RANGER/ENVIRONMENTAL OFFICER
COURSE OUTLINE
"Problem Solving for Natural Resource Management"

COURSE AIMS

This is an advanced level course which aims to provide students with a sound knowledge and understanding of problem solving for natural resource management using the learning cycle, namely observing, evaluating, planning and acting. The course also develops a range of 'key competencies' for natural resource management. This course is aimed at technical level staff within a range of organisations and communities, who have already completed courses equivalent to the Community Level (Level 2).

LEARNING OUTCOMES

Upon completion of this course, students should be able to:

1. Knowledge

- Have an advanced understanding of the learning cycle and its associated concepts
- Have a clear understanding of policies and legislation on natural resource management.
- Assess power relations between different stakeholders to identify the impact of data collection and analysis.
- Select and apply indicators for social and ecological health.
- Select and apply appropriate methodologies for social and ecological monitoring and analysis.
- Synthesise and evaluate raw data using criteria of social and ecological health.
- Work effectively with stakeholders to develop threshold for social and ecological health.
- Develop a plan of action using the log-frame.

2. Skills

- Have effective oral communication, including presentations and public speaking.
- Have effective written communication, including the ability to produce basic reports in comprehensible and unambiguous English.
- Effectively negotiate and resolve conflict.
- Demonstrate a high level of ability to exercise, adapt and develop 'key competencies', namely holistic thinking, ability to manage change and complexity, participatory, critical awareness, group working, communication, reflectiveness and empathy.
- Work independently, and plan and execute project on time.
- Have a basic understanding of how GIS maps are created and their uses in natural resource management.

TEACHING METHODS

The course will be taught through a range of activities, including group discussions, presentations, practical work, role playing and problem solving. Students will be expected to complete recommended reading prior to each day. At the end of each session, there will be an evaluation of the day's activities and learning through a reflective journal and a graffiti board.

CONTENT SUMMARY

MODULE I – ADAPTIVE MANAGEMENT

Session 1.1: Introduction to plan for the day and training in general

Session 1.2: Identifying problems in natural resource management

Session 1.3: Key concepts for NRAMP

Session 1.4: The Learning Cycle

Session 1.5: Exploring a healthy cultural- ecological system

Session 1.6: Evaluation of Module 1

MODULE 2 – OBSERVATION

Session 2.1: Recap of Module1 and plan for the day

Session 2.2: Indicators

Session 2.3: Evaluation of Module 2

MODULE 3 – EVALUATION

Session 3.1: Recap of Module 2 and plan for the day

Session 3.2: Data analysis and interpretation

Session 3.3: Stakeholder engagement

Session 3.4: Evaluation of Module 3

MODULE 4 – PLANNING AND ACTING

Session 4.1: Recap of Module 3 and plan for the day

Session 4.2: Log frame production

Session 4.3: Monitoring Action

Session 4.4: Evaluation of Module 4

MODULE 5 – ASSESSMENT

Session 5.1: Recap of Module 4 and plan for the day

Session 5.2: Assessment (preparation of plan of action)

Session 5.3 Evaluation of Module 5

MODULE 6 – ASSESSMENT

Session 6.1: Recap of Module 5 and plan for the day

Session 6.2: Assessment (oral and written presentations)

Session 6.3: Evaluation of Module 6 and Course in general

ASSESSMENT

Assessment Details

This course will be assessed through a problem-solving exercise and use of daily assessment sheets. Students will be given a natural resource management scenario for applying the NRAMP approach. They will be expected to work through the scenario in groups and produce a plan of action for the problem. This will be presented as a group report outlining in detail the application of NRAMP concepts (adaptive, participatory, etc.) within the plan. Each student will also be expected to give an ***individual*** oral presentation on one aspect of their plan.

Students will also be given a maximum of five (5) module assessment sheets to complete throughout the duration of the course.

ITEM	ASSESSMENT TASK	% of Total Mark
1	Module Assessments	20
2	Witten Report	40
	Oral Presentation	40
		100

Minimum Achievement to Pass this Course

To be eligible to pass this course, students are required to complete all forms of assessment and must demonstrate a reasonable degree of competence in the required course objectives as examined in each form of assessment.

In order to pass this course, students must obtain at least 65% on their overall grade.

A certificate will be awarded on satisfactory completion of the assessment.

Acknowledgement and Referencing

Full and detailed acknowledgments (i.e. referencing) must be provided where contributions are drawn from the literature or other sources in the preparation of the report.

RESOURCES

Teaching space with desk, chairs and a chalk board or white board.
Basic stationary
Basic computer facilities (optional)
Accommodation and logistics
Guidelines for trainers

READING

A number of resource sheets will be produced to accompany the course. Each resource sheet will have a further reading to direct students to other resources including reports, articles and web resources.

COURSE CONTENT

DAYS/SESSIONS	TOPICS		PROBLEM	KNOWLEDGE DEVELOPED	SKILLS DEVELOPED	TEACHING TECHNIQUE	DURA-TION
SESSION 1: ADAPTIVE MANAGEMENT	1.1	Introduction to plan for the day and training in general		Understand basic planning concepts (aims, outputs, activities)	Active listening	Seminar	15 min
	1.2	Identifying problems in Natural Resource Management		Able to identify natural resource problems	Oral communication	Brainstorming in pairs and as a group	45 min
	1.3	Key concepts for NRAMP: Adaptive, Participative, Holistic, Practical, Evidence-based		Understand usefulness of NRAMP key concepts in natural resource management.	Group working Oral communication Holistic thinking	Work in groups to compare the NRAMP with other management plans, e.g. PRMU in order to identify differences and highlight key concepts.	1 hr
	1.4	The learning cycle		Understand the usefulness of the learning cycle and the different stages of the learning cycle.	Group working Oral communication Holistic thinking	Use the learning cycle to tackle the specific problems identified in Topic 1. Students will work in groups and present to the whole class.	1 hr
	1.5	Exploring a healthy cultural- ecological system	Natural resource exploitation through mining	Understand the concepts of cultural and ecological health and their interactions using a holistic approach.	Group working Able to use compendium Holistic thinking	Students work in groups using compendium to produce cause and effect diagram. They will answer "What are the effects on health of mining in rivers in the North Rupununi?" Trainers will help facilitate exercise and final compendium maps will be printed and displayed.	3 hrs
	1.6	Module Evaluation		Understand the concept of evaluation	Reflection Critical awareness	Students will be asked to complete an entry in their reflective diary and post views on the graffitti board	45 min

COURSE CONTENT

SESSION 2: **OBSERVATION**	2.1	Recap session: to review the key concepts and ideas from the day before and plan for the day		Understand the key concepts and ideas from Day 1. Understand basic planning concepts (aims, outputs, activities)	Reflect on what they learnt. Oral communication	Students work in pairs to list five most important points from the day before. The whole class will also list the most important points from the day before. Trainer introduces the day.	1 hr
	2.2	What are indicators and how do you choose the right ones?	Natural resource exploitation through mining	Understand the concepts of functions and indicators. Demonstrate practical knowledge in the use of indicators, and how to choose the appropriate indicators for monitoring and decision - making. Understand the important policies and legislation when choosing indicators. Be able to select appropriate technique for measuring indicators.	Group working Oral communication Critical awareness	Students will be asked to map the compendium nodes from the mining activity into a table of cultural and ecological functions (as described in the technical manual) Students will be asked to put nodes in the right category to understand the right indicators. Students will be asked to choose which indicators they would advise a community to use for monitoring mining. These indicators will then be used to discuss how to choose appropriate indicators.	5 hrs
	2.3	Module Evaluation		Understand the concept of evaluation	Reflection Critical awareness	Students will be asked to complete an entry in their reflective diary and post views on the graffitti board	45 min

COURSE CONTENT

SESSION 3: **EVALUATION**	3.1	Recap session: to review the key concepts and ideas from the day before and plan for the day		Understand the key concepts and ideas from Day 2. Understand basic planning concepts (aims, outputs, activities)	Reflect on what they learnt. Oral communication	Students work in pairs to list five most important points from the day before. The whole class will also list five or more most important points from the days before.	1 hr
	3.2	Data analysis and Interpretation	Natural resource exploitation logging and livelihood activities through ecotourism	Understand how data analysis can provide evidence for decision - making. Understand concepts of data analysis such as distribution, ranking and thresholds. Understand key concepts of GIS.	Data analysis using Microsoft excel. Holistic thinking. Critical awareness Carry out basic paper - based GIS.	Students will be given a set of monitoring data and a set of questions in relation to an ecotourism scenario. They will be expected to do basic data analysis to answer the questions. Students will be asked to map the findings of the data analysis on a paper - based GIS to identify potential conflict of interest between stakeholders. E.g. The layers of the GIS will be a base map of land cover with logging concessions and additional layers of community use and biodiversity hotspots.	2 hr
	3.3	Stakeholder Engagement		Understand different stakeholder's interests, values and power relations. Identify problems and opportunities	Effectively negotiate conflict. Oral communication Ability to manage change and complexity. Participation. Group working. Empathy	Students will be divided into different groups to represent different stakeholders in a conflict scenario e.g. *the logging/ecotourism conflict*. Each group will be given basic information not known to the other groups. A role play will be used to identify problems and opportunities.	3 hrs
	3.4	Module Evaluation		Understand the concept of evaluation	Reflection Critical awareness	Students will be asked to complete an entry in their reflective diary and post views on the graffiti board	45 min

SESSION 4: **PLANNING AND ACTING**	4.1	Recap session: to review the key concepts and ideas from the day before and plan for the day.		Understand the key concepts and ideas from Day 3. Understand basic planning concepts (aims, outputs, activities)	Reflect on what they learnt. Oral communication	Students work in pairs to list five most important points from the day before. The whole class will also list five or more most important points from the days before.	1 hr
	4.2	Log-frame Production.	Conservation management	Understand concepts necessary for planning: goal, aims, outputs, activities, assumptions, indicators and responsibilities	Group working Oral communication Critical awareness Holistic thinking Project development	Students will be given a simplified proposal for a potential conservation management project. Working in groups, they will then produce a log frame for the proposal. This particular exercise may be tedious and as such would need careful guidance.	4 hrs
	4.3	Monitoring action				Supervise a class **discussion** on log frame contents and monitoring action.	1hr
	4.4	Module Evaluation		Understand the concept of evaluation	Reflection Critical awareness	Students will be asked to complete an entry in their reflective diary and post views on the graffiti board	45 min

SESSION 5 **ASSESSMENT**	5.1	Recap session: to review the key concepts and ideas from the day before and plan for the day.		Understand the key concepts and ideas from Day 4 and 5. Understand basic planning concepts (aims, outputs, activities)	Reflect on what they learnt. Oral communication	Students work in pairs to list five most important points from the day before. The whole class will also list five or more most important points from the days before.	1 hr
	5.2	Development of Management Plan		Understand how to use the NRAMP cycle in detail for a natural resource management project	Group working Oral communication Written communication Critical awareness Holistic thinking Project development Reflectiveness Work independently Plan and execute project	Students will be divided into groups and would be given a natural resource management scenario. Students would be expected to use the NRAMP cycle and concepts to produce a plan of action for the problem. See assessment details	5 -6 hrs
	5.3	Module Evaluation		Understand the concept of evaluation	Reflection Critical awareness	Students will be asked to complete an entry in their reflective diary and post views on the graffiti board	45 min

SESSION 6 **ASSESSMENT**	6.1	Recap session: to review the key concepts and ideas from the day before and plan for the day.		Understand the key concepts and ideas from Day 4 and 5. Understand basic planning concepts (aims, outputs, activities)	Reflect on what they learnt. Oral communication	Students work in pairs to list five most important points from the day before. The whole class will also list five or more important points from the days before.	1 hr
	6.2	Presentation of Management Plan		Understand how to use the NRAMP cycle in detail for a natural resource management project	Oral and written communication Presentation styles, holistic thinking, group working, Participation Project development Ability to work independently	Each group will submit a written report, outlining in detail, the application of NRAMP concepts within the plan. Each student would be expected to give an individual oral presentation on one aspect of their plan. Facilitators will grade oral and written presentation and give feedback on student's performances.	4 - 5 hrs
	6.3	Module Evaluation		Understand the concept of evaluation	Reflection Critical awareness	Students will be asked to complete an entry in their reflective diary and post views on the graffiti board	45 min

MODULE 1: ADAPTIVE MANAGEMENT

SESSION 1.1 INTRODUCTION TO PLAN THE DAY AND TRAINING IN GENERAL

Topics to be covered:

- Concepts of planning before starting any activity
- Tools for effective communication and learning
- Importance or reflection and evaluation

Knowledge developed: Understand basic planning concepts (aims, outputs, activities)

Skills Developed: Active listening

Duration of session: 15 minutes

Resource sheets for session:

- Session Plan 1.1
- Agenda for Module 1
- How to be a good listener
- Tips on effective reading
- What does reflection mean?
- What is Evaluation
- Pre Evaluation Form

SESSION PLAN 1.1 INTRODUCTION TO PLAN OF THE DAY AND TRAINING IN GENERAL

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will listen to trainer	Flip chart sheets, markers, Colored chalk.	Seminar	Trainer will outline -Purpose and objectives of training -Agenda and plan of the day - ***45 mins*** Trainer should stress the -importance of planning before starting an activity -importance of making observations throughout the day and recording them - the need for participants to be reflective learners

MODULE I AGENDA

8:00 Registration

8:30 Welcome and Introduction to Training

8:45 Identifying Problems in Natural Resource Management

9:30 Key Concepts for NRAMP

10:30 Break

10:45 The Learning Cycle

11:45 Lunch

12:50 Exploring a Healthy Cultural – Ecological System

15:50 Evaluation

16:35 Wrap Up

Ranger/Environmental Officer Training November 2007

HOW TO BE A GOOD LISTENER

If you ask someone to give a one word description of listening, some would say hearing; however, hearing is physical. ***Listening*** is following and understanding what the speaker is saying, it is ***hearing*** with a ***purpose***.

Listening leads to the ***understanding of facts and ideas***, it takes attention, or sticking to the task at hand in spite of distractions. A person who incorporates listening with concentration is actively listening. ***Active listening*** is a method of responding to another that encourages communication. Good listening is built on three basic skills: attitude, attention, and adjustment

1. ATTITUDE

Make Eye Contact:

Be sure to look at the speaker in the face most of the time, especially look at her/his eyes. If you forget to make eye contact, the speaker may think you are bored, withdrawn, or simply not listening. Also be culturally sensitive: some individuals may be uncomfortable with too much direct eye contact.

***Take A Listening Position*:**

Sit or stand in a comfortable position with your body aimed in the general area where the speaker is. Try to be in a relaxed position. Face the speaker and make appropriate eye contact. Be aware of other non-verbals: placement of arms, leaning forward when necessary, head nodding, degree of personal space, smiling.

2. ATTENTION

***Paraphrase The Speaker's Message*:**

Paraphrasing means stating in your own words what someone has just said. Some common ways to lead into paraphrases include:

- What I hear you saying is…
- In other words
- So basically how you felt was…
- What happened was…

The speaker then has a chance to know you have understood what she/he has said. This also gives the speaker the opportunity to try to make the message more clear if she/he doesn't think you really understood.

***Ask Clarifying Questions For Understanding*:**

If something the speaker says is unclear to you, ask her/him a question to get more information. Such questions make you an active, interested listener; the speaker can tell that you've been listening enough to have a question and care enough to ask. Ask open ended questions when you need more information, e.g., "Could you explain an example of a natural resource that is being exploited in the North Rupununi? Avoid the overuse of closed questions. Closed questions are those that just requires a yes or no response and tend to halt communication e.g Is there exploitation of natural resources in the North Rupununi?

***Make Comments, Answer Questions*:**

When the speaker stops or pauses, you can be a good listener by making comments about the same subject. If the speaker asks a question, your answer can show you were listening or how much you understood. Use silence to your benefit instead of attempting to fill the conversation with constant talk.

Provide Appropriate Feedback:

The speaker is likely to be interested in your opinions and feedback. Feedback should always be given in an ***honest and supportive way.***

3. ADJUSTMENT

Empathy:

Empathy is the **recognition** and **understanding** of the states of mind, including beliefs, desires and particularly emotions of others. Every individual is different and have their own ideas and value systems.

Openness:

Listen with **openness**. Be a supportive, but neutral listener. . Be careful of judgments and stereotypes you have that block openness. Attempt to put yourself in the other person's shoes in terms of trying to understand how they feel, while also not becoming consumed with their difficulties. Incorporate your own self-care so that you do not burn out.

Awareness:

Be **aware** of your own biases. We all have biases-this is part of human nature. The key is to not let them get in the way of what others have to say. Try to fully understand the person and their context versus relying on just your personal experience to guide them.

Poor Listening Habits and Good Listening Habits

Poor Listening Habits	*Poor Listeners...*	*Good Listeners...*
Criticizing a speaker	Criticize the speaker's voice, clothes, or looks. Therefore, they decide that the speaker won`t say anything important.	Good listeners look for the ideas being presented, not for things to criticize
Finding fault with the speaker	Become so involved in disagreeing with something the speaker states that they stop listening to the remainder of what was said.	Listen with the mind, not the emotions. Good listeners jot down something they disagree with to ask the speaker later, and then go on listening.
Allowing yourself to be distracted	Use little distractions -- someone coughing, a pencil dropping, the door opening and closing -- as an excuse to stop listening.	Filter out distractions and concentrate on what the speaker is saying.
Faking attention	Look at the speaker but don't listen. They expect to get the material from the textbook later.	Understand that speakers talk about what they think is most important. Good listeners know that a good lecture may not contain the same information as the textbook.
Forcing every lecture into one format	.The listener is so concerned with organization that he misses the content.	Adjust their style of note-taking to the speaker's topic and method of organization.
Listening only for facts	Only want the facts. They consider everything else to be only the speaker's opinion.	Want to see how the facts and examples support the speaker's ideas and arguments. Good listeners know that facts are important, because they support ideas.
Listening to only the easy material	Think it is too difficult to follow the speaker's complicated ideas and logic. A poor listener wants entertainment, not education.	Want to learn something new and try to understand the speaker's point. A good listener is not afraid of difficult, technical, or complicated ideas.
Calling a subject boring	Decide a topic or session is going to be dull and "turn out" the speaker.	Listen closely for information that can be important and useful, even when a topic or session is dull.
Overreacting to "push button" emotional words	Get upset at words which trigger certain emotions -- words such as communist, income tax, Hitler or abortion. Emotion begins and listening ends.	Hear these same words. When they do, they listen very carefully. A good listener tries to understand the speaker's point of view.
Wasting thought speed	Move along lazily with the speaker even though thinking is faster than speaking. A poor listener daydreams and falls behind.	Use any extra time or pauses in the lecture to reflect on the speaker's message. They think about what the speaker is saying, summarize the main points, and think about the next points.

TIPS OF A GOOD LISTENER

The speaker and the listener must both work hard when communicating to make sure each one gets the message.

- **Have one conversation at a time.** Listening to two things at one time means you can't hear or think about either one.
- **Let others finish talking.** To listen well, you must stop talking. Don't interrupt or put words in the other person's mouth.
- **Don't be turned off by how others talk.** Try to listen to what a person says and not how he or she says it. It is easier to listen to some people than others.
- **Make sure you heard right.** If you didn't hear or don't understand what someone said, have them say it again. Ask them to explain it.
- **Know what the other person wants.** Ask yourself, *Why are we talking?* Is what they have to say important?
- **Watch body language.** Body language is a person's gestures, tone of voice, body posture, and facial expressions. It may say more than words.
- **Listen to what the other person DOESN'T say.** People don't like difficult situations. They may not look at you, use unnatural words, or pause a lot. If they do, ask questions to help them.
- **Don't let "red flag" or "hot button" words throw you off.** Some words such as *gay and abortion etc* can upset us. This stops us from listening. When you hear things that make you mad or upset, try to listen anyway.

For this course to be effective, its critical that both students and instructors exercise good listening skills. This would only contribute to the smooth flow and understanding of the NRAMP process.

REFERENCE:

1. http://extension.unl.edu/welfare/listener.htm
2. http://www.twu.edu/o-sl/counseling/SelfHelp026.html
3. http://www.ccsf.edu/Services/LAC/lern10/listening.html

LEARNING BY READING

The Reading Process

We read differently for different tasks:

1. Scan for key words. This is a 'search-and-recognise' technique. Think of a train timetable: 'What time is the first train after 5pm today?' You are looking for a specific image: 17:00 in this case. In the case of a book look at the index, contents and author's/editor/s blurb.

2. Skim for an overview. This is the technique you use to find out if the article contains the information you need. Think of glancing quickly through a magazine: 'Is this article going to be interesting?' When looking at a book ask yourself whether a particular chapter is relevant. Skim the introductory chapter for an overview of the contents and author's editor's perspective.

3. Word by word reading. This is very slow and is seldom necessary, unless you are working with a highly technical text with very unfamiliar vocabulary, or in a language in which you are not fluent.

4. Reading to understand or **analytical reading.** This is best done after skimming.

Analytical Reading (Reading to Understand)

Find the book or web site. First, **scan** the contents index, and introductory sections, to ensure that the text is relevant. Next, **skim** through the relevant sections to give yourself an overview of the content. **Only read the relevant parts**. At this stage read for understanding. Now move on to a more analytical approach. This analytical process **takes everyone some time to do**, but it is time well spent if it is done well. If done properly it will save you having to return to this text again at a later date.

a. Record your sources

Re-read the text and note down the answers to your questions, deciding on the information you require for your task. Always note for each article the Author, Title, Publisher, Date. If you find brief sections of the text to use as quotes, copy exactly the text in inverted commas and note the page number. Develop good habits in noting the source of your information. This good practice will save you time; otherwise you will find yourself checking repeatedly.

b. Review

Review your notes. Are they well organised and in a logical format? Do they answer the questions you posed and provide the evidence you need?

c. Organise your notes

Only read until you have enough material to write your assignment. Keep your notes in good order, making sure that you have sufficient material to address each of your developing arguments. Colour coding the different sections might help.

d. Write

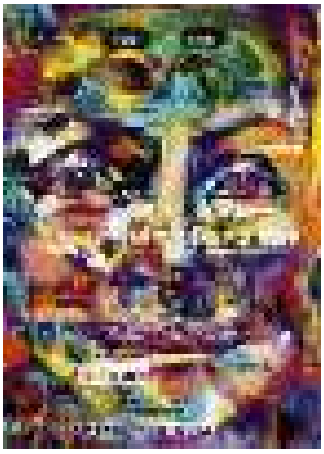
Do not use reading as an excuse to delay the writing. You need sufficient time to complete this task properly and to capitalise fully on the time you have spent, reading and gathering the evidence.

Tips for Effective Reading

- Duration of reading is important, take regular short breaks as this aids ***reflection***. Do not read for more than 3 hours without a 20 minute break.
- Breaking your reading up into shorter sections, each followed by a break may prove helpful.
- Exhaustion leads to confusion and misinterpretation. If you feel sleepy when reading, take a break, and get some fresh air or exercise before returning to the task.
- If reading cause's problems with your vision check the light by which you are reading. It may be advisable to check the status of your vision at the opticians.
- Reading from a computer screen can be tiring. An anti-glare device for the screen may prove helpful. You may also wish to try altering the background colour of your computer screen for greater comfort in continuous reading.
- If reading and noting information is a problem you may wish to experiment with other means of providing yourself with the information. Many people prefer to learn by ***listening***. Listening can help in the selection of useful points from the text.

Reference:

1. http://www.kent.ac.uk/uelt/learning/online/effective-reading.html
2. http://www.cod.edu/people/faculty/fancher/STUDY.HTM
3. www.speysidehigh.net



"Experience is not what happens to a man; it is what a man does with what happened to him." Aldous Huxley

WHAT DOES REFLECTION MEAN?

Reflection is ***thinking for a purpose*** - someone who wants to understand their own learning. Thus, reflection is also about wanting, or at least being willing, to change the way we learn.

Reflection is ***analysing*** how we learn (taking apart our own learning processes). Reflection is also about ***evaluating*** how effectively we learn - making judgments on our own performance, and that is not always an easy or comfortable thing to do.
Most of all, reflection includes being ***critical*** - not in a negative or destructive way, but through rigorous questioning and deep probing into ***what*** and ***how*** we learn. Many people would say that the most important characteristic of an effective student in higher education is that they are capable of ***critical thinking*** – (actively challenging both themselves and others.)

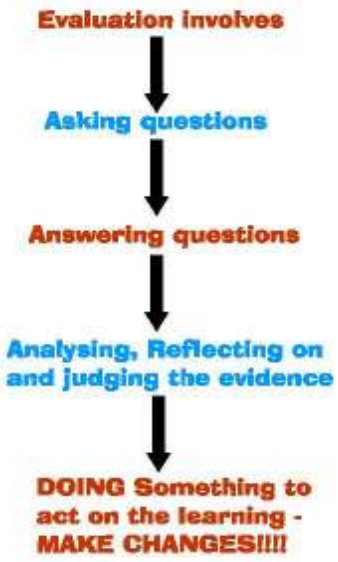
A common form of documentation used to record student site observations and encounters is a **reflective work journal**. Keeping a work journal helps students achieve positive results (both personally and academically) by helping them to focus their thoughts and feelings in relation to learning objectives

What Should I Write in My Journal?
Here's a few of the ingredients which go into a keeping a great journal:

- Journals should be snapshots filled with sights, sounds, smells, concerns, insights, doubts, fears, and critical questions about issues, people, and, most importantly, yourself.
- ***Honesty*** is the most important ingredient to successful journals.
- A journal is ***not*** a work log of tasks, events, times and dates.
- Write freely. Grammar/spelling should not be stressed in your writing until the final draft.
- Write an entry after each session. If you can't write a full entry, jot down random thoughts, images, etc. which you can come back to a day or two later and expand into a colourful verbal picture.
- Use the journal as a time to meditate on what you've seen, felt, and experienced, and which aspects of the training continues to excite, trouble, impress, or unnerve you.
- Don't simply answer the questions given, but use them to keep your writing/"swimming" focused.

Reference:

1. http://www.fiu.edu/~time4chg/Library/reflect.html
2. http://servicelearning.umn.edu/students/resources/What_is_reflection.html
3. http://servicelearning.umn.edu/students/resources/journals/Reflective_Work_Journal_Overview.html



Without the final stage the evaluation is useless!!!!!!!

WHAT IS EVALUATION?

"How did that recipe work? What would make it better? What did the people who cooked ate or paid for the meal think? What will I do differently next time?"

We evaluate all the time- it's an everyday part of life; we do it all the time!

In the voluntary sector people work hard, have little money, are very committed, and care a lot...some how it must be good...BUT at the end of the day **what difference does the work make?**

- How do we know what is being achieved- the results, if any, of the work?
- Are they meeting people's needs- which people?
- It is not enough to say "We are doing a good job".
- What needs to change and how?

The answers to these questions are discovered through evaluation.

Evaluation is assessing and judging the value of a piece of work, an organization or a service. Its main purpose is to help you reflect on what it is you are trying to achieve, assessing how far it is succeeding, and identify required changes.

