Department of Life Sciences
University of the West Indies
St. Augustine
Trinidad

Matura National Park ESA participatory biological baseline survey

FIELD SURVEY HANDBOOK

2nd Edition

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Veerle Van den Eynden & Alësha Naranjit

Introduction to the use of this manual.

This manual was written to provide the information needed for all researchers and participants involved in this survey to be able to carry out the research.

Besides describing in detail the methodology that we use for fieldwork, it also gives some theoretical background information on why and how we carry out this research.

It is a work in progress, and will be updated and re-distributed regularly when necessary.

Alongside this extensive manual, we will produce two small field manuals that people can carry into the field: one for the vegetation survey, one for the forest use survey.

Matura National Park Environmentally Sensitive Area

Matura National Park was declared an Environmentally Sensitive Area (ESA) in November 2004, the first such area for Trinidad and Tobago.

This means that the forest and all the natural resources within it are conserved and protected for everyone's benefits. Matura National Park conserves a large area of primary tropical forest and the largest intact *mora* forest in Trinidad and Tobago. It protects important wildlife habitats, such as for the pawi, ocelot and other endangered and rare animals and plants. Matura National Park also conserves the natural and scenic beauty of streams, waterfalls and rugged mountains.

At the same many communities are found around Matura National Park, some people even live within it. They depend upon Matura National Park for various things.

Matura National Park is 9000 ha (22,400 acres) and includes the watersheds of the Rio Seco, Rio Salybia, Grande Rivière and Shark River.

This project studies the biodiversity, the plants and animals, of Matura National Park as well as how the forest and its resources are used by local and visiting people. This will provide scientific data needed to effectively manage and monitor Matura National Park and its biodiversity.

There is many things that need studying for years to come. This survey is a first step in this process.

At present Matura National Park is managed by Forestry Division (FD), Ministry of Public Utilities and the Environment. When the park was declared as an ESA, a Matura NP Stakeholders Management Committee was created by the Environmental Management Authority (EMA). This committee, which meets monthly, is formed by representatives of EMA, FD, M2M network (representing local communities around MNP), Council of Presidents of the Environment (umbrella organization representing environmental NGOs), Ministry of Tourism, Ministry of Community Development and Sangre Grande Regional Corporation. The committee oversees the management of the park to achieve the objectives of its designation as an ESA.
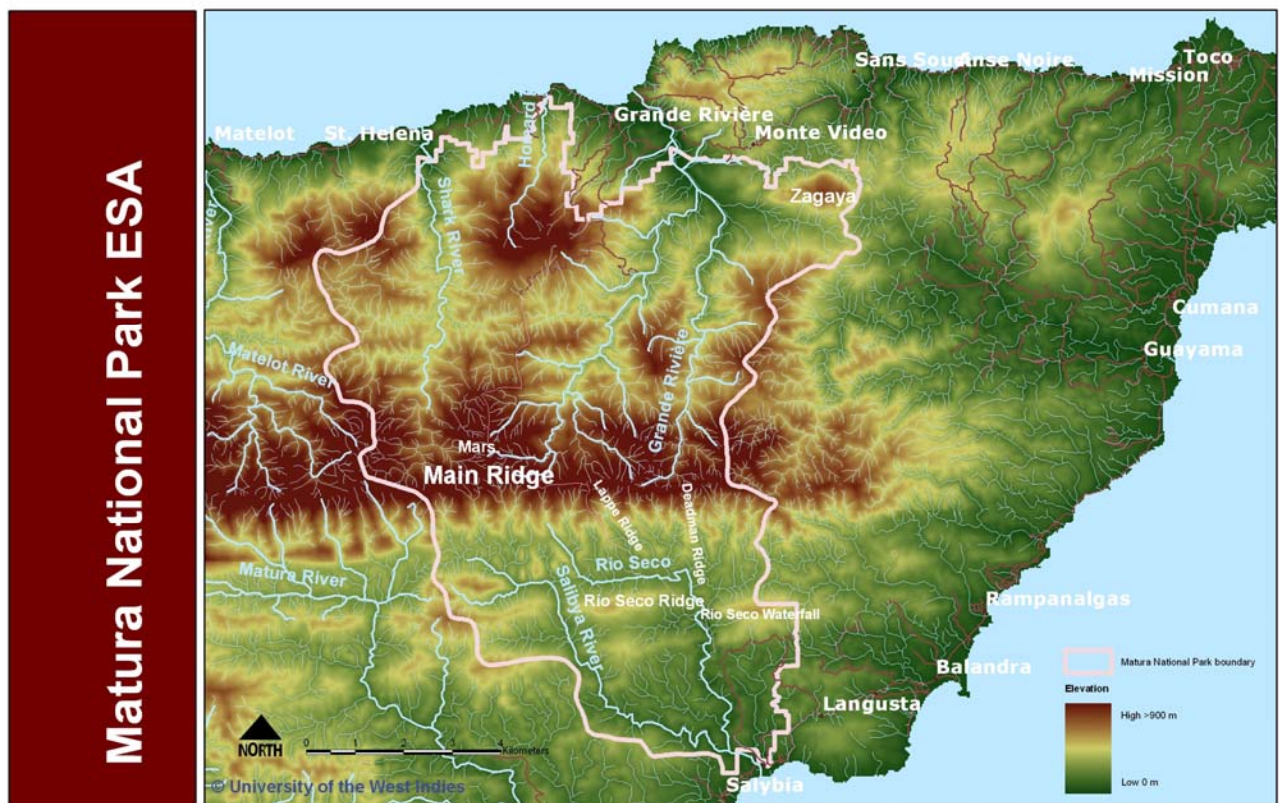
Map 1. Matura National Park Environmentally Sensitive Area

Why this research

As Matura National Park ESA was declared, it was realised that not enough scientific information was available about the area. Which plants exactly grow there? How do these plants vary throughout the area? What is the state of the vegetation? How disturbed are certain areas because of logging or other activities? What is the population of wildlife like? And what about the insects, birds, butterflies we find there?

These are just some examples of questions that could be asked.

Most research that has so far been done in Matura National Park ESA has focussed on trees and timber. But a forest contains more than just trees. Very few data are available on herbaceous plants, epiphytes, insects, mammals, mosses, fungi, …. in Matura NP.

Biological diversity or biodiversity

What is biodiversity? Most people have heard the word or may have some idea of what biodiversity means. Biodiversity, which is short for biological diversity, means nature's variety.

It is the variety of all life forms that exist: different plants and animals, the genes they contain and the ecosystems of which they form a part.

In Trinidad and Tobago there are about 2500 species of plants and probably 15,000 species of animals.

Why conserve biological diversity?

Biological diversity changes all the time. But during the last centuries, the only change has been decrease. We all realise that our environment is deteriorating and that the abundance of plants and animals decreases.

The main reason for this decrease is human activities. The abundance in plants and animals becomes lower because of pollution, disturbance, and over-exploitation of plants, animals and areas and the reduction and fragmentation of natural areas.

Think for example about the effect of litter in the sea on marine animals, the effect of bird collecting and hunting; and the effect of squatting on forest cover.

Biodiversity also has many values or uses for people. It first of all provides us with essential things, like food, materials, medicines, etc. It provides some of us with income. It also helps to keep the environment healthy. Vegetation provides habitat and food resources for animals. Vegetation reduces soil erosion.

Biological diversity also gives aesthetic beauty and opportunities for recreation and relaxation.

Without biological diversity the world would not be a happy place.

Conservation of our biological diversity has become a priority at world level. Trinidad and Tobago is committed to conserving its biological diversity and using it in a sustainable way. This requires the input and efforts of everyone. There are often conflicts between conservation and human activities. We need to deal with both aspects – conservation and human activities.

What is a baseline survey?

This survey will first of all provide scientific data on the biological diversity (plants and animals) of Matura National Park ESA. It will provide an inventory of the plants and animals of the area and also of how they are related with each other (for example different plant groups).

At the same time the survey will be like the starting point, from where we can compare similar surveys in the future. That way we will be able to see what changes, how things change and why. This is what we call monitoring.

The methods we describe in this manual are chosen because they are the methods most commonly used for such surveys, and they also link in with similar surveys that (will) take place in Trinidad and Tobago and elsewhere.

VEGETATION SURVEY

The aim of the vegetation survey is to study the plant diversity of the Matura National Park Environmentally Sensitive Area in detail: which trees, shrubs, herbs and lianas (vines) grow there. We want to discover how these plants grow together in what we call plant communities, how these plant communities change within the area because of different environmental factors (climate, geology, soil type, altitude, etc.), what structure the forest has and how this changes within the area.

We want to know which species are common, which ones are rare and why; and for which species we should be concerned.

Selecting survey sites

Matura National Park ESA has an area of 9000 ha (22,400 acres). Altitude varies from 0 to 575 m. The easternmost extension of the Northern Range runs east-west through the park. North and south of this main ridge one finds lower ridges and mountains: St. David-Zagaya ridge and Matura reserve ridge. From the main ridge a series of lower ridges run north-south, separated by streams.

The geological strata of Matura National Park ESA are mainly composed of metamorphic rock. Soils are largely classified as sandy clay loam. Small areas of calcareous sandy clay and clay soils are found at the northern and southern edges.
Limestone is found in the Maraval formation (Rio Seco river – sulphur spring area, north of Matura reserve ridge) and the Tompire formation (St. David ridge and Zagaya).
The vegetation found at higher elevations is montane forest and secondary montane forest. The northern part of Matura National Park ESA consists of evergreen seasonal forest and secondary evergreen seasonal forest. On the southern side the vegetation is a mixture of evergreen seasonal forest , mora forest and secondary forest. About 10% of the area of the ESA is inhabited and/or farmed, a larger area is possibly disturbed. Human disturbance in the southern part of Matura National Park ESA was estimated from aerial photographs to affect 349 ha in 1969 and 300 ha in 1994.

Vegetation and plant communities are influenced by factors like topography, climate, geology, altitude, slope exposure and human disturbance. Because it is impossible to study the entire vegetation of Matura National Park ESA, we select certain sites where we will study sample plots of vegetation, hoping to cover the maximum of variability.

This sampling is called "stratified" sampling, where the sites are chosen according to factors like soil, geology, altitude and vegetation.

Twenty-four 50 x 50 m permanent sample plots are will be established in Matura National Park ESA. These plots are located more or less along a North-South transect

line running from Grande Rivière to Salybia. The North-South transect line follows existing geographical ridges and its exact position depends on access routes. This transect line is will be set up as a permanent trail, marked with paint and markers, so plots are easily accessible for monitoring and re-surveying in the future

Along this North-South transect, sample plots are positioned in sets of three plots on the west-facing slopes, more or less parallel to the main slope. One plot is positioned on the ridge, one in the middle of the slope, and one at the base of the slope.

The plot on the ridge should not include the trail, but should be either west or east of the trail. The plot at the base of the slope can include a stream.

Plots must be homogeneous in vegetation, excluding disturbances where possible.

Three sets of three plots are south of the main ridge, four sets of three plots north of the main ridge, three additional separate plots are on the main ridge itself.

