimenia caffra

Umkhemeswana Strychnos cocculoides Umswantsha Ximenia americana

Umgalanyeza Albizia

Iwohlo Acacia erioloba

Isihaga

Unyawutshana

Ihlwili Combretum imberbe

Umgwadi

# THEMES/STORIES EMERGING FROM COLLECTED DATA: A Preliminary Report

Story 1: Household histories

Village	No.of Hh	Agricultural profiles	Environmental & general history	Issues
Gwaai East	94	Fields on the upland Kalahari sandy ridges -6 hectares allocated per family by the FC	Now the legitimate village with infrastructural development and services being provided by the RDC 1993/4: Allocation of plots for married children and in-migration of other people.  -Shift from farming along the river to upland areas - permits are still operational for resources across the Falls road and the forest area between the road and cultivation areas but for all the other areas permits are not required excerpt for the prohibited species; namely: Mtshibi, Mkamba, Mkusi, Mukwa and Mngoma	-Grazing constriction due to the Vet fence on the Falls road is a major source of concern -Puzzle: low risk and moderate returns from the sandy fields vs the clays on the valley.  Villagers whose tenure was insecure or who moved in the last 20 years perceive the FC in a positive light and are satisfied with the developments taking place in the village. Villages who settled in the area earlier than in thelast twenty years view their livelihoods, particularly from livestock earnings as deteriorating due to the limited range as a result of the Vet fence

Gwaai West	55 former tenants	clayey soils along the	which was after commercial	-Did they not move in from somewhere else initially?
		-Due to lack of livestock dipping facilities; villagers	1930-50s: FC moved in and was after timber and wildlife. Introduction of permits whose levies were very low. Cordial relations with the owners of forest lands One of the oldest settlements on the west part of the forest from which former tenants are supposed to be relocated- most of the families are descendants of people who occupied the forest before the FC gazzetted Gwaai.  Since 1996 being harassed by FC officers for resisting relocation of the east.  Argument is that the forest environment has changed little although some people noted more trees where people were evicted from in the late 1980s. Some noted increases in the river sand due to cultivation in the east, where the major river that dissects	Argument is that production is high and unparallaled in the region on the red clay soils only found within a few river valleys  -Likewise, livestock conditions are of higher quality on the west than for those on the east neighbouring CAs due to availability of quality range which extends into the forest  5 households refused to be interviewed because they were too agitated (all of them young couples)
Mapfungautsi North	98 households around 40 of whom were displaced from the forest in 1986 and were interviewed in 1994	Most fields are on the sandy soils; pple are also not happly about land use reorganisation initiated by AGRITEX which will result in settlement being up on the Mafungatsi Plateau while grazing will be in the river valley and in the forest. Many people of Shangwe origin thought the FC was responsible for the resettlement initiative, indicating their suspicions of the FC; On the other hand the Shonas have welcomed the move	Shangwe who were in the forest, they are unhappy with the RMC	thatch grass  Further problems are developing with the grazin scheme as to how it is to beflected:

Mapfungautsi South	36 households  I former tenant of forest	On the bottom of the village there are clay to loamy soils which are prone to water-logging in a rainy season: but towards the forest the soils are pure sands which are heavily leached under too much rain-mgmt system was to cultivate on the lower fields in a heavy rains year and on the uplands when less wet: systen disrupted by the annexation of uplands by the FC in 1988-90.	Mostly from Rhodesdale commercial farms in Kwe Kwe area- moved in the early 1950s and displaced the original settlers who moved into their own village in the same locality. "Madheruka" Vakauya nemoto muhari  Shona people are accused of having brought Chirungu (white ways of life) into the area as well as accused of being thieves.  Most of the villagers perceived the woodlands in their locality as having less trees and the forest environment close to them as changing for the worse since the 1950s due to greater demands for construction materials from rising populations. The increase in people has resulted in less wildlife species being seen in the forest.	Discourse is progovernment among the Shonas: see the reservation as a good thing for their future- a way of meeting future needs: the originals' (the "Shangwe") discourse is anti-FC- they lost their access to resources -the FC's extension of the boundary into communal land has become as land for cultivation becomes scarce given the village being squeezed between the forest and the neighbouring district (breadth of appx. 4km)  Whereas initial thinking was that the village was not participating because they did not want to be involved in the scheme, they reality is that they are very much for the project. The project has been slow in getting to the communities on this part of the forest.
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#### Discussion