Reference:

1. http://www.evaluationtrust.org/evaluation/evaluate.html

SESSION 1.2: UNDERSTANDING AND IDENTIFYING PROBLEMS IN NATURAL RESOURCE MANAGEMENT

Topics to be covered:

- Types of natural resources and their problems
- Identifying problems in natural resource management

Knowledge developed: Able to identify natural resource problems

Skills Developed: Oral communication, holistic thinking,

Duration of session: 1 hour

Resource sheets for session:

- Natural Resources of the North Rupununi
- Introduction of the People
- Biodiversity: "Flora and Fauna"
- Physical Geography
- Historical Livelihoods
- Oral presentation skills
- Commercial Logging in the North Rupununi
- How to design rich picture diagrams

SESSION PLAN 1.2: UNDERSTANDING AND IDENTIFYING PROBLEMS IN NATURAL RESOURCE MANAGEMENT

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
Students will be divided into groups and given different natural resources. Each group will be required to discuss issues relating to their specific natural resource. Each group will draw spider diagram or pictorial representation, mapping issues surrounding that resource(***20 mins***) Each group will then present its findings to the class. (***20 mins, 5 mins per group)***	**Resource Sheets** - Natural resources of the North Rupununi *Materials* Flip chart sheets, markers, Colored chalk	Brainstorming in pairs and as group.	Trainer will Introduce topic and assign natural resources to different groups e.g. fish, minerals, NTFPs, timber e.t.c ***(5 mins***) Allow students to discuss issues relevant to their natural resource, after which group presentations should be done ***(10mins)*** Monitor time for group presentations Wrap up and hand over to next session (***5 mins***)

NATURAL RESOURCES OF THE NORTH RUPUNUNI

It is not surprising that this region is naturally abundant of natural resources which have been harvested by the local communities for years. As such, these resources are directly linked to the communities' livelihood activities – providing thatching for houses (species of palm leaves), source of food (wild meat), ornaments (balata crafting, basketry) and even local medicinal uses. The Amerindian Communities have truly come to survive off their environment. Natural resource activities which contribute to local livelihoods include fishing, hunting, gathering, subsistence logging and handicraft making.

(a) Animal Wildlife – The North Rupununi has an abundance of such wildlife due to its rich ecosystems. As such they are a very valuable resource to the communities of the North Rupununi. Some are hunted and eaten as a source of protein. Fishes for example, are the common source of protein throughout the year even though species diversity will vary between dry and wet seasons.

Wildlife is also valued for their role in eco-tourism where tourists will pay to get a glimpse of wild animals in their natural habitat. As a result, job opportunities are made available e.g. tourist guides. Trappers earn a livelihood by trapping certain species for local and international wildlife trade.

Below is a list of the rich animal wildlife that makes up an integral part of the North Rupununi natural resources.

Local Name	**Scientific Name**	**Makushi Name**	**English Common Name**
Bush Cow	*Tapirus terristris*	Waira	Brazilian Tapir
Watras	*Hydrochaeris hydrochaeris*	pranwei	Capybara
Savannah Deer		kîri yakî	White Tailed Deer
Bush Deer		Kusari	Red Brocket Deer
Land Turtle	*Geochelone carbonaria/denticulata*		Red and Yellow Footed Tortoise
Yaci		Kiekan	Armadillo
Agouti/John	*Agouti paca*	Kuri	Red Rumped Agouti
Labba	*Dasyprocta agouti*	warana	Paca
Tartuga	*Podocnemis expansa*	warara	Giant River Turtle
Caiman	*Caiman crocodiles*	Kare	Spectacled Caiman
Caiman	*Melanosuchus niger*	Karatu	Black Caiman
Water Dog	*Pteronura brasiliensis*	Turara	Giant River Otter
Jaguar	*Panthera onca*	kaikushi	Jaguar
Wild Hog	*Pecari tajacu*	Parka	Collared Peccary
Wild Hog	*Tajassu pecari*	Pinkî	White Lipped Peccary
Anteater	*Myrmecophaga tridactyla*	tamanuwa	Giant Anteater
Deer Tiger	*Felis concolor*	sariwara	Puma

Table 1. *Showing list of common animal wildlife found specifically in the North Rupununi*

Family	Genus	Species	Creole	Makushi
Ageniosidae	*Ageniosus*	*brevifilis*	Dawalu	pîrapîrari
Auchenipteridae	*Parauchenipterus*	*galeatus*	Imehri	anuiya
Auchenipteridae	*Trachycorystes*	*trachycorystes*	Boots	amîri
Callichthyidae	*Hoplosternum*	*thoracatum*	Round-headed Hassar	kîriwou
Characidae	*Acestrorhynchus*	*falcatus*	Fox Fish	maikan
Characidae	*Astyanax*	*sp.*	Big-eye serebe	kamîya, sapuru
Characidae	*Brycon*	*falcatus*	Curumai	purumai
Characidae	*Metynnis*	*hypsauchen*	White Pacu	kumaru, waita
Characidae	*Myleus*	*pacu*	Cartabac	kamana
Characidae	*Pygocentrus*	*nattereri*	Cashew Perai	suyu arai
Characidae	*Serrasalmus*	*niger*	Black Perai	riktun arai
Characidae	*Triportheus*	*rotundatus*	Basket Fish	pîkarumá
Cichlidae	*Cichla*	*ocellaris*	Lukunani	kamakara
Cichlidae	*Crenicichla*	*alta*	Sunfish	kurapi
Cichlidae	*Geophagus*	*surinemensis*	Sand Grinder	saimaka
Ctenoluciidae	*Boulengerella*	*cuvieri*	Sword Fish	moruwi
Curimatidae	*Leporinus*	*friderici*	Dare	kîmîiyari
Curimatidae	*Prochilodus*	*rubrotaeniatus*	Yakutu	kîmîta
Cynodontidae	*Hydrolycus*	*scomberoides*	Baiara	
Cynodontidae	*Hydrolycus*	*armatus*	Creek Baiara	wînni, paya
Doradidae	*Hassar*	*notospilus*	Bitter Head	maipupai
Doradidae	*Pseudodoras*	*niger*	Zip Fish	kuyun kuyun
Erythrinidae	*Hoploerythrinus*	*unitaeniatus*	Yarrow	karasai
Erythrinidae	*Hoplias*	*aimara*	Haimara	aima
Erythrinidae	*Hoplias*	*malabaricus*	Huri	patakai
Erythrinidae	*Erythrinus*	*erythrinus*	Bush Yarrow	woyomari
Gymnotidae	*Electrophorus*	*electricus*	Electric eel	a'rinra
Loricariidae	*Ancistrus*	*hoplogenys*	Banjuman	ariwa
Osteoglossidae	*Arapaima*	*gigas*	Arapaima	warapai
Osteoglossidae	*Osteoglossum*	*bichirrosum*	Arawana	arauwuna
Pimelodidae	*Pimelodus*	*blochii*	Johnny Mangy, Larima	katîrîna
Pimelodidae	*Pseudoplatystoma*	*tigrinum*	Long-head Cullet	ararama
Pimelodidae	*Pseudoplatystoma*	*fasciatum*	Short-head Cullet	kurutu, karama
Pimelodidae	*Rhamdia*	*quelen*	Kassi	rekî
Potamotrygonidae	*Potamotrygon*	*sp.*	String Ray	sipare
Sciaenidae	*Pachypops*	*grunniens*	Small Basha	siriki
Sciaenidae	*Plagioscion*	*sqamosissimus*	Basha	pakupa

Table 2*. Showing a list of fish species specifically found in the North Rupununi*

(b) Plant Wildlife – Many resources are gained from the forests of the North Rupununi and has been used by the Amerindians for years in times past .Today many of these resources are still utilized by the communities. Several species of trees are known to be used specially for building and general construction purposes; while others are used as firewood (a source of energy). Species that are used as timber are listed in Table 3 below.

It's important to note that many other natural resources have important and common uses. Some non-timber resources have a wide variety of uses ranging from materials for thatching of roofs, brick making, basket weaving and every importantly, medicinal uses.

Plant name	**Scientific Name**	**Plant name**	**Scientific Name**
Wallaba	*Eperua* spp.	Itaballi / Moon Tree	*Vochysia surinamensis*
Mora	*Mora excelsa*	Balata	*Manilkara bidentata*
Cedar, Water Cedar, Swamp Cedar, White Cedar, Shingles	*Tabebuia insignis*	Shibidan, Lapani	*Aspidosperma vargasii*
Small lilies	*Nymphaea* spp.	Angelina Rock/Wamaradang	*Dicorynia guianensis*
Moco moco	*Montrichardia arborescens*	Hububalli	*Loxopterygium sagotii*
Aripipi Palm	*Astrocaryum aculeatum*	Wild banana	*Musa* spp.
Lana	*Genipa americana*	Jamoon	*Syzygium cumini*
Congopump	*Cecropia* spp.	Mamvin	-
Inga, Whitee	*Inga* spp.	Mamma/Cassava Muma Tree	-
Guavaballi	*Iryanthera* spp.	Mariapret	-
Oldman back	-	Honey wood	-
Mahoo	*Sterculia* spp.	Meyai	-
Dalli	*Virola* spp.	Arrowa	-
Greenheart	*Chlorocardium rodiei*	Kunami	*Clibadium surinamense*
Bloodwood	*Vismia* spp.	Yarula	*Aspidosperma excelsum*
Kabocalli/ Kabukali	*Goupia glabra*	Aromata	*Clathrotropis brachypetala*
Big Lilies	*Victoria amazonica*	Aspeko	*Pouteria guianensis*
Ite Palm, Tibisiri	*Mauritia flexuosa*	Haiawa	*Protium decandrum*
Manni	*Symphonia globulifera*	Hubidi	*Anacardium giganteum*
Bamboo	*Guadua* spp.	Kufa	*Clusia grandiflora*
Water hyacinth	*Eichornia crassipes*	Krawa	*Ananas comosus*
Busy busy	-	Savannah mora	*Thyrsodium guianense*
Corkwood	*Pterocarpus officinalis*	Savannah greenheart	-
Kokrite	*Attalea regia*	Paurine, or lapenny	*Centrolobium paraense*
Mukru	*Ischnosiphon arouma*	Freijo	*Cordia alliodora*
Manni Tree	*Symphonia globulifera*	Kuru	*Astrocaryum* spp.
Bullet wood	*Manilkara bidentata*	Awara	*Astrocaryum vulgare*
Simarupa	*Quassia simarouba*	Nibbi	*Heteropsis* spp.
Silverballi	*Ocotea* spp.	Kauta	*Licania* spp.
Purpleheart	*Peltogyne venosa*	Bush cashew	*Anacardium occidentale*
Crabwood	*Carapa guianensis*	Wamaradang	*Swartzia leiocalycina*
Lu	*Oencarpus bacaba*	Wild Genip	*Muellera urens*

Turu	*Jessenia bataua*	Aciter	-
Leopard wood	*Brosimum* spp.	Genipap	-
Kakaralli	*Eschweilera sagotiana*	Bununi	-
Ocoballi	-	Mai-yea tree/ Bitter Tree	*Quassia simarouba*

Table 3. *List of plants species found in the North Rupununi*

Plant name	**Scientific Name**	**Use**
Kokrite leaves	*Attalea regia*	roof thatching material; fruits are eaten
Mukru	*Ischnosiphon arouma*	basket making
Ite leaves	*Mauritia flexuosa*	roof thatching material; fruits are eaten
Lu leaves	*Oencarpus bacaba*	roof thatching material
Tibisiri	*Mauritia flexuosa*	wide variety of handicraft
Crabwood seeds	*Carapa guianensis*	to make crabwood oil
Buruhuda	*Parinari campestris*	bark used to treat snake bite; fruit can be eaten
Kakeralli	-	used to treat diarrhea
Greenheart	*Chlorocardium rodiei*	Seeds used treat for worms and general skin problems
Congo pump	-	Young leaves used to make beverage; young shoots are used to make flutes which are used in parishara dance.
Balata	*Mimusops globosa*	Fruit is eaten, latex for making of containers and ornaments.
Wallaba	*Eperua* spp.	used to make bows; bark used to treat internal injuries
Mora	*Mora excelsa*	Bark used to tan leather

Table 4. Showing a list of non-timber products found in the North Rupununi

Reference:

1. Forte, J. (ed.). (1996). *Makusipe Komanto Iseru. Sustaining Makushi Way of Life*. North Rupununi District Development Board: Annai, Guyana.

INTRODUCTION OF THE PEOPLE OF THE RUPUNUNI

Amerindian children playing

The North Rupununi Wetland catchment is the traditional home of the Makushi people. Although the Makushi are still the primary ethnic group in the area, many communities contain a mixture of other indigenous groups and immigrants from the more populated coast.

The primary livelihood activities in the area are subsistence farming and fishing, with some amount of hunting and gathering, trapping, brick making, and cattle ranching. The main local crop is cassava (*Manihot esculenta*), of which several varieties are grown to produce farine (roasted cassava grains), cassava bread, tapioca, and various beverages. There is also some local commercial exploitation of wildlife for the meat and pet trades.

Wildlife represents a major local food source in the North Rupununi. Mammals and fish in particular provide the majority of the protein intake for villagers (Watkins *et al*., 1999). According to a study by the Makushi Research Unit (Forte, 1996) over 100 species of fish are eaten by Makushi. As such, fishing is an extremely important subsistence activity. Aside from subsistence and economic value, the North Rupununi wetlands also feature prominently in indigenous culture and folklore, and have significant aesthetic value, serving as a primary place of recreation for local residents.

The residents of the North Rupununi are distributed among sixteen primary communities, consisting of approximately 5000 people. Although ten of these communities have legal title to some of their traditional lands, all of the communities currently practice customary user rights to their surrounding land and resources. The villages are represented by elected *Toshoa,* or Captains. These leaders came together in 1996 to establish the North Rupununi District Development Board (NRDDB), a regional, community-based NGO, which currently acts as the coordinating body for conservation and development initiatives in the area.

References

1. Forte, J. (ed.). (1996). *Makusipe Komanto Iseru. Sustaining Makushi Way of Life*. North Rupununi District Development Board: Annai, Guyana.
2. Watkins *et al.* (1999). (eds). *The Vertebrate Fauna of the Iwokrama Forest: Final Report from Work Carried Out in the Iwokrama Forest by the Academy of Natural Sciences of Philadelphia 1996-1998*. The Academy of Natural Sciences: Philadelphia.

BIODIVERSITY: FLORA AND FAUNA

The North Rupununi is made up of a range of ecosystems which in turn provides a unique and diverse selection of habitats for a rich biodiversity. The rainforest, savannas and wetlands that dominate this region are ultimately responsible for the areas mosaic landscape. Rainforest regions will support a higher biodiversity of life naturally. However, wetlands ecosystems are highly productive areas which support a wide diversity of plants and animals.

This is mostly due to its periodic change of environment between wet and dry seasons which provides the opportunity for supporting a much higher diversity in terms of providing an abundance of food, breeding grounds, and habitats. Fishes, turtles and many native birds feed, breed and live in the wetlands all year round. Aside from this, many species of migratory birds may also rely on wetlands as feeding and breeding grounds.

Flooding of these wetlands provides the opportunity of migration for fishes and other species of fauna that would have been otherwise isolated for a time of the year. This sort of migration promotes species survival by allowing the species to spread to other regions. Similarly, plant species are assisted by seasonal flooding by permitting seed dispersal of the native plants of the North Rupununi from one area to another.

Generally speaking, forest ecosystems support a very high abundance of plants and animals as compared to a savanna ecosystem. There has been over 1500 species documented in the Iwokrama Rainforest (Iwokrama, 2007). The forested region of the North Rupununi area is generally mixed forest with no particular dominance. These vary from Tropical Moist Forest, Tropical Dry Forest and at higher altitudes (on mountains and hills); Tropical Montane Forests. These species include important non-timber product species such as Crabwood (Carapa guianensis) which is well none for the oil that is produced from its seeds.

Photos compliments Waldike Prince

Some common timber species include Wallaba (*Eperua spp.*), Mora (*Mora excelsa*), Silverballi (*Ocotea spp.*), Bullet Wood (*Manilkara bidentata*) and Greenheart (*Chlorocardium rodiei).* Kokrite (*Attalea regia)* and Ite Palm or Tibisiri (*Mauritia flexuosa*) are also prevalent and serve as thatching materials for the Amerindian communities. Clearing of forested areas for farming has been the culture of the Amerindians for many years and has contributed to the soils' nutrient richness.

Forested areas gradually give way to extensive savannas. The savanna is a rolling grassland scattered with shrubs and isolated trees. Not enough rain falls in a savanna to support forests (Source: Blue Planet Biomes – Savanna). Also, unlike the soils found in the forested areas, soils here have a very poor nutrient content. During the dry season, plants that would be prevalent are those that are specially adapted for dry/drought conditions. They may have long tap roots which will enable them to reach the deep water table and unique ways of conserving water. Many plants of the savanna have storage organs or are otherwise modified to conserve water so as to survive the dry season (Source: Blue Planet Biomes – Savanna).

With regard specifically to fauna (animals) of the North Rupununi, it has been estimated that this sub-region supports populations of over 65% of the species of wildlife found in Guyana (Iwokrama and NRDDB, 1998) and it is a known fact that Amerindian communities have coexisted with such wildlife for thousands of years (Forte, 1996). The North Rupununi is home to many species of endangered animals and including those that have come to be known as the 'Giants of El Dorado'. Some of these include the Harpy Eagle (*Harpia harpyja*), Capybara (*Hydrochaeris hydrochaeris)*, Jaguar (*Panthera oncca*) and Giant Anteater (*Myrmecophaga tridactyla*).

Over 400 species of fish were recorded from surveys of only three of the river systems in the area. Interestingly, comparable wetlands in South America such as the Varzéa of Mamiraua and the Pantanal wetlands indicate records of only 400 and 200 species of fish respectively (Appendix B). The Rupununi, Rewa, and Essequibo Rivers are home to Arapaima (*Arapaima gigas*), and healthy populations of the endangered species Giant River Turtle (*Podocnemis expansa*), Black Caiman (*Melanosuchus niger*), and Giant Otters (*Pteronura brasiliensis*). Without a doubt, species richness for insects, amphibian and reptiles will show a similarly diverse range.

Photos compliments Waldike Prince

Table 5: species richness within the Iwokrama Forest:(Iwokrama, 2007)

Taxonomic Group	Recorded in Iwokrama	Estimated in Iwokrama	Estimated in Guyana
Birds	450	>500	>800
Mammals	127	>200	>220
Fish	420	>420	>800
Reptiles and Amphibians	135	>150	>200

Overall, it is important to recognize and appreciate the functions of the many unique ecosystems that are apart of the North Rupununi both individually and as one large interconnected system, which is ultimately responsible for the health and productivity of all biodiversity found within it.

References:

- Source: Blue Planet Biomes (2000) Savanna Website: http://www.blueplanetbiomes.org/savanna.htm (Accessed: March, 2007)
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Toka village, North Rupununi

PHYSICAL GEOGRAPHY OF THE NORTH RUPUNUNI

The interior regions of Guyana has long been admired as a most unique and beautiful place by local people and tourists alike. This is so because of the fact that these areas have a combination of wide *biodiversity*– *flora* and *fauna* and breathe-taking views greatly due to its geographical features– rivers, rapids, mountains. The North Rupununi District in south-west Guyana is a mix of savannah, forest and wetland *ecosystems* (Eden, 1964, 1974). It is separated from the South Rupununi by the Kanuku Mountains. Overall, the entire Rupununi system is on the eastern margin of a larger savanna system that extends into Brazil, separated by the Ireng and Takutu rivers that come together to form the Rio Branco.

The *geology* of the Iwokrama and North Rupununi region is complex due to its age. Early *plutonic* and volcanic rock formation, regional *metamorphism*, *rifting*, uplifting, and oscillating periods of sedimentary deposition and erosion have shaped the area into a patchwork landscape of varying geological characteristics. These processes have fundamentally influenced *topography*, soils, water flow, as well as the potential for commercial activities such as mining, agriculture and timber production (Source: Geology of the Iwokrama Forest – *unpublished*).

Geological attributes contribute significantly towards *soil profile* and structure. This will have a great role therefore, in determining what vegetation is dominant and where they would be found in the Rupununi. Soil Profile takes into account several factors such as decaying matter; which determines how rich the soil will be in terms of nutrients, and secondly the type of soil formation (i.e. sand, silt or clay) which has a role to play in the soils ability to absorb and also retain water. The soils of the Savanna will differ from that of the rainforest region of the Rupununi in that they will show low mineral/nutrient retention and water storage. Flora (plants) therefore, that are found living in the North Rupununi are specifically adapted for surviving in these conditions (See resource sheet: *Flora and Fauna* to learn more).

The North Rupununi Wetlands has a high *habitat* diversity including white, black, and clear water streams, foothill and mountain streams, dissected river systems and ox-bowlake formations. These *wetlands* are dominated by the Rupununi, Rewa, and Essequibo Rivers, and include over 750 lakes, ponds and inlets covering approximately 22,000 ha. The hydrology of the area is directly influenced by the Rupununi Water Catchments, Siparuni Water Catchments and the Essequibo Water Catchments. However, it is the Rupununi River Catchments that is mostly responsible for the North Rupununi's unique transformation during the wet season.

The North Rupununi is a truly unique place with a landscape that is subject to changes on a yearly basis when considering its climate. As a result of the occurrence of dry and wet seasons which gives rises to a very diverse and unique wetland system, they have been considered a source of great ecological and cultural roles to the existing communities in the area. Approximately 8,000 km^2 of the North Rupununi savannas form a seasonally flooded plain rimmed on the north-west by the Pakaraima Mountains.

The principal rainy season is from May to September with an average rainfall of 1780 mm, but with substantial year to year variation (Hawkes and Wall, 1993). There is a short raining season during late December early January. The total annual rainfall within the Iwokrama Forest varies from 1,400 – 3,000 mm and this accounts for between 50 and 70% of the total annual rainfall during the main wet season (Source: Iwokrama: Climate of the Iwokrama Forest-*unpublished*). In the North Rupununi Savannah rainfall during the wet season months would usually be 300-400mm.
Reference:

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- *Hawkes, M.D. and Wall, J.R.D. (1993). The Commonwealth and Government of Guyana Rain Forest Programme, Phase I, Site Resource Survey, Main Report. Natural Resources Institute: Chatham, UK.*
- *Iwokrama (unknown) Climate of the Iwokrama Forest (unpublished)IWebsite:http://iwokrama.org/library/pdfdownload/Climate%20of%20the%20Iwokrama%20Forest.pdf [Accessed: March, 2007]*
- *Geology of the Iwokrama Forest (unpublished) Website: http://www.iwokrama.org/library/pdfdownload/Geology%20of%20the%20Iwokrama%20Forest.pdf [Accessed: March, 2007]*

HISTORICAL LIVELIHOODS

The people

The Makushi and other indigenous people have lived in the Rupununi for thousands of years. Fortunately, like elsewhere in the Americans, there has been a rebound in local indigenous populations. About 50 years since the British colonial health service feared the Makushi population was close to extinction, they are now the second largest indigenous group in Guyana and the third largest in Brazil; and still growing.

Indigenous population figures in Guyana

Indigenous peoples are the fourth largest ethnic group in Guyana with a total population approximately 50,000 (Other ethnic groups live primarily on the coastlands.)

FISHING

The Amerindians are expert fishermen and women, both in the rainy and dry season. As the water level drops many fishes are trapped in ponds and pools making it easier for fishermen to use nets, seins and fish poison. The use of river turtle meat and their eggs also fall into the category of fishing. Fishing was done mainly to feed every family in a community. Whenever a group of individuals went to do fishing leaders often ensure that the entire community benefit from the catch. A group of women or men often volunteered to prepare the fish caught. They had many ways of preparing their dishes. Some of the main dishes were the roasted fish from which we have the present barbeque today, and the well known tuma pot. This resource was also used as protein for Indigenous people in past years. Village and other activities were often managed by the village leader.

FARMING

In the past farming was done on a subsistence basis where everyone enjoyed communal work with the tradition of cooperativeness which has been practiced long before recorded history. A main activity for indigenous community development was an activity called the matri-man *mayu*. An invidual will host a *mayu* or self help activity in which he will invite other members of his community, this term matri-man, well known as the *mayu* was a way of helping each other in work, after which the participants

would get together after labour to socialize and enjoy their main beverage the parakari. The Amerindians also made fermented beverages with pumpkins, corn, pine apple, watermellon and yams.
The Rupununi savannah was one area targeted by outsiders to settle in and take up lands. Local farmers practiced a lot of traditional farming so as to maintain their cultural livelihoods. Some local farmers then turned from traditional farming to a more money earning business

PEANUT INDUSTRY

In the post-Uprising period, the State encouraged commercial agriculture such as peanut farming, and produce was shipped by air to the coast. Many households converted mix-crop farms into peanut production. However, the peanut market collapsed in the 1980's leaving farmers without agricultural cash source and many farmlands significantly eroded. Furthermore, the scale of peanut farming was never enough to substitute for the loss of income from balata and cattle ranching.

HUNTING

Over the past years, hunting was done sustainably by the indigenous people. The hunters maintained their family by using this resource in a sharing manner. These hunters were skilled men who knew the importance of the environment that they were living in. The rules of hunting were similar to fishing where everyone participated in all community activities. Hunting was done mainly in the wet season when fishing was difficult. Hunters often prepare themselves for hunting by abstaining from sexual relations prior to their hunting trip. This prevented animals from running away when were are in the presence of hunters. The main methods of hunting were the bows and arrows. Traps were also used as a means of capture for their source of food. Wabani was used by hunters for both night and day to wait for their game .This a small hut shade built up in trees so that animals would be unable to see. Other types of hunting methods i.e. (imitating

the sound of the animals) were also used for the labba and the agouti.

GATHERING

The indigenous people depend greatly on the natural resources for a living. Non-timber forest products were used for making handicraft and ornaments. The older men often held sessions to teach children in various areas of handicraft. Fruits from the forest and elsewhere were gathered for food as well as for certain domestic animals. Some resources that the Amerindians used were the kokorite seeds (to eat), balata seeds and the Brazilian nut

CATTLE RANCHING

Rupununi cattle trail
The cattle business in the Rupununi Savannahs began in the late 19th century with the arrival of outsiders. Between 1919 and 1953, the main trail for cattle trade between the Rupununi region and the coast cut through present day Iwokrama Forest, as the Essequibo River was not completely navigable. Vaqueros and other local people were more frequent users of the Iwokrama Forest area during this period. The present day families of the village of Fairview, located within the reserve, moved to the area in height of the cattle trade. The cattle trail closed in 1953

Yakarintha village, North Rupununi

LOCAL CATTLE TRADE

Cattle destined for trade with the Patamona communities northwest of the Forest were sometimes driven through the area. A few related men would make the journey, each taking a few head of cattle. They used cattle for food while other local men exchanged cattle for the valued Maionkon cassava graters that came into Guyana from Venezuela. These graters were then widely traded within the larger Rupununi area.

BALATA BLEEDING

Balata bleeding

The Balata, or Bullet Wood, is a tree that produces natural latex extracted by cutting into the tree. For approximately 100 years the Iwokrama Forest area was visited by balata bleeders (harvesters) from all around Guyana. There was even a trading post at the northeastern end of the forest.By 1968, the balata industry began to wane, but some balata bleeders continued the practice. The majority of Rupununi families depended on seasonal income from balata bleeding to supplement their subsistence needs. By the 1970's the balata market had collapsed, leading to intensified sale of wildlife species, for example the Arapaima and the Black caiman for its skin

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Reference:

1. http://iwokrama.org/business/historicalbusiness.htm. Date accessed - 15, March, 07

Guyana, a nation with about 14 million hectares of potentially loggable forests covering some three fourths of the nation's total area could generate perhaps US$10-20 billion in raw log sales for a country with a per capita income of US$800"- Nigel Sizer, 1996 (Profit Without Plunder – Reaping Revenue from Guyana's Tropical Forest without Destroying Them, World Research Institute).

COMMERCIAL LOGGING IN THE RUPUNUNI AREA

In Guyana, there are significant areas of tropical forested lands that have remained mostly for livelihood uses by communities that depend primarily on the forest for their day to day livelihoods. However, over the last decade, pressures have been increasing for a higher scale of commercial logging. With this rapid increase in timber harvesting, there is little data that is collected on how these increased levels of extraction will impact Guyana's forests or people who are directly and indirectly interlinked with the forest and the resources that lie therein. It is imperative that policy-makers are aware of the potential impacts, so that the decisions that are and will be made with regards to forest resources are well-informed.
Currently commercial logging is managed by the Guyana Forestry Commission, with specific types of extractive licenses.

1. **The North Rupununi District Development Board (NRDDB) -** which is a community based organization composed of leaders from sixteen villages of the North Rupununi, held two State Forest Permits(SFP) of 20,000 acres each. The SFPs were granted in 2003 and the Guyana Forestry Commission provided training for locals in this field.