The exact position of the sets of plots is determined by altitude, geology, human disturbance and vegetation type.
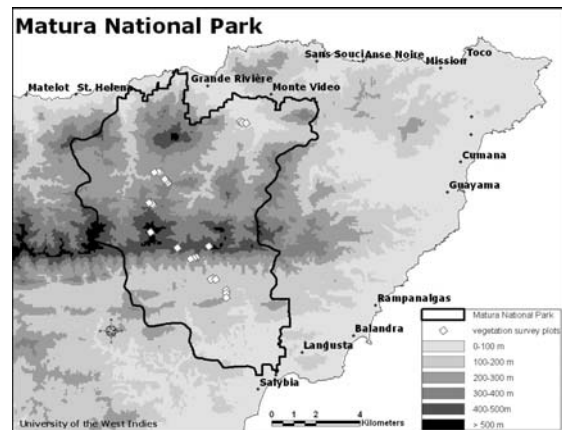
Figure 1. Vegetation survey sites

Plot design
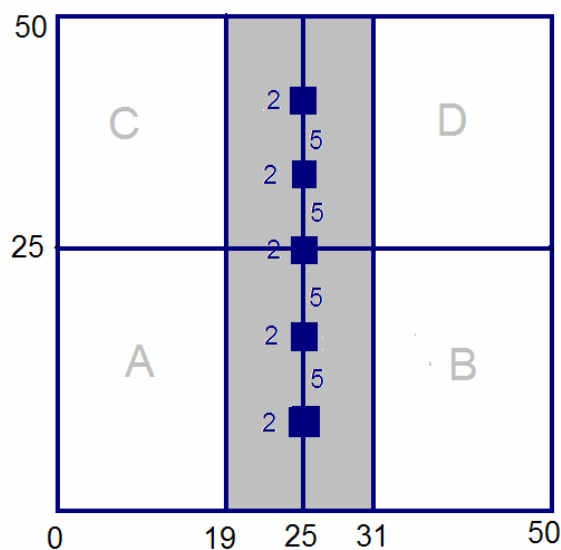
Figure 2. Plot design

The vegetation is surveyed at **three levels**:

➢ Within a **50 x 50 m plot** all trees with a diameter above 10 cm are surveyed.

➢ Within a smaller **12 x 50 m subplot** all trees with a diameter between 2.5 cm and 10 cm are surveyed.

➢ Within five **2 x 2 m quadrats** the ground flora and seedlings are surveyed.

Establishing and lay-out of plots and quadrats

The laying out of the plot is done by the entire team.

The corners of the plot and subplots are marked with 1 meter markers; the centre of the quadrats with 50 cm markers.

The baseline of the plot runs more or less parallel with the ridge. Centreline 1, which contains the 2 x 2 m cuadrats, should be oriented parallel to the slope so that it includes as much within-plot variation as possible: down a slope, across the ridge, across a stream.

The total length of the plot must be corrected according to the slope so that the horizontal size of the plot is always 50 x 50 m. Use the slope correction table to correct distances for slopes; or measure horizontal distances directly using a rangefinder (which corrects automatically for slopes).
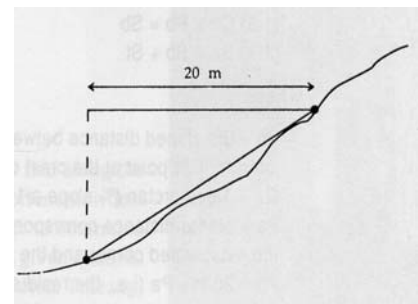
Figure . Slope correction

Steps in laying out the plot:

Note: try to minimise errors in plot shape by establishing all lines away from a centreline.

❶ Stake the **base point of centreline 1** randomly.

❷ Lay out **centreline 1** with a 60-m tape or using a rangefinder, using a chosen compass bearing. Make sure to lay out the entire line according to this compass bearing.

If using a tape, measure the slope with a compass and calculate the slope correction with the slope correction table to determine the true distance to be measured on the ground. All change in slope must be measured and adjusted accordingly along the centreline.

The endpoint and middlepoint of centreline 1 is staked.

The centreline tape is left in place.

❸ The **topline** is laid out using a compass bearing, which is 90 degrees to the compass bearing of centreline 1. A rangefinder or a second 60-m tape is used, measuring 25 m to either side of the centreline, correcting for slope.

Both endpoints are staked.

The two six meter points for the subplot are also staked (6 m either side of centreline 1), after correction for slope.

The tape is removed.

❹ **Centreline 2** is laid out, staking again the end points and the 6 m points for the subplot after slope correction.

The direction is 90 degrees to the compass bearing of centreline 1.

The tape is left in place.

❺ From centreline 1, establish the **baseline** by measuring out 25 m either side, correcting for slope.

Stake both endpoints and the 6 m points for the subplot, after correction for slope.

The tape is removed.

❻ Two lengths of string are now run along the 6m points to show the boundaries of the 12 x 50 m subplot.
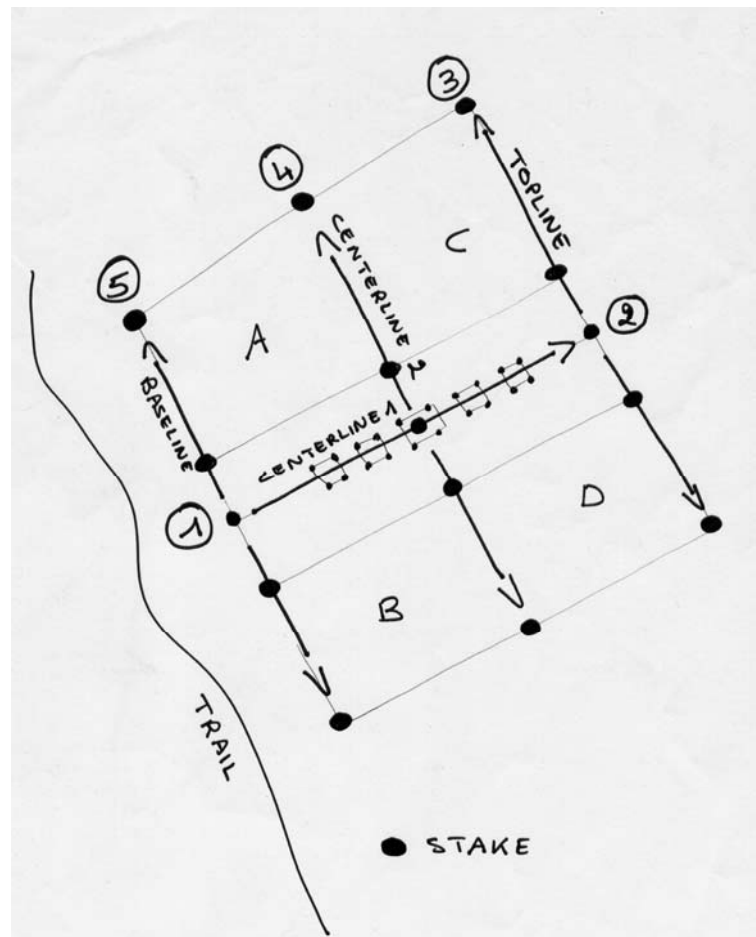
Figure 4. Laying out the plot

❼ The central points of five **2 x 2 m quadrats** are marked along centreline 1, using short markers. One 2 x 2 m quadrat is positioned in the centre of the plot; another 4 quadrats are laid along the centreline, two either side of the centre, leaving each time 5 meter between two quadrats.

Recording site details

For each 50 x 50 m plot we record:
➢ Plot number
➢ Date
➢ Name of person taking notes
➢ Site name
➢ Short description how to reach the plot from the trail (draw map if necessary)
➢ Geographical co-ordinates (GPS or from map)
➢ Altitude (GPS)
➢ Vegetation type (as we see it)
➢ Plot orientation
➢ Slope aspect
➢ Slope degree
➢ (Plot, subplot and quadrat length and width after slope correction, if not using rangefinder)

Within each plot a **soil sample** is taken. This is a mixture of four samples that are taken in a random place in each of the subplots. This is later analysed for texture, pH and nutrients.

The **canopy cover** is measured with a densiometer. Four readings are taken within each quadrat, in a N, E, S and W direction. This is done for all five quadrats.

Surveying the plot

The plot is surveyed by 2 teams:

Team 1 tags all trees, measures diameter, and sketches position of trees = Tagging team.

Team 2 collects plant specimens = collecting team.

Both teams work separately and take their own notes, referring to the same trees by recording the tree tag number.

Note: the 2 x 2 m quadrats should be surveyed first by the collecting team, before the surveying of the main plot and subplot, to reduce trampling of the small plants which may occur during sampling of the larger vegetation.

50 x 50 m plot

Within the 50 x 50 m plot all trees with diameter 10 cm or above at breast height (1.3 m) are surveyed. We measure the tree's diameter, tag the tree, locate its general position within the plot on a sketch map and collect a plant specimen. Surveying is first done in quarter A, then B, then C then D.

The trees are tagged and surveyed starting from the baseline and in parallel zigzag lines.
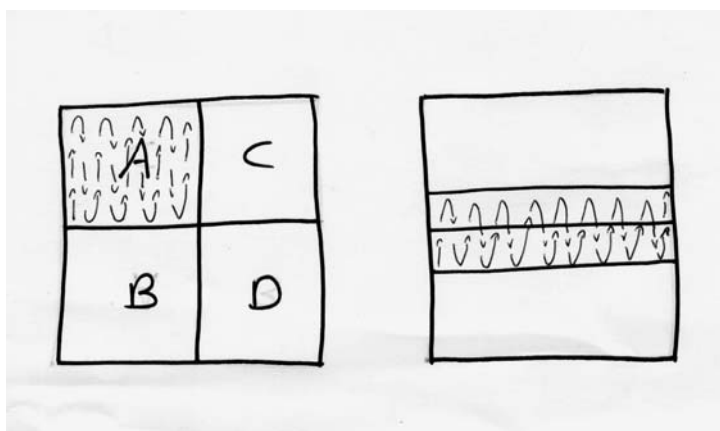
Figure 5. Surveying subplots in zigzag lines

Tagging trees

All trees in the 50 x 50 m and 12 x 50 m plots are tagged with permanent aluminium tags **at 1.6 m high**.

The tag is nailed into the tree, leaving the nail sticking out for 2-3 cm. All tags must face towards the plot's centreline. For small trees the tag can be attached to a branch with a wire.

Each tag has a numbered code:

MESA - Matura Environmentally Sensitive Area.

01- Plot number (01 to 24).

A – Subplot code (A, B, C or D)

01 – Tree number

Completed tag: **MESA 01-A-01**

Measuring tree diameter (DBH)

The diameter of each tree is measured at breast height (1.3 m high) using a diameter tape. For smaller and regular trees (< 10 cm diameter) callipers can be used. The point of measurement is marked with red paint.

A stake of 1.6 m can be cut with a mark at 1.3 m and used to determine the point for attaching tag and for measuring DBH.