It appears that people in each of the four different villages have different histories as they relate to the FC's institutions and practices. The histories have particularly diverged in the last two decades. In the case of Gwaai/Mbembesi forest, people on the east of the forest, site of the IRD (FC) relocation programme, generally perceive their lives getting better with services now being provided as well as having more secure tenure in relation to their relations with the FC. However, the same people on the eastern part of Gwaai are concerned about declining cattle production due to a limited range they now have access to since the veterinary control fence was erected along the Victoria Falls road. They also perceive the woodlands around them as gradually deteriorating with more settlement in the area induced by relocation policies of the FC which has seen new settlers moving in. Another reason put forward for changes in the woodlands is the shift from cropping within the river valley clsys to the upland sandy ridges in the last few years. The major reason forwarded for the shift from cultivating in the red soils on the valley is less risk in the event of average to less rainfall ( the area lies in region IV which receives around 400-600mm of rain per year). Most villagers argued that in cropping the sandy ridges involves less risk as the average falls are poor, however, for a good season like 1996-97, the production from the sandy fields is much lower due to heavy leaching. This is what happened in Tachi (the new and non-participating village in Mafungautsi) given the sandy soils in the village.

The arguments put forward by people on the east contrast sharply with those by people on the western part of Gwaai forest. One of the major reasons for people resisting to move to the east lies with the reliable and "good" crop, as well as livestock, production from the valley depressions and their red to brown clays. Most of the elder people claimed that the western area is the "bread basket" for the greater populations of the district of Lupane in which it lies. It might be that the soils in the west are not as heavy or clay as in the east as evidenced by the presence of mopane woodland in the east unlike in the west where there are only a few small patches of the species (mopane species is said to do well in heavy clay soils).

Another major contrast between the east and the west is in the impasse between villagers and the FC over the relocation policy which has been resisted since 1993 (cf Scott, 1985). This resistance on the part of villagers has resulted in conflicts developing with the FC. They are former tenants and most families are actually descendants of the original forest dwellers present at the time of reservation in the 1930s who later became tenants. Villagers on their part refuse to be referred to as "squatters" and instead allege the FC officers to be the squatters as none of them are from the Matebelcland region. The major issue of conflict revolves around the discontinued issue of permits for the cutting of poles and grass collection for homestead repair. While on the FC part this is done to compel residents to move to the east, on the community side, they are refusing to be moved, despite this problem. Some were illegally harvesting these products without permits. Even though the villagers have a residents association to mediate their problems with the FC, officials tend to ignore them.

For the Mafungautsi villages, it is turning out that the village which is not participating in the resource sharing scheme is not doing so due to project management rather than people's own feelings towards it. Many Shona people were supportive of establishing the project. They were also pro-conservation in the sense that they supported forest reservation in order to ensure future generations supply of forest resources. At the same time, nearly of the villagers were anticipating the formation of management structures facilitated by the FC in order that they formalise current resource accesses which are officially illegal. Land shortages for future generations are a serious problem in this area and people are looking at the forest as likely to alleviate the problems.

In the village that is participating in the resource sharing programme (where I did some work in 1994), there has been some controversy surrounding especially the distribution of revenue from sale of forest products, contrary to earlier assumptions regarding the village that villagers would be happier with the implementation of the project. Conflicts have developed between the Resource Management Committee, responsible for the day-to-day running of the resource sharing scheme, and the "Shangwe" communities over the use of proceeds from the sale of thatch grass. The FC project personnel were not careful in assisting the formation of the RMC in this village. The RMC comprises village leadership and the Councillor for the WARD as well as the chief of the area's advisor. The leadership misappropriated the revenue derived from the sale of grass that was due to the community and because this was done by the leadership it is difficult for the community to recover the money as even the chief who would have intervened in this case, is also involved. This has had a negative impact on the morale and support of communities for the whole programme. Were the RMC composed of people not in the leadership then they would have been accountable through the village leadership and the local chief as is the practice in the area. At the same time AGRITEX is enforcing

the implementation of a resettlement plan in the village which a majority of the original settlers are not supportive of. Already some households have been moved to the upland ridge of the Maßungautsi Plateau which is closer to the fields and forest. The impact of this movement has to be monitored in relation to different actors' perceptions and resultant resource use. Findings to date still have to be complemented by resource use patterns in relation to the introduction of the project.