2. **The Makushi Yemekun Cooperative (MYC)** - is a group of small scale loggers from the North Rupununi .These loggers were cutting lumber from a State Forest Permission (SFP) area that had been allocated to the NRDDB. The MYC's stated mission is to develop a financially sustainable cooperative that would assist loggers, local wood workers and communities to increase income in a manner that uses the resources of the forest sustainably.

A canoe docked at a landing in the Rupunui.

Harvesting within the SFP area is limited to some communities because of the issue of distance, and lack of transportation. Trails are cut by loggers for tractor to take out produce from the SFP to various areas. The MYC falls directly under the NRDDB structure and reports to the board but is not registered as a legal entity. The formation of the MYC was supported by the GFC which also provided training for locals in this area.

3. **In 2006, the Iwokrama International Centre for Rainforest Conservation and Development, established a sister company called Iwokrama Timber Incorporated (ITI**) - Iwokrama Timber Inc. is a shareholder company including the local communities of the North Rupununi This subsidiary of Iwokrama would act as the medium for the sustainable harvesting and marketing of forest products from Iwokrama. This step came as a result of a decision made by the Iwokrama Board of Trustees that would facilitate Iwokrama fulfilling its mandate of demonstrating practical and sustainable management of the forest. The community inclusive land use plan for Iwokrama's forest programme defines a 108, 992 ha. area reserve for sustainable forestry, using reduced impact logging techniques.

The Environmental Protection Agency (EPA) approved Environmental and Forestry Management plan allows 20, 000m3 extraction per annum. As part of an eight – year forest development strategy, extraction of timber is proceeding with Tiger Woods Incorporated. This harvesting of timber is as a result of a joint venture company between Iwokrama Timber inc. and Tiger Woods Inc. to be called Iwokrama Sustainable Timber Inc.

Conservation International Guyana (CIG)
In the Upper Essequibo area, there is a forest conservation concession which was acquired under a Timber Sales Agreement (TSA) for the lands administered by the Guyana Forestry Commission (GFC). This area is being managed by Conservation International – Guyana with the communities of Apoteri, Rewa and Crashwater also known as the ARC communities. Although the area is not being logged, the arrangement with the Guyana Forestry Commission is that royalties will still be paid as if the area were being logged.

4. **Other Logging Associations**

The Rupununi Loggers Association - was allocated its first SFP for 15,000 acres of land sometime in 2006. This SFP is located just adjacent of the Annai District area with access to the concession

being through the Annai District lands. A forest station was established at Annai with assistance from the Regional Democratic Council (RDC) of Region Nine. The awarding of the first logging concession to the Rupununi Timbers Association and establishment of a forest office at Annai was conducted through assistance from the Annai RDC.

References:-

1. Iwokrama International Centre. 2006. *Report 2006*. Iwokrama International Centre for Rainforest Conservation and Development.

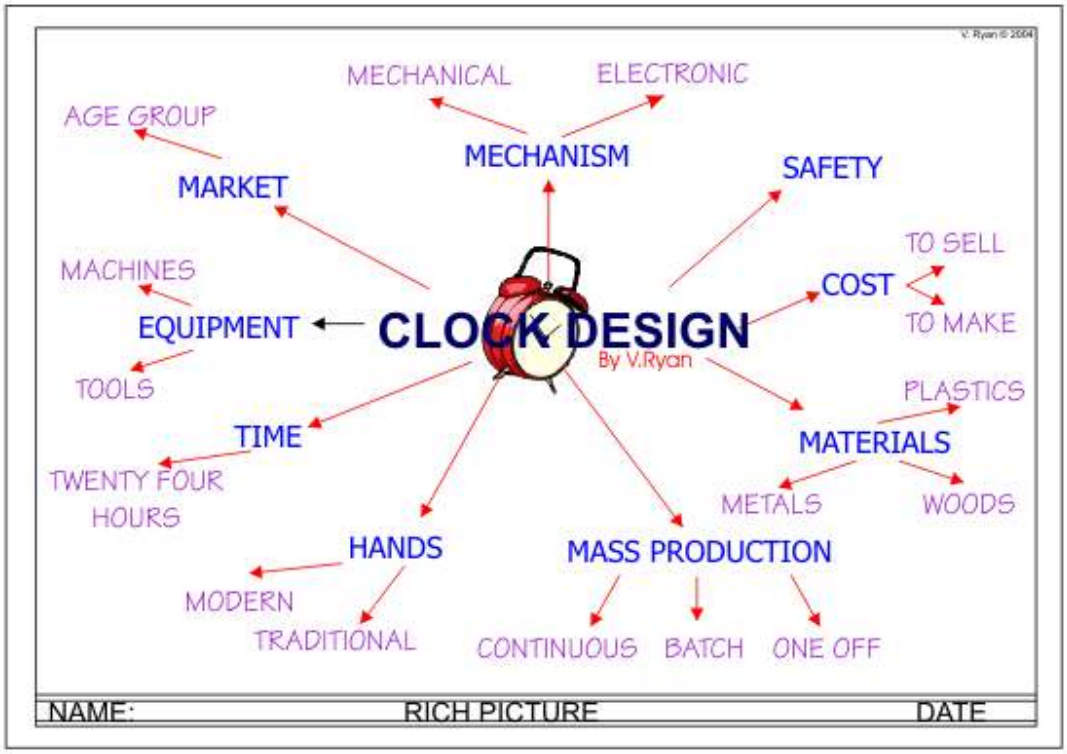
2. Mendes, Andrew & Macqueen, Duncan. 2006. *Raising Forest Revenues and Employment – Unlocking the potential of small and medium forest enterprises in Guyana*. International Institute for Environment and Developmennt

3. Guyana Forestry Commission. 2007. Service Charter. GFC.Nigel Sizer. 1996 .Profit Without Plunder – Reaping Revenue from Guyana's Tropical Forest without Destroying Them, World Research Institute.

Website Visited:
http://www.iwokrama.org/library/pdfdownload/specialfeature IwokramaBusinessPlan - March 2007.

HOW TO DESIGN RICH PICTURE/SPIDER DIAGRAMS

Below is a simple diagram with the main theme in the centre and words linked to the theme arranged around it. If you add drawings/pictures to most of the words then the diagram becomes a **'rich picture'**



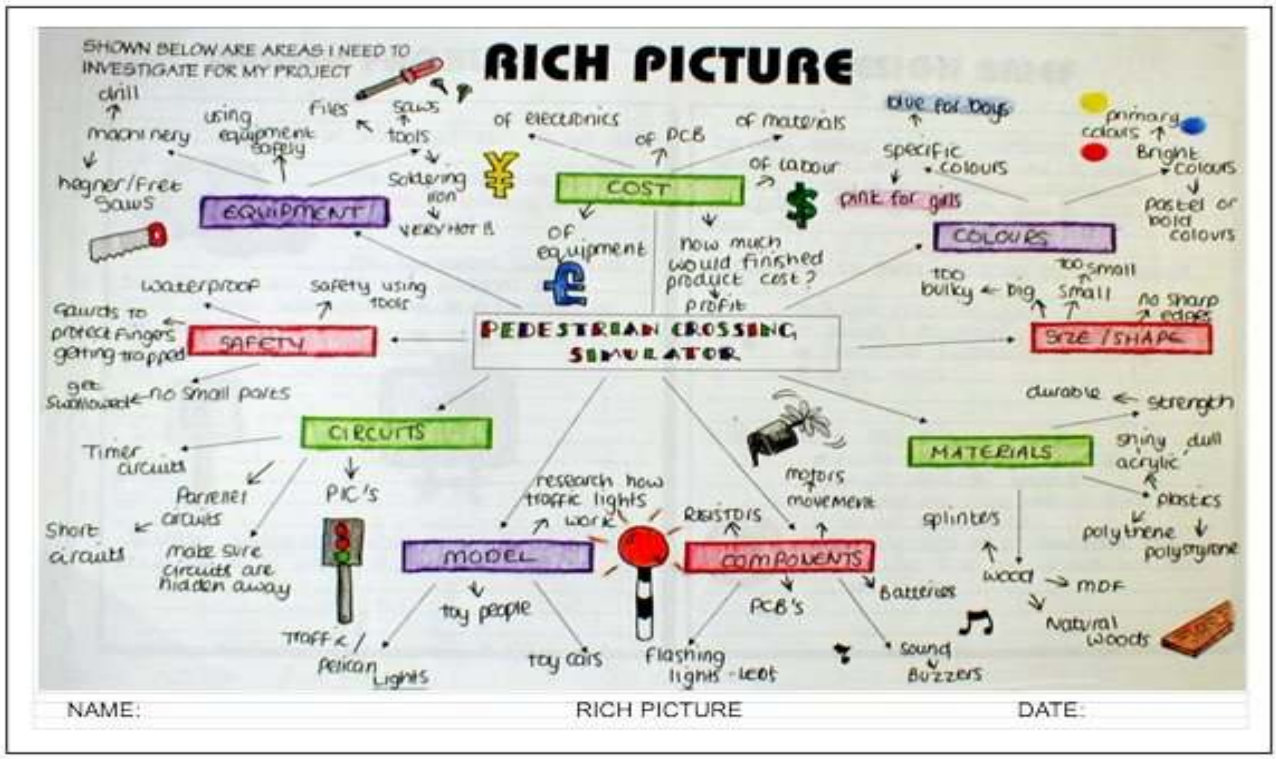
V. Ryan © 2001-2005

A 'Rich Picture' is the first stage in the design process. When you start designing, the ***theme is placed in the centre*** of the page and link words are positioned around it. This can be seen on the examples above. These link words should be ***related*** to the centre theme and they will help you think of points that you must consider when trying to solve the design problem.

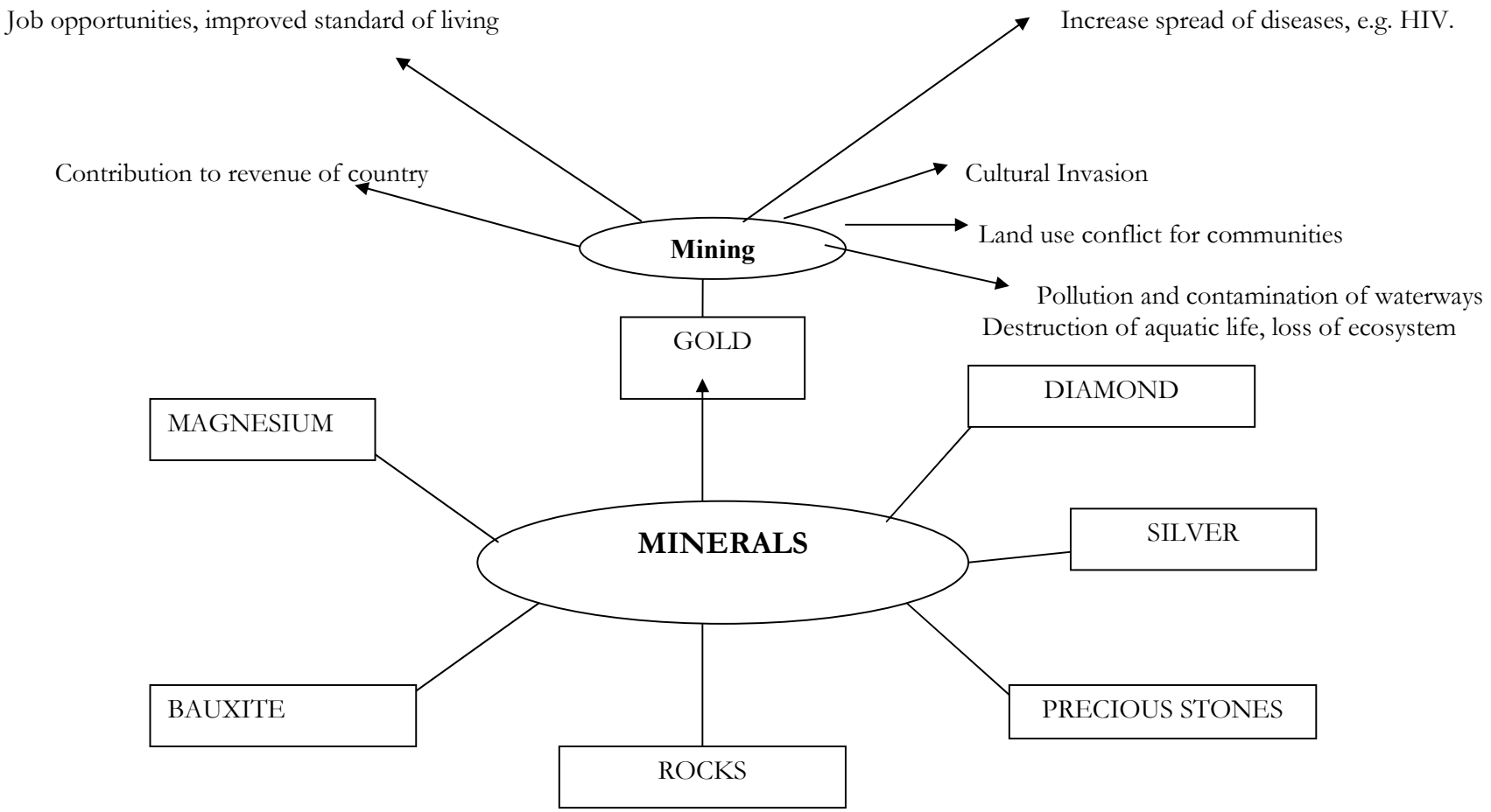
In example above the word ***'materials'*** may prompt you to consider different woods, metals and plastics that could be useful when trying to work out the best materials for your solution. In this way you should write as many words as possible around the theme but only if they have some link. A rich picture should also have pictures or diagrams and small notes to give a good, clear, visual effect.

GUIDELINES

- You may wish to write your ***theme*** in an imaginative **style**, adding appropriate shade and **colour.**
- The 'link' words are placed around the main theme and written accurately between very faint guidelines. The guidelines are important as they ensure the printing is accurate and make it easy for the class and facilitator to read your information.
- Some of the 'link' words also have words arranged around them. This allows more detail to be placed on the design sheet. Look at the link word **'materials',** this has several words arranged around it.
- You can add pictures to a word (you do not have to add pictures for every word). The example below has very few drawings but it shows a good detailed rich picture.
- Do not overcrowd the page but at the same time ensure that you have included plenty of detail.



SAMPLE SPIDER DIAGRAM **(outlining problems/benefits of use of Minerals (GOLD) NRAMP REO Training, November 2007**



ORAL PRESENTATION SKILLS

The following is a detailed description of the criteria used for oral presentations. It is designed as an aide-memoire (reminder) and as a basic reference for presentations.

Overall impression in a presentation covers audibility, use of voice, body language including:

- **Appearance**: calmness and confidence with content; beware of stiffness and clumsiness, anxiousness and an imposing or threatening attitude. Manage nervous gestures and facial expressions

- **Enthusiasm:** emotional involvement with the content, and appropriate body language; beware of lack of enthusiasm and interest in the matter presented, and contradictory messages by mismatching enthusiasm and body language

- **Posture**: standing straight naturally; avoid slouching or slumping, crossing your arms and holding on the overhead projector

- **Expression**: clarity of expression and clear articulation, avoiding mumbling and eating words; use language appropriate to the audience, explaining difficult words and technical jargon, avoiding slang. Beware of non-words eg um, ah, etc. It may help to record your presentation in advance to check on clarity of expression.

- **Timing**: Efficient use of time can mean effective use of it. Avoid preparing too much material which means cutting out during the presentation. Don't waste time stating: *given the short time available*…as this only further reduces your minutes. Do not make excuses.

Practice your presentation beforehand for time management and stating key important points. If you cut your presentation short, or going over time is not in your favour as you may be leaving out important messages under pressure. Be to the point by avoiding unnecessary words or sentences. You can always elaborate if you have a few minutes spare.

Listener involvement: maintain eye contact across the audience, without staring! Move towards the audience, ask questions and seize on **feedback** to improve performance. Avoid addressing just one side of the audience, or only reading from your notes.

Watch for lack of interest and tiredness from audience and respond appropriately.

CONTENT AND EVIDENCE OF RESEARCH

Knowledge of subject, evidence of planning, quality of evidence used, use of experience and critical reflection are necessary for an effective presentation and are often the areas being graded.

1. Structure

- **Opening**: describe the objective/reason of presentation and its relevance to the audience; keep a balance between the opening, main content (body of presentation) and the closing remarks which conclude the presentation.

  Beware of brushing through openings or making it too long, and make sure that the presentation is in line with the objectives stated. The opening is one of the most important elements of a presentation or speech and it usually sets the tone for what follows. The success of an entire presentation may well depend on it. ***Therefore the objectives, body and closing of your presentation should follow a logical order, so avoid disconnected components and check for coherence.***

  Examples and quotes from one's own experience are useful to support and explain ideas and concepts presented and they can reinforce key messages. It can be helpful to illustrate quotes and examples through cartoons and can lighten a presentation. Avoid jokes if you are not sure about the audience as this strategy can backfire. Mention the author of a quote when not your own.

  However an anecdote or joke at the beginning can put the audience and yourself at ease and the rest of the presentation can come more naturally. It goes without saying that your **jokes should be tasteful and not cause offence.**

- **Closing:** The concluding statement is very important as the speaker has the opportunity to pull the different strands of the presentation together and stress the key messages. The closing remarks should be **clear, concise** and **relate to the initial objectives**. Give a final recommendation.

  Beware of forgetting to present a **proper closing statement** due to lack of time, and avoid an abrupt conclusion which is improvised on the spot. Preparing it will allow you to pace your delivery and ensure an effective close to your presentation.

2. DELIVERY

a. Voice

- **Speed**: as the speaker you can control the speed of your delivery and be aware of it as you go along. Beware of wanting to say everything at the last minute.

  As mentioned briefly above, take your audience temperature, watching for signals such as lack of interest and respond accordingly. For example if your presentation is in a language that is not your mother tongue or first language, or if you speak to an audience in a language that is not their first, speak slower than you would normally. This gives you more time to think about what you want to say and makes you more understandable to your audience.

  If your time is almost over and you want to extend it for a few more seconds to finish off in style, it is appropriate to say: *and finally…and in conclusion…and to finish.*

- **Volume**: check your audibility with the audience, and manage your volume as you go along. Avoid monotonous soliloquy and monologues. Vary the tone according to the emphasis you want to give to the messages. Check room acoustics. It may be an idea to check volume of your delivery with a colleague and listen to a recording of your rehearsal.

- **Natural movement**: take some measured steps, move hands appropriately and guide your body language. Be aware of walking nervously while you talk, staying still in one place, and swinging your body. Avoid excessive gesticulating, do not keep hands in pockets, or point to members of the audience. It may be worth videoing a practice session and reviewing it with a colleague.

- **Pauses**: If used, pauses can be very effective in a presentation, and can be used at any time and are particularly useful in covering for non-words (um, ah, ugh...) Avoid too many pauses, too short or too long ones. Studied pauses of 3-4 seconds can add a dramatic effect and build momentum.

b. Audio-visual Aids

- **Managing your presentation**: have a good balance between talking and using audio-visual aids to communicate your message: transparencies, flipchart, board, video, powerpoint presentation etc. Check your transparencies for spellings focus and read from the projector table using a pen or pointer to refer to the point being talked about. If using transparencies, keep facing towards your audience and not towards the board and read from the transparency. Switch off projector when not needed, as this then focuses attention on you and cuts out the background noise.

Beware of excessive use of transparencies during time allocated as you may end up rushing through and presenting less important points. Get to know your tools ahead of time, knowing how to switch on and off the machines. Also check the position of the projector/laptop/flipchart, in order that no shadows or arm blocks the audience from seeing the screen. Arrange with your team to manage logistics e.g. switching on and off, passing materials etc.

- **Size of characters**: should be visible and readable to the most distant person in your audience. Test for font size and modify accordingly. Avoid characters that are too small and prefer characters which are sans serif for example Arial or Verdana. Whatever your choice, ensure that they are readable from a fair distance.

  If handwriting on transparencies, ensure it is clear and free of spelling errors. You can also put a transparency through the photocopier if you have typed something out, and this will take care of any legibility issues.

  Use both upper and lower case characters, using bold, underlining and italics as appropriate to add emphasis, add colour in moderation.
  Upper case lettering is best avoided, but can work for titles.

- **Spelling***:* run a spell check beforehand and ask a friend or colleague to read your presentation to check for typos and grammar.

- **Density**: use keywords and not more than seven lines per transparency to avoid overcrowding. Remember that visual aids are a complement to your presentation not a substitute. Using keywords allows you to talk and expand on them in your delivery. Encourage feedback and participation; response to questions

Involve the audience as much as you can to make the presentation more lively and interactive. It is also a way of checking their understanding (or lack of) of your subject. Respond to questions in a professional manner and do not get annoyed with the person asking the question. If the question seems pointed or rude do not be provoked into responding in the same manner. Reply calmly and patiently. You may get them on your side!

Finally, take a deep breath and plunge right in!!

Adapted from the Oral Presentation Skills Criteria, International Centre for Health Management, Istituto Superiore di Sanità, Rome, 1996

SESSION 1.3: NRAMP KEY CONCEPTS

Topics to be Covered: -

- NRAMP Key Concepts: Holistic, Participative, Evidence-based, Adaptive, Practical

Knowledge developed: Understand usefulness of NRAMP key concepts in natural resource management

Skills Developed: Group working, oral communication, holistic thinking

Duration of session: - 1 hour

Resource Sheets for session: -

- North Rupununi Adaptive Management Plan (NRAMP).
- Arapaima Management Plan (AMP).
- Piyakita Resource Management Unit Plan (PRMU).
- NRAMP Approaches: Holistic, Participative, Evidence-based, Adaptive, Practical.
- NRAMP approach to Natural Resource Management.
- A Guide to comparing NRAMP with other management plan.
- NRAMP Principles: Ethics in Natural Resource Management, Ecological sustainability, Social Justice.

SESSION PLAN 1.3: NRAMP KEY CONCEPTS

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
Students will work in groups to compare the NRAMP with other management plans. *(20 mins)* - They will use a prepared list of questions to identify differences and highlight key concepts - Each group will present their findings.*(20 mins*	Flip chart sheets, markers, Colored chalk.	- Group discussion and case studies, - Explanation of key terms.	Trainer introduce topic and explain key terms and concepts of NRAMP *(10 mins).* -Give students outline of questions to guide them as they compare the plans *(5 mins)* Wrap Up

SAMPLE: COMPARISON OF NRAMP WITH OTHER MANAGEMENT PLANS

QUESTIONS	Arapaima Management Plan (AMP)	North Rupununi Adaptive Management Plan (NRAMP)	Piyakiita Resource Management Unit (PRMU)
1. Which management plan offers the best alternative for stakeholders	- Participation of stakeholders and decision- making must receive guidelines from governmental institutions	- Gives all stakeholders equal opportunity to make decisions without depending strongly on government agencies and influences	- Decision-making is the responsibility of Village Council or elected Committee under the authority of Ministry of Amerindian Affairs According to Amerindian Act
2. What impact will decisions made today have in the future and which plan is likely to suit those decisions?		- The 3 management plans will seek to have a regulatory framework for the future. The NRAMP easily adopts changes in the process of implementation using the learning cycle	
3. Which of the management plans allows changes to be included as they occur?	Sealed document that would require time to make changes	Evaluation allows for reflection and leaves room for making changes in the plan	
4. Does each plan allow learning to happen while it is being implemented? Explain		Yes- This involves a definite learning cycle to allow for reflection in the implementation of the plan. To make changes in areas of weakness, while others had a "one shot" approach – public awareness/community	

		consultations with out much follow-up. - Training taking place during the process of implementation.	
5. What concepts in each plan allows for learning and adaptation?	Fishermen from within communities involved in data collection	Learning cycle- (planning, acting, observation, evaluating) Allows for flexibility in plan.	Community members allowed to attend all meetings
6. What are the fundamental concepts of each plan?	Manage the Arapaima in the North Rupununi by counting, monitoring, fishing quota determination, fishing quota sharing, fishing, selling	- using L – cycle to help communities manage their natural resources - The approach is holistic, participative, evidence-based, adaptive, practical	Has regulation to manage - waste disposal - water quality/quantity - biodiversity - tourism and sustainable Eco Development
7. What are the similarities in these management plans?	-Consultation with communities - evidence-based - Adaptive (should be revised every 3 years) - Participative	-Consultation with communities - evidence – based - Adaptive - Participative	- Participative to some extent

NRAMP APPROACH TO NATURAL RESOURCE MANAGEMENT

There are a wide range of approaches to natural resource management. Some approaches; 1) delegate decision-making responsibility to experts, focus on particular disciplines (such as hydrology or economics), or require significant levels of funding to implement, 2) Other approaches are sometimes termed 'bottom-up', where the agendas for natural resource management are set and driven by local communities, 3) In NRAMP, we recognise that natural resource management is a highly complex activity which needs to consider issues of human capacity, the specific nature of natural resource management and the wider socio-political and ethical environment within which it operates.

A significant limiting factor with both expert and community led approaches is human capacity. Natural resource management involves a range of skills, including ecological knowledge, political awareness, inter-personal abilities, information management and financial management to name a few. These require basic levels of literacy and numeracy, as well as the time and energy that such a complex activity needs. However, in many developing countries, such as Guyana, these basic requirements are usually lacking as a result of poor education, low levels of health care and lack of infrastructure. It is therefore recognised that there are a limited number of people that have the capacity to facilitate the NRAMP approach. So rather than classifying the approach as **institutionally** or **community led,** a more suitable label for NRAMP could be **'champion-led'.**

Another distinctive feature of the NRAMP approach is its **'inclusivity'.** When approaches are institutionally- or community-led, there is an assumption of **'exclusivity'.** In other words, a particular group develops exclusive rights to decision-making within the process. For institutionally-led approaches, this usually implies that experts within the institutions take control while for community-led approaches, community leaders drive decision-making. The **champion-led approach** seeks to involve all parties in the decision-making process, with the champions taking on a neutral role as facilitators.

The above general introduction leads to five principles for consideration within the NRAMP approach: *adaptive; participative; holistic; evidence-based; and practical.* These are outlined in more detail in the resource sheets below.

NRAMP APPROACH: EVIDENCE- BASED

NRAMP emphasises that **decision-making in natural resource management should be based on concrete facts.** If you can't measure something, then you can't manage it. Thus, the process has a strong element of **ecologica**l and **social monitoring** which ought to provide the necessary evidence for supporting the process deliberations and recommendations. We would like to stress here that although **monitoring** is **time-consuming and resource intensive,** without reliable information the process will soon lose credibility and **stakeholders will find it difficult to make decisions** in the **absence of factual evidence**. Decisions in the absence of factual information may even turn out to be extremely damaging.

NRAMP has tried to balance the need for a particular item of information and the resources required to collect it. Significant effort must be used to identify appropriate types of information which can be collected at a low-cost and with limited training. For example, biological indicators are excellent sources of information since local people are already familiar with local species and observation often requires just good eyesight, a pen and paper!

Once the information has been collected, a fundamental component of evidence based decision-making is the creation of an information system. This does not necessarily mean that it has to be computer-based. **For an information system to be of use in supporting decision-making, the information must be;**

- **easily compiled**
- **provided in a format that is easy to understand access**
- **straightforward to update**
- **any analysis which identifies cause and effect explained in clear and transparent terms.**

For example, if the information shows that fish populations are being exploited unsustainably, stakeholders must be able to clearly see which data supports this evidence and which criteria has been used to label the exploitation as unsustainable. The ability to focus on an appropriate scale to inform practical decision-making is also important. Data and analysis about a whole region will be of no use if problems emerge concerning a particular water body.

Fundamentally, the information system must be distributed as far and wide as possible, especially to those communities that depend on the wetlands resources for their livelihoods. An excellent example of an easily accessible "information system" is the process for developing and distributing the **Darwin Initiative Bulletin**, a simple newspaper which is printed regularly and distributed to all communities and stakeholders. Thus, the role of the **NRAMP champion** also involves facilitating the collection, storage, analysis and dissemination of information on the NRAMP process.