Tips for measuring diameter:

➢ Make sure tape is not bent or twisted and kept clean.
➢ Point of measurement must be correctly located (at 1.3 m height).
➢ Make sure plane of tape is at right angle to the trunk of the tree.
➢ Make sure the tape is not sagging but kept tightly around the tree while measuring.
➢ Make sure measurements are taken correctly from the zero mark on the tape (which may not be at the very beginning of the tape).
➢ Make sure DBH is measured and not circumference – remember a DBH tape has two sides, one showing ordinary cm; one directly showing DBH in cm.
➢ Make sure the tape is positioned against the trunk of the tree and is passed under all vines. Only remove vines and other plants around the tree if there is no other option.
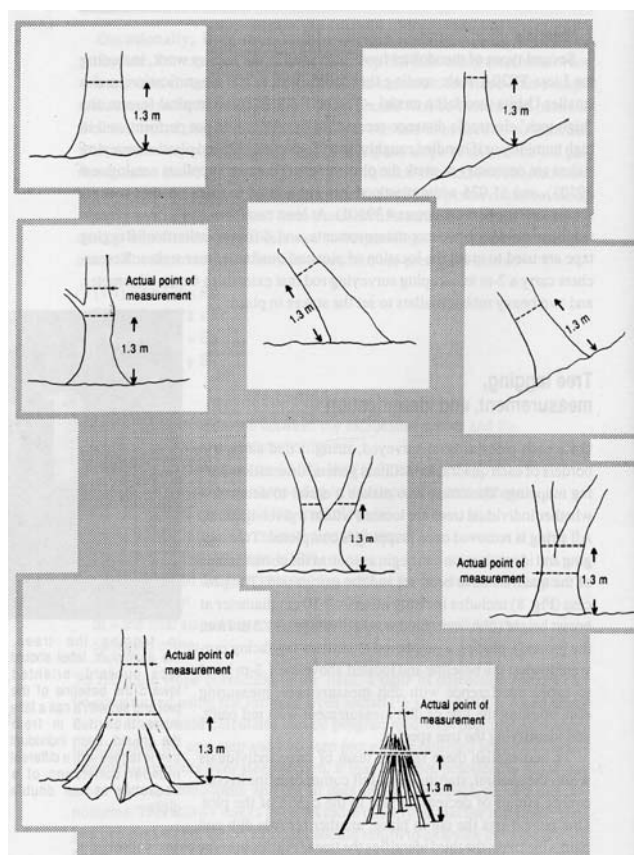
Figure 6. Where and how to measure tree diameter

Recording tree position

The position of individual trees in each subplot A, B, C and D is marked approximately on a sketch map of the subplot so these maps can be used in the future to find the trees easier. It also gives some indication of tree associations.

12 x 50 m subplot

Within a central 12 x 50 m subplot all trees and lianas with diameter 2.5 – 10 cm are surveyed and tagged. We measure the tree's diameter, tag the tree, locate its general position within the plot on a sketch map and collect a plant specimen, follow the same procedures as for the 50 x 50 m plot.

2 x 2 m quadrats

Within the quadrats all plants (herbs, shrubs, seedlings, accessible epiphytes) < 2.5 cm diameter are surveyed, recording height, diameter, % cover within the quadrat and life form. The life form can be: shrub, herbaceous plant, liana, climber, fern, epiphyte or seedling.

These plants are not tagged. Instead, a number code is given to each plant.

Code = Plot number – quadrat number- plant number

E.g. **01- -12** (Plot 1, quadrat 3, plant number 12).

Collecting and processing voucher specimens

Collecting

We collect voucher specimens of all plants. These are used as **reference material**, so we know later without doubt which plants we are studying.

One plant may have different common names in different countries or areas, but has only one unique scientific name all over the world. We use the voucher specimen to determine this scientific name.

A specimen must be **representative** for the plant. It must show stems, leaves, flowers, fruits and other parts that are characteristic for the plant. For example, for a plant known to have edible tubers the tuber should be collected. At the same time, we do not want to kill plants unnecessary. Normally roots would not be collected. Special care should be taken when collecting rare plants, not to kill the last few remaining plants.

A specimen must be small enough to fit between a double folded newspaper (25 x 35 cm). If the entire plant can not be collected (too large), then a small part must be collected, showing as good as possible all the plant's characteristics. For example the way the plant branches, how the leaves are organised on the stems, the shape of leaves, etc. When a plant has compound leaves, the specimen should have a few entire leaves on the branch. The specimen should still be representative for the plant, so do not pick the smallest leaf that fits easily within the paper, when the plant really has big leaves.

Palm leaves (what we may generally refer to as the 'palm branch') are usually quite large and are collected in a special way to reduce the size of the samples, while still retaining the plant characteristics necessary for identification. The whole leaf must be removed from the point where it joins the tree trunk (usually pulling the leaf down is better than cutting it down). Three parts of the leaf are collected. Before cutting the leaf up, the total number of pinnae is counted and noted. Also the total length of the leaf including stalk is noted. The top part of the leaf; a middle section with about 3 pinnae left on 1 side; and the base of the leaf including the lowest 2 pinnae are collected. Entire inflorescences and fruits can be collected and dried.

It is often difficult to collect specimens from tall trees. We can use extendable pruners (up to 10 m high), or try to shoot leaves or branches down with a slingshot (shooting up pebbles to directly hit leaves, or shooting up a fishing line to pull down twigs). One collected leaf is still better than none, because we might collect the same tree somewhere else later on. Binoculars can be used to study the leaves on the tree and to try and find the same leaves fallen on the ground. If both these methods fail, a fallen leaf could be collected from the ground, as long as one is sure that the leaf belongs to that particular tree.

Each collected plant is given a **unique herbarium reference number**. For the vegetation survey, the entire tag number of the tree (or number code of herbs) is written on the underside of the leaf with a ballpoint pen; or on a piece of masking tape which is attached to the specimen. It is important to make sure all specimens are well marked and the tape cannot fall off: a specimen with no number is useless, as we would not know which plant it came from.

Any **information** that will not be visible on the specimen must be **written down** in a notebook at the time of collection: is it a tree, a shrub, how high is it, what is the

colour of the flower, the colour, shape and size of the fruit, has it any sap and if so which colour (transparent, white, red, yellow), has it stilt roots, has it spines on the trunk, a certain smell, etc.

Normally, information on the collection site must be noted: place name, geographical co-ordinates (latitude / longitude), altitude (height above sea level), vegetation type, how common the plant is, etc. Information on how a plant is used can be noted, plus its local name.

For the **vegetation survey**, any necessary information will be noted in a field notebook by the plant collection team. For trees it is sufficient to write down the tree tag code, plus any plant characteristics. The tree tag code refers to the data sheets, where we can find information on collection site etc. A herbarium reference number will be given later in the herbarium.

For the **forest use survey** all information on plant characteristics, collection site and uses will be noted in a fieldbook.

All collected specimens are placed together in a plastic bag. Small or delicate plant specimens or specimens with fruits or flowers must be placed on their own in a small plastic bag with the tree tag number written on a piece of paper inside it, before placing it in the larger bag. Flowers or fruits can easily fall off the branches and it would be impossible to know from which specimen it was.

All collected specimens must be kept in well sealed bags until they reach the herbarium, to avoid drying out.

Pressing and drying plants

After plants have been collected they are pressed and dried as soon as possible after collecting (3-4 days is a maximum delay).

Typically they are put between double-folded newspaper. All the characteristics of the plant must show. The plant may need to be bent into a V or N shape to fit the newspaper. Leaves may have to be removed so they don't cover each other or the flowers. A pile of leaves on top of each other shows nothing. It is then better to remove some.
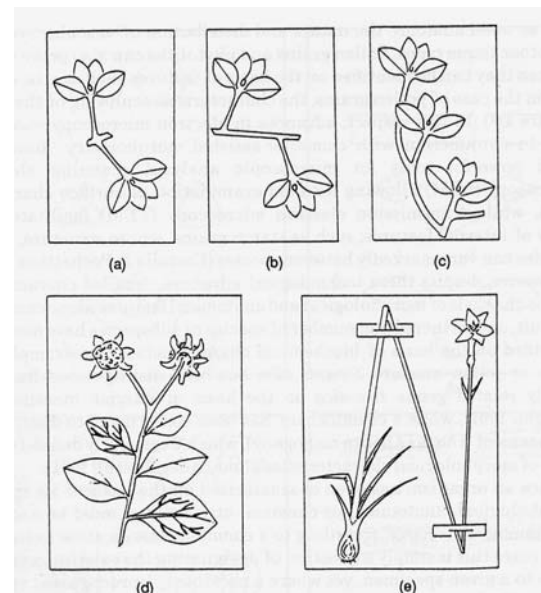
Figure 7. Examples of how large specimens can be cut or bent and positioned on paper, showing both leaf sides

At least one leaf should be turned over to show the underside. Large leaves may need to be folded, making sure the tip and base are visible. Thick plant parts like fruits or roots or cacti stems may have to be sliced into slices of 2-3 cm thick.

The **plant reference number is written on the newspaper** in the bottom right-hand corner with permanent marker pen.

All specimens are then placed in a plant press.

After plant specimens have been taken to the herbarium at UWI, they will be dried in a heated drier. The plants are taken out of the plant press. Each newspaper is placed between sheets of ribbed cardboard and felt sheets. This will speed up drying. All is then put in the plant press and that is placed in the dryer to dry for 24 – 48 hours.

Now all recorded information is used to make a label. For this project, all data will be entered into a computer database. Labels will be produced from that.

Dried, pressed plant specimens are glued onto white card sheets (28.5 x 42 cm), together with a label on which is written all the information we collected about the plant: reference number, scientific name, local name, collection site, collector, characteristics, uses, survey for which the plant was collected, etc. This label is glued in the lower right-hand corner of the sheet.

FLORA OF TRINIDAD	
Carapa guianensis Aublet	Meliaceae
Crapo	Det.: Veerle Van den Eynden
Matura National Park ESA, near Rio Seco, primary evergreen tropical forest.	
Altitude: 150 m 10°44'35" N 61°03' 55" E 8 Aug. 2005	
Tree 20m high.	
Use:	
Barry Mahabir 25	
TRIN No:	
Matura National Park ESA biological baseline survey, Dept. Life Sciences, UWI National Herbarium of Trinidad and Tobago	

Figure 8. Example of plant voucher label

Figure 9. **Example of mounted herbarium plant specimen**

Mounted plant specimens are kept in the **herbarium**. They can be kept like this for centuries and will always serve as reference material for this study.

Plant specimens will be collected as reference material for the vegetation survey (reference to which plants are in the plots) and for the forest use survey (reference to which plants are used and how).

Plant identification

Each plant species has a **unique scientific name**. This is a double Latin name (e.g. *Mangifera indica*, mango), consisting of a genus name (***Mangifera***) and a species name (***indica***). We write a scientific name in *italics*.

Behind the scientific name we usually write the name of the author who published this scientific name: *Mangifera indica* **L.**

• A plant species name looks like this:

Mangifera indica L.

Genus   Species   Authority

Genus	Species	Authority
Genus is a group of species that have similar characters.	In combination with the Genus name, the species name gives a unique binomial label for a species. They are both usually written in italics	The Authority is the name of the person who assigned the name of the species. It is an integral part of the name but is usually left off

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Plants are identified based on their characteristics. We would typically look at:
➢ the structure of the leaves (single or compound)
➢ how the leaves are arranged on the stem (opposite, alternate, whorled)
➢ the shape of the leaf
➢ the margin of the leaf
➢ leaf venation
➢ any other leaf characters (hairs, oil dots, glands, stipules)
➢ latex, sap, exudate
➢ the structure of flowers.

In order to identify a plant we use a step-by step process, using plant identification keys. First we determine the family to which the plant belongs, then the genus and finally the species name.

Identification keys are sets of instructions that allow you to compare the set of characters your plant has with character sets of different Orders, Families, Genera, Species or other levels of classification.
By matching your plant's characters with that of a group (family / genus), you can place your specimen in that group or not.

Keys take you through this process by comparing each character in succession and "discarding" the groups that do not have the same character as your specimen. At each step the key asks you questions about your plant and directs you to the group of names that most closely fit your plant.