## Story 2: Forest uses and importance

Key question: How important are different forest resources to different people's livelihoods? Who uses what forest resources from which part of the forest and how often?

## The Story

Given the dissimilarities of each village, the stories from each are retained separately. At least until the second set of data collection. In all the four sites the words "impilo" and "upenyu" were used as criterion for evaluating the importance of a particular resource. Loosely translated the words may mean "livelihood" but more intrinsically the words may mean the everyday usefulness, hence, value, of a resource. Alternatively the words may point to the value of a resource in people's lives besides for basic needs like food and income.

#### Gwaai west

Women place higher values on thatch grass and fruits while men tend to have higher values for grazing and poles. Women also ranked firewood higher than men and also included clays for plastering walls among the resources that they considered important. Women gave higher scores for thatch grass in relation to income and *impilo*. The access areas for the village are; the main forest area; the area between homes and forest boundary, the settlement area and the area adjacent to the Bembesi River. Some households that do not engage in the struggles for survival that others do; tend to limit their access areas to the settlement area only; which does not have as many resources, especially inferior thatch grass.

Current results from the detailed interviews indicate big differences between the rich and poor. The rich being those owning more than 15 herd of cattle and producing a lot of grain, in excess of 10 bags. The poor being those who produce little, less than 5 bags of grain, and own less than five cattle nor do they own any donkeys. Those with at least four donkeys have adequate draught power which they can lease to other households in exchange for some commodities or as social capital. Such people are in the middle range. Cattle play an important role in the livelihoods of households in this region as a whole. Cattle provide security against crop failure and are sold for staple supplies and other basic necessities besides providing draught power. The rich use forest resources for construction, due to the impasse with the FC over building permanent homes (see conflict story), and for grazing but other resources do not play as important a role in their livelihood. Were it not for the impasse with the FC, they would not be relying on the forest for construction materials. These are

poles and thatch grass. The rich use nails in construction were the poor would use fibre from certain tree species. The poor, on the other hand, depend on forest resources for survival, and therefore rely on a diversity of them, as well as doing work for the rich. Among some of the poorer young men are the hunters who, despite the high risks involved, have to hunt to supplement their families' food provisions as well as generate income through sale of meat. Fruits are another resource that is important in their livelihood systems, particularly in the late dry season. With some of the poorer women making a porridge from magwadhi as a nutritional supplement. This type of porridge was not mentioned by the richer households.

Women, of all wealth categories, are responsible for collecting thatch grass in a woody grassland area that is 5-10km away from the settlement area. Because the area is right in the forest and far away from settlement areas, they organise themselves into groups of neighbours and/or relatives. However, each woman would be collecting their own thatch, though they might help each other in ferrying the grass bundles back home. Because nearly all the houses in the village are thatched, they are rethatched every two to three years, collection of thatch grass is a yearly activity during the early dry season for women. Some households, usually the poorer ones, sell some of the grass either locally or to the FC. Though the money raised might not be much, to the households involved it contributes a lot to their welfare, given the lack of opportunities for other income generation activities.

Game meat was one resource that was very difficult to get information about. Only one man in his late thirties admitted during interviews to hunting and boasted that even the Forest Protection Unit members knew that he hunted small animals. The illegality of hunting wild animals for meat is not in dispute, but the change of institutions around this resource in the 1980's seems to have sparked ingenious ways of accessing this resource. Prior to independence in 1980, trapping of problem animals was permitted. That is, animals which would have strayed into the people's fields, on condition they were killed within that locality. Once the animal had limped back into the forest, it became illegal to follow it up. Thus, a number of animals like; kudu, eland, warthog, were part of households' diet through this arrangement.