NRAMP APPROACH: HOLISTIC

Natural resource management in developing countries is often associated with particular special interest areas, such as **biodiversity conservation** or **poverty alleviation**. This usually results from the particular funding agency and its interests, for example, conservation Non Governmental Organisations (NGOs) focus on biodiversity, while development agencies focus on poverty alleviation. A major danger in being labelled a special interest project is the automatic downgrading of the project.

> "It is also recognised that powerful NGOs and agencies selectively identify environmental problems to further strengthen their position in the country. It is easy to blame local people for biodiversity loss and environmental degradation thus justifying the shift in control for local natural resource management away from local people to these NGOs and agencies".

We want to make it absolutely clear here that the **NRAMP approach** firmly supports the fact that **local and traditional natural resource users** are an integral component of regional ecosystems. Traditional communities have often been able to arrive at a relatively balanced relationship with their local environment and NRAMP aims to build on these experiences and support the maintenance of traditional and sustainable forms of exploitation.

Because local communities depend on natural resources for their survival, they will be the first to feel the effects of changes in natural resource management practices. They will also ultimately determine the **success** or **failure** of any natural resource management approach. The aim of NRAMP is therefore to break out of the constraining focus on special interest categories, such as biodiversity conservation, and take a **holistic approach** to the management of the North Rupununi wetlands, including **social, economic, and political and health aspects.**

NRAMP APPROACH: ADAPTIVE

*"A **wicked problem** is something that manifests itself only as you try to engage and change it, and in doing so, the problem in turn changes; there is no definite solution that people could aim at; no case history to draw upon; no right or wrong approach to take which would make everybody equally happy; and there is no way to anticipate the consequences of people's actions or environmental change."*

In managing natural resources, we are clearly dealing with a **highly complex situation.** This situation can be described as a **"wicked problem". The best way to tackle a wicked problem is to constantly learn about the changing situation and adapt accordingly.**

The issues that communities face in the North Rupununi are mostly related to the resources they extract from the wetlands, or the unwanted impacts of living so near to wetlands (such as malarial infections of epidemic proportions). For example, the onset and intensity of the seasons vary significantly from year to year, resulting in highly unpredictable abundance and distribution of key resources such as fish. Additional complications arise from the range of stakeholders, with differing roles and objectives, involved in the management of these natural resources. These related dilemmas, as with other types of "wicked problems", are characterised by continual change.

Unlike simple problem-solving activities where the problem is well-defined and unchanging, **managing North Rupununi natural resource dilemmas involves continual monitoring, learning and negotiation amongst the range of interested and affected parties.**

A central aspect of the NRAMP process is its **adaptiveness**. We believe that management plans within such contexts cannot be stringent, but ought to change with changing circumstances. A principal aim of NRAMP style management process is to improve a problematic situation; we expect things to change as the process is implemented. This automatically implies that we have to;

1. Set goals according to stakeholder aspirations.
2. Collect background information to help set a baseline to determine whether the goals are achievable.
3. Evaluate this information according to the goals.
4. Plan future actions in order to support positive change or reverse negative change.
5. Put into action the agreed plans by allocating responsibilities and resources.
6. Observe the changes that are taking place.
7. Evaluate **whether these changes are in accordance with the agreed plans.** This example contains the five steps of goal setting, observation, evaluation, planning and implementation, which can be repeated as many times as is necessary. The process can be described as a **learning cycle**.

NRAMP APPROACH: PRACTICAL

Stakeholders unfamiliar with adaptive management planning have a tendency to unconsciously mix observation, evaluation, planning and action, and sometimes naturally omit certain stages. Communication among stakeholders is also generally unstructured and informal. The type of behaviour characteristic of stakeholders is also dependent on existing capacities, resources and interests.

A significant challenge is therefore to build capacity, channel resources, and promote interest for an efficient, effective and ethical implementation of NRAMP. Thus much of the initial effort has to be extended in the practical tasks of building basic capacity among stakeholders (such as numeracy, literacy, and time management skills), making sure that resources are not channelled to meet other aims, and trying to generate long-term enthusiasm and support for a process which does not promise immediate financial returns and is currently entirely dependent on donor funding.

One must remember that NRAMP is essentially an output of the individuals participating in the process. There is recognition that stakeholders are under significant pressures: the pay is low, living and working conditions are difficult, and devastating illnesses such as malaria are frequent. Thus expectations have to be adjusted accordingly and a certain element of flexibility and practicality has to be built into the process.

There is also an understanding that it is easier to be incompetent, lazy and corrupt if one hides behind the anonymous veil of a stakeholder group or institution.

It is much more difficult to hide if responsibilities are clearly attributed to you as an individual. Some individuals also feel powerless by the constraints set upon them by their stakeholder group. Thus a fundamental aspect of the NRAMP practical approach has been to empower competent individuals to push through positive change.

NRAMP APPROACH: PARTICIPATIVE

A key element of the NRAMP process is participation. There are three main ways one can develop and implement a natural resource management process.

1. The first approach is to decide for stakeholders. So-called experts are brought in to write a plan which tells stakeholders what to do. A major problem with this approach is that most experts are not "know all geniuses" so their understanding of a situation will always be limited, especially if they haven't spent a long time on site to become familiar with the local and national culture, and the local ecology. Most expert-led plans are therefore limited in their application since they usually focus on the expert's area of specialisation and rarely take into account local details. In many cases, all that is left for the host country is an end-of-project report which lies gathering dust on a shelf.

2. The second approach is for experts to decide with stakeholders. This is where the experts work with stakeholders every step of the way to develop a plan that ought to in theory represent a wide range of views. This approach is often a compromise between the limited time and resources available to carry out the project and the wish to engage and build capacity within stakeholders.

This approach is also appropriate only if the experts are residents within the area of interest and have a guaranteed long-term commitment to it.

3. The third approach is to facilitate and empower stakeholders to make their own plans. Here, the experts' opinions are not included in the plan at all, and instead the experts become facilitators, or 'champions' to focus on building stakeholder capacity to develop the plan. This third approach is the ultimate aim of NRAMP. With the shift towards more democratic decision-making, the days of top-down dictatorial control are increasingly no longer appropriate. Institutions and experts that promote centralised control are finding it difficult to appropriate the necessary resources and command the required respect to implement major regional plans.

There is also a deeper questioning of the term "participation". Apparently open events such as stakeholder fora often result in the most powerful stakeholders pushing their agenda, while the weaker groups, usually the very individuals that depend on the natural resources for their livelihoods and survival, are not able to contribute to the decision-making process. The NRAMP process makes a concerted attempt to engage the most marginalised and promotes the clear identification of distinct categories of stakeholders.
For example, prioritising those whose essential needs (such as health nutrition and shelter) have not been met and clarifying who will benefit or lose from any decision.

Unfortunately, the major drawback of stakeholder capacity building and empowerment is that concrete outputs take time to be produced in the initial phases of plan implementation. The advantage though is that eventually the outputs can be self-sustaining through local champions, without the need for external expertise and funding.

ETHICS IN NATURAL RESOURCE MANAGEMENT

The two ethical principles proposed below have underpinned (foundation of) the NRAMP in its initial stages. The main themes they consider are ***ecological sustainability*** and ***social justice.*** Together, they provide the foundation for achieving both a healthy ecology and a healthy society in the North Rupununi.

The ethical principles outlined are meant to serve as a format for people to consider and discuss, in the hope that better guidelines are developed which will be appropriate for the ever-changing circumstances in the Rupununi, Guyana, and worldwide.

Why is there a need for consideration of ethical issues within a process focusing on natural resource management? **Ethics is about people's values and beliefs**. These values and beliefs **determine how we exploit natural resources and how the benefits of natural resource exploitation are shared**.

- Is the current level of natural resource use/exploitation within the Rupununi sustainable?
- Can we guarantee that future generations will have access to the same levels of resources?
- Are current levels of resource exploitation fair?

Questions such as these are very much about challenging people's existing values and beliefs. Ethics should therefore be at the centre of any natural resource management process.

"The ethical principle of ecological sustainability is firmly based on balancing the needs of the present population with other species that share the same locality, without compromising the needs of future generations of all species."

The guiding principle of ecological sustainability is to balance our immediate needs with those of future generations. People in the Rupununi can currently meet many of their essential needs (such as fish and crops for consumption, materials for building, etc) without having a significant impact on the species that they live with. How can we guarantee that future generations will have access to the same resources and to therefore have a similar standard of living, while at the same time maintaining the same balance with other species? How can we guarantee that even the current generation can have access to the same resources in even the next 10 years?

***Box 1**: Ecological Sustainability*

The ethical principle of social justice is about giving all members of society an equal say in decisions so that these are arrived at in a fair and consensual way. This gives equality of voice between men and women, young and old, poor and rich, different cultures, different colours, abled and disabled, educated and uneducated, different religions, etc. The aim here is to minimise conflict, racism, prejudice, chauvinism, corruption, and injustice.
There are several practical implications for NRAMP. E.g. Decision-making power about managing local resources should be given to those people who actually live in the Rupununi. Communities in the Rupununi have a right to determine how their resources are exploited and who should benefit from the exploitation. They also have a right to determine which services should be provided, such as education and health care, and how they should be run.

***Box 2**: Social Sustainability*

These questions can be used as a guideline in facilitating Session 1.3, comparing the NRAMP with other management plans.

COMPARING MANAGEMENT PLANS

- Which management plan offers the best alternative for stakeholders?
- What impact will decisions made today have in the future and which plan is likely to suit those decisions
- Which of the management plans allows changes to be included as they occur?
- Does each plan allow learning to happen while it is being implemented? Explain
- What concepts are used that allow learning and adaptation?
- What are the fundamental concepts of each management plan?
- What are the similarities in these management plans?

SESSION 1.4: THE LEARNING CYCLE

Topics to be covered:

- Use of the learning cycle and its stages.
- How the learning cycle can be applied to address natural resource problems.

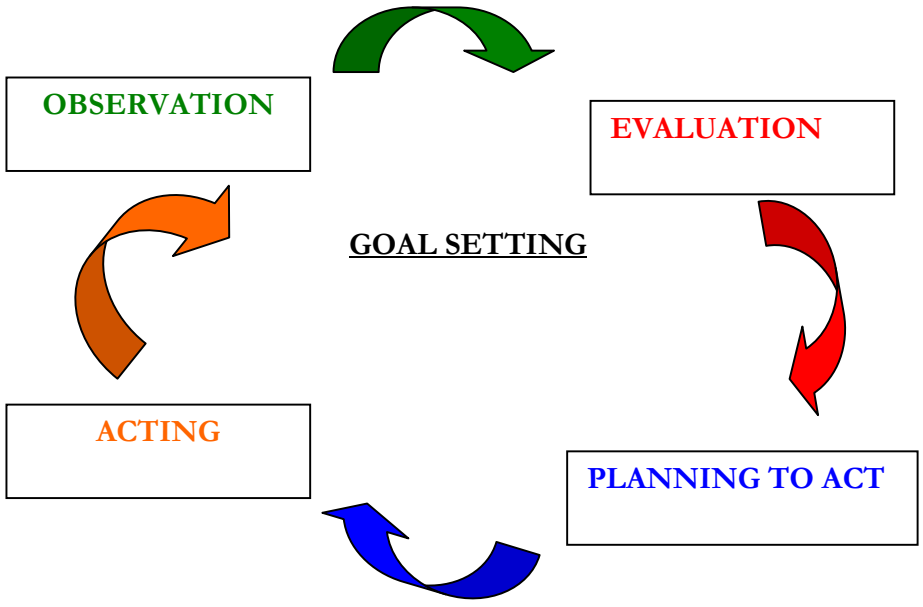
Knowledge developed: Understand the usefulness of the learning cycle and the different stages of the learning cycle.

Skills Developed: oral and written communication, holistic thinking, group working, and problem solving.

Duration of session: - 1hr

Resource sheets for session:

- The learning cycle: Observing, evaluating, planning, acting.
- Sample 3 & 4 Learning Cycles



SESSION PLAN 1.4: THE LEARNING CYCLE

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
Students will - Work in groups - Use learning cycle to address a problem identified in Session 1.2 ***20 mins*** - Present work to the entire class ***30 mins***	Basic stationeries	- Group work to take a problem through the learning cycle - Oral presentation	Trainer will -Introduce topic and outline learning cycle and its usefulness ***5 mins*** - Guide students in the selection of problem to be used. - Trainer should ensure that the problem selected is simple enough to be completed in 1 hr Wrap up and handover to next session ***5 mins***

THE LEARNING CYCLE

1. GOAL SETTING

To provide a focus for management of natural resources and to direct stakeholder effort it is important to establish a shared goal. This is the **first step** undertaken within the adaptive approach to natural resource management. For example, a stakeholder group may want to address the specific problem of a declining fish catch and scarcity of timber for building as part of their overall management process. This may come into conflict with other stakeholder priorities and objectives. To address these potential conflicts, ***the first step is to reach initial stakeholder agreement on the exact nature of the problem and what goal or goals need to be established.*** The negotiation process should also take into account different spatial and temporal scales in goal setting. For example, a stakeholder group may want to continue eating fish, so in the face of declining fish numbers the long-term goal they set could be to develop a management strategy to maintain fishing and therefore fish populations at sustainable levels. However, the short-term immediate goal may be to halt the decline of fish numbers. They may also set a goal to ensure adequate timber supply in the future. Although there may be overlap in some activities, each of these goals may require distinct learning processes to address specific issues.

2. OBSERVING

This phase focuses on the **collection** and **recording** of information in relation to the goal(s) established by stakeholders. Of course it is impossible to collect data on all the issues of interest, especially in situations where human resources are limiting and logistics are difficult. The first task in the observation stage is therefore to develop a simple representation of the situation, highlighting the most important features. This task can be referred to as 'modeling'. Once a model of the situation is developed, one can proceed to the data gathering stage. The data collected can be referred to as 'indicators' since they can help us build and verify the model. This may involve collecting data through primary and secondary sources and displaying the resulting information according to a format that can be easily understood and accessed by different stakeholder groups.

3 EVALUATING

Evaluation is about using monitoring and other information collected to make judgments about whether the management goal is being achieved or not. It is also about using the information to make changes and improvements to the overall process.
The evaluation of the information collected and identifying problems and opportunities involves an analysis of the information against a set of social and ecological criteria. Stakeholders will be able to identify problems and opportunities within the current situation or which may emerge in the future if current trends continue. Some individuals may find it relatively straight forward in developing criteria or thresholds for indicators, but it is

important to understand that evaluating the indicators or progress towards a management goal is based on our own specific values.
As we all have different ways of valuing and judging components it is important to develop a consensus among stakeholders when undertaking the evaluation phase.
It is in the evaluation phase that a decision needs to be made on whether stakeholders are ready to move on to the next phase of the adaptive management process and develop a plan of action, or re-visit the goal setting and observation phases until there is sufficient confidence in the type and quality of information collected to go to the next stage.

4. PLANNING

The planning phase involves developing a plan of action to put into reality the agreed goals. The plan should clearly state the objectives (why are we doing this?), expected outputs (what do we want to get as a result?), activities (how are we going to do it and when?), measures of progress and success (how do we know we've done it?), assumptions (what do we need in order to do it?), and responsibilities (who is going to do it?). A commonly used technique to compile the answers to these questions is the development of a "logical framework" or log-frame.

5. ACTING

This phase is where stakeholders actually go and do something that has the potential to change the situation. Initially, NRAMP may have very little "action" i.e. impact on the ground may not happen for a while as people spend most of the time sharing visions, gathering information and evaluating.
Some people may argue that one is actually carrying out a form of implementation during the planning, observing and evaluating steps of the adaptive management process. We would actually like to emphasize here that NRAMP focuses on bringing tangible improvements to the North Rupununi wetlands and the communities that depend on them for their livelihoods. So, in our case "action" does not include the "see and talk" element (i.e. observation and evaluation) -- action is about attempting to make a real improvement on the ground -- and it should be measured in terms of, for example, recovering the populations of Arapaima, or reducing the number of children dying of wetland related illnesses such as malaria or dysentery.

SAMPLE 3: LEARNING CYCLE

"CANAL BLOCKAGE BY GARBAGE IN A SECTION OF GEORGETOWN:

In order to decide how to go ahead with tackling the problem of the canal being blocked, we first need to establish what we would like to achieve from managing this situation. In this case we need to understand **why** there is so much littering being done within the city. Once we figure out the real causes, we would **evaluate** the negatives and the positives of the situation. At this stage we start to **plan** taking into consideration everything involved in this problem. We can then later **plan how we can solve the problem** .Finally we **execute the plan while monitoring** to see whether out actions are having any impacts on the issue we are working to solve.

1st stage

OBSERVATION – Putting together what the facts of the situation are is the first step to being able to manage the situation. Asking questions of the situation to find what answers are available. This process will ensure the process for resolving these issues are evidence based.

- There are 5 specific streets where littering is very prevalent, and where the garbage is frequently thrown into the nearby canals.
- There are not many garbage bins in this specific area. There are only 2 bins found along the 5 streets in this area.
- There is a law for littering offences.
- This law is not being thoroughly enforced with penalties being applied.
- Litter is collected once every two weeks from the area.
- The canal is cleaned twice annually.
- There are 10 roadside vendors who sell snacks and beverages in plastic and Styrofoam containers.
- Canals are drained via a Koker, into the Atlantic Ocean.
- Location of drainage of canals into the ocean has a lot of garbage, and is also close to a hotel and restaurant.
- There is one 'No Littering, Penalties Apply' signboard that has fallen off the tree it was nailed to along one of the streets.

2nd stage

EVALUATION – After the facts of the situation are thoroughly explored, the next step is to understand what exactly the facts mean for the situation and what the potential opportunities and threats that currently exist or that can arise because of the situation. It is important to remember that this stage is based on the findings from the observation stage and what it is the desired achievement from managing the situation.

Negatives	**Positives**
1. Continued littering and accumulation will foster the survival of disease vectors which can result in communicable illnesses. 2. Unattractive scenery of city environment 3. With the canals being blocked with garbage, there will be flooding when the rain falls, as the water would not be able to be drained properly from the area. 4. The laws of the country with regards to littering are not being adhered to nor implemented properly. 5. A lot of the waste materials are not biodegradable for example the plastic and Styrofoam containers that the vendors use. 6. There are not enough garbage bins for people to use within the area. 7. There is an apparent lack of awareness by residents and other users of this area on the legal, health and environmental consequences of littering.	1. There is a sign board that can be reused. 2. The hotel and restaurant owners can be included in the process for cleaning the area as they have A healthy environment 3. Healthy society 4. Respectful mentality by citizens towards laws 5. Lots of other job opportunities for those without jobs 6. Attract more international economy to the rest of country 7. Clean and free waterways in canals and trenches 8. Reliable laws and enforcement officers

3rd stage

PLANNING

In planning for the management of any activity, there is a valuable tool that can be used. This approach uses a logical framework (logframe) for clearly defining the goals, specific objectives for managing the situation. It then becomes easy for these to be translated into activities that have to be implemented to achieve the objectives and in so doing the goals that are set. A log frame also gives simplicity to the management planning process by ensuring that management actions are set in keeping with the goals of the stakeholders involved.

GOAL	Specific Objectives	Activities	Who	How	When	Indicators
To have a clean and healthy environment	**To reduce the amount of garbage that is disposed of on the streets and in the canal**	**1. Strategically place 5 bins along each street.** **2. Ensure that the vendors on the road have garbage bins next to their stalls so that their patrons can dispose of their garbage properly** **3. Remove garbage from bins twice weekly to prevent over spilling of bins unto the streets and into the canals** **4. Work in collaboration with the police to have littering offences recognized and penalized in accordance with the no littering law.**	**Citizens, local businesses** **Vendors** **City Council** **Citizens and Police Force**			**Reduced amount of garbage seen in the canals and on the street based on the amount that used to be observed on the streets and in the canals by 70% in the first 2 months, and by 100% by the first quarter.** **Increased use of bins** **Reduced numbers of vectors and stray animals in the area**
	To reduce the flooding incidences and levels of flooding in the city area with better drainage	**1. Clean drains of effluent and garbage** **2. Develop and implement a regular schedule of cleaning of drains** **3. Liase with the City Council to have a strategy for handling incidences of floods or expected floods** **1. Re-construct and re-post the one**	**Citizens, local businesses, Environmental NGO's working in the area, City Council**			**Reduced levels and incidences of flooding of areas not geographically susceptible to flooding after the rain has fallen by 80%**

	To increase the level of awareness of citizens on the importance of not littering and maintaining a clean environment	**dilapidated NO LITTERING sign** **2. Place additional public awareness signs on the importance of not littering, in strategic public access areas** **3. Liase with the school to have a clean environment /no littering programme that would allow students to be ambassadors for a clean environment** **4. Develop a programme in collaboration with the EPA to have their officers give regular talks to the community on littering and other environmental issues**	**Citizens, local businesses** **Citizens, local businesses, with guidance from the EPA** **Citizens, EPA and students** **EPA, citizens**			**Increased social responsibility of citizens and agencies in having and maintaining a clean and healthy environment** **Reduced amounts of garbage and garbage that is irresponsibly disposed of in the environment by 70% in the first 2 months and by 100% after the first quarter** **Bins being used by citizens and persons passing through the area for disposing of garbage in all instances**

4th stage

ACTING AND MONITORING

This phase involves Implementing the activities described in the log frame above, and use the indicators to monitor levels of change in the problem situation being addressed. In being able to use the indicators efficiently, there has to be a system for collecting, storing analyzing data to inform the indicators, that will in term determine the levels of change of the garbage disposal and flooding problem in the area. The feedback from the indicators will then take the citizens through another iteration of the learning/management process to review the situation.

SAMPLE 4: LEARNING CYCLE

A PRACTICAL EXAMPLE OF ADAPTIVE LEARNING

The example below illustrates the adaptive management process to newcomers of NRAMP.

FEEDING A FAMILY OF 12 FOR THE MONTH OF DECEMBER 2006, VILLAGE OF THE NORTH RUPUNUNI. THE PROBLEM – NOT ENOUGH FOOD BEING BOUGHT OR CAUGHT TO FEED THE FAMILY.

1. GOAL SETTING

30th October 2006

In order to decide how to go ahead with tackling the problem of feeding a family, we first need to establish the overall aim. In this case the family is hoping to provide adequate nutrition in a way that is not too time consuming.

2. OBSERVING

The Salty family decide to have a talk about keeping an eye on how they can better manage the food problem they are having. At this stage a model of the situation is developed which allows the family to collect information on how much food they have, how they collect food, the cost of food and how this information is going to be evaluated. Once this information is known they can then later evaluate their present situation.

On Friday 1st November 2006 , the Salty family record what food and money they have for the month, what amount of food they need and the cost of food.

1. What food and money do we have for the month?
-Three bags of 100lbs farine
-20lbs beef
-12 persons
-$5,000
-60lbs rice
2. What amount of food do we need?
-5lbs of beef will feed 12 people for one day
-10lbs of fish will feed 12 people for one day
-12lbs of farine will feed 12 people for one day
-8lbs of rice will feed 12 people for one day
-5lbs of onions will be needed each month for 12 people
-2 tins of oil will be needed each month for 12 people
-1lb of salt will be needed each month for 12 people
-15lb of sugar will be needed each month for 12 people
-10 cakes of soap will be needed each month for 12 people
-extra food items needed
3. The cost of food?
-1lb of beef is $160
-1lb of fish is $140
-1lb of rice is $60
-1lb of farine is $60
-1lb of onions is $100
-tin of oil is $360
-1lb packet of salt is $40
-1lb packet of sugar is $60 -cake of soap is $50
-extra food items needed each month are $2000

3. EVALUATING

On the same day they all looked at the positive and negative things about the situation that they have

Good things [-enough farine, some meat, some money

Bad things [not enough protein for members of the family, not enough beef, not enough money

4. PLANNING

On the 10th November 2006 they decide to have a talk with the villagers about the fishing trips they plan on having with them. This will allow them to increase the amount of protein for the family.

On the 11th they decide to make a list of some of the items they need to get from the shop.

On the 12th they decided on other ways to increase their food amounts:

-how big they will cut the pieces of beef

-all the boys in the family will go fishing with other village members two times a week. This should bring in enough protein for the family.

-will use the money to buy oil, onion, garlic, soap, sugar, salt and other things you cannot make or get from the forest

-will use 1lbs farine per person per a day

-four pieces of beef per person per a day

They record information on the food they have, the amount of food they would need, the cost of food for the coming month and why they could not get some types of food.

5. IMPLEMENTATION

Family members go ahead with implementing the plan as follows:

The boys went fishing 2 times a week.

The beef was cut into smaller pieces and each person got four pieces.

The money was used to buy onions, garlic, salt, sugar, oil, soap, rice and some extra food items.

1lb of farine was used for each person per day.

All food eaten, caught and bought was recorded.

Reasons for why they couldn't get some types of food were also recorded.

6. OBSERVING

1st to the 7th December 2006

Everyone got 3 meals per day.

The boys went fishing 2 times in that week and they got 30lbs fish.

5lbs beef, 16lbs rice and 56lbs farine was cooked for that week.

They went to the shop to buy onions, garlic, salt, sugar, oil, soap, rice and some extra food items. The total cost of this was $4660.

8th to the 14th December 2006

They could not go fishing for this week because there was too much rain.

They cooked 10lbs of beef 20lbs rice and a bag of farine for that week.

15th to the 21st December 2006
The boys went fishing three times for this week but only caught 10lbs of fish which was not enough to feed the family.
There were a lot of people in the pond for the week from other communities with seine and poison so it was harder for the boys to go to get a large amount.
They had to eat the remaining 5lbs of beef.
They cooked 10lb rice and 60lb of farine.
22nd to the 31st December 2006
The boys found a new fishing area so they went camping for 3 days. They also went hunting so now they have 60lbs fish,1 labba,1deer and one turtle. They cooked 20lbs rice and 15lbs farine. They couldn't eat anymore farine as one bag got wet.

7. EVALUATING

Was there enough protein for the family?
-Week 1 they were 20lbs of fish protein short.
-Week 2 they were 50lbs of fish protein short.
-Week 3 they were 50lbs of fish protein short.
-Week 4 they had enough protein.
Was there enough rice and/or farine?
-Week 1 they had enough.
-Week 2 they had enough.
-Week 3 they had enough.
-Week 4 they were 40lb of farine short.
Did they have enough money to buy food from the shop?
-Yes, they had $340 left after going to the shop.
Are people working enough?
-They need to fish and hunt more to make sure there is enough protein and to sell this to make money for next month.
Do they have enough energy?
-Yes but they need to fish and hunt more often.
Why couldn't they catch more fish?
-It was raining during one week.
-Too many people were fishing in the pond with seine and poison.

8. PLANNING

They need to increase the number of fishing and hunting trips to 3 times a week.
They need to sell any extra fish and meat they get.
They need to go to ponds further away from where others fish.
They need to start a farm.
Record information on the food they have the amount of food they would need, the cost of food for the coming month and why they couldn't get some types of food.
They need to discuss with the other members of the community to make sure they do not over fish some ponds and to stop using poison for fishing.