The final identification of a plant always needs to be verified with a good scientific description of the plant species and with herbarium reference material.

Planning and organisation of people and equipment

The field team needs to be briefed and the equipment checklist needs to be verified before going into the field. Roles and responsibility of each team member must be clear.

Field equipment

GPS
Altimeter
Compass
Topographic map – 1:25,000 – waterproof
Cutlass
Pen knife
Camera
Cell phone

Rangefinder
Plastic markers – 15 of 1 m + 4 of 50 cm
Steel meter tape (60 m) (2)
String to mark subplot   Plot equipment
Flagging tape
Densiometer (measures canopy cover)
Soil sample auger

Aluminium tree tags (400/plot)
Aluminium nails (400) and wires
Hammer
Diameter tapes (2)
Paint – red for DBH mark; green for trail   Tree tagging / measuring equipment
Callipers
Clipboard
Waterproof pocket for forms
Data sheet forms on waterproof paper
Pens and pencils

Pruners (2)
Telescopic pruner
Catapult slingshot plus pebbles
Binoculars
Plastic bags (5 large; 30 small)   Plant collecting equipment
Masking tape
Waterproof notebook
Pens and pencils

Tents (2-3)
Sleeping mats (6)
Backpacks (6)
Camping stoves (2)
Cooking sets (2)
Matches / lighter
Torches (4)
Tarpaulin   Camping equipment
Dry bags
Safety rope
First aid kit
List of safety procedures
Water bottles / containers
Rubber boots

All survey equipment is packed in separate string bags per topic. The content is listed on each string bag.

All equipment needs to be checked before and after each field trip.

Suggested personal items to bring on a fieldtrip

Food

Bring enough food for the entire trip, plus one extra day, in case of emergency.

Breakfast – strengthening: oats, granola, farina, sugar, milk powder, raisins, coffee, tea,…

Lunch – quick and light: bakes, bread, pies, cheese, processed sausages, cereal bars, crix, nuts, fruit, …

Dinner – hot, strengthening, yet easy and quick to cook: macaroni, rice or noodles, salt fish, tins of tuna, corned beef, processed meat sausages, packets of dried soup, non-perishable vegetables (carrots, pepper),…

Plate/bowl + cup + spoon + knife

Clothing
Rubber boots
Sets of dry clothing, including dry socks
Sheet, blanket or sleeping bag
Toiletries

Pack everything in strong plastic bags to keep everything dry.

Health and safety procedures

Before starting a vegetation survey field trip

Check equipment

➢ Check all equipment is in good order and present a few days before every trip, in time to replace, refill or repair any items as needed;
➢ A final check of equipment is done as the vehicle is packed.

Compose the field team

➢ A list of people for a field trip is compiled ahead of time;
➢ All people need to be informed in time;
➢ A few days before the start of the trip each team member is contacted to confirm their participation in the trip;
➢ If a team member cannot attend the trip a replacement should be found in order to ensure a minimum team size of 5 people;
➢ If a team member knows that he/she cannot make a trip he/she should contact the team leader as soon as possible so alternative arrangements can be made.

Know your team

➢ The team leader should know any medical problems that a team member may have or may be prone to; this will enable quick and appropriate action to be taken if any such problem were to arise.

Know the route

➢ Know the terrain to be crossed and ensure that at least one of the team members is familiar with the survey area and route or is confident navigating by GPS, map and compass;
➢ The team leader should revise the survey site and route on the map to familiarize him/herself it;
➢ Find out information about the survey site; community members are helpful to find out if there are any dangers in the area, if they can be avoided and how.

Planning time schedule

➢ Plan the time schedule of the field trip in order to avoid driving after dark;

➢ Make sure to arrive at a campsite after walking in still in daylight to check over site and set up camp.

Check weather forecast

➢ Although weather forecasts may not be totally accurate they do give an idea of the type of weather to expect in the days to come;
➢ Heavy rain in the survey area may mean a rise in the rivers or can lead to flash flooding of streambeds (the river might 'come down'); it can also cause trees to fall, especially on steep slopes;
➢ No field trip should be undertaken when a tropical storm or hurricane has been forecast;
➢ The ultimate decision for a filed trip to go ahead or not according to the weather is taken by the team leader, together with team members at the start of a trip.

First aid and emergency measures

➢ Ensure that at least one team member (preferable more) has been trained in first aid techniques;
➢ Ensure that the first aid kit is complete;
➢ Ensure to carry medical emergency contact details as part of the first aid kit;
➢ Make sure to know where the closest proper medical care facility is and know the fastest way to reach it;
➢ The Sangre Grande Hospital is the closest hospital to Matura National Park and the closest facility which has anti-venom in case of venomous snake bites;
➢ Leave detailed plans for the trip (start and end date, field site, team members attending, cell phone contact) with a member of staff at UWI and with the nearest police station (Matura police station or Matelot police station);

Clothing and footwear

➢ All team members should wear long pants;
➢ All team members should wear high, closed boots, preferably knee-heigh rubber boots;
➢ Long-sleeved shirts can protect arms from biting insects.

During a field trip

Walking in and navigation

➢ Ensure to switch on GPS at the start of the trip and fix the position before entering the forest;

- ➢ Ensure that at least one person knows the route to follow or is familiar with the use of topographic map, compass and GPS to navigate the route; remember that in many forest areas GPS reception is poor or non existing;
- ➢ Where necessary mark the trail followed with flagging tape, paint or cutlass marks on trees;
- ➢ A team should walk together in a group at all times; the team leader allocates a person to walk first and a person to walk last; all team members must remain between them; the team walks at the pace of the slowest person;
- ➢ Be aware of any potential hazards or dangers on the trail when walking, such as animals (snakes, ants), tree roots, steep slopes, fallen trees, overhanging, etc.
- ➢ Do not place your hands or feet where you cannot see, in particular when walking through undergrowth or when climbing over fallen trees, clear any undergrowth vegetation with a cutlass if necessary.

Dangers and annoyances in the forest

Bête rouge (jiggers)
This mite is not dangerous but can make you very uncomfortable for days. It is so small that you cannot see it. They brush off from surrounding vegetation onto your skin/clothes and cause ichiness. Wearing clothes that cover the skin as much as possible, tucking pants into socks and shirt into pants can help. Repellent can prevent bites. In Matura National Park, bête rouge seems to be present on some of the southern slopes.

Stinging Insects
Avoid attracting stinging insects by wearing light-colored clothing and avoiding perfumes or colognes. Should such an insect approach, do not wave wildly and swat blindly - instead use a gentle pushing or brushing motion to deter them. If stung, apply antihistamine cream as soon as possible to stop/reduce the swelling. Some people may be allergic to bee/ wasp stings.

Ticks
These brush onto you or your clothes as you walk through the bush. You can check yourself at the end of the day and use a pair of tweezers to remove any that you find as soon as possible.

Snakes
Only three snake species in Trinidad are potentially dangerous: fer de lance (mapepire balsain), bushmaster (mapepire zanana) and coral snakes. Most bites, even from venomous snakes, are not lethal. Dangerous complications from a snakebite are more likely to occur if the patient or those in attendance panic or if inappropriate treatment is given.

Avoid snake bites:

➢ wear strong, high boots
➢ wear long trousers
➢ be careful when stepping over logs and into areas where there is a lot of leaf litter or ground cover.
➢ do not try to clear away vegetation with bare hands
➢ do not try to kill or capture any snake
➢ if you do spot a snake, alert the team and if possible avoid the area; if you cannot avoid the area keep an eye on the whereabouts of the snake
➢ if the snake is moving, stamping on the ground a short distance away will alert it to your presence and cause it to move away from the noise and vibrations.

In case of snake bite:

➢ Do not panic: the snake may be one of Trinidad's non-venomous species; even if it is one of the dangerous species, its bite probably will not prove lethal.
➢ Try to identify the snake in question: memorise or photograph its markings. If the snake has been killed, keep the body, but handle the snake by the tail (the teeth can still inflict a venomous wound).
➢ Reassure the person bitten; let him/her sit or lie down in a secure, comfortable, shaded, place.
➢ Remove all jewellery
➢ Wash the snakebite with soap and water
➢ Wrap a fairly tight bandage around the site if the bite is on the limb; this will slow circulation but not restrict it
➢ Immobilize the limb with a splint
➢ Do not cut the bite wound, do not try suction, do not apply a tourniquet
➢ If the wound or surrounding area is painful, take oral paracetamol at the standard dose; or cool the limb but do not apply ice directly to the wound
➢ Do NOT take aspirin
➢ Drink fluids (water) but no alcohol.
➢ Do not be convinced to drink anything else such as any anti-snake bite remedy
➢ Get the person to Sangre Grande hospital as soon as possible;
➢ If necessary carry him/her out on a stretcher made out of 2 poles cut from small trees and tarpaulin or sheeting; walking could encourage the spreading of venom
➢ En route to Sangre Grande hospital try to telephone them and tell them that you are coming. Explain briefly the circumstances. Take the dead snake with you: handle it by the tail or in a box or bottle.

Scorpions

Be careful when stepping over logs and into areas where there is a lot of leaf litter or ground cover there may be scorpions living/sheltering there.

Plants

There are some plants that should be avoided. Nettles can be found in more open areas and can cause skin irritation. Thorny vines can hook into your skin as you pass by. The thorns are sometimes very sharp and can easily cut into the skin. If you are caught by these, stop and untangle carefully to avoid cuts and scratches.

Flash floods

Flash floods can occur when there has been a large amount of rain previously. They can occur suddenly but not without warning. If walking in a stream/river there are two things which happen before a flash flood: the water will start streaming faster (sometimes only slightly, this can sometimes be seen by the stirring of leaves in pools and the slower sides of the river) and just before the flood you will see silt/ dirt in the water. If you think the river will flood get out of the watercourse and move to higher ground. The river can rise several feet in a flood like this. Do not attempt to cross rivers that are flooded. It is safer to wait a few hours for the rain to stop and the river to subside.

Trap guns

Some poachers use trapguns, which is illegal. They are metal pipes, charged with bullets, connected to a wire. They are usually set along animal tracks. Avoid walking off trails.

Hunting

During the hunting season (October to March) the team should be aware that hunters might be hunting in the forest, using dogs and guns.

Falling trees

Heavy rain or wind can cause trees to fall, especially on steep slopes.

Campsite safety

- ➢ Check chosen camp site for any glass, sharp objects, rocks, branches, things which may fall, insect nests, trap guns, etc;
- ➢ Set up camp high enough away from rivers that could flood;
- ➢ No alcohol or drugs should be consumed during field work.

Fire

Small, controlled fires can be lit to keep away mosquitoes and other insects from the campsite. Any fire must be completely extinguished before leaving the campsite.

Drinking water

Be sure that the water you are collecting is clean. Use water purification tables or boil water if unsure.

Hygiene

Each individual in responsible for ensuring that all human excrements are buried.

Waste

All garbage must be carried back out of the forest. Rivers and streams should not be contaminated with soap or detergents.