As permits are no longer issued for key resources like poles and thatch grass and yet play an important part of households' livelihoods this has led to the development of conflicts between the FC and forest residents, explored in the next theme.

#### Gwaai east

Grazing is the most important resource across the 20 households with whom PRAs were conducted. As one young woman put it: "Grazing feeds our livestock from which we get money, food (meat and milk). We also use cattle for ploughing our fields, and as transport to carry materials for building our homes". However, there are variations across women and men as to which forest resource is next in importance in relation to their livelihood. Women place higher scores on firewood importance for livelihood and food preparation, then the clay soils in construction. Men, on the other hand, tend to place greater value on poles and then thatch grass. Firewood has high scores for income indicating the significance in this village in generating income for some households. Understandably, because there are not many fruit tree species in the woodlands around this village, fruits are ranked lowly

among both men and women across all household types and getting low or no scores for their nutrition value. This is the only village in which leaf litter, is mentioned as a resource that plays a important role in the fertility of arable fields.

Many houses in this village are built out of stone and/or bricks such that the use of poles in this village is other than for the construction of houses. At the same time, permits are difficult to get from the FC, because of the distances that household members have to walk to the FC office where they are issued. Wealth in this village is also measured in relation to cattle ownership. Donkeys are less used in this village than their counterparts in the west. Given the good relationship with the FC; resources are accessed legitimately through permits. Firewood is one resource which generated extra income for a few households in the village in the last two years.

Mapfungautsi north

This village has the highest diversity of forest resources mentioned as important to many households. Women place higher scores for fruits in generating income and food, given the reliance on *isithinina* (a local porridge made from *strychnos* spp.) among a high number of Shangwe especially in the late dry season and early summer. There are more households in this village relying on medicines; broom grasses; game meat and honey than in all the other three villages. Despite formal institutions, and the arrangements through the pilot programme, a great number of households still access resources like different type of poles, especially the main ones; fibre for rope, which are prohibited by the FC. This is why there are many sources of conflict from different groups in this village as explored in the next theme. Another resource which is causing conflict is, carving wood. One original settler who moved from the forest voluntarily has managed to build a shop from the sale of commercial timber, which he got without a permit. Yet another original settler, a young man, earns a living from either selling poles or building structures that require construction poles.

Compared to their counterparts in the south of the forest; in people this area rely more on thatch grass from the forest. However, reliance on thatch grass from the forest is higher among the original settlers unlike immigrants who rely on a riverine variety of grass. This is due to time constraint at the time of harvesting thatch grass from the forest. At the time, immigrants, who grow a lot more crops than the settlers, would be busy harvesting their crop produce before the onset of the dry season. At which time livestock roam freely with no herders, thereby damaging crops that would still be in the fields. Thus, at he time they complete harvesting; the thatch grass season from the forest will be over and they then rely on the riverine grass (ndawura) for thatch. While women play a lead role in the harvesting of thatch grass from the forest, because of the long distance involved, men sometimes take part in transporting or assisting women, depending on the household. Because of the distance to the thatch grass area, women organise themselves into groups of neighbours and/or relatives during the harvesting season.

Mapfungautsi south

Agricultural production (crop) appears to have greater significance in people's livelihoods than forest resources in this village. Land is consistently ranked higher than all the other resources by both men and women. Game meat is a forest resource that was also ranked highly by both men and women. Thatch grass, is collected locally from field bunds and boundaries. All the households interviewed in

this area did not use the forest as a source of thatch.

Two issues separate households in this village from other households in the other three villages. Firstly, household access to resources is not necessarily mediated by FC regulations, despite what they inhibit. Household members' access to resources appears unfettered given the distance from the FC camp, at least 20km away. Household members access resources like poles for construction without permits and there is no history of being arrested for such offences in the whole village. Secondly, forest resources are not as important to many households livelihood as agricultural ones compared to other households in the other villages. Grazing for livestock and firewood are the key resources from the forest. There was only one carpenter in the village who depended on the forest for his raw materials; carvers depended more on the local forest for their materials.