SESSION 1.5: EXPLORING A HEALTHY CULTURAL-ECOLOGICAL SYSTEM

Topics to be covered:-

- Concepts of cultural and ecological systems and their health
- Community and Wetland Health
- Introduction to use of paper-based compendium

Knowledge developed: Understand the concepts of cultural and ecological health and their interactions using a holistic approach

Skills Developed: holistic thinking, oral communication

Duration of session: - 3 hours

Resource sheets for session: -

- System health properties
- Introduction to use of Compendium
- Sample 5 – Cause and Effect Diagram

SESSION PLAN 1.5: EXPLORING A HEALTHY CULTURAL-ECOLOGICAL SYSTEM

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will work in groups using compendium to produce cause and effect diagram. -They will answer "What are the effects on health of mining in rivers in the North Rupununi and other mining areas. -Each group will present findings to the class. ***35 mins***	Resource sheets: problems. flip chart sheets, markers, Colored chalk, computers,	Group working to produce cause and effect diagram Able to use compendium Holistic thinking Oral presentation	Trainer will introduce topic outlining concepts of a healthy cultural –ecological system. ***45 mins*** Trainer will explain how to use compendium and its befenfits in natural resource management. ***45 mins*** Each group will use compendium to produce cause and effect diagram. ***1 hour*** Final compendium maps will be printed and displayed Wrap up and handover for next session***5 mins***

SAMPLE CAUSE AND EFFECT DIAGRAM

"Effect on health of mining in rivers in the North Rupununi "

ECOSYSTEM HEALTH

FUNCTIONS	CAUSE & EFFECT
• Water quality • Erosion • Fish and Animals • Birds (health) • Plants (health) • Fish and Animal Migration • Noise and Air Pollution	• Water discoloration • Change of water course/direction • Migration of animals • Erosion of banks/loss of plant life • Habitat destruction • Pollution of equipment (noise and smoke)
COMMUNITY HEALTH	
• Water consumption • Fish and wild meat consumption • Trafficking in persons • Drug Use • Loss of Culture • Conflict • Health • Social Problems	• Health of population/water-related illnesses • Mercury consumption/related illnesses • Sexual abuse • Introduced drug trade • Loss of traditional practices • Increase of malaria, typhoid, yellow fever, HIV/AIDS • Family abuse, human labour

NRAMP: ***Ranger/Environmental Officer Course, November 2007***

NOTE*: Facilitators should encourage students to be creative in depicting this information; it doesn't necessarily have to be in a table format.*

SYSTEM HEALTH PROPERTIES

Although the community and wetland health ethics of ecological sustainability and social justice provide a long-term vision for natural resource management, specific short-term to medium-term goals need to be set to achieve this. These goals should be developed using the system health properties, described below, in combination with the four scenarios presented in the following section.
A community or wetland that is not subject to external changing conditions can be described by two system health properties; existence and ideal performance. These system health properties are defined as questions below:

EXISTENCE – ***Does the community or wetland have the basic requirements to exist?***
For example, the basic requirements that allow a rainforest ecosystem to exist are plants, animals, nutrients, water and solar energy. The basic requirements for a community are shelter, food, water and health. Without any of these basic requirements a rainforest ecosystem or a community would not exist.

IDEAL PERFORMANCE – ***Is the community or wetland working well?***
For a system to be working well it requires system processes to be performed at the optimum level and numbers of components to be at an optimum level. For example, if an area of rainforest is working well, all processes such as germination and the numbers of elements such as a Howler Monkeys, would be at an optimum level. For example, a community is working well when a component such as income generation is achieved through efficient working to allow adequate time for other important activities such as spending time with the family. If the system exists but not all processes occur at an optimum level or if some elements are under represented then the system would not be working well. When external conditions are changing then to maintain the existence and ideal performance of a system additional system health properties are required; resistance, flexibility and adaptability. These system health properties are defined as the following questions:

RESISTANCE – ***Can the community or wetland stay the same with changing conditions?***
For example, within a rainforest one bee species could be crucial to pollinating five different plant species that provide food for numerous birds and mammal species. The rainforest ecosystem would have low levels of resistance to a disease affecting this particular bee species because without it the five different plant species would not be pollinated and the food resource would be lost. A similar rainforest with five bee species that fulfil the same role would have a higher level of resistance as the loss of one bee species through disease would not stop the pollination of the plants and the continuation of the food resource. Similarly within a community, if for example, the family structures within the community provide good support and cohesion the community is more likely to resist changing conditions. However, if the family structure is loose then the ability of the community to resist change will be small.

FLEXIBILITY – Can the community or wetland accommodate changing conditions using existing resources?
For example, a rainforest ecosystem could be described as flexible if, after the forest has been disturbed through forestry activities, plant species can recolonise as there are sufficient nutrients and an available seed bank within the soil. If colonisation cannot occur because there is a lack of nutrients in the soil and a limited seed bank then the rainforest ecosystem would not be flexibile. Within a community, having diverse livelihoods and physical mobility, for example, would allow the community to cope with changing conditions as they could focus on a different livelihood activity or gather resources from another suitable area.

ADAPTABILITY – Can the community or wetland adjust to changing conditions using new resources?
For example, a rainforest ecosystem could be destroyed by a large scale catastrophic mudslide. However, it would be described as being adaptable if recolonisation of the plant species could occur through a river system transporting seeds and animal species from a rainforest ecosystem further up the river catchment. If the destroyed rainforest ecosystem was not connected to another rainforest through physical transport processes such as a river flooding then the current rainforest would not be adaptable. For a community to adjust to changing conditions through using new resources there would need to be individuals within the community that are educated and have a range of skills to cope with the changing conditions.

HEALTHY WETLANDS! HEALTHY PEOPLE

The World Health Organisation (WHO) defines 'health' as "a complete state of physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO Constitution, 1948). In 1986, the Ottawa Charter for Health Promotion added that "the fundamental conditions and resources for health are peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice and equity"(WHO, 1986). The effects of changes in the environment, both at the larger scale (e.g. climate change) and at the smaller scale (e.g. land use change) can have fundamental consequences for human health.

In a recent report from the Millennium Ecosystem Assessment (MEA/WHO, 2005), the link between human health and ecosystems, particularly the services they provide (which includes provisioning services such as food and fresh water; regulating services such as regulation of floods, drought, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as spiritual and recreational services) was highlighted. Changes in these ecosystem services can have drastic effects on the health of dependent communities.

Wetland ecosystems (including lakes, rivers, marshes, and coastal regions to a depth of 6 meters at low tide) deliver a wide range of ecosystem services that contribute to human well-being, such as fish, water supply, water purification, climate regulation, flood regulation, coastal protection, recreational opportunities, and, increasingly, tourism (RAMSAR, 1971). At the same time, the degradation and loss of wetlands is more rapid than that of other ecosystems (Millennium Ecosystem Assessment, 2005). Indirect drivers of degradation and loss have been population growth and economic development. The primary direct drivers of degradation and loss include infrastructure development, land conversion, water withdrawal, eutrophication and pollution, over harvesting and overexploitation, and the introduction of invasive alien species.

The knock on health threats of these changes in wetland ecosystems include the reduction in fish supply, increased incidence of vector-borne and waterborne diseases, degradation of water supply and quality, increased risk of flooding, excessive nutrient loading in water bodies and decrease in potential economic income. Growing pressures from multiple direct drivers increase the likelihood of potentially abrupt changes in wetland ecosystems, which can be large in magnitude and difficult, expensive, or impossible to reverse.

The links between environmental change and human health are complex because they are often indirect, displaced in space and time, and dependent on a number of modifying forces. Two routes have been identified for avoiding disease and injury caused by ecosystem disruption: one is to prevent, limit or manage environmental damage; the other way is to make whatever changes will protect individuals and populations from the consequences of ecosystem change. For the latter, two inter-related aspects need to be considered to understand the potential negative health impacts of ecosystem change: the current (and likely future) vulnerability of populations; and their future capacity for adaptation. The forces that

place populations at risk (such as poverty and high burdens of disease) in many cases also impair the capacity of these populations to prepare for the future.
It has been well documented that it is the poorest and least powerful people who are most vulnerable to environmental change, access to resources and disease and injury. Indigenous peoples fall into this category, and a recent series on indigenous peoples and health launched by *The Lancet* (see http://www.thelancet.com/collections/series/indigenous_health) highlights the limited focus to date on these groups of people. Although over 80% of the world's indigenous peoples live in Asia, Latin America, and Africa, little is known about their health status or access to health services. The few studies of particular communities indicate that the health of indigenous peoples is substantially poorer than that of the general population, with disease and mortality rates much higher than the general population (Hsu, 1990; Kestler, 1995; Escobar et al., 2001).

Importantly, unlike many western models of health, indigenous peoples' notion of health is often not individual, but one that encompasses the health of the whole community and the health of the ecosystem in which they live (Stephens et al., 2005). As Horton (2006) points out, with the second decade dedicated to the world's indigenous peoples launched at the fifth session of the UN Permanent Forum on Indigenous Issues (UNPFII) in May 2006, now is the time to act for the health of these extremely vulnerable groups.

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SESSION 1.6: MODULE EVALUATION

Topics to be Covered: - Individual, Facilitator and Course Evaluations

Knowledge developed: Understand basic concepts of evaluation and reflection.

Skills Developed: Reflection, Critical awareness, written communication

Duration of Session - 45 min

Resource Sheets for Lesson: -

- EO/Ranger Course Evaluation Form(Appendix)
- What is Evaluation (Session 1.1)
- How to be a good listener (Session 1.1)
- What does reflection mean? (session 1.1)

SESSION PLAN 1.6: MODULE EVALUATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will complete an entry into their reflective diary and daily evaluation form ***15 mins*** - Students will also post views on the graffiti board ***10 mins***	Basic Stationery Exercise book, pens, pencils, graffiti board, chalk, markers	Individual Reflection and critical analysis of information gathered and learnt for that day	Trainer will explain concepts of reflection, critical analysis and evaluation. ***15 mins*** Wrap up for the day ***5 mins***

MODULE 2 – OBSERVATION

SESSION 2.1: RECAP SESSION

Topics to be covered:

- Review of key concepts and ideas
- Plan for the day

Knowledge Developed: Understand the key concepts and ideas from previous session

Skills Developed: oral and written communication, reflection and listening

Duration of Session: 45 min

Resource sheets for session

- Session Plan 2.1
- Module 2 Agenda

SESSION PLAN 2.1: RECAP OF MODULE 1 & PLAN FOR MODULE 2

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will work in pairs to list five most important points from the day before. ***10 mins*** - The entire class share and discus the most important points of the previous day. ***10 mins*** - Students will assessed on work done in Module 1 ***25 mins***	Basic Stationery Exercise books, pens, pencils,	Group work, class discussion, lecture	Trainer will outline plan for the day. Trainer should stress the importance of - planning before starting an activity - making observations throughout the day and recording them - participants to be reflective learners ***15 mins***

MODULE 2 AGENDA

8:00	Recap and Plan of Day
9:00	Concepts and Functions of Indicators
10:30	Break
10:45	Concepts and Functions of Indicators
12:15	Lunch
13:00	Concepts and Functions of Indicators
14:00	Break
14:15	Concepts and Functions of Indicators
15:15	Evaluation
16:00	Wrap Up

SESSION 2.2: USE OF INDICATORS FOR MONITORING AND DECISION-MAKING

Topics to be covered:

- What are Indicators? Types of indicators
- Qualities of a good indicator
- How to choose indicators for monitoring and decision-making
- How to choose appropriate techniques for measuring indicators.

Knowledge Developed: - To understand the concepts of function and indicators

Skills Developed: Reflection, oral and written communication, listening

Duration of session: - 5 hours

Resource Sheets for session: -

- What are Indicators?
- Techniques for Determining Indicators: *Qualities of a Good Indicator*
- Techniques for Measuring Indicators.
- Environmental Monitoring Techniques
- Wetland Health Indicators
- North Rupununi Technical Manual NRAMP
- Module Assessment

SESSION PLAN 2.2: USE OF INDICATORS FOR MONITORING AND DECISION-MAKING

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will use the Technical Manual to identify indicators used for the Rupununi Wetlands. ***10 mins*** - Students will identify ecological and cultural indicators from the technical manual, then determined whether they were effective using criteria discussed in " Qualities of a Good Indicator" ***45 mins*** -Students will map compendium nodes from the mining activity(***Session 1.5***) into a table of cultural and ecological functions ***30 mins*** - Students will put nodes in the right category to understand the right indicators - Students will then advise choice of indicators for mining in the community. Students will aslo visit a site and collect bio-physical data. ***30 mins*** - Students will be given an assignment to apply 1.Their knowledge of techniques used to measure indicators 2. Use of relevant policies and legislation in choosing indicators. ***20 mins***	Resource sheets: flip chart sheets, markers, Colored chalk, computers,	Group working Explanation of key terms.	***The trainer will*** - Introduce topic, explaining what indicators are using examples from the ***North Rupununi Technical Manual.*** ***45mins*** - Discuss with students the qualities of a good indicator. ***45 mins*** - Discuss and explain how to choose indicators using flow chart. - Supervise groups in choosing indicators that can be used to monitor mining in a community. - Facilitate discussions on choice of indicators of each group with the entire class. ***20 mins*** - Discuss techniques used to measure indicators. ***25 mins*** -Explain importance of knowing critical policies and legislation when choosing indicators. ***15 mins*** Wrap up and handover for next session. ***10 mins***

WHAT ARE INDICATORS?

Once a model of the management issue has been developed, a set of **indicators** need to be identified to help determine the *health* of the system in relation to the goal. Indicators can be used to **simplify, quantify, analyse and communicate the health status** of a particular aspect of the cultural-ecological system by *depicting issues* in *less complex terms* or in a single meaningful message. For mechanical systems, the task of identifying indicators for systems performance is relatively simple.

Box 1: *Example of indicators used to determine performance of a simple system*

Take for example a Car: On a car's dashboard, an information system presents all the key indicators of car performance: speed, engine revolutions per minute, fuel level, engine temperature, and various icons which light up if certain vital car components malfunction.

Selecting indicators for the performance of living systems is more difficult. For most living systems, it is almost impossible to have a complete understanding of how the whole system works and behaves, and its resulting state. There are far too many structures and processes to monitor and these change and adapt with changing environmental conditions.

An example of a simplified set of indicators developed to check the viability of an extremely complex living system is the sequence of basic tests a doctor does the moment you walk into his or her surgery with a serious illness. They check your temperature, breathing, pulse and weight to height ratio.
This will give the doctor immediate information on your viability. Further checks are then required to identify the cause of your ill-health according to a series of models they have attributing symptoms to diseases.

Box 2: *Example of indicators used to determine performance of a complex system*

1. An indicator therefore identifies a measurable ***structure,*** such as weight, or ***process***, such as heartbeat, that can be used to describe the relative status of a particular aspect of a living system.

2. No single indicator can give a complete picture of a situation, and so indicators are more accurately defined as partial indicators. Indicators provide **evidence** that a certain condition exists or certain results have or have not been achieved.

3. A good indicator alerts you to a problem before changes become **irreversible** and helps you recognise the areas to focus on in order to resolve the problem.

TECHNIQUES FOR DETERMINING INDICATORS

QUALITIES OF A GOOD INDICATOR

To determine useful and measurable indicators of your ***management goa*l,** your indicator should be able to;

A. Measure progress towards your goal
B. Be user-friendly.

A. Each indicator should have the following characteristics if they are to provide a <u>good measure of progress</u> towards a goal:

- Be representative of system health properties, namely: existence; ideal performance; resistance; flexibility; and adaptability (**Session 1.5**)
- Be accurate and bias free.
- Be reliable and consistent over space and time, some indicators will be specific to particular locations and time frames.
- Assess trends over time.
- Provide early warning of detrimental change.
- Provide timely information.
- Be scientifically robust and credible.
- Be verifiable and replicable.
- Have a target level or baseline against which to measure them.

B. Although an indicator may be good at measuring progress towards the goal they will be useless if they do not also fulfill the following <u>user-friendliness criteria:</u>

- **Accessible** - easily measured given resource constraints.
- **Affordable** - make use of existing data where available or be cost effective and rapid to measure.
- **Understandable** - simplify complex phenomena and be clear and unambiguous, easy to understand and be able to be communicated by all stakeholders and decision makers
- **Relevant** – developed by and meet the requirements of different end-users and can be directly linked to practical action.

<u>REFERENCE</u> cited:

1. Reed M.S., Fraser E.D.G., and Dougill A.J. (2006). *An adaptive learning process for developing and applying sustainability indicators with local communities.* Ecological Economics, 406-418.

TECHNIQUES FOR MEASURING INDICATORS

The following sections describe in detail a number of different techniques that can be used to measure performance for a range of indicator types based on qualitative and quantitative data collection. These cover techniques that investigate typical cultural and ecological components that are often used as indicators in the context of natural resource management associated with wetland ecosystems and indigenous communities.

- Interviewing
- Diagramming and Visualization
- Ranking and Scoring
- Environmental Monitoring techniques

1. INTERVIEWING - Semi- structured interviewing can take place with individuals or in focus groups (6-10 people) (see Box 1). Selecting participants can be random, but in many cases it may be dependent on the objective of the interview. Whether you are carrying out interviews or focus groups, it is important to keep the following points in mind (*adapted from Pretty et al., 1995*).

Box 1. When/when not to use focus groups (adapted from Krueger, 1994).

Consider the use of a focus group when;

- Insights are needed in exploratory or preliminary studies.
- There is a communication or understanding gap between groups or categories of people.
- The purpose is to uncover factors relating to complex behaviour or motivation.
- The researcher desires ideas to emerge from the group.
- The researcher needs additional information to prepare for a large-scale study.
- The intended audience place high value on capturing the open-ended comments of the target audience.

Do NOT use focus groups when:

- The environment is emotionally charged and more information of any type is likely to intensify the conflict.
- The researcher has lost control over critical aspects of the study.
- Statistical projections (of numerical data) are needed.
- Other methodologies can produce better quality information or more economical information of the same quality.
- The researcher cannot ensure the confidentiality of sensitive information.

TEAM PREPARATION

What does the team think is important to understand more about and how will they find this out? Team preparation should focus on developing and refining an interview guide or checklist, assigning team roles and responsibilities and promoting good group dynamics and behaviour.

Preparing the interview guide or checklist is a critical step in planning to conduct semi-structured interviewing. The interviewer/moderator uses the interview guide to control the flow of questions during the session. An interview guide usually contains between nine and, at most, twelve questions (see Table 1). The interviewer/moderator may write margin notes in the guide to help her through each stage of the discussion. An interview guide should not exceed two pages.

The questions in the interview guide are usually followed by probes, between one and five bulleted points beneath the question that allow further investigation of the particular question. The interview guide should only ask questions that are directly related to the interview objectives. It should not veer off, for instance, and ask personal questions which may be only slightly related to the purpose of the discussion.

Table 1. Example interview guide for an interview

Question 1	What are the community sources of water?
Question 2	What are the resources used in the community?
Question 3	Where are the resources that are used by the community located?
Question 4	At what times of the year are the different resources used?
Question 5	How frequently are the different resources used?
Question 6	What are the techniques used for each resource?
Question 7	How much of each resource is used?
Question 8	What is the status of each resource used?
Question 9	How have the different resources changed over the last twenty years?
Question 10	What groups of people are using the different resources?
Question 11	What are the limits/rules to resource use?

INTERVIEW CONTEXT

It is important to be aware of issues such as ***timing, body language, seating arrangements, biases etc.***

INTERVIEW STRUCTURE

The interview should last between 1 – 1 ½ hours and have four main stages:

1) **Introduction** - the purpose here is to establish rapport with the participants by getting a sense of their concerns about the nature and structure of the discussion. It is also important to establish a comfortable environment so participants are comfortable disclosing opinions and feelings. The introduction is also an opportunity to provide information on what to expect during the session.

2) **Transition**- the aim here is to obtain a snapshot of the participants overall perceptions or views about the topic and to set the stage for an in-depth discussion. These questions move the discussion into the next stage, which is the in-depth investigation.

3) **In-Depth Investigation** - the purpose of the in-depth discussion is to generate detailed, substantive information about participant's views toward the most important issues in the interview guide, and to enable participants to elaborate on responses about the topic.

4) **Closure** - this final stage creates an opportunity for participants to alter or clarify positions they have made in earlier discussions, to verify conclusions drawn across topics, and if necessary, to prepare participants for the discussion's end. This is usually done when the subject matter is highly personal or elicits strong emotions. In this final stage, you should **thank** participants for attending the session; to **acknowledge the experiences and views** of participants as valid and enlightening; and to **remind** participants why their advice was important. You can also use this time to handle any final logistical matters.

SENSITIVE INTERVIEWING

It is important to **listen sensitively** during an interview and have an **open attitude.** Ten points for sensitive interviewing are:

1. Prepare as a team and agree a team contract
2. Use a checklist or interview guide
3. Be sensitive and respectful to everyone involved
4. Use visualisation methods to enhance participation and dialogue
5. Listen and learn
6. Ask open-ended questions using the six helpers (Who? What? Why? Where? When? How?)
7. Probe responses carefully
8. Judge responses (facts, opinions, rumours)
9. Verify through triangulation (cross-checking)
10. Record response and observations fully

SENSITIVE QUESTIONING

Effective interviewing is about asking open-ended and non-directive questions, and to carefully probe the responses. Tables 2 and 3 outline some of the types of questions that should and should not be used during interviews.

JUDGING AND CROSS-CHECKING RESPONSES

It is important to judge the information which is generated through discussions, and not to accept the first answer you hear immediately. You can categorise information in three different ways:

1) **Fact** - a commonly agreed time and place specific truth;
2) **Opinion** - a person's or a group's view on a topic;
3) **Rumour** - unsubstantiated information from an unknown source.

It's important to judge what you think a response is and whether you then need to do further investigation or cross-checking. Normally, cross-checking involves triangulation i.e. establishing the accuracy of information by comparing three or more types of independent points of view on data sources (for example, interviews, observation, and documentation; different times) bearing on the same findings.

Table 2. Some types of questions that could be used in semi-structured interviewing.

TYPE OF QUESTION	DEFINITION	EXAMPLES	ADVANTAGES	DISADVANTAGES
Open-Ended Questions	Questions which do not fix attention on any specific factor. They allow respondents to structure an answer along any of several dimensions and encourage an expansive reply. Usually, they begin with one of the six helpers **Who? What? Why? Where? When? How?** Most of the questions in the interview guide should be open-ended.	*What do you do as a local ranger?* *How do you find the school?*	- Can provide a substantial amount of information because the interviewee is not bound to a limited answer. - Reveal what is truly on the interviewee's mind as opposed to what the interviewer suspects is on the interviewee's mind.	- Can result in lengthy replies, which may make it more difficult to control the interview.
Dichotomous Questions	Questions that can be answered by "yes" or "no", or some variation, such as "maybe" and "I guess so". Limit your use of dichotomous questions to the end of the discussion, when you want to wrap up the discussion and bring focus to responses.	*Is the fish in the pond decreasing?* *Is there a spiritual significance to this lake?*	- Can be used to discourage someone from monopolizing the discussion. - Can confirm or clarify a point.	- Can limit conversation. - Can bring out unclear responses.
Specific Questions	Questions that require a precise reply.	*How many fish do you catch a day?* *What is your role in the natural resource management committee?*	- Can confirm or clarify a point. - Are useful in controlling the interview. - Are usually preferred toward the latter parts of the interview as the moderator narrows the range of inquiry.	- Can limit conversation.
Probing Questions	Probes reveal more in-depth information by clarifying earlier responses or expanding on previous statements by a participant. They ensure that "data gaps" do not occur. Probes can also test the strength of someone's opinion and encourage dissenters to speak up. Effective probing is a critical task for the moderator. Good probing generates conversation by focusing attention on the response rather than on individuals. Probes may be open-ended or closed-ended, but are usually open-ended.	*-What specifically could be done to overcome that?* *-What is it about…….. that causes you to feel that way?* *-Help me understand...* *-How so?* *-In what way?* *-What else?* *-Anything else?* *-How does that……apply to you?...to others?* *-What does (Descriptive word) mean for you?* *-How would you describe the feeling/thought...to someone who didn't know (from another agency, another user)?* *-Please tell me more about...* *-Please give me an example of...* *-What can someone else tell me about this?* *-What ideas/reactions have I/we missed?.....not heard yet?* *-Can someone help (Name) out?* *-When was the last time you saw/felt/thought.....* *-Does anyone feel differently about this issue?* *-What's the good news/bad news about this issue?*	-Can provide more in-depth information. -Can be used to encourage certain participants to speak.	-Can limit conversation. -Could put pressure on certain people to talk.

Table 3. Some types of questions that should be avoided in semi-structured interviewing

QUESTIONS TO AVOID	COMMENT	EXAMPLES
Leading questions	A leading question has the answer already embedded in the question. There is a way to ask participants how they would solve a problem without asking a leading question: • The moderator first asks the question in a very general, open-ended manner. Responses will usually be based on participants' most recent experiences or opinions. The moderator should not initially supply examples of ways to solve the particular problem in question. Doing so might limit the discussion. • Next, the moderator offers "cues" about alternative possibilities when the discussion lags. These cues are written as probes under the question in the discussion.	*Don't you think Arapaima are important species?*
Double-barrelled Questions	These questions require two sets of responses.	*How do you feel about Arapaima fishing and what are you going to do about it?*
"Why" Questions	Too many "Why" questions can turn people off because: "Why?" has only one answer form…….. "Because", which restricts the range of answers. "Why?" may sound attacking, like an interrogation, so the reply is often defensive. "Why?" puts people on the spot, making them feel as if they have to think of a plausible reason at once. "Why?" can be very personal, touchy, inflammatory and just plain rude…….not eliciting, encouraging, or inviting. "Why?" invites rational thinking or responses that seem appropriate to the situation rather than emotional or spontaneous responses.	*Why is there Arapaima fishing occurring in that pond?*
Dichotomous Questions	Because these questions tend to limit the discussion, they should be used only sparingly.	*Is Arapaima fishing occurring in that pond?*

RECORDING THE INTERVIEW

Recording the detail of interviews is vital. In most fieldwork, a great deal of valuable information is lost due to the failure to take good notes and as a result of excess focus on diagrams.

- Ask permission to record discussion of those present.
- Use a discreet notebook (not a big clipboard)
- Record the detail of what is said and, whenever possible, what is not said but can be sensed (such as hesitation or tension, which can be equally important) - this is sometimes referred to as the "hidden transcript" or "subtext".
- Record the detail of what is observed and how the interview developed (the process)
- Record who said it (female/male, young/old, worse off/better off)
- Make follow-up notes after the interview (during which team members can compare their notes with others to cross-check information).
- Record personal impressions of the interview.

SELF-CRITICAL REVIEW

After the interview is over, it is important to assess critically which questions were effective and which were not, how some questions could have been phrased differently, how the context influenced the flow of information, everyone's body language.

References cited

1. Krueger, R. A. (1994). Focus groups: *A practical guide for applied research.* Thousand Oaks, CA: Sage Publications.

2. Pretty, J., Gujit, I., Scoones, I. and Thompson, J. (1995). *A trainer's guide for participatory learning and action.* London: IIED.

DIAGRAMS AND VISUALIZATIONS

Diagrams and visualizations are pictorial or symbolic representations of information, and are a central element of participatory analysis and learning. They work because they:

- Provide a focus for attention while discussing an issue;
- Stimulate discussion by both non-literate and literate people;
- Can represent complex issues or processes simply;
- Provide a means for cross-checking and therefore provoke effective group work;
- Inspire(stir up) creative associations;
- Stimulate people's memory about their past and present situations;
- Reinforce the written or spoken word;
- Assist in decision-making and monitoring (Pretty et al., 1995).

Phases of diagramming in the field (after Pretty et al., 1995):

1) Preparation – this will involve clearly defining roles of the team in terms of who is asking questions, note-taking, observing etc. You need to make sure you have the right materials with you - although wherever possible make use of local materials. Ensure that you involve a range of people, possibility by using the same method with different groups. The informants tell you something by drawing the diagram and what they draw and omit, tells you something about the informants. Choose a time suitable for the people who will be involved and agree on the duration.

2) Starting – you need to explain why you are there and follow an introductory protocol. Begin with non-sensitive diagramming such as historical/time lines. Use simple starting questions such as ***"I do not know this area very well. I see the tree we are sitting under and the road through the village, but can you show me what the rest of the community looks like?"; or "You showed us many different crops in your fields. If this pile of stones represents your crops, can you show us how much of your fields is planted with each crop?"*** A demonstration can help when a method appears to need lengthy explanation: for example, show with stones the proportions of vegetables you grow in your own garden.