Contents of first aid kit

Cold compresses
Gauze roll bandage
Sterile eye pad
Trauma pads
Dressing pads
Athletic tape
Blister moleskin
Elastic bandages
Adhesive bandages
Antibiotic ointment
Antiseptic cleansing wipes
Ibuprofen
Paracetamol
Gloves
Scissors
Tweezers

Water cleansing tablets
Iodine
Antibiotic crème
Elastic knee bands
Elastic bandages with Velcro closure
Cortisone cream
Sting-relief crème
Insect repellent
Antihistamine
Anti-diarrheals
First aid book
Penknife
Matches
Safety pins
Finger splint

Emergency contacts

Emergency Health Service: 645 7610 or 624 4343 (POS) or 6534343

Fire Department 990

Police Emergency 999

Nearest Ambulance is based at Sangre Grande Hospital.

Sangre Grande Hospital Accident and Emergency: 6682468. This is a 24 hour number.

Sangre Grande Hospital has mapepire antivenom in stock.

Matura Police Station: 6684511 – to be contacted before and after each trip

Matelot police Station: 6708220.

Poison Hotline S.G. hospital: 6914742

Analysing data

Field data are entered into a database per plot and per species.

The composition of the forest and the plants within it are described and analysed in various ways:

- ➢ Species richness – how many different plant species doe we find in Matura National Park ESA.
- ➢ Species abundance – how frequent is each species within Matura National Park ESA.
- ➢ Species evenness – how evenly or unevenly are species distributed throughout Matura National Park ESA.
- ➢ Which species are dominant and which ones are rare.
- ➢ Basal area per species – the diameter distribution of each species.

By combining all or some of these variables we can calculate what we call diversity indices to describe the plant diversity of Matura and we can calculate an "importance" value index for each plant species. Then we can compare this with other tropical forests.

The structure of the forest will be described and analysed through diameter and height class distribution and canopy cover.

Plant communities are identified with statistical analysis called cluster analysis and ordination analysis. Based on which plant species we find in each plot and other characteristics, we can see which plots are similar and which are not. Similar plots are grouped together into plant communities.

Possible **relationships** between vegetation and environmental factors will be analysed with statistical analyses called regression analysis and discriminant analysis.

Data sheets

Slope correction table

Degree slope	Slope corr. factor	2m	m	4m	5m	6m	7m	8m	9m	10m	11m	12m	1 m	14m	15m	16m	17m	18m	19m	20m	25m	0m	50m
1	1.000	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	25.00	30.00	50.01
2	1.001	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.01	10.01	11.01	12.01	13.01	14.01	15.01	16.01	17.01	18.01	19.01	20.01	25.02	30.02	50.03
3	1.001	2.00	3.00	4.01	5.01	6.01	7.01	8.01	9.01	10.01	11.02	12.02	13.02	14.02	15.02	16.02	17.02	18.02	19.03	20.03	25.03	30.04	50.07
4	1.002	2.00	3.01	4.01	5.01	6.01	7.02	8.02	9.02	10.02	11.03	12.03	13.03	14.03	15.04	16.04	17.04	18.04	19.05	20.05	25.06	30.07	50.12
5	1.004	2.01	3.01	4.02	5.02	6.02	7.03	8.03	9.03	10.04	11.04	12.05	13.05	14.05	15.06	16.06	17.06	18.07	19.07	20.08	25.10	30.11	50.19
6	1.006	2.01	3.02	4.02	5.03	6.03	7.04	8.04	9.05	10.06	11.06	12.07	13.07	14.08	15.08	16.09	17.09	18.10	19.10	20.11	25.14	30.17	50.28
7	1.008	2.02	3.02	4.03	5.04	6.05	7.05	8.06	9.07	10.08	11.08	12.09	13.10	14.11	15.11	16.12	17.13	18.14	19.14	20.15	25.19	30.23	50.38
8	1.010	2.02	3.03	4.04	5.05	6.06	7.07	8.08	9.09	10.10	11.11	12.12	13.13	14.14	15.15	16.16	17.17	18.18	19.19	20.20	25.25	30.29	50.49
9	1.012	2.02	3.04	4.05	5.06	6.07	7.09	8.10	9.11	10.12	11.14	12.15	13.16	14.17	15.19	16.20	17.21	18.22	19.24	20.25	25.31	30.37	50.62
10	1.015	2.03	3.05	4.06	5.08	6.09	7.11	8.12	9.14	10.15	11.17	12.19	13.20	14.22	15.23	16.25	17.26	18.28	19.29	20.31	25.39	30.46	50.77
11	1.019	2.04	3.06	4.07	5.09	6.11	7.13	8.15	9.17	10.19	11.21	12.22	13.24	14.26	15.28	16.30	17.32	18.34	19.36	20.37	25.47	30.56	50.94
12	1.022	2.04	3.07	4.09	5.11	6.13	7.16	8.18	9.20	10.22	11.25	12.27	13.29	14.31	15.34	16.36	17.38	18.40	19.42	20.45	25.56	30.67	51.12
13	1.026	2.05	3.08	4.11	5.13	6.16	7.18	8.21	9.24	10.26	11.29	12.32	13.34	14.37	15.39	16.42	17.45	18.47	19.50	20.53	25.66	30.79	51.32
14	1.031	2.06	3.09	4.12	5.15	6.18	7.21	8.24	9.28	10.31	11.34	12.37	13.40	14.43	15.46	16.49	17.52	18.55	19.58	20.61	25.77	30.92	51.53
15	1.035	2.07	3.11	4.14	5.18	6.21	7.25	8.28	9.32	10.35	11.39	12.42	13.46	14.49	15.53	16.56	17.60	18.63	19.67	20.71	25.88	31.06	51.76
16	1.040	2.08	3.12	4.16	5.20	6.24	7.28	8.32	9.36	10.40	11.44	12.48	13.52	14.56	15.60	16.64	17.69	18.73	19.77	20.81	26.01	31.21	52.01
17	1.046	2.09	3.14	4.18	5.23	6.27	7.32	8.37	9.41	10.46	11.50	12.55	13.59	14.64	15.69	16.73	17.78	18.82	19.87	20.91	26.14	31.37	52.28
18	1.051	2.10	3.15	4.21	5.26	6.31	7.36	8.41	9.46	10.51	11.57	12.62	13.67	14.72	15.77	16.82	17.87	18.93	19.98	21.03	26.29	31.54	52.57
19	1.058	2.12	3.17	4.23	5.29	6.35	7.40	8.46	9.52	10.58	11.63	12.69	13.75	14.81	15.86	16.92	17.98	19.04	20.09	21.15	26.44	31.73	52.88
20	1.064	2.13	3.19	4.26	5.32	6.39	7.45	8.51	9.58	10.64	11.71	12.77	13.83	14.90	15.96	17.03	18.09	19.16	20.22	21.28	26.60	31.93	53.21
21	1.071	2.14	3.21	4.28	5.36	6.43	7.50	8.57	9.64	10.71	11.78	12.85	13.92	15.00	16.07	17.14	18.21	19.28	20.35	21.42	26.78	32.13	53.56
22	1.079	2.16	3.24	4.31	5.39	6.47	7.55	8.63	9.71	10.79	11.86	12.94	14.02	15.10	16.18	17.26	18.34	19.41	20.49	21.57	26.96	32.36	53.93
23	1.086	2.17	3.26	4.35	5.43	6.52	7.60	8.69	9.78	10.86	11.95	13.04	14.12	15.21	16.30	17.38	18.47	19.55	20.64	21.73	27.16	32.59	54.32
24	1.095	2.19	3.28	4.38	5.47	6.57	7.66	8.76	9.85	10.95	12.04	13.14	14.23	15.32	16.42	17.51	18.61	19.70	20.80	21.89	27.37	32.84	54.73
25	1.103	2.21	3.31	4.41	5.52	6.62	7.72	8.83	9.93	11.03	12.14	13.24	14.34	15.45	16.55	17.65	18.76	19.86	20.96	22.07	27.58	33.10	55.17
26	1.113	2.23	3.34	4.45	5.56	6.68	7.79	8.90	10.01	11.13	12.24	13.35	14.46	15.58	16.69	17.80	18.91	20.03	21.14	22.25	27.82	33.38	55.63
27	1.122	2.24	3.37	4.49	5.61	6.73	7.86	8.98	10.10	11.22	12.35	13.47	14.59	15.71	16.83	17.96	19.08	20.20	21.32	22.45	28.06	33.67	56.12
28	1.133	2.27	3.40	4.53	5.66	6.80	7.93	9.06	10.19	11.33	12.46	13.59	14.72	15.86	16.99	18.12	19.25	20.39	21.52	22.65	28.31	33.98	56.63
29	1.143	2.29	3.43	4.57	5.72	6.86	8.00	9.15	10.29	11.43	12.58	13.72	14.86	16.01	17.15	18.29	19.44	20.58	21.72	22.87	28.58	34.30	57.17
30	1.155	2.31	3.46	4.62	5.77	6.93	8.08	9.24	10.39	11.55	12.70	13.86	15.01	16.17	17.32	18.48	19.63	20.78	21.94	23.09	28.87	34.64	57.74
31	1.167	2.33	3.50	4.67	5.83	7.00	8.17	9.33	10.50	11.67	12.83	14.00	15.17	16.33	17.50	18.67	19.83	21.00	22.17	23.33	29.17	35.00	58.33
32	1.179	2.36	3.54	4.72	5.90	7.08	8.25	9.43	10.61	11.79	12.97	14.15	15.33	16.51	17.69	18.87	20.05	21.23	22.40	23.58	29.48	35.38	58.96
33	1.192	2.38	3.58	4.77	5.96	7.15	8.35	9.54	10.73	11.92	13.12	14.31	15.50	16.69	17.89	19.04	20.27	21.46	22.65	23.85	29.81	35.77	59.62
34	1.206	2.41	3.62	4.82	6.03	7.24	8.44	9.65	10.86	12.06	13.27	14.47	15.68	16.89	18.09	19.30	20.51	21.71	22.92	24.12	30.16	36.19	60.31
35	1.221	2.44	3.66	4.88	6.10	7.32	8.55	9.77	10.99	12.21	13.43	14.65	15.87	17.09	18.31	19.53	20.75	21.97	23.19	24.42	30.52	36.62	61.04
36	1.236	2.47	3.71	4.94	6.18	7.42	8.65	9.89	11.12	12.36	13.60	14.83	16.07	17.30	18.54	19.78	21.01	22.25	23.49	24.72	30.90	37.08	61.80
37	1.252	2.50	3.76	5.01	6.26	7.51	8.76	10.02	11.27	12.52	13.77	15.03	16.28	17.53	18.78	20.03	21.29	22.54	23.79	25.04	31.30	37.56	62.61
38	1.269	2.54	3.81	5.08	6.35	7.61	8.88	10.15	11.42	12.69	13.96	15.23	16.50	17.77	19.04	20.30	21.57	22.84	24.11	25.38	31.73	38.07	63.45
39	1.287	2.57	3.86	5.15	6.43	7.72	9.01	10.29	11.58	12.87	14.15	15.44	16.73	18.01	19.30	20.59	21.87	23.16	24.45	25.74	32.17	38.60	64.34
40	1.305	2.61	3.92	5.22	6.53	7.83	9.14	10.44	11.75	13.05	14.36	15.66	16.97	18.28	19.58	20.89	22.19	23.50	24.80	26.11	32.64	39.16	65.27
41	1.325	2.65	3.98	5.30	6.63	7.95	9.28	10.60	11.93	13.25	14.58	15.90	17.23	18.55	19.88	21.20	22.53	23.85	25.18	26.50	33.13	39.75	66.25
42	1.346	2.69	4.04	5.38	6.73	8.07	9.42	10.77	12.11	13.46	14.80	16.15	17.49	18.84	20.18	21.53	22.88	24.22	25.57	26.91	33.64	40.37	67.28
43	1.367	2.73	4.10	5.47	6.84	8.20	9.57	10.94	12.31	13.67	15.04	16.41	17.78	19.14	20.51	21.88	23.24	24.61	25.98	27.35	34.18	41.02	68.37
44	1.390	2.78	4.17	5.56	6.95	8.34	9.73	11.12	12.51	13.90	15.29	16.68	18.07	19.46	20.85	22.24	23.63	25.02	26.41	27.80	34.75	41.70	69.51
45	1.414	2.83	4.24	5.66	7.07	8.49	9.90	11.31	12.73	14.14	15.56	16.97	18.38	19.80	21.21	22.63	24.04	25.46	26.87	28.28	35.36	42.43	70.71
46	1.440	2.88	4.32	5.76	7.20	8.64	10.08	11.52	12.96	14.40	15.84	17.27	18.71	20.15	21.59	23.03	24.47	25.91	27.35	28.79	35.99	43.19	71.98
47	1.466	2.93	4.40	5.87	7.33	8.80	10.26	11.73	13.20	14.66	16.13	17.60	19.06	20.53	21.99	23.46	24.93	26.39	27.86	29.33	36.66	43.99	73.31
48	1.494	2.99	4.48	5.98	7.47	8.97	10.46	11.96	13.45	14.94	16.44	17.93	19.43	20.92	22.42	23.91	25.41	26.90	28.40	29.89	37.36	44.83	74.72
49	1.524	3.05	4.57	6.10	7.62	9.15	10.67	12.19	13.72	15.24	16.77	18.29	19.82	21.34	22.86	24.39	25.91	27.44	28.96	30.49	38.11	45.73	76.21
50	1.556	3.11	4.67	6.22	7.78	9.33	10.89	12.45	14.00	15.56	17.11	18.67	20.22	21.78	23.34	24.89	26.45	28.00	29.56	31.11	38.89	46.67	77.79