Institutional matrix and forest resources

		ana joresi resources	• • • • • • • • • • • • • • • • • • • •		
	Institutions operating at various levels				
Forest Resource	Household level	Community level	State/National		
Poles	Men's responsibility		Permits for cutting in forest areas		
Intungo		Areas of collection allocated by local leaders			
Mbariro					
Cattle grazing	Males responsible	Certain areas at certain times of the year	Forbearance		
Goats/Sheep grazing					
Game meat	Young men's responsibility				
Thatch grass/Brooms	women's responsibility		Permits and sharing system		
Carvewood		Use restricted to specific species one of which is an FC "Royal" spp.	Permits but defacto no control		
Medicines					
Honey					
Fruits					
Macimbi					
Mushrooms					
Fibre					
Firewood					
Arable land					
Commercial grazing			<u> </u>		

1 Timber concessions					

Survey Results

Hypothesis 1: Villagers' perceptions differ by their locations: households in each village have their own needs for forest use.

Hypothesis 2: Women and men place different values on different resources. Women place rank thatch grass higher than men, while men place higher values on poles.

Hypothesis 3: Rich and poor households have different perceptions of resources. Poorer households place higher value on non-timber forest resources than richer households.

Hypothesis 4: Old and young people rank different resources differently. Young people place higher ranks on fruits

Hypothesis 6: Young men place higher value on carvewood than older men

Hypothesis 7:

**Progress:** 1. Field data from detailed second round interviews has been collated but detailed analysis still in progress. 2. Preliminary analysis of survey data, along the above hypotheses, has been done, but in depth analysis using more robust statistics is outstanding.

Outstanding fieldwork: Household forest resource importance through scores

To be done after the two seasons' data collection on household resource use: for both the forest resources and the other resources; group them in categories e.g construction materials and grain-crops vs non-grain crops and have the husband and wife in each household score out of 10 the importance of each resource to their welfare for the groups of resources in comparison. Looking back for one year in relation to importance.

# Story 3: Co-management? Conflicts? or Resistance: State - people interactions around forest reserves

Key question: What are the factors that influence the nature of relationships between local people and forest managers? What are the nature of the relationships across different sites: conflictual, shared management, characterized by resistance? How have the relationships evolved over time? What role do institutions play: both formal and local?

#### The Stories

#### Gwaai West

-"Foresters are the squatters - we were born here and the Forestry Commission found us here.... Forests are for people not animals and trees.... This is all in independent Zimbabwe..." These are some of the sayings from different people in Gwaai west, characterizing the nature of their relationships with forestry officials and attitudes towards the FC. Different groups organise differently around the untenable relations they have with the FC, given it's intended goal of ridding the west of all human settlement. Organisation revolves around registering legitimacy of rights of stay.

"Mrs Farqhuar (former safari camp manager in Gwaai Forest) who came and took land away from us can kill animals at will and cut trees for pleasure, while we cannot do that and yet she found us living here. This is very painful!"

"It worries us a lot to be talking about living conditions all the time instead of concentrating on development. We are not free in Zimbabwe, we are not yet independent."

The eastern part of the forest to which western residents are supposed to be relocated is described as "semi-arid, barren, and has no water sources".

#### Administrative issues

Current Area Manager (who, together with the forester in charge, have since been fired for selling timber fraudulently), alleged to be "very harsh and hostile as well as brutal; no one is allowed to use any tree product nor cut grass"

- a) Threats of eviction accompanied by and effected through the denial of permits to access construction materials, and use of "squatter" discourse
- b) Closure of dip tanks and wells thereby cutting-off livestock and people from important sources of sustenance
- c) Irregular fines of residents for cutting poles as well as destruction of new homes: September, 9 1997 cases of \$4,000 fines for poles as well as destruction of newly established homes of grown-up children or shifting of homes in general
- d) Undermining of school operations through the deterrence of school constructions: structures are mostly brick under thatch
- e) Inhibiting and stopping services and potential donor funded development initiatives
- f) Banning of new fields; even if it's for grown-up children establishing themselves.

#### Gwaai East

-In Gwaai east, relationships with the FC are characterized by cooperation and the forging of partnerships around certain activities. The FC is obviously encouraging settlement in this part of the forest. The responses to requests by local structures are dealt with quickly and in their favour in contrast to the west. Organisation at local level is to facilitate development.