3) During – you need to ensure that the stick or pen – the symbol of power – is handed over to those not immediately inclined to be

margin into the process. Use local materials as much as possible. **You need to make sure all symbols used are understood by everyone**. Make sure someone is taking notes on the various discussions that occur in parallel around the diagram. Use the guidelines outlined in semi-structured interviewing to guide the questions being asked. **Make sure that an exact copy of the diagram is made (by the team or by local people) if the original is on the ground and/or take a photograph of the diagram**.

4) After – cross-check the diagram with different social groups: women and men; old, young and children; worse of and better off; landless and landed etc. Analyse what the process (discussion and diagram) has thrown up, **identifying ambiguous and unclear issues**. Use this to plan the next step of the fieldwork. Remember that this should be done with local people.

There are many types of diagrams and visualizations including **resource maps, social maps, mobility maps, transects, time lines and historical profiles, seasonal calendars, daily routines, flow diagrams, impact diagrams, crop biographies, pie diagrams and Venn diagrams.** More details about these can be found in Pretty et al. (1995). The following outlines four main techniques:

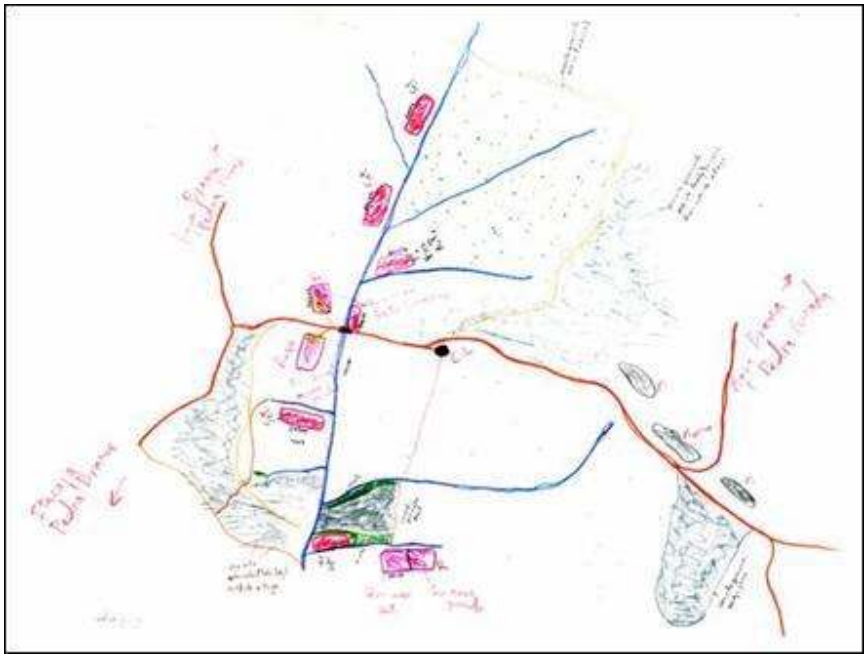
Diagramming and Visualizing Techniques

1. Mapping

This technique can be used to develop and understand natural resource use, social use of resources and the way people move about the landscape. It can involve pen and paper, or drawing on the ground, and using semi-structured interviewing to establish a discussion. See Figure 1 for an example of a map.

involved. Bring people on the

Figure 1. An example of a map



2. Transect walks

This technique is useful for observing in person things sketched in maps. It also gives the opportunity to talk about things of local importance. It involves identifying a route with key informants, and then carrying out semi-structured interviewing while walking the route. Taking photographs at certain points and marking positions with a GPS may also be useful to triangulate data sources.

3. Seasonal calendars

This technique is particularly useful for understanding trends and changes over time, and for making correlations between different seasonal patterns e.g. flooding and fish catches. While carrying out a semi-structured interview, informants are asked to make diagrams/ graphs that illustrate trends and changes in certain activities and/or events over the course of a single day, a week, or a year. See Figure 2 for an example of a seasonal calendar.

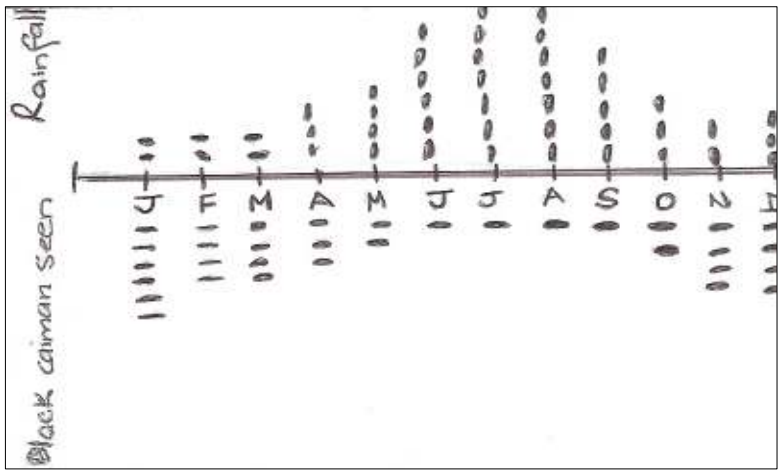


Figure 2. An example of a seasonal calendar

4. Flow diagrams

This technique can help to understand the complexities of linkages and relationships at the local level, and local people's perceptions of the impacts of an intervention or process. While carrying out a semi-structured interview, informants are asked to show the linkages/flows between different components and/or an impact/process. See Figure 3 for an example of a flow diagram.

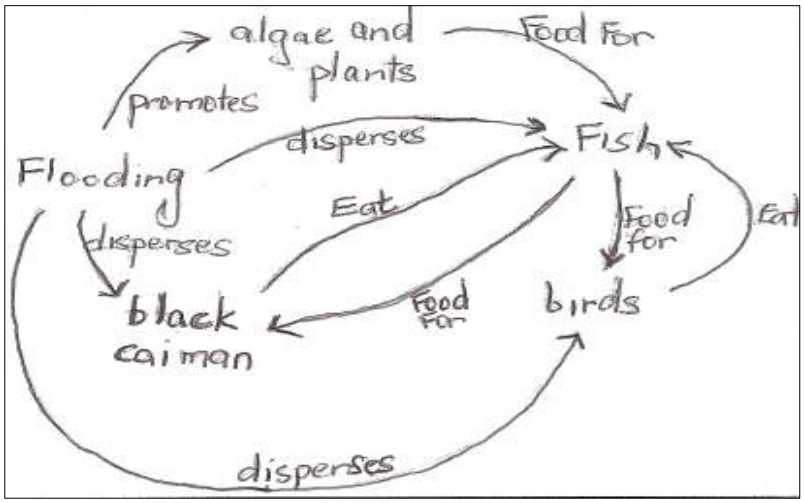


Figure 3. An example of a flow diagram

References cited

Pretty, J., Gujit, I., Scoones, I. and Thompson, J. (1995). *A trainer's guide for participatory learning and action.* London: IIED.

RANKING AND SCORING

Ranking and scoring methods can be used to explore and understand people's perceptions and choices in a range of subjects, including resource allocation and well-being. They also help to show why different groups of people e.g. old/young, rich/poor etc., have different criteria for making judgments and decisions about the management of resources, the use and perceived value of local institutions etc. There are three methods that can be used (from Pretty et al., 1995):

Preference ranking

Semi-structured interviews are first conducted to identify people's options and criteria. A matrix is then developed in which items or alternatives are compared directly against the others until they are ranked from highest (best) to lowest (worst).

Matrix scoring

Semi-structured interviews are first conducted to identify people's options and criteria. A matrix is then developed in which items or alternatives are compared against selected criteria which the people use for judging them.

Well-being or wealth ranking using card sorting

Through semi-structured interviewing, it is first necessary to agree on the indicators being used to measure wealth or well-being. Then households in a village, for example, are all given a number on a card. Using at least three informants, each informant is asked to sort the cards into piles of, for example, poor to wealthy. Depending on the number of piles, each household is then given a score. For example, if 5 piles were created, and household 10 was placed in the 5th pile representing 'poor', that household is given a value of 1/5 or 0.2. This is carried out for all households and by all informants. An aggregate score is then calculated from the three informant's information, and households can then be placed in classes of wealth/well-being.

References cited

Pretty, J., Gujit, I., Scoones, I. and Thompson, J. (1995). A trainer's guide for participatory learning and action. London: IIED.

ENVIRONMENTAL MONITORING TECHNIQUES

To understand wetland system health, using an environmental monitoring scheme, it is important to develop an approach that determines the spatial and temporal characterisitics of a system and provides useful information to help develop system health indicators. A range of techniques are required to achieve this and fall into three main categories:

- Functional wetland classification
- Physical characteristic monitoring techniques
- Biological monitoring techniques

PHYSICAL CHARACTERISTICS MONITORING TECHNIQUES

Impacts from land use change, such as mining or logging, can influence not only the chemical and biological quality of the river or waterbody but also the character and quality of the habitat. To assess any impacts of land use change and to provide a base-line monitoring tool for habitat quality, a holistic approach to monitoring physical characteristics is require.

The River Habitat Survey (Environment Agency, 1997) is one such approach. The River Habitat Survey has been developed in the UK to provide a national survey tool that describes the character and quality of habitats, the modifications affecting them, and has allowed the creation of a database of river habitats so that regular monitoring of the state of river systems can take place (Raven *et al.,* 1998). It has provided a system for classifying rivers according to their habitat quality and allowed relationships to be determined between habitat, biological and chemical quality (Raven *et al.,* 1997). Modified versions of the River Habitat Survey have been used in a number of countries to assess river systems and to assess the relationship of land use change amongst habitats, invertebrates and birds (e.g. Manel *et al.,* 2000).

The River Habitat Survey records over 120 variables describing the channel, flow character, banks and catchment within three main sections (for full methods see Environment Agency, 1997). Spot checks are used to record channel and bank material, features, vegetation types and land use as well as flow type within the channel. This type of survey approach can be adjusted to provide descriptors of other waterbodies such as wetlands, lakes and ponds. A 500m 'sweep-up' assessment is also used to record the predominant habitat features such as surrounding land use, bank profiles, extent of trees and extent of larger scale channel features. Measurements are also taken of the morphological dimensions of the channel or waterbody.

BIOLOGICAL MONITORING TECHNIQUES

Monitoring plant and animal species, to determine spatial and temporal patterns, is important in understanding the overall health of wetland system. It is expensive and impossible to monitor all species so a few species, that are thought to be representative of key food webs, should be monitored. Species that can be identified and monitored easily, such as birds, macro invertebrates, large reptiles and fish, are often useful species to monitor. Initially it is important to understand the natural cycle, in population numbers and species diversity, within each wetland type. This can form a baseline for later assessments regarding external or internal impacts to the system.

References

Environment Agency (1997) 1997 River Habitat Survey. Field Methodology and Guidance Manual. Environment Agency, Bristol. Unpublished.

Manel, S., Buckton, S.T. and S.J. Ormerod, (2000) Testing large-scale hypotheses using surveys: the effects of land use on the habitats, invertebrates and birds of Himalayan rivers. Journal of Applied Ecology, 37, 756-770.

Raven, P.J., Fox.P., Everard M., Holmes N.T.H. and Dawson F.H., (1997) River Habitat Survey: a new system for classifying rivers according to their habitat quality. In: Freshwater Quality: Defining the Indefinable? Eds: Boon, P.J. and Howell, D.L. The Stationary Office, Edinburgh. pp. 215-234.

Raven, P.J., Homes, N.T.H., Dawson, F.H., Fox, P.J.A. Everard, M., Fozzard, I.R., and K.J. Rouen, (1998) River Habitat Quality: the physical character of rivers and streams in the UK and Isle of Man. River Habitat Survey, Report No. 2, Environment Agency, Bristol.

BIO-PHYSICAL MONITORING ACTIVITY

SAMPLE SITE MONITORING FORM

Site Name_____ **Date of Survey**_____ **Weather Conditions**_____

Name of Surveyors_____ **GPS Location**_____ **Time Surveyed**_____

	FEATURES		
1	**Geomorphic**	River ☐ Pond ☐ Creek ☐ Canal ☐ Other ☐	
2	**Hydrological**	a. **Water present:** Yes ___ No ___	b. **Water colour:** black __ Clear__ Brown__ Other__
3	**Waterdody Dimension**	**Water** : Width_____ Depth_____ Length_____	
4	**Waterbody Features**	Soil Type_____ Vegetation present_____ Erosion Visible_____	
5	**Habitat**	Agriculture_____Forest_____ Savannah____ other_____	
6	**Land Use**	Fishing__ Farming__ Tourism__ Hunting__ Logging__ Gathering__ Cultural_ Recreation_ Other___	
7	**Species (description, average size, colour, location, e.t.c**	Animals_____ Plants_____ Macro-invertebrates_____	
	Other Observations		

NOTE

Above is an example of a Monitoring form that can be used as a guide for practical monitoring activities. Monitoring Forms can be designed to suit the objective of the lesson and demographics of the Site to be visited.

MODULE ASSESSMENT

ACTIVITY 1

Qualities of a good indicator

Using the North Rupununi Technical Manual,

1. Identify and select one ecological indicator and one cultural indicator used in Wetlands project

2. For each indicator selected, discuss how effective they were in measuring the progress of the project goal.

3. Discuss how User-Friendly these indicators were.

Facilitator's tips

When conducting this activity, ensure that you're adequately acquainted with the contents of the North Rupununi Technical Manual. You can design other exercise like this one, all you need are selected indicators for a particular goal/s, possibly that of an existing or past project.

ACTIVITY 2

1. Map compendium nodes (information) from mining activity (*Session 1.5*) into a table of cultural and ecological functions.

2. Discuss and select possible choice of indicators for mining in the community.

3. Present your findings to the class

SESSION 2.3: MODULE EVALUATION

Topics to be Covered:

Individual, Facilitator and Course Evaluations

Knowledge developed:

Understand basic concepts of evaluation and reflection.

Skills Developed: Reflection, Critical awareness, written communication

Duration of Session - 45 min

Resource Sheets for Lesson: -

- EO/Ranger Course Evaluation Form
- What is Evaluation (Session 1.1)
- How to be a good listener (Session 1.1)
- What does reflection mean? (session 1.1)

SESSION PLAN 2.3: MODULE EVALUATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will complete an entry into their reflective diary and daily evaluation form ***15 mins*** - Students will also post views on the graffiti board ***10 mins***	Basic Stationery Exercise book, pens, pencils, graffiti board, chalk, markers	Individual Reflection and critical analysis of information gathered and learnt for that day	Trainer will explain concepts of reflection, critical analysis and evaluation. ***15 mins*** Wrap up for the day ***5 mins***

MODULE 3 – EVALUATION

SESSION 3.1: RECAP SESSION & PLAN FOR MODULE 3

Topics to be covered:

- Review of key concepts and ideas
- Plan for the day

Knowledge Developed: Understand the key concepts and ideas from previous session

Skills Developed: oral and written communication, reflection and listening

Duration of Session: 45 min

Resource sheets for session:

- Session Plan
- Module 3 Agenda

SESSION PLAN 3.1: RECAP SESSION & PLAN FOR MODULE 3

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will work in pairs to list five most important points from the day before. ***10 mins*** - The entire class share and discus the most important points of the previous day. ***10 mins*** - Students will assessed on work done in Module 1 ***25 mins***	Basic Stationery Exercise books, pens, pencils,	Group work, class discussion, lecture	Trainer will outline plan for the day. Trainer should stress the the importance of - planning before starting an activity - making observations throughout the day and recording them - participants to be reflective learners ***15 mins***

MODULE 3 AGENDA

8:00	Recap and Plan of Day
9:00	Data Analysis and Interpretation
11:00	Break
11:15	Stakeholder Engagement
12:20	Lunch
13:15	Stakeholder Engagement
14:15	Break
14:30	Stakeholder Engagement
15:20	Evaluation
16:00	Wrap Up

SESSION 3.2: DATA ANALYSIS & INTERPRETATION

Topics to be covered:

- Use of data analysis in decision making
- Concepts of data analysis
- Key concepts of paper-based GIS

Knowledge developed:

Skills Developed: oral and written communication, holistic thinking, group working, problem-solving

Duration of session: 2 hrs

Resource sheets for session:

- Monitoring Data **– Bird Data for Surama Lake (State of the North Rupununi Report)**
- Commercial logging concession in the North Rupununi Wetlands (Session 1.2)
- Key concepts/use of GIS
- Eco – Tourism Scenario: Using data analysis in decision-making
- List of birds monitored in the Wetlands Project and data analysis
- Community Cultural system data for Surama
- Maps showing sites monitored for ecological and cultural data (Wetland Project)
- NRAMP Approach - evidence –based (Session 1.3)

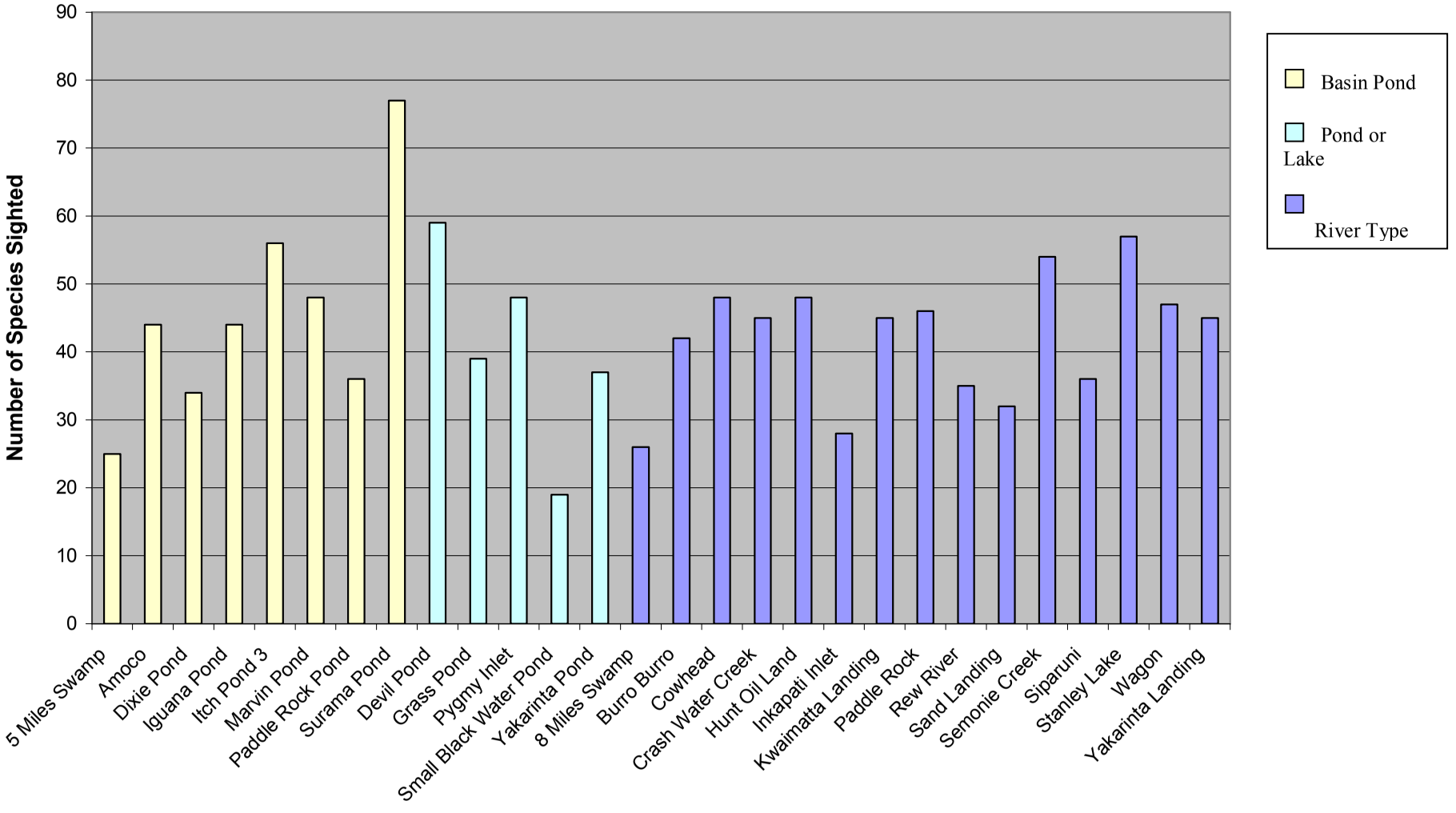
SESSION 3.2: DATA ANALYSIS & INTERPRETATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will be given a set of monitoring data and a set of questions in relation to an ecotourism scenario - they will be expected to analysis date to answer the questions ***30 mins*** - Students will map data analysis findings on a paper based GIS to identify potential conflict of interest between stakeholders. ***40mins***	Basic stationeries: Flip chart, markers, - computer	Group working Use of Microsoft excel Holist thinking	Trainer will introduce topic and explain a ecotourism scenario to the students. ***10 mins*** Trainer will facilitate group discussions on the findings of each group ***30 mins*** Revise NRAMP Approach (evidence-based) resource sheet.

Number of bird species Observed in the 31 Sites monitored by the Wetlands Project:

174: Highest Observed: Orange-winged Parrot at Crash Water Creek (958) and Black Bellied Whistling Duck at Kwaimata Landing -Rupununi River (902)

Neotropic Cormorant Anhinga White-faced Whistling-Duck Black-bellied Whistling-Duck Muscovy Duck Rufescent Tiger Heron Fasciated Tiger-Heron White-necked Heron Great Blue Heron Great Egret Snowy Egret Little Blue Heron	Tricolored Heron Cattle Egret Striated Heron Agami Heron Capped Heron Black-crowned Night Heron Yellow-crowned Night Heron Boat-billed Heron Buff-necked Ibis Green Ibis Wood Stork Maguari Stork Jabiru Snail KiteHook-billed Ki	Osprey Purple Gallinule Azure Gallinule Sunbittern Sungrebe Limpkin Southern Lapwing Pied Plover Solitary Sandpiper Yellow-billed Tern Least Tern Large-billed Tern Black Skimmer Green Kingfisher Amazon Kingfisher Green-and-rufous Kingfisher	Pygmy Kingfisher Green-tailed Jacamar White-banded Swallow Pied Water-Tyrant White-winged Swallow Blue-and-white Swallow Band-Rumped Swallow White-headed Marsh-Tyrant
Variegated Tinamou Blue-winged Teal King Vulture Black Vulture Turkey Vulture Lesser Yellow-headed Vulture Greater Yellow-headed Vulture Zone-Tailed Kite Swallow-tailed Kite Great Black Hawk Black-collared Hawk Gray Hawk Roadside Hawk White-tailed Hawk Crested Eagle Harpy Eagle Black Caracara Yellow-headed Caracara Crested Caracara Barred Forest-Falcon Slaty-backed Forest-Falcon Laughing Falcon Pearl Kite Falcon American Kestrel Bat Falcon Little Chachalaca Marail Guan Spix's Guan Black Curassow Crested Bobwhite Grey-necked Wood Rail Gray-winged Trumpeter	Green-rumped Parrotlet Orange-chinned Parakeet Golden-winged Parakeet Sapphire-rumped Parrotlet Black-headed Parrot Caica Parrot Dusky Parrot Blue-headed Parrot Blue-cheeked Parrot Yellow-crowned Parrot Festive Parrot Orange-winged Parrot Mealy Parrot Red-fan Parrot Greater Ani Smooth-billed Ani Reddish Hermit Crimson Topaz Amazonian White-tailed Trogon Violaceous Trogon Black Nunbird Black-necked Aracari Green Aracari Channel-billed Toucan White-throated Toucan Toco Toucan Cream-colored Woodpecker Ringed Woodpecker Lineated Woodpecker Crimson-crested Woodpecker Powerful Woodpecker Red-necked Woodpecker Yellow-chinned Spinetail	Spangled Cotinga Capuchinbird Burnished Buff Tanager Oil Bird Palm Tanager Silver-Beaked Tanager Blue-Crowned Motmot Black-chested Jay Gray-breasted Martin Brown-breasted Martin Bicolored Wren Pale-breasted Thrush White-necked Thrush Red-capped Cardinal Lesser Seed-Finch Ruddy-breasted Seedeater Grassland Sparrow Wedge-tailed Grass-Finch Highland Grass Finch Rusty-margined Flycatcher Tropical Kingbird Fork-tailed Flycatcher Thrush-like Schiffornis Screaming Piha Guianan Red Cotinga Ruddy Ground-Dove Blue Grund-Dove White-tipped Dove Blue-and-yellow Macaw Red-and-green Macaw Red-bellied Macaw Red-shouldered Macaw Brown-throated Parakeet Painted Parakeet	Eastern Meadowlark Moriche Oriole Giant Cowbird Yellow Oriole Yellow-rumped Cacique Red-rumped Cacique Crested Oropendola Green Oropendola Swallow Wing Puffbird Great Kiskadee Lesser Kiskadee Pale-vented Pigeon Ruddy Pigeon Plumbeous Pigeon Eared Dove Plain-breasted Ground-Dove Wedge-billed Woodcreeper Chestnut-rumped Woodcreeper Spotted Antpitta Vermillion Flycatcher


Number of Species Sighted
90
80
70
60
50
40
30
20
10
0
5 Miles Swamp
Amoco
Dixie Pond
Iguana Pond
Itch Pond 3
Marvin Pond
Paddle Rock Pond
Surama Pond
Devil Pond
Grass Pond
Pygmy Inlet
Small Black Water Pond
Yakarinta Pond
8 Miles Swamp
Burro Burro
Cowhead
Crash Water Creek
Hunt Oil Land
Inkapati Inlet
Kwaimatta Landing
Paddle Rock
Rew River
Sand Landing
Semonie Creek
Siparuni
Stanley Lake
Wagon
Yakarinta Landing
Basin Pond
Pond or Lake
River Type

ECO – TOURISM SCENARIO

Using Data Analysis for Decision-Making

The Surama Community is interested in expanding its tourism operations by offering tourists an opportunity to do bird watching. Tourists will be taken to different sites in the community where birds are frequently present. Residents have noticed that many birds visit a particular Lake, and as such it might be one of the sites that tourists can visit to do bird watching.

In the designing of the Wetlands Project, indicators were selected. Some of these indicators may give crucial information for decision-making in Surama's tourism effort.

A. Ecological Systems Data

Using the savannah bird data collected for the Surama Lake by the Wetlands Project answer the following questions.

1. Analyze and simplify this data by using graphs or bar graphs to show, which season or month recorded the highest # of bird species.

2. Which bird species is more abundant in the wet season and dry season

3. What is the # of bird types found in the wet seasons compared to the dry season?

4. Which time of the year is best suited for bird watching for savannah – type birds?

B. Community Cultural System Data

Using the community cultural data for Surama, answer the following questions.

1. What types of jobs are available in this community?

2. Is there a governance structure that can manage this eco-tourism project?

3. Do they have the capacity to facilitate an expansion in tourism? E.g basic structures for accommodation, law enforcement, etc.

4. What king of networking this community has with the outside world that would assist them in their tourism effort?

CULTURAL SYSTEM DATA

SURAMA

Community structure

Characertisitics, organisation and institutions:

Population of 249 with 34 households;
Village Council with 1 Toushau (Annai District), 1 Senior Councilor, 6 Councilors;
Law enforcement via the Police Station in Annai and Village Council, but village also has 1 Regional Constable and 1 Rural and 1 Supernumerary Constables;
One nursery and one primary school;
One health centre – common illnesses include Malaria, Influenza, diarrhoea, vomiting and fever;
One church – the church building is presently under repair so services are being held under the old nursery school;
Additional accommodation and buildings in village includes Eco-Lodge, Eco-Benab, Activity Centre, Resource Centre, Cassava Project, Surama Zoo;
One member of Makushi Research Unit (local women's empowerment group);
Village groups include the Parents Teachers Friends Association (PTFA), Ecotourism Committee, Surama Cassava Project, Church Group, Mother's Union, Blue Paw Filming Group, Wildlife Club, Sewing Group, Sports Club, Fisheries Committee, Agriculture Committee, Development Committee, Youth Group.