How to determine the total plot length corrected for slope:

Make sure to measure the slope in degrees, NOT percentage

If the slope is even over the entire length of the plot:
Measure the slope
Find the distance to measure on the ground in the table, for 2 m, 6 m, 25 m or 50 m plot

Example: if the slope is 12 degrees, the 50 m plot becomes 51.12 m; the 25 m subplot becomes 25.56 m; the 2 m quadrat becomes 2.04 m
For any other distance, **multiply** the horizontal distance with the slope correction factor, which is 1.022 for a 12 degree slope.

If the slope changes at various places within the plot:
Measure the distance and slope degree for the first slope

35

Calculate the corresponding horizontal distance by <u>dividing</u> the distance on the slope by the slope correction factor.
Calculate the remaining horizontal distance.
Continue until you've reached the full 50 m horizontal distance.

<u>Example</u>: slope is 12 degrees for the first 9.5 m. This 9.5 m on the ground corresponds with a horizontal distance of 9.5 / 1.022 = 9. m.
The remaining horizontal distance to measure is 50 - 9.   = 40.7 m.
Then slope is 18 degrees for 2 .7 m on the ground. This 2 .7 m on the ground corresponds with a horizontal distance of 2 .7 / 1.051 = 22.55 m.
The remaining horizontal distance to measure is 40.7 - 22.55 = 18.15m.
Then the slope is 5 degrees for the remaining distance.
The remaining horizontal distance of 18.15m corresponds with a distance of 18.15 * 1.006 = 18.26m on the ground.
The total length of the 50 m plot on the ground is now 9.5 + 2 .7 + 18.26 = 51.46 m.

FOREST USE SURVEY

...or talking and working with people

The **aim** of this research is to know how Matura National Park ESA and its resources are used.

➢ We want to find out the history of land use, communities and resource use in the area.
➢ We want to map land use and land types or vegetation types or forest types within the landscape in a visual way.
➢ We want to find out which forest resources are used; where they come from; who uses them and what their "value" is. The value or importance of natural resources is more than simply their economic or quantitative value. Real value includes social and cultural factors.
➢ We also want to know patterns of resource use and availability in space and time.

People who **use** Matura National Park ESA can roughly be divided in 3 categories in how intensely they interact with Matura National Park ESA:

➢ A limited number of people live within Matura National Park ESA itself. Certain people hold legal land titles to the land; others have illegally occupied state land (squatting).

➢ Matura National Park ESA is surrounded by COASTAL communities: Matura, Salybia, Langusta, Balandra, Rampa-nalgas, Guayama, Anglais, Cumana, Toco, Mission, Trois Roches, l'Anse Noire, Sans Souci, Monte Video, Grande Rivière, St. Helena, Matelot.

➢ External users: visitors, hun-ters, tour guides, government agencies,…
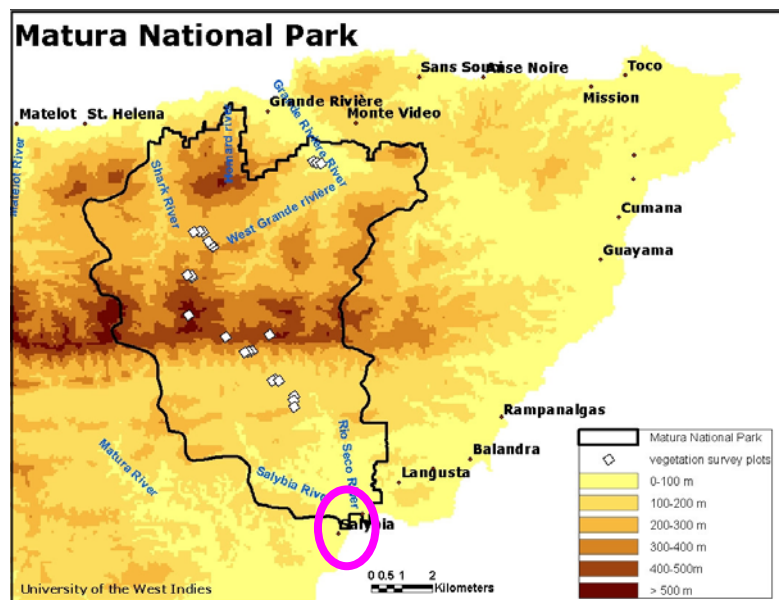
Information on use is collected from all these user.

Matura National Park ESA is surrounded by a larger forest area and positioned within a larger region, NE Trinidad. Resource use within Matura National Park ESA is influenced by resource use in the region. Use of resources therefore needs to be studied within the larger region (NE Trinidad), with an aim to distinguish which uses occur within Matura National Park ESA and which outside. E.g. timber extraction may only take place in forest outside Matura National Park ESA.

. . . . 38

How do we do this?

For studying the use of Matura forest and its resources (plants, animals,…) we use **participatory research** methods and tools. The idea is to gather local knowledge and look at topics from the insider's point of view: the point of view of local communities.

In our case, local people participate both in the organisation and carrying out of the research and other people participate as the providers of knowledge.

Besides providing the data and knowledge that are needed for the management of Matura National Park ESA, participatory methods also encourage the people involved to think about the topics we study and empowers the people involved.

When working with people, a lot of the information we collect is qualitative (stories, experiences, ideas, views). We must try to quantify this information, or turn it into number and figures.

We do research at various levels: with **groups** and with **individuals**; with **people from local communities** and with **outsiders** (e.g. hunters, visitors,…). The idea that by asking different people for the same information (for example working with different groups in one community) and by asking the same people for information in different ways (for example in individual interviews and in group sessions), we can cross-check and verify the information.

Separate sessions and interviews are held with men, women and children, because they possibly have different views that we want to know about. Also other factors influence a person's knowledge and views: education level, occupation, age, income, etc.

At the end all information is presented back to the communities to check if our conclusions are correct.

The planned activities are:

▫ **Group sessions in seven selected communities**
▫ **Interviews with key informants (forest users ; knowledgeable people)**
▫ **Questionnaires with random individuals**

Group meetings or group sessions

The advantage of group meetings is that a group of people can discuss the topics and can agree or disagree on something and discuss it. This gives a broader view of the different opinions that exist in a community. The group can also help each other remember things and produce good lists.

Group sessions are held in seven selected communities with separate groups of men and women. These can be at the same meeting, with separate groups; or at separate meetings. Group sessions are also organised with primary and secondary school children at their schools.

Groups are formed by inviting people from the community. They should ideally be a random section of the population plus key informants with specialist knowledge of natural resources and Matura NP or the forest.

During group meetings, various "exercises" are done. These exercises are usually a fun way to collect information and to assess people's opinions, values and preferences.

By doing the same exercises with different groups, differences in perceptions and views between groups can be shown.

How to plan and organise a successful group meeting:

▫ Plan carefully what the purpose is of the meeting
▫ Arrange a good time and place for the meeting.
▫ Invite people personally or via word-of-mouth to the meeting, explaining the purpose, time, place and duration.
▫ Remind them on the day itself.
▫ Plan/prepare handouts and all materials for the meeting.
▫ Plan a strategy to encourage discussions, e.g. prepare questions;
▫ Create a nice atmosphere - arrange snacks/drinks;
▫ Give a short introduction explaining the purpose of the meeting
▫ begin and end at more-or-less the planned time;
▫ start with items/topics/issues on which it is easy to get agreement or acceptance of differences of opinion;
▫ When there is conflicting opinions, try to have these differences resolved by the group;
▫ Have at least 2 facilitators: one to speak and explain and guide the discussions, the other to take notes (or tape-record the sessions).
▫ Try to end on a high "positive" note
▫ Explain what will happen next at the end of the meeting.

Participatory exercises for group meetings

During the group meetings we look at the use of natural resources in the entire landscape or region (not just in Matura National Park ESA or in forest).

Mapping exercises

Mapping is an exercise whereby different aspects of the community or the area around it are sketched in a visual way by the group. We start with pre-drawn maps of the community and its surroundings.

1. **Mapping of land use, landscape elements, land / vegetation / forest types, land tenure, access and natural resources around each community (incl. Matura National Park + wider area).**

The group is asked to illustrate the surroundings of the community on a pre-drawn GIS generated map. The pre-dawn map shows major features such as coastline, village location, major rivers, roads, Matura National Park ESA boundary, mountain ridges, etc.

The group is asked to draw and name the different types of lands they distinguish in and around the village (vegetation types / forest types). Local names for these areas are used. They are also asked to name areas and features (if any). Natural resource use within each land type will be discussed, as well as access and rights to natural resources and tenure of land types.

It is important to use good quality maps or paper, and keep them in a safe place for future reference. One person can direct drawing if mapping is done by the group as a whole.

2. **Transect walks**

The mapping of the area can be verified with transect walks, whereby the transect cuts across the different land use areas that have been mapped. A transect is walked by foot.

Using the map, or the advice of informants, a route is chosen that travels across the different land use areas and additional notes are written down about land use and land types. This transect is walked with one or some participants of the group meeting at a later time.

Scoring exercises

Scoring exercises express the "value" or "importance" of resources or of different categories. Different categories or groups are compared and people's choices, opinions and values can be quantified. Scoring is done by distributing 100 beans over different categories or groups. The amount of beans piled on each category reflects the importance value.

Overall "value" or "importance" is now translated into a number, although these numbers should not be seen as exact amounts, but more as indications.

The results are recorded on specially designed data sheets.

For each recording a small note should be made why this score was given, as a justification.