Mapfungautsi North

-Mapfungautsi north is characterized by failing ambitions on the part of both participating communities and the FC. The co-management project was conceived as a means to resolving problems, and hopefully as well as an end. A few years down, problems are emerging largely due to the failure by the project team to craft a course for realising a "vision" that seems to have been lacking in the first place. While enjoying the benefits from the project so far, some groups are organising around the spirit of "kudyidzana" (literally "to eat together", meaning working together or jointly) to realise their original visions of the programme.

Intra-community conflicts: a) RMC comprises only Shangwe who claim to be the only legitimate beneficiaries of the project as the original settlers; b) RMC do not police/arrest Shangwe transgressors: on what basis does the RMC then arrest the Shona and others?! The case of the donkey load of fibre (10/08/97) and cart load of poles (ibid). Check RMC calendar and arrest list!! "White hunters finished most of the animals that were in Mapfungautsi Forest"???

Inter-ethnic conflicts: Shonas moved into Gokwe before 1980 as a result of being displaced by LSCF and in order to farm and live freely"; away from white control over land and resources; assertion by one resident.

Shonas struggle against control by the Shangwe especially through resource institutions; e.g. the use of pots for fetching water from the river,

Land allocation anomalies, Immigrants allocated up to 5 acres only while settlers are allocated no less than 10 acres of farmland.

RMC in the last thatch grass season (1997) they were found to have been issuing fake permits as well as allowing certain groups access without permits

Administrative problems

"...FC dwells mostly on documentation of information rather than implementing viable projects that can bury our memories of eviction and thereafter become friends (partners in resource management). So far the project appears to be a mechanism of diverting our attitude towards the forest (i.e. the Shangwe's demands to go back to their ancestral lands)."

The FC is not as supportive as it should be given the lack of financial training of RMCs; irregular visits to projects as well as inadequate and lack of advice about running projects. Failure to incorporate as many needs as there are resource users, e.g. the case of carpenters who are mostly young men, who would have been gainfully employed through the establishment of a carpentry workshop to employ their skills.

Land pressure: a sixty-year old man, immigrant, suggested the FC lease out some of the forest land for farming by neighbouring communities

Tentative conclusion Policies, practices and attitudes/personalities of forest managers combine to produce different outcomes in different places. These factors can lead to the development of conducive environments for the development of co-management arrangements or forms of resistance at the local level or outright conflict between local people and forest managers.

#### Data needs:

FPU data on arrests and for which "crimes" for the four villages: the futility of chasing games (to be collected).

NB: Case studies will be based on resource use patterns and importance to different households who might then engage in struggles to assert their claims to forest resources or areas which would have been inhibited by FC formal institutions.

#### Gwaai West

Detailed case studies of hunters, the conflict between forester and Sibanda Jnr, any thatch grass cutters from the Mafa (check with Forest Hill)

Document the contrasts between the two sides of the forest: infrastructure; schools, homes, boreholes; and agricultural production; crops and livestock

Institutions: informal and formal ones: how do local people organise themselves? Who are the key actors? (to be teased out and then gaps identified for further collection)

#### Gwaai East

Different management style in Gwaai east (co-management in practice and the outcomes): the firewood merchants case (to be collected) and permit system.

### Big herd of cattle owner vs Vet and FC:7/10/98

Cattle were supposed to be shot for having been let into the west for grazing during the late dry period. The owner of the cattle was "mischievious" and cut the vet fence to allow his cattle to graze the other side of the road after three of his herd had already died from lack of grazing on the eastern side.

If my cattle die then my children will not know what cattle look like and thus my family will be dead.

#### Mapfungautsi North

Detailed case studies of: delegations to FES from locals, the fruit women, the poles contractors and former tenant & timber merchant as well as the carpentry co-operative, RMC vs agitated locals: the forest managers in both sites; the fear of former foresters and subsequent pursuit of harassment policy (more detailed ethnographies required after initial analysis of data already collected).

Institutions: informal and formal ones: how do local people organise themselves? Who are the key

actors? (to be teased out and then gaps identified for further collection)
How do the RMCs and grass cutting/revenue sharing systems work in practice?

Mapfungautsi South No conflict story.





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