Local resources collected, produced and consumed internally

Water – village wells, dug well and rainfall harvesting.

Fish – the table below outlines the fish species caught in the wet and dry seasons, the locations of fishing and the average amount of fish caught per family per month:

	Fish species (local names)	**Fishing locations**	**Average amount caught per family per month (lbs)**
Wet season	Hassar, Amuri, Imehri, Kassi, Dawalu, Satellite fish, Perai, Policeman, Kuyun, Cabidel, Cullet, Butter fish, Skeete, Tiger fish, Haimara, Hassar, Yarrow, Houri. Crab is also harvest seasonally and an occasional	Taramu Creek, Thunder Creek, Surama Creek, Burro Burro River, Surama Lake. Crabs are harvested from Surama Mountain	Between 1-20

	Arapaima		
Dry season	Perai, Houri, Yarrow, Yakatu, Kasi, Kwang, Cullet, Arowana, Fox Fish, Patwa, Hassar, Banjuman, Bushy Mouth, Dare, Haimara, Cabidel, Serebe, Sand Grinder, Alligator Fish, Logo Logo, Satellite Fish, Cullet	Surama Lake, Burro Burro River, Taramu Creek, Surama Creek, Siparsiparu, Surama Pond	Between 10 lbs - 30 lb

Non timber forest products –Nibbi and Mukuru (harvested from within the village).

Land for agriculture - Cassava, Banana, Ground Provision such as Eddo, Dasheen, Greens

Livestock – includes chickens and cattle.

Timber – Simarupa, Shibidan, Angelina Rock, Mora, Wallaba, Bulletwood, Bitter Cedar, Lappenny, Hububalli, Kabakalli. Logging is done in the forested areas surrounding the village and along the road.
Firewood collected as source of energy.

Wild animals for human consumption - Tapir, Labba, Deer, Peccary, Powis, Tinamou. Main hunting grounds are along the Burro Burro River, within NRDDB logging concession and sometimes in the conservation area (this is because people follow the animals into this area).

Wild animals for ecotourism – many animals seen around Rock Landing, Surama Pond, Cassava Project, Surama Mountain, Burro Burro Landing.

Wild animals for the pet trade – songbirds are trapped/collected from around the village on a regular basis.

Resources to make fishing and hunting equipment - bow wood for bows and arrow plant/wildcane for arrows.

Resources for transportation - feet (walking), canoe and paddle.

Resources imported (sourced outside the community)
Sources of energy via solar panels and a generator
Tools for fishing and hunting include hooks, cast nets, seine nets, cutlass, gun.
Tools for agriculture include cutlass, axe, hoe and chainsaw.
Resources for transportation include bicycles, motor bike, vehicle, outboard engine and boat.
Equipment for trapping birds include bird nets and trapping cages.

Resources exported
Hammocks made from cotton grown on farms.
Farine and other extra produce sold to community members and other villages, Rockview, and Iwokrama.
Fish surplus sold to villagers.
Song birds
Handicrafts

Culture
Makushi, Wapishiana, Arawak, Indo-Guyanese.

Land tenure
Titled under the Annai Amerindian District.

Community processes
Governance
There are monthly village meetings at which village issues are discussed with the senior council and village councillors. There are also Annai district meetings to discuss issues relating to the village and the district. The various groups also conduct meetings on a needs basis to discuss issues pertaining to their respective interest.

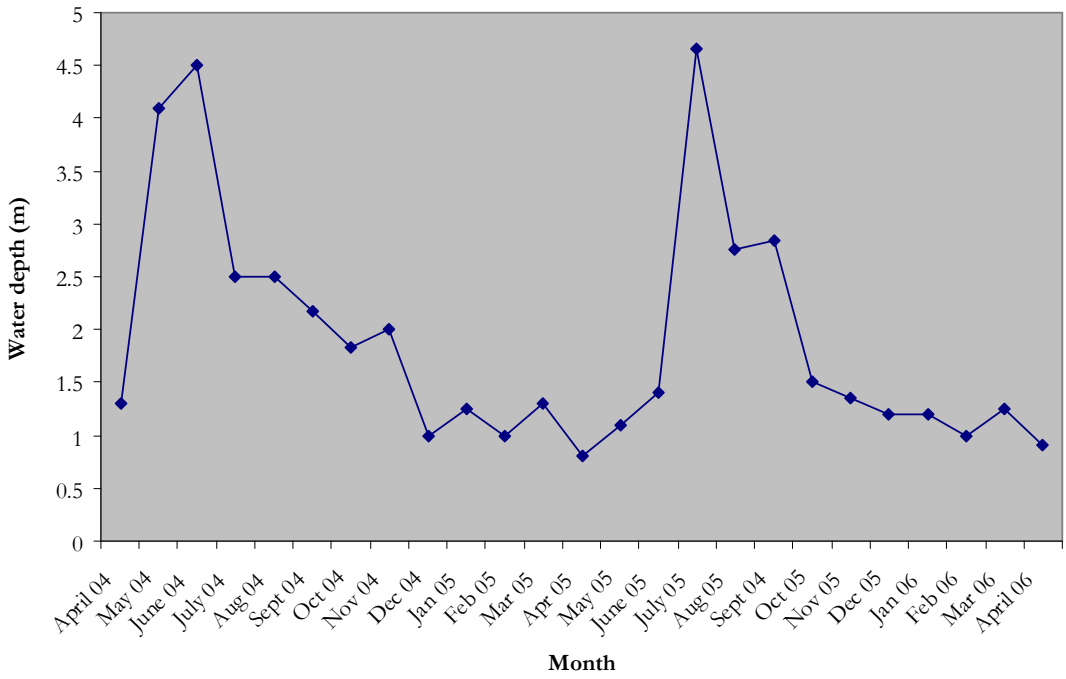
Communication
Communication takes place through HF Radio (Freq 5300), Radio Paiwomak, e-mail and a satellite phone.
Natural resource activities
Activities contributing to local livelihoods include fishing, hunting, gathering, farming, tourism (guiding), subsistence timber harvesting, logging (Makushi Yemeken Coorporative), small scale cattle rearing, handicraft making, Sewing Group, Agriculture/Cassava Project and Activity Centre.

External linked activities
Government jobs (teacher, health worker), shop keeping, Iwokrama jobs, Bina Hill jobs, Rockview jobs, selling at markets, wildlife/nature filming, Canopy Walkway, Medeci Mining Company Ferry Crossing and Road Construction jobs.

ECOLOGICAL SYSTEM DATA : Surama Lake

Physical features and human activity
This lake located on 21 N273800 UTM 459050, is found approximately 4000 m in an easterly direction from the Surama Cassava Project Center. It is a permanent pond which is separate from the main river. The area around the pond is mostly flooded forest, with Palms and Lanas growing along the water's edge, and Moco Moco growing in the lake. The water in the lake alternates between brown, during the low water season and white, during the high water season of the year, and it comes from direct rain fall, rain water draining into the lake, flooding from the river and ground water discharge. The average dimension of the waterbody is a width of 270 m and a length of 300 m. The flooding regime indicated by

water depth is shown below. The banks of this lake have been labelled as east and west. Both banks have a gentle inclination and is vegetated with no erosion occurring. The east bank is made of a combination of sticky clay and gravel and sand while the west bank is made of sticky only. The vegetation on the east bank is continuous, with underwater tree roots being present during the high water season. On the west bank, these two features are also present but there is also the presence of exposed bank side roots. On the east bank there are shrubs and trees and saplings. While on the west bank there are bryophytes, tall herbs and grasses and climbers. The vegetation at this site is emergent and submerged. The bottom of the pond is mud.



Water depth (m) in *Surama Lake* over the monitoring period

Major human activities in this area include: fishing for home use and for selling, hunting, farming without pesticides, settlement, tourism activities, transportation, scientific research and local recreation.

Bird profile

Wetland habitat birds seen at *Surama Lake* over the monitoring period

Bird species	F	AI	TI	V	A	Habitat	04 Wet Season	04-05 Dry Season	05 Wet Season	05-06 Dry Season
Yellow-rumped			√	√		RI, LF, HU	2	27	136	40

Cacique										
Neotropic Cormorant	√					FW, RI	7	29	10	3
White-winged swallow			√			RI, FW	0	10	19	18
Greater Ani		√	√			RI, MN, FW	14	3	26	0
Striated Heron	√	√				FW, MN, RI	8	9	10	5
Red-capped Cardinal			√	√		RI, SC	1	14	4	5
Ringed Kingfisher	√					RI, FW, MN	3	8	7	4
Great Egret	√	√				MU, FW	4	8	0	5
Wood Stork	√	√				FW	0	14	0	0
Muscovy Duck		√		√		FW, RI	0	6	0	8
Cocoi Heron	√	√				FW, RI	1	5	3	5
Limpkin		√				FW	0	2	0	9
Anhinga	√					FW, RI	0	4	1	5
Sungrebe		√				FW, RI	1	4	3	2
Lesser Kiskadee	√	√	√	√	√	FW, RI	0	7	1	1
Wattled Jacana		√				FW	0	5	0	3
Amazon Kingfisher	√					RI, FW, MN	0	5	1	2
Green Kingfisher	√					RI, FW, MN	0	3	2	2
Southern Lapwing			√			FW, HU, SV	0	4	0	2
Solitary Sandpiper		√				FW, RI	0	6	0	0
Rufescent Tiger Heron	√	√				FW	0	3	1	1
Black Caracara			√	√		RI, LF, SC	0	5	0	0
Capped Heron	√	√				FW, RI	0	4	0	0
Black-collared Hawk	√	√				FW, RI	0	2	0	2
Fasciated Tiger-Heron	√	√				RI	4	0	0	0
Pied Lapwing		√				RI	0	4	0	0
Pygmy Kingfisher	√					RI, LF, FW	0	4	0	0
Jabiru	√	√				FW	0	2	0	1
Grey-necked Wood Rail		√		√		FW, MN	0	2	1	0
Green-and-rufous Kingfisher	√					RI, FW, LF	1	2	0	0
Yellow-chinned		√	√			FW, SC	0	0	1	1

Spinetail										
Black Skimmer	√	√				MA, MU, RI	0	1	0	1
Sunbittern		√				RI, LF	0	1	0	1
Swallow-winged Puffbird			√			RI, SC, LF	2	0	0	0
Black-crowned Night Heron	√	√				FW, MU	0	1	0	0
Great Blue Heron	√	√				FW, RI	1	0	0	0
Osprey	√					MA, FW, RI	0	1	0	0
Yellow-billed Tern	√					RI, FW	0	1	0	0
Large-billed Tern	√					RI, FW	0	1	0	0

Savanna habitat birds seen at *Surama Lake* over the monitoring period

Bird species	**F**	**AI**	**TI**	**V**	**A**	**Habitat**	**04 Wet Season**	**04-05 Dry Season**	**05 Wet Season**	**05-06 Dry Season**
Pale-vented Pigeon				√		SC, SV, RI	7	71	7	6
Eared Dove				√		SC, HU, SV	0	64	0	0
Brown-throated Parakeet				√		SV, SC	13	8	16	0
Tropical Kingbird		√	√			SC, HU, SV	8	10	9	8
Smooth-billed Ani			√	√		SC, HU	10	8	1	0
Yellow-crowned Parrot				√		SV, SC	12	0	0	0
Black Vulture				√	√	SC, HU	4	3	0	3
Fork-tailed Flycatcher			√	√		SV, HU, SC	3	6	0	0
Sulphury Flycatcher			√	√		PA	7	0	0	0
Red-bellied Macaw				√		PA, SV	7	0	0	0
Silver-Beaked Tanager				√		SC, HU	4	3	0	0
Ruddy Ground-Dove				√		SC, HU	0	0	0	5
Blue-and-yellow Macaw				√		PA, LF, RI	0	0	4	0
Blue-and-white			√			SC, HU	3	0	0	0

Swallow										
Crested Caracara			√	√	√	SV, HU, SC	2	1	0	0
Savannah Hawk					√	SV, SC	1	1	0	1
Yellow-headed Caracara			√	√	√	SV, SC, HU	2	1	0	0
Blue-Gray Tanager				√		SC, HU	0	2	0	0
Chestnut bellied Seed-Finch				√		SC, HU, LF	2	0	0	0
Maguari Stork	√	√				SV, HU, FW	0	0	0	2
White-tipped Dove				√		SC	1	0	0	0
Gray Hawk					√	SC, HU	1	0	0	0
Lesser Yellow-headed Vulture				√	√	SV, SC, FW	0	1	0	0

Forest habitat birds seen at *Surama Lake* over the monitoring period

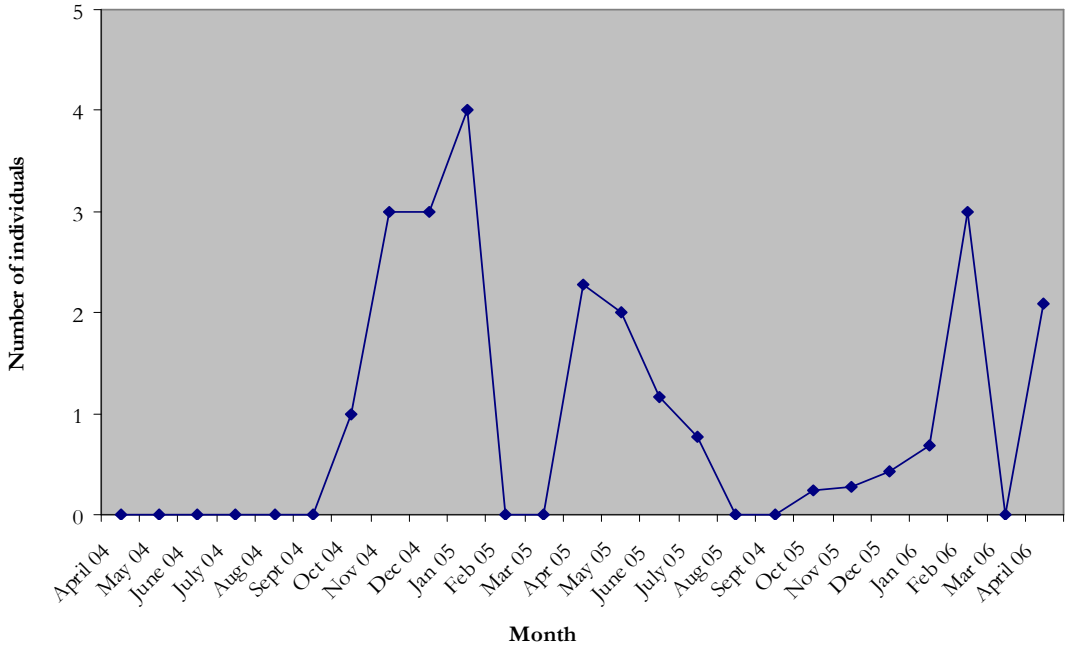
Bird species	**F**	**AI**	**TI**	**V**	**A**	**Habitat**	**04 Wet Season**	**04-05 Dry Season**	**05 Wet Season**	**05-06 Dry Season**
Giant Cowbird			√	√		LF, SC, HU	20	33	3	0
Green Ibis		√				LF, RI	2	11	1	36
Orange-winged Parrot				√		LF, SC	18	8	7	17
Red-and-green Macaw				√		LF	11	16	10	10
Green Oropendola				√		LF, MF	25	1	0	0
Red Billed Toucan				√		LF	7	6	4	8
Blue-headed Parrot				√		LF	12	5	0	0
Ruddy Pigeon				√		LF, MF	16	0	0	0
Dusky Parrot				√		LF	4	8	2	0
Red-rumped Cacique			√	√		LF	2	9	1	0
Crested Oropendola				√		LF	1	3	3	5
Scarlet Macaw				√		LF	0	4	4	0
Mealy Parrot				√		LF	2	0	6	0
Green-tailed Jacamar			√			LF, SC	5	2	0	0
Channel-billed Toucan				√		LF	5	1	0	0

Little Chachalaca			√	√		LF, SC	5	0	0	1
Golden-winged Parakeet				√		LF	4	0	0	0
Red-fan Parrot				√		LF	0	0	4	0
Amazonian White-tailed Trogon			√	√		LF	1	1	1	0
Red-throated Caracara			√	√		LF	2	0	0	0
Black-headed Parrot				√		LF	0	2	0	0
Black Curassow				√		LF, MF	1	0	0	1
Blue Ground-Dove				√		LF, SC	0	2	0	0
Great Tinamou			√	√		LF	0	1	0	0
Variegated Tinamou			√	√		LF	0	0	0	1
Spix's Guan				√		LF	0	0	1	0
Thrush-like Mourner			√	√		LF, MF	1	0	0	0
Oil Bird				√		LF, MF	0	1	0	0
Laughing Falcon					√	LF, SC	0	0	1	0

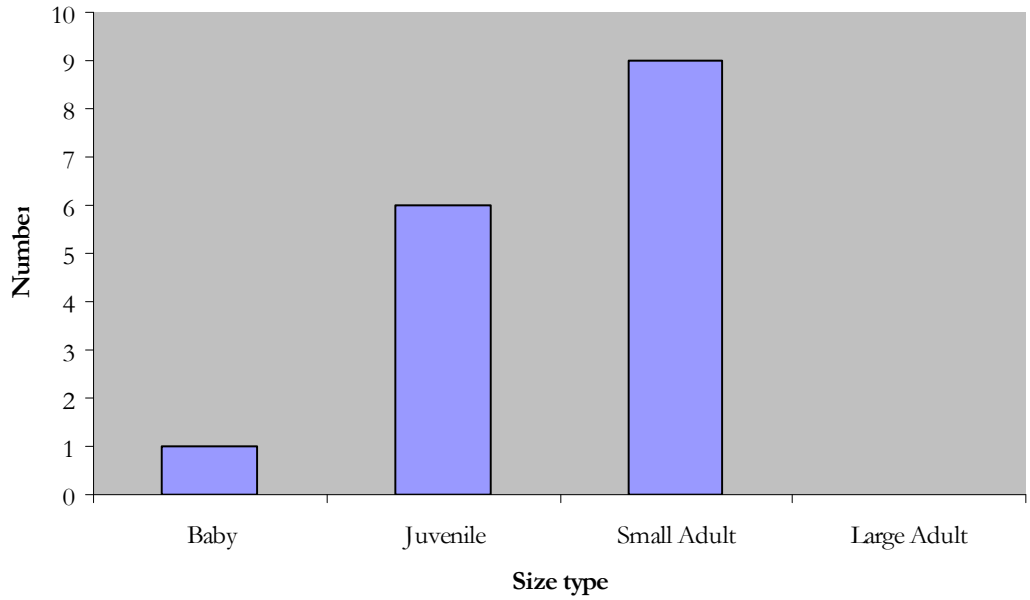
Human altered habitat birds seen at *Surama Lake* over the monitoring period

Bird species	**F**	**AI**	**TI**	**V**	**A**	**Habitat**	**04 Wet Season**	**04-05 Dry Season**	**05 Wet Season**	**05-06 Dry Season**
Great Kiskadee	√	√	√	√	√	HU, SC, MN	4	8	10	17
Rusty-margined Flycatcher			√	√		HU, SC, RI	0	0	16	20
Roadside Hawk			√		√	HU, SC	2	0	0	1
Gray-breastedartin			√			HU, SC	0	3	0	0
Cattle Egret	√	√				HU	1	0	0	1
Pale-breasted Thrush			√			HU, SC	1	0	0	0

Caiman



Black caiman numbers in *Surama Lake* over the monitoring period

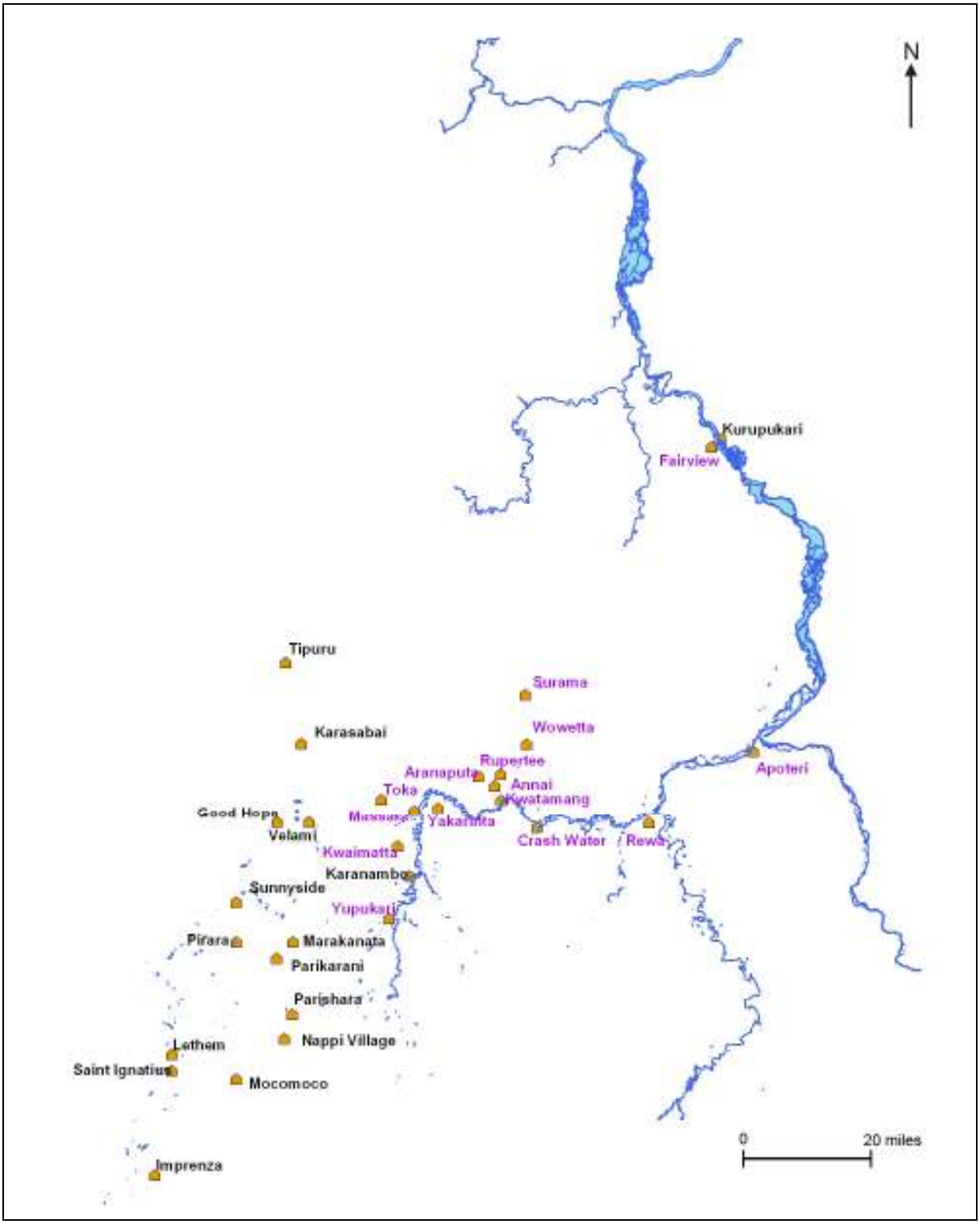


Different size types of black caiman found in *Surama Lake*

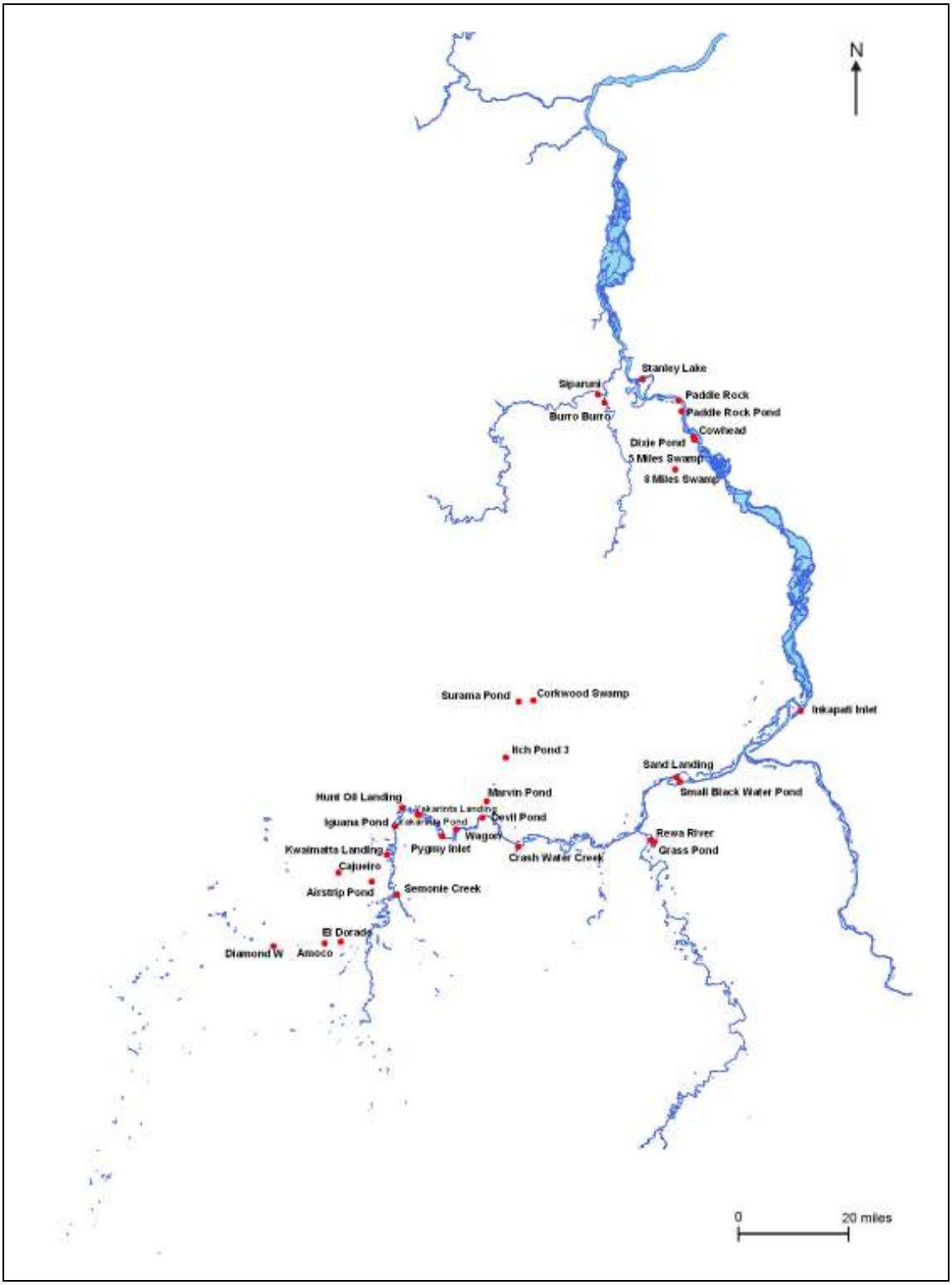
Spectacled caiman also present in this site.

Giant river otters

Giant river otters were not found at this site.



Map 1: showing the villages of the North Rupununi – the villages highlighted in pink are the official villages which form part of the North Rupununi District Development Board and the sites for social monitoring in the North Rupununi Wetlands.