. Quantify the importance / value of land use types through scoring.

The land use types from the mapping exercise (e.g. estate lands, forest, gardens,…) are copied onto cards. Among these land use types, how does the group score their relative importance for the community's general well being (distribute 100 beans over different land types (cards).

4. Listing and scoring of natural resources or uses for each land type.

The group is asked to list different uses for each land type (e.g. hunting, food, timber, recreation,….). At this stage we look at general uses or use categories, not at individual plants or animals.

These uses are copied onto cards. For each use category on the cards, the group is asked to value the importance of each land / forest type (distribute 100 beans).

5. Listing and scoring of most important species for different use categories for forest

*The group is asked to list the **forest** products (max 10) they think are the most important in each use category (resulting from exercise 4). Separate listings are done for plants and animals.*

They are then asked to distribute 100 beans among them to express their relative importance. An extra category of all other remaining taxa is included and its importance scored relative to the 100 score for the 10 listed taxa.

6. Scoring the past-present-future of natural resource use.

The group is asked to score the importance of each resource use category (from 4) 30 years ago, now and 30 years into the future by distributing 100 beans.

Timeline

7. History of forest use / land use and resources.

Ask the group to draw a timeline on paper and note events, changes,… in land use, forest use, access, etc.

Calendar

A calendar is a tool that helps to look at changes that take place over the period of a year and to discuss what happens in different seasons, rather than only discuss what is happening at the moment the study is being done.

8. Seasonality of resources and use

A calendar of the 12 months of the year is drawn on a large piece of paper. On the calendar different seasons are indicated (dry / rainy / hunting). The group is asked to indicate when resources are available, collected, used, traded etc. This could include general livelihood activities.

Explore any conflicts, competition for resource use, demand for resources, access rules, etc.

Flow diagram

9. Product flow and abundance of forest resources.

For a selection of use categories and plants or animals, ask the group to draw the flow from collection, gathering, through sale, trading,… to consumption. Discuss restraints, abundance, problems, etc.

We will do this for game and timber in general, also for some specific uses that were mentioned in that group.

At the end of the group meeting we ask for suggestions for resource users to interview.

Participatory exercises with children:

Some of the same exercises can be done with children. Others can be adapted.

Quantify the importance / value of land use types through scoring.

Listing of uses and natural resources for each land type.

Listing of most important species for different use categories for the forest and indicating the frequency of use.

Instead of asking children to score the importance of the resources, we can ask them to say for example how often they have collected certain resources or how often they have eaten game species.

What do we need to take along to group meetings:

➢ Minimum 20 large sheets of paper for exercises 1, 7, 8, 9
➢ Pre-drawn maps (minimum 3 copies) of village surroundings for exercise 1
➢ White cards for exercises 3, 4, 5, and 6
➢ Pens – various colours
➢ 3 sets of 100 beans
➢ Data sheet forms for exercises 3, 4, 5, and 6
➢ Notebook and pen
➢ Leaflets about the survey

Interviews

With interviews we want to collect specific quantitative and qualitative information from a sample of the population and gain a range of insights on topics. Interviews can be done in different ways, varying from informal to following a very rigidly structured questionnaire.

We will be doing what are called **semi-structured** interviews. This means that you have a certain **list of questions or topics** you want to talk about. Extra topics can be added, and the order is not important. The interview is carried out like a spontaneous conversation, and can involve a lot of chatting about different things. You can pick up on things people say and ask extra questions about that. The person being interviewed does not feel "studied". By not following a rigid structure, but letting the conversation evolve spontaneously, and asking questions in different orders, the interview feels more relaxed.

But the conversation is still steered in such a way that eventually all the topics are covered, in whichever order, and all information is obtained.

You can either have a **mental list** of topics you want to discuss or questions you want to ask (in your head) or you have a **written list** with you.
Not all questions are designed and phrased ahead of time. The majority of questions are created during the interview, allowing both the interviewer and the person being interviewed the flexibility to discuss issues.

The person you interview will be a lot more comfortable if you do not have to look at your papers all the time, but can look at him or her instead and can interact and show your interest. Show interest, enthusiasm and respect for the person you are interviewing. Listening is more important than talking.

It is good to start with chatting and talking about any event or topic, and slowly move towards the specific questions you want to ask.

Explain always at the beginning why you are interviewing this person and what the project is about.

It is important to interview people when it is a good time for them. Even if that means at 8pm in the evening or 8am on a Saturday morning.

As local people, you may have your own ideas and might feel that you know more. It is still important **not to presume** that you already know all the information you are collecting. You have to ask the same questions again and again to everyone you interview, and always **start from the point of being ignorant**. Even at the risk of being considered stupid. Never think that you have heard it all. The last person you

interview might still come up with some new information. And we are interested in the variety of things that people know or think, not in what is "right" or "wrong" or how much the interviewed person knows. You must also make sure you do not record your knowledge, but the other person's. In a way you must try to be an "outsider" who knows nothing and has come to learn.

Even though these interviews might seem more casual conversations than serious work, it is important to do them in a **systematic** way, by discussing exactly the same topics, or asking the same / similar questions to all the people you interview. Only that way can you compare the information you collect, and get quantitative data.

How to ask questions

It is important **not to suggest** an answer, or force an answer, by the way in which a question is asked.

For example, if you ask a person **"Is the forest important for protecting watersheds"?** They can only say "yes" or "no" and would probably say "yes", thinking that that is what we want to hear.

If you ask "**Give me   reasons why the forest is important"**, people might not mention watershed protection at all. They might mention "for hunting, for tour guiding, for timber".

If you ask **"Is the forest important to you"**, that gives the most freedom for the person to answer. That gives a better indication of what people think and which things they think are important.

A similar example is:
Is the name of this plant black sage?
What is the name of this plant?
Does this plant have a name?

Instead of asking for a specific answer, it is better to **encourage** people to give their **own explanation** in their own words.

Use questions whereby people can tell the things they know or think, rather than just being able to say "yes" or "no".

Stimuli can be used during interviews to guide the conversation. This can be done by showing people something (pictures, items) to help them remember things. For example, rather than asking people to name the uses of forest trees, taking every

person on a walk in the forest will give very different information. Now people do not rely just on their memory of which trees grow in the forest and how you can use them. Seeing the trees will trigger their memory.

It is important to **standardise** such interviews for different informants. So if 20 people are taken on a walk through the forest they should all do the same walk and see the same trees. Then you can compare the information they give you.

The information from interviews is written down during the interview in a notebook. Or the interview can be tape-recorded and transcribed afterwards.

It is important to **cross-check** information. The information given by one informant may not be correct. That is why it is important to interview many people. If things seem wrong, they need to be checked.

No extra people should be present during interviews, because they may influence the conversation.

In order to see whether information is based on people's own use or own knowledge, or on hearsay, we will for every use related questions note whether this info is based on (using the code 1 to 4):

  1. **Direct observation of use** – we see it being used
  2. **Informant uses** – he / she says so
   . **Informant heard / knows about use**
  4. **Common knowledge**

Basic information

Whatever the type of study, we always note the following information to describe the person we interview so that we can link information with certain social factors.

 ➢ name
 ➢ gender
 ➢ age group
 ➢ occupation
 ➢ education
 ➢ ethnic identity
 ➢ locality
 ➢ birth place
 ➢ lived here for how long

Do not ask all this information right at the start. That is very imposing. Weave it into the conversation as you go along. Or ask it at the end.

Who to interview

Interviews will be carried out with one person at a time.

We can select people randomly in the community. But we can also target specific people to interview.

In this study we will interview what we call "**key people**": people that have a special knowledge about Matura forest and about natural resources (plants, animals); and specific users of natural resources (hunters, tour guides, crafts people,…).
We will find these people by asking around, or by referring.

We will aim to interview **minimum 20 people in each selected community**.

We will ask informants about:
➢ Detailed forest resource use, quantification and valuation of specific and general use categories.
➢ Time allocation / marketing / amounts / seasonality / …..
➢ Views / aspirations / perspectives on Matura National Park ESA / conservation / …..

Within each community we will also interview a **person of authority** (village council president,….) on:
➢ Community history and characterisation
➢ Land use history
➢ Cultural background of resource use / land use

We will also separately interview **users from outside the area**.

What we need to take to semi-structured interviews

➢ Guiding list of questions and topics we want to discuss
➢ Notebook or data sheet
➢ Pen

Interview with person of authority

- ➢ How long has the village existed.
- ➢ Describe the history and any historic events, esp. to do with natural resources.
- ➢ What do people's livelihoods consist of in this village
- ➢ What is the population of the village, number of people / households.
- ➢ Which areas do people use for farming, growing crops, gardening, fishing, hunting,…
- ➢ Do there exist traditional or other rules regarding forest use, fishing, hunting, land use
- ➢ Do these apply to insiders / outsiders and how
- ➢ How are these maintained / controlled
- ➢ Are there changes in forest use in the area (logging, clearing,….)
- ➢ Do you know of changes in the area of the forest that is used
- ➢ Do any traditional rules exist for protecting the forest?
- ➢ Are there places that are traditionally protected (not by government)
- ➢ ….

Interviews with key people

Exact questions will vary according to the type of use: recreation, logging, hunting, craft, medicine, farming,….

- ➢ Do you use the forest around here in any way?
- ➢ How do you use the forest?
- ➢ What things do you use from the forest? *(detail the species if applicable)*

All the following questions need to be asked separate for each use or thing the person would have mentioned, and might need to be adapted according to the use.

- ➢ Where do you get the best …….? *(whatever the use or things was, for example grass palm, agouti, hiking)*
- ➢ When do you get the best ………? *(whatever the use or thing was)*
- ➢ How often do you use this?
- ➢ When was the last time you used it or collected it or did this?
- ➢ How much time do you spend on this use?
- ➢ How far do you have to walk?
- ➢ Is this for your personal use or do you trade, sell or obtain income from this use?
- ➢ If so, try to quantify the amount of use and the income obtained (if not sensitive). Is this a primary or secondary source of income?

You may have to repeat these questions for various uses, until you've obtained the information for all the different uses that this person makes from the forest.

- Do you do something to protect the forest and its diversity (plants / animals) during your use? Which? Why?
- Should such measures be taken? Who should do it?
- Do you know of changes in the forest? Why? Reasons?
- What would you recommend for the development or future of the forest?
- Do you know of other uses of the forest, that other people might do? If so, give information and indicate how you know this (1. Direct observation of use; 2. Informant uses; 3. Informant heard / knows about use; 4. Common knowledge).
- Do you know of other people we should interview because they use the forest?
- Do you know Matura National Park or ESA is? Where is Matura NP?
- Why do you think it was declared?
- Have you ever visited Matura NP? How often? When last? Where did you go?
- Is Matura NP important for you / for local communities / for Trinidad? Explain.
- How should Matura NP be used / managed /…
- Any suggestions for the development of Matura NP?
- Should hunting be allowed or not in Matura NP?

Note the person's name, gender, age group (<15; 15-25; 25-35; 35-45; 45-55; 55-65; >65), employment or source of income, education level, place of living, birth place, lived here for how long.

Give each person a leaflet on Matura National Park at the end of the interview !

Review notes at home to make sure they are complete.

Interviews with visitors to Matura National Park and surroundings

These short interviews will be held with visitors at Shark River, Rio Seco waterfall trail, etc

Take along to interviews:
- This list of questions and topics we want to discuss
- Notebook and pen.
- Mature NP leaflets

Questions about their visit

➢ Do you often come here? How often? For example how many times per year, or is this your first time? How often did you come over the last year?

➢ What attracts you to coming to this place? Why do you come here?

➢ How many people are in your group?

➢ Where did you travel from? How did you travel here (car, maxi, bus,…)?

➢ How long do you plan to stay (few hours, 1 day, overnight, camping….)

➢ What have you been doing here so far (or what do you plan to do whilst you are here? For example bathing in river, walk in forest,….?

➢ If people do a walk in the forest, where do they go? How far do they walk in? Do they go by themselves or with a guide?

➢ Do you plan to visit any other places in the area?

➢ Do you have any suggestions of how this area could be improved or developed? Or are you happy with how it is?

➢ Will you come again in the future?

Questions on Matura National Park

➢ Do you know what Matura National Park is?
➢ Do you know where it is?
➢ Why do you think it was declared?
➢ Do you think Matura National Park is important for you?
➢ Why or why not? Give maximum 3 reasons.
➢ Do you have any suggestions for the development or use of Matura National Park?

Personal Information
Note:
➢ Age group: <15 ; 15-25 ; 25-35 ; 35–45 ; 45–55 ; 55–65 ; >65
➢ Gender : male / female
➢ Employment: an indication of their type of employment
➢ Education: primary, secondary, tertiary

Interviewing Guidelines

We do **semi-structured interviews:** you have a **list of questions or topics** you want to talk about, not a rigid questionnaire.

Extra topics can be added. Try to find out as much information as possible about **how the person you interview uses the forest and Matura national park!** Ask questions adapted to this person's use of the forest.

Show **interest**, **enthusiasm** and **respect** for the person you are interviewing. Listening is more important than talking.

Make sure you **cover all the necessary topics** you want to talk about (from the list). You are **free to add extra topics**.

Explain at the beginning why you are interviewing this person and what the project is about.

Interview people when it is a good time for them.

You may have your own ideas and might feel that you know more. **Do not presume** that you already know all the information you are collecting. You have to ask the same questions again and again to everyone you interview, starting **from the point of being ignorant**.

We are interested in the variety of things that people know or think, not in what is "right" or "wrong" or how much the interviewed person knows.

Do not suggest an answer, or force an answer, by the way in which a question is asked. Although you might want to help the person think about forest uses or trigger their memory. Do not mention what people you have interviewed before have said.

Encourage people to give their **own explanation** in their own words.

Use questions whereby people can tell the things they know or think, rather than just being able to say "yes" or "no".

Write all information down during the interview in a notebook. Read this through at home after the interview, to make sure you have noted everything.

No extra people should be present during interviews, because they may influence the conversation.

Questionnaires

In questionnaires you ask **exactly the same set of questions** to a group of people, with no room for variation or extras.

Questions will usually have short answers, give a choice of options, ask for a Yes / No answer or multiple choice.

Questionnaires are more **quantitative** than interviews, but also more impersonal.

Care should be taken that people will not improvise the answers.

There is less chance for improvisation if people are given the freedom to produce their own answer, rather than being asked to answer Yes / No or multiple choice.

Who to interview

For questionnaires we will select a **random sample of approximately 50 households** to interview **in each selected community and surroundings.**

We do the random selection by starting at various points in the community and interviewing alternate houses along the street (interview in a house, skip a house,…). In order to interview approximately equal numbers of men and women we will interview a man in the first house, a woman in the 2nd house, a man in the third house, etc. If that cannot be done the sex can be swapped and alternated again at the next house.

At least 10 interviews should be done outside the village.

What we need for questionnaires:
➢ Questionnaire forms
➢ Pen

Matura National Park Questionnaire

(Comments in italics are notes for the interviewer, not necessarily to be asked to the person you are interviewing)

Community / Place	
Interviewer name	

Questions on forest and forest use

(A forest is a large area with a high density of trees and other woody vegetation, growing more or less closely together. A backyard with trees is not a forest.)

Is the forest of interest to you? *(tick)*

Yes	No

If yes, why?

Do you personally use the forest around where you live in any way? If so, for what? How frequently? Where do you go for this use?

These can be practical uses, for example hunting, collecting certain plants; or can be for gardening, for hiking, for enjoyment,…..You may need to help the person think about certain uses.

The questions on species / things / how often /… might not be appropriate for each use. Try to get a good description for the place where a person would go for this particular use, so we can know whether it is in Matura NP or not.

Write as many uses as the person mentions, but maximum 5.

Use	Things or species or details	How often or when	When last	Where / which area

Is the forest a positive or negative natural resource *(tick)***?**

Positive	Negative

Do you know of any sites or attractions to visit in the forest?

How often do you visit them?

Do you know of any areas in the forest that could become like a visitor attraction?

Do you use or consume forest products that you do not collect yourself
(for example things that you buy or that are given to you)?

Product	How often / when	When last	How you get it

What are the most important uses or functions of the forest according to you. *(write as many as the person gives, but maximum three)*

1	2	3

Which human activities do you think can disturb the forest (its plants / its animals / or the entire forest)?
(write as many as the person gives, according to degree of disturbance, but maximum 3)

1	2	3

Optional: (Do these activities have any benefits?)

. . . . 55

What would you do if all the forest around here disappeared?

| |
| |

Questions on Matura National Park

Do you know what Matura National Park is?

| Yes | No |

(if answer is NO, explain what Matura National Park is, show on the map and jump to the question "Do you think MNP is important)

Where is it?

| |

Why do you think it was declared?

| |

What do you think the protection of Matura National Park means?

| |

Have you ever visited Matura National Park?

| Yes | No |

How often over the last year? | | **When was the last time?** | |

Where did you go?

| |

Do you think Matura National Park is important for you?

| Yes | No |

Why or why not?

| 1. | 2. | 3. |

Do you have any suggestions for development or use of Matura National Park?

Do you think hunting in Matura National Park should be allowed or banned?

Questions on conservation:

Do you think conservation of wildlife (plants, animals, forest) is important?

If yes, give reasons.(write down all reasons the person gives, but maximum 3)

Yes	No

1.	2.	3.

Do you practice conservation in any way? How?

Personal information

Name	
Level of education	
Employment or source of income	

Age group (tick)	< 15	15 - 25	25 - 5	5 - 45	45 - 55	55 - 65	> 65

Gender (tick)	Male		Female	

Place of birth	
Lived here for how long	

Participant observation

Observation is an important aspect of research on natural resources. This is simply observing what people do with plants and animals, observing how they are used for various purposes, etc.

Ensuring the quality of information

Even although many methods that we use seem very informal (more chatting than working), it is very important to follow a certain **structure**.

➢ Cover the **same questions** with every person you interview, even if every individual conversation will be very different.
➢ Carry out the **same group exercises** with every group.

That way we can compare the results between people, between communities, and between different groups.

Verifying information on natural resources

In order to see whether information is based on people's own knowledge, or hearsay, we will for every use-related questions note whether this info is based on:

1. **Direct observation of use**
2. **Informant uses**
 . **Informant heard / knows about use**
4. **Common knowledge**

All plants and animals referred to during interviews should be verified in the field and a **sample specimen** should be collected where possible.

This means that collection trips are made with the person who gave the information to collect the plant or animal in questions.

For the collection of plants, see the procedures under vegetation survey.

Animals will be collected when there can be doubt or confusion over which species is mentioned and if it is reasonably possible.

For example fish and seafood species can be collected life or dead from fishermen or with informants. These should be kept on ice until they can be identified at UWI.

Mammal species will not be collected.

Data sheets

PRA Land and forest types vs use categories

Village	Date
Group	Participants
Facilitator	

1. Among the following land / forest types, which one do you think is most important for the community's well-being (100 beans)
2. List different use categories for each land type
3. For each use category on the cards, value the importance of each land / forest type (100 beans)

PS these land types are examples and can be changed !!!

	Forest	Estate	Abandoned estate	Backyard garden	Beach	River	Village	Sea				
Overall												
Food												
Medicine												
Timber												
Firewood												
Marketable items												
Hunting												
Recreation												
Tourism												

PRA most important species per use category

Identification and relative weighting of most important plant and animal taxa per use category (max 10 for each category)

List the forest plant and animals (max 10) you think are the most important in each use category (resulting from exercise 2)

Distribute 100 beans among them to express their relative importance. Include an extra category of all other remaining taxa and score their importance relative to the 100 score for the listed taxa.

Village		**Date**	
Group		**Participants**	
Facilitator			

Food				**Timber**				**Hunting**				**Marketable items**				**Medicine**			
Plants		**Animals**		**Plants**		**Animals**		**Plants**		**Animals**		**Plants**		**Animals**		**Plants**		**Animals**	
Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score
Total = 100				Total = 100				Total = 100				Total = 100				Total = 100			
Remaining species vs 100				Remaining species vs 100				Remaining species vs 100				Remaining species vs 100				Remaining species vs 100			

PRA most important species per use categories – continued

Village		Date	
Group		Participants	
Facilitator			

Craft				Hunting place				Cultural Uses				Firewood			
Plants		Animals		Plants		Animals		Plants		Animals		Plants		Animals	
Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score	Names	Score
Total = 100				Total = 100				Total = 100				Total = 100			
Remaining species vs 100				Remaining species vs 100				Remaining species vs 100				Remaining species vs 100			

PRA Past – present – future of uses

Village		Date	
Group		Participants	
Facilitator			

For each use category on the cards, value its importance in past, present and future (divide 100 beans)

	0 years ago	Now	In 0 years time
Food			
Medicine			
Timber			
Firewood			
Marketable items			
Hunting			
Recreation			
Tourism			
Environmental Uses			
Hunting place			
Cultural uses			
Craft			

Analysing the information

Analysis is examining information, sorting it out, adding it up or comparing it so that we can understand all the different parts of it in relation to the whole, which is how Matura National Park ESA and its resources are used.

Reviewing the questions

The questions that we asked before the information was gathered should be reviewed. Why was this information necessary? Which questions was it to answer? What kinds of decisions are to be made based on this information? Did we cover all these questions?

At the same time, information that was maybe not expected might have been collected now and needs to be added.

Organising the information

Organising information for analysis varies according to the thinking processes of different people. There is a certain logic that can be followed.

Gather together all relevant information that has been collected. If necessary, sort information into parts which belong together.

Some information will be organised according to community, or according to person that was interviewed, or according to forest resource/use, or according to plant or animal species.

Decide how to analyse information.

Analysis of parts may be simply adding up numbers and averaging them or comparing information to examine the relationship of one thing to another.

Analysis can take note of similarities. It can contrast information by setting two things in opposition so as to show the differences (for example mean – women; young - old). It can relate pieces of information to establish relationships between them

Analyse quantitative information.

Quantitative (numbers) information or numbers will be entered into a computer database and analysed through statistics.

Information collected during interviews and questionnaires will be quantified where that is possible. If descriptive information was given we will divided the answers into groups and categories and given them codes.

Information from scoring exercises will be analysed in a quantitative way.

Analyse qualitative information.

Analysing qualitative (descriptive) information is a creative and critical process.

Information obtained from group sessions will be analysed by the entire team in order to summarise it for the entire region, or to categorise it per community.

Qualitative information collected during interviews and group meetings will be summarised in a describing way.

Information from mapping exercises will be added to the GIS database and compared with GIS data.

Information will be presented back to the communities in order to validate it.

GOOD LUCK AND ENJOY THE RESEARCH

NOTES