Map 2 : showing the sites of ecological monitoring in the North Rupununi Wetlands

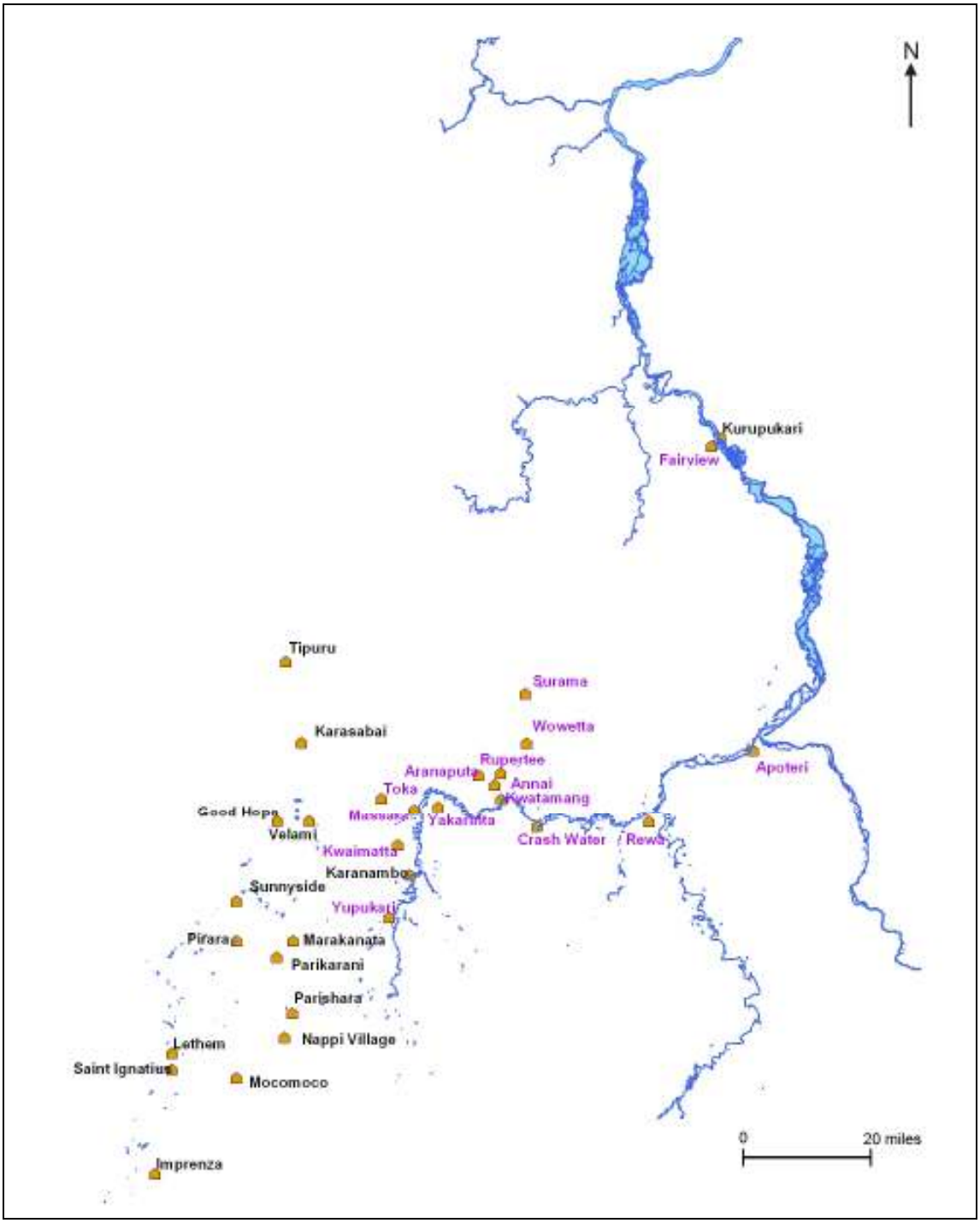


Figure 3 – Map showing the villages of the North Rupununi – the villages highlighted in pink are the official villages which form part of the North Rupununi District Development Board and the sites for social monitoring in the North Rupununi Wetlands

PAPER-BASED GIS (Geographic Information System)

A GIS is mapping software that links information about where things are with information about what things are like. Unlike a paper map, where "what you see is what you get", a GIS map can combine many layers of information (ESRI, 2003). A GIS is a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information; that is, data identified according to location.

EXAMPLE

In the picture above, 9 villages dominated by Marind people, all have same language, history and share 3 major rivers for living. Some of them are farmers, which already knew how to cultivate; some of them still gain resource from nature.

To get landuse zone, a community workshop was conducted in every village. Landuse zones were draw by local communities in a sketch map based on local knowledge. During the workshop they were also discussions, about local importance for each traditional landuse drawn in sketch map. In developing their maps by sketch, the communities started with the river, which is most important part of their lives. After that they drew watershed area, various type of forest and important area highlighted by their own symbols. (*www.geografiana.com/makalah/sosial/participatory-**gis**-identified-local-landuse-zoning-conservation-merauke.)*

SESSION 3.3: STAKEHOLDER ENGAGEMENT

Topics to be Covered:

- knowledge of different stakeholder interests, values and power relations,

Skills Developed:

oral and written communication, listening, effective conflict negotiation techniques, group work and participation

Duration of session: - 3 hours

Resource Sheets for session:

- NRAMP Stakeholder Engagement Process
- Conflict Resolution
- Natural Resource Conflict Management
- Conflict Scenarios

NRAMP: Ranger/Environmental Officer Course, November, 2007

SESSION PLAN 3.3: STAKEHOLDER ENGAGEMENT

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will be divided into different groups to represent different stakeholders ***10 mins*** - Each group will be given a fact sheet with information not known to each other - Students will role play to identify problems and opportunities in solving a natural resource management conflict. ***1 hr, 50 mins***	Basic stationery Exercise books, pens, pencils etc.	-Role playing -Brainstorming for ideas - group work	Trainer will introduce topic by explaining the concept of conflict and resolution. ***45 mins*** Trainer will monitor conflict resolution session/role play and initiate discussions among students Wrap up and handover for next session ***10 mins***

NRAMP: STAKEHOLDER ENGAGEMENT PROGRESS

Engaging with a range of stakeholders with an interest in the North Rupununi wetlands was a core activity in the project (see Table 5 for list of stakeholders). This helped to understand who the stakeholders were, their levels of power, their relationships to and with one another, as well as identifying decision-making structures, the processes of decision making and the location of key resource personnel. This was done through a number of ways and included:

1) Regular one to one meetings with stakeholders to discuss particular stakeholder issues;

2) A regular project bulletin to keep stakeholders up to date with project activities and outputs;

3) A stakeholder forum which brought together all the stakeholders face to face for a workshop to identify problems and opportunities;

4) An in-depth study to look at institutional structures for wetland biodiversity conservation in Guyana. This was in the form of a Masters thesis by a University of Guyana staff member seconded to the project.

Table 5 – ***List of North Rupununi wetlands stakeholders in Guyana that were consulted during the project***

North Rupununi District Development Board
Fifteen communities of the North Rupununi
Iwokrama International Centre
Environmental Protection Agency
University of Guyana
Conservation International – Guyana
World Wildlife Fund – Guyana
Wildlife Division – Government of Guyana
Fisheries Division – Government of Guyana
Flora and Fauna International – Guyana
Amerindian Peoples Association
Karanambu Trust
Ministry of Amerindian Affairs – Government of Guyana
Guyana Forestry Commission

One of the main outcomes of these stakeholder consultations was the ***unanimous agreement*** between the different stakeholders that the ***North Rupununi District Development Board (NRDDB) and the local communities should have the central role of management and governance of the wetlands in the North Rupununi.*** Other stakeholders, such as the **Iwokrama International Centre** and the **Environmental Protection Agency** would play a supportive, advisory role. Lack of resources (human, technical and financial) is the main problem for these institutions for the day to day management of the wetlands.

More focused consultations with the NRDDB and local communities identified livelihood sustainability and security, economic activities and increased education and awareness of wetlands as some of the benefits that could come out of the North Rupununi wetlands project and the development of NRAMP. In addition, they identified the need for more information on the wetland cultural-ecological system such as wetland functioning and land use and ownership. The aspect of education, awareness raising and further capacity building were particular issues identified by all the stakeholders. Boxes 4 and 5 illustrate the detailed feedback given by the different stakeholder groups.

Over the course of the project, the Ministry of Amerindian Affairs has also been involved in developing guidelines for community based natural resource management in the North Rupununi. This has led to the proposed establishment of a natural resources management unit in the North Rupununi called the Payakîîta Resource Management Unit (PRMU) which will be linked to the existing NRDDB by virtue of a shared chair. An important point to note here is that the PRMU specifically focuses on supporting decision making within the titled communities of the North Rupununi.

The area covered by these communities is only an extremely small fraction of the North Rupununi Wetlands which includes the catchments of the Rupununi, Burro Burro, Siparuni and Essequibo rivers. Also, there are a much wider range of stakeholders involved in the management of the North Rupununi Wetlands, including non-titled Amerindian communities within the North Rupununi region, Iwokrama International Centre, Karanambo Trust, Conservation International and the communities living in the South Rupununi who can have a significant impact on the Rupununi River downstream if they put into place major land use changes. Thus NRAMP focuses on a much greater scale and greater mix of stakeholders than PRMU. However, all stakeholders, but particularly the NRDDB and local communities recognise the need to coordinate PRMU requirements and outputs with the outputs of the North Rupununi wetland project.

CONFLICT RESOLUTION

Wherever people with different interests, skills and experiences work together, there is potential for conflicts. Many fear conflict as they regard it as uncomfortable and destabilising. However, when conflicts have been identified and clearly stated at an early stage, there is the chance of positive conflict management and also resolution. But when there is no awareness that conflict is brewing (or no one feels responsible to deal with it), it can become destructive and break a group apart.

In the context of co-managing natural resources, conflicts are likely to arise and may quickly become bitter. This is because access to and use of resources can be a vital requirement for the stakeholders involved - so much so that they would defend it by all possible means. Thus participants of such processes have to be particularly aware of conflicts and their causes as well as of viable strategies (both traditional and alternative) - to deal with conflicts.

"Conflict is normal" as an entry point for discussion about conflicts:
Conflict can be an important force for positive change. It can usually be managed to allow people to express their views fully and peacefully. Underlying or latent conflicts **should not be avoided.**

What is Conflict? Conflict is a state of opposition or disagreement. A state of opposition between persons or ideas or interests. There are several types of conflicts:

- Intergroup Conflicts
- Family Conflicts
- Interpersonal Conflict

DEVELOPING A STRATEGY FOR CONFLICT RESOLUTION

a. Identification of stakeholders
b. Stakeholder assessment

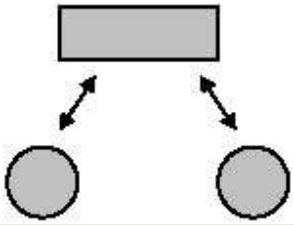
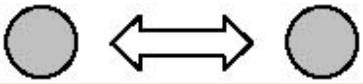
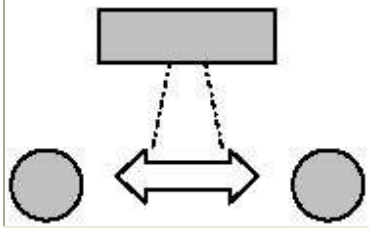
After an assessment of stakeholders has been made and a draft analysis of the conflict has taken place, a strategy for conflict resolution can be developed.

POWER BUILDING TACTICS

- Strengthen Local Organisations
- Develop Common Vision and Goals
- Bring Forward Sound Information
- Introduce New Actors (NGOs, Media, Technical Experts)
- Work towards Transparency
- Democratise the Process

- Create Opportunities for Leadership
- Reinforce Local Traditions
- Educate People about their Rights, Responsibilities and Obligations.

"Different forms of Conflict Negotiation":

Conciliation is an..... 	· attempt by a neutral third party to communicate separately with disputing parties for the purpose of reducing tensions and agreeing upon a process for resolving the dispute
Negotiation is a..... 	· voluntary process in which parties meet face to face to reach a mutually acceptable resolution of the issue
Mediation is the..... 	· assistance of a neutral third party to a negotiation process. mediators have no power to render a decision

Review of Conflict

- What are the central issues to this conflict?
- Who is involved?
- What kind of outcome do I hope to achieve?
- Which Resolution Method would best help me to reach that objective?
- What are the potential outcomes with that method?
- The Best Outcome
- Minimal Outcome
- The Worst Outcome

NATURAL RESOURCE CONFLICT MANAGEMENT AND RESOLUTION

Natural resource conflicts are disagreements and disputes over access to, and control and use of, natural resources. These conflicts often emerge because people have different uses for resources such as forests, water, pastures and land, or want to manage them in different ways. Disagreement also arise when these interest and needs are incompatible, or when the priorities of some user groups are not considered in policies, programmes and projects. Such conflicts of interest occur in all societies.
Conflicts will always occur to some degree in every community, but it can often be managed and resolved. Most conflicts are characterised by the presence of multiple stakeholders who themselves may have subgroups with varying interests.

Conflicts manifest themselves in many ways, ranging from breaking rules to acts of sabotage and violence. Sometimes conflicts remain hidden and latent. People may allow grievance to smoulder (burn) because of fear, distrust, peer pressure, financial constraints, exclusion from certain conflict resolution procedures, or for strategic reasons.

Scenario 1

A government created a protected area because of its high biological diversity and historical significance. National authorities collaborated with several international conservation agencies to develop a management plan that proposed banning cultivation in the area, despite the presence of farming communities. The local people did not find out about the plan until it was finalized. Residents voiced, but were ignored by the government.

Scenario 2

An environmental permit was granted to a developer to construct and operate a beverage factory. Despite serious issues raised by the community in which the factory was going to erected, plans went ahead as planned. Several months after the commencement of activities at the factory, there was an outbreak of skin infections and dysentery. According to residents in the area, these illnesses were cause by effluents from the factory polluting the water and air. While most of the community were in support of the factory activities being halt, there were those who disagreed, since the factory provided a means of livelihood for them and their families.

Scenario 3 (NRAMP: Ranger/Environmental Officer Course November, 2007)

Surama and Wowetta are two Amerindian villages found in close proximity to each other in the North Rupununi. Surama is a highly forested area, while Wowetta is more or less savannah. Wowetta had embarked on a eco-tourism project which involves viewing of the

Cock – of-the-rock (a bird), in its natural habitat. Surama has a thriving sustainable logging initiative and shares its boundaries with that of Wowetta. Conflict arose when members from the logging company cut transect lines with in the area where the birds nest.

HOW TO CONDUCT THIS SESSION?

Clearly understand and outline the scenario to your students. Scenarios should not be limited to those mentioned above. Facilitator can design a scenario to suit the ability of and situations surrounding their students. These scenarios can be generated from resource maps created by the students.

1. Room setting must be accommodative of discussions.
2. Divide the class into sections, representative of every stakeholder (community, political or non-governmental based) e;g EPA, Iwokrama, MOAA, CI, Toushaus, e,t.c.
3. To make the discussions interesting, give each group other support information that is not know to the other groups.
4. Allow for discussions amongst stakeholders and guide the conflict resolution process.
5. Have major stakeholders state their problems and what they think they need for the situation to be resolved.
6. Listen to the comments of other stakeholders and initiate comments and responses when necessary.
7. At the end of the session, facilitator should have outlined the issues, causes of the conflict, and recommended plan of action for resolution.

Reference

- Castro, Peter, etal; Conflict and Natural Resource Management, © FAO 2000.

SESSION 3.4: MODULE EVALUATION

Topics to be Covered: - Individual, Facilitator and Course Evaluations

Knowledge developed: Understand basic concepts of evaluation and reflection.

Skills Developed: Reflection, Critical awareness, written communication

Duration of Session - 45 min

Resource Sheets for Lesson: -

- EO/Ranger Course Evaluation Form
- What is Evaluation (Session 1.1)
- How to be a good listener (Session 1.1)
- What does reflection mean? (session 1.1)

SESSION PLAN 3.4: MODULE EVALUATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will complete an entry into their reflective diary and daily evaluation form ***15 mins*** - Students will also post views on the graffiti board ***10 mins***	Basic Stationery Exercise book, pens, pencils, graffiti board, chalk, markers	Individual Reflection and critical analysis of information gathered and learnt for that day	Trainer will explain concepts of reflection, critical analysis and evaluation. ***15 mins*** Wrap up for the day ***5 mins***

MODULE 4: PLANNING AND ACTING

SESSION 4.1: RECAP SESSION & PLAN FOR MODULE 4

Topics to be covered:

- Review of key concepts and ideas
- Plan for the day

Knowledge Developed: Understand the key concepts and ideas from previous session

Skills Developed: oral and written communication, reflection and listening

Duration of Session: 45 min

Resource sheets for session

Session Plan
Agenda for Module 4

SESSION PLAN 4.1: RECAP SESSION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will work in pairs to list five most important points from the day before. ***10 mins*** - The entire class share and discus the most important points of the previous day. ***10 mins*** - Students will assessed on work done in Module 1 ***25 mins***	Basic Stationery Exercise books, pens, pencils,	Group work, class discussion, lecture	Trainer will outline plan for the day. Trainer should stress the the importance of - planning before starting an activity - making observations throughout the day and recording them - participants to be reflective learners ***15 mins***

MODULE 4 AGENDA

8:00	Recap and Plan of Day
9:00	Log Frame Production
11:00	Break
11:15	Log Frame Production
12:20	Lunch
13:15	Log Frame Production
14:20	Break
14:35	Monitoring Action
15:30	Evaluation
16: 15	Wrap Up

SESSION 4.2: LOGFRAME PRODUCTION

Topics to be covered:

- Understanding concepts of planning goals
- aims, outputs, activities,
- assumptions, indicators and responsibilities

Knowledge developed:

Understanding concepts of log-frame production.

Skills Developed:

oral communication, critical awareness, holistic thinking, and project development skills

Duration of Lesson: - 4 hours

Resource Sheets for Lesson:

- How to produce a Log-frame
- Sample 6: Log-frame

SESSION PLAN 4.2: LOGFRAME PRODUCTION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will be divided into groups and would be given a simplified proposal of a conservation management project. -Each group will produce log frame for the proposal ***3 hrs***	Flip chart sheets, markers, Colored chalk. - Computer - basic stationery, exercise books, pens, pencils etc	- group working - class discussions Explanation of key terms	Trainer will introduce topic by explaining the importance of log frame. ***15 mins*** Trainer will outline structure of log frame and its components. ***30 mins***

HOW TO PRODUCE A LOGFRAME

The planning technique proposed in this section, the **log frame,** supports stakeholders in thinking through the different aspects of action plans. These aspects include the overall goal, the associated outputs and activities, the responsibilities and the necessary resources. Developing a logframe also involves an element of negotiation to arrive at a consensus
Below is an example of a log frame and the following explains the main aspects:

1) **Goal** – this is the overall goal or vision for the project.

2**) Aims** – these are the aims or purpose of the project. There may be one or several aims.

3) **Outputs** – these reflect what will be produced by the project to achieve the aims.

4) **Measurable indicators** – these will show whether or not aims/outputs have been achieved. Each indicator should relate to an explicit aim/output, be measurable and can be qualitative or quantitative. *See 'Indicators' resource sheet for more details.*

5) **Means of verification** - once indicators have been developed, the source of the information and means of collection (means of verification-MOV) should be established for each indicator. A MOV should test whether or not an indicator can be realistically measured at the expense of a reasonable amount of time, money and effort.

6) **Activities** – list the activities that will be undertaken to achieve each output. For each of these activities, indicate who will carry out the activity (this could be a group of people or named individuals) and the period during which the activity will be carried out.

Project summary	**Measurable indicators**	**Means of verification**
Goal:		
Insert the overall goal of the project		
Aims:		
Insert the aims that will help to achieve the overall goal	*Insert the indicators that will represent the aims*	*Insert the proof or evidence that will be given to confirm that the aims have been achieved*
Output 1. (*insert outputs with activities relevant to that outputs in lines below*)	*Insert the indicators that will represent the outputs*	*Insert the proof or evidence that will be given to confirm that the outputs have been achieved*
Activity 1.1 (*insert activities relevant to this out put*)	*Insert who will carry out this activity and when*	
Activity 1.2, etc		
Output 2.	*Insert the indicators that will represent the outputs*	*Insert the proof or evidence that will be given to confirm that the outputs have been achieved*
Activity 2.1.	*Insert who will carry out this activity and when*	

SAMPLE LOG-FRAME

PROJECT SUMMARY	MEASURABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
GOAL: Manage biological resource for conservation and sustainable use through public awareness and training. - Protection of the eco-systems and natural habitats. - Promote and encourage research, which can contribute to conservation and sustainable use of biodiversity.			
PURPOSE			
To build capacity of stakeholders at both local and national level in the implementations of NRAMP	●Increase training in Biodiversity monitoring and management. ●Promote sustainable livelihood schemes such as eco-tourism.	Publish biodiversity monitoring field manuals Adaptive Management Plan	Work closely with partners for a successful completion For all training.
Output 1	***Community wetland monitoring and eco-tourism course***		
Training of community members	Ability to share skills, experiences and knowledge within the community	Monitoring by wildlife clubs and village environmental officers.	Full cooperation from NRDDB, Ministry of Education and the Ministry of Amerindian Affairs.
Activities	The ability for local community to sustain livelihood activities such as eco-tourism		
-Workshops/Training	Identify activities that will generate an income Start up money will be facilitated through earth watch expedition schemes.		
Output 2	***Wetland monitoring and management ranger environmental officer course***		
	Short course	Determine the number of successful participants	
Activities Community Workshop and Trainings	Project team to plan the workshop; develop training programme materials, stakeholder workshop. (duration – 1 week)		

Output 3	***Wetland biodiversity primary school teacher and student packs***		
	Materials to be thought in Schools.	Surveys to be carried out in school to verify to knowledge of students.	Curriculum adopted by the Ministry of Education.
Activities Development of training material	Materials will be developed in consultation with relevant stakeholders offices of the Ministry of Education and the Ministry of Amerindian Affairs. (Duration 14th Nov.-30th Dec.2007)		
Output 4	***Sustainable management of wetland biodiversity university postgraduate course***		
	Identify if the course is presently being offered at the U.G	Collect data on number of students participating in the course	
Activity Development of course materials	Developed course materials to be included in the existing masters course or biodiversity professionals		
Output 5	***NRAMP Impact Assessment Report***		
	Provide information on resource and capacity requirements for implementation of NRAMP.	Report will be accessible on the internet	
Activity Development of NRAMP Impact Assessment Report	Developing report for the NRAMP Impact Assessment along with NRDDB, technical assistance from Government and consultation with Communities		
Output 6	***Publications and Presentations***		
	Journals to be published at an international level to promote findings.	Permanent wetlands exhibition centre to be establish at BHI/NRDDB headquarters and a similar exhibition at IIC Field Station.	NRDDB/ BHI and IIC has benefited from access to the material.
ActivityPublications and presentations	Public awareness programme through radio, television and newspapers at the local, national and international level.		

Prepared by: Samantha Heyliger, Paulette Torres, Ricky Moses, Gary Sway, Nigel John **– REO Training, November 2007**

SESSION 4.3: MONITORING ACTION – (LOG FRAME)

Topics to be Covered:

- Understanding concepts of planning goals, aims, outputs, activities, assumptions, indicators and responsibilities

Knowledge developed: Understanding concepts monitoring action..

Skills Developed: oral communication, critical awareness, holistic thinking, and project development skills

Duration of session: - 1hour

Resource Sheets for Lesson: -

- Log frame of project proposal
- Implementation of the Plan
- Monitoring Action

SESSION PLAN 4.3: (MONITORING ACTION (LOGFRAME)

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
After each group produces their log frame for the proposal, the entire class will discuss on log frame contents and monitoring action ***1 hour***	-lip chart sheets, markers, colored chalk. - basic stationery, exercise books, pens, pencils etc	- group working - class discussions Explanation of key terms	Trainer will monitor and guide log frame production of the groups. Trainer will explain importance and components of implementation. ***15 mins*** Trainer can create a scenario for students to analyze e.g. over spending budget

PLAN IMPLEMENTATION

To implement the plan requires careful management and co-ordination of effort. Management of resources such as, people, money, materials, energy, space and communication needs to occur to ensure successful implementation of the plan.
Many plans fail because they are not fully implemented. This can be because insufficient thought, during the development of the plan, was given to how it will operate and be managed, and because successful management tools were not adopted. The following sections describe a series of management tools and approaches to assist in management plan implementation.

PLAN MANAGEMENT

Initially it is important to determine the management structures required to implement a plan. A simplified management structure is proposed for the delivery of a plan to manage and assess changes to wetland health.
Level 1 - Plan Steering Committee – The role of this body is to oversee plan implementation, assess the quality of outputs, agree annual budgets and resourcing and appoint a plan manager. This committee should not get involved in day-to-day management issues. A steering committee can be made up of stakeholders, management board of an organization or community representatives.
Level 2 – Plan/Project Manager – This individual is responsible for the delivery of the plan on time, to budget and to the satisfaction of the steering committee. They are responsible for the day-to-day decisions, financial management, reporting, staff management and communication. They should report directly to the steering committee.
Level 3 – Plan/Project Staff – These individuals are responsible for assisting the project manager in implementation of the plan including the appropriate reporting and communication. They should report directly to the project manager.

PROJECT MANGER'S DUTIES

There are a variety of tasks a project manager has to undertake and take responsibility for to ensure successful delivery of a plan. The principle tasks include:

Duty	Description
Implementation Workplan	Development of a comprehensive workplan that describes clear objectives, responsibilities, time allocations and dates of delivery. The plan should include a Gantt chart (Gantt charts illustrate the start and finish dates of critical plan activities in the form of a bar chart).
Staff management	Ensuring all staff is briefed on the overall plan goal, their individual role within the workplan, fieldwork requirements, reporting

	contribution and timetable for delivery. Providing regular assessment of staff performance and feedback to staff.
Plan management meetings	Setting up and running initial start up meeting with all staff, implementing regular team meetings to coordinate project delivery and regular individual staff meetings to discuss performance.
Financial management	Tracking the amount of time used by staff and cross-checking it with the budget allocation, informing staff of the amount of time they have for allocated tasks, tracking project expenditure, including expenses and purchases, to ensure plan remains within budget.
Reporting	Regular reporting to the steering committee and stakeholders of plan implementation progress against the workplan, financial situation and any other management issues such as staff resourcing.
Liaising with the steering committee and other stakeholders	Establishing a clear line of contact with the steering committee, keeping the steering committee informed through regular contact and meetings and alerting the steering committee immediately to any fundamental changes in the work programme.
Planning field work	Coordinating any field work, organizing and fully instructing staff, ensuring access is permitted and keeping fieldwork records.
Managing paper files	Ensuring that all plan documentation is correctly filed and coordinating the storage of documents in one single location.
Managing electronic files	Ensuring that all project electronic files are correctly stored and named, tidying up folders and files into appropriate locations.
Report preparation	Planning, supervising and checking of reports and outputs, instructing staff clearly over their reporting requirements, ensuring all reports and outputs are checked prior to issue.
Equipment	Ensuring that any required equipment is purchased on time, checking that any equipment used is returned correctly in an appropriate condition.
Health & Safety	Ensuring all staff are informed of Health & Safety issues, making sure that staff have completed relevant risk assessments.

MEETING AND REPORTING SCHEDULE

Meetings and reporting are valuable communication tools within plan implementation. Informal communication is also important but formal communication strategies are essential if successful delivery of the plan is to be achieved.

The meeting and reporting schedule should be agreed between the steering committee and project manager before the plan is implemented. The exact schedule is determined by the scope, time and cost of the plan. However, a suggested approach is as follows:

MEETINGS

Meeting	Attendees	Timing	Scope of meeting
Steering committee meeting	Steering committee and project manager	Quarterly	Project manager reports progress to the committee on plan progress and financial situation
Plan start-up meeting	Project manager and all staff	Start of plan implementation	Introduction to overall plan goal, staff role within the workplan, fieldwork requirements, reporting contribution and timetable for delivery
Plan management meetings	Project manager and all staff	Monthly	Review of plan progress against workplan and discussion of any management issues
Diary meeting	Project manager and all staff	Weekly	Review of staff location and priorities for coming week
Staff individual meetings	Project manager and individual staff	Monthly	Review of staff performance with positive feedback

REPORTING

Report	Sent to	Timing	Scope of report
Regular progress report	Steering committee	Monthly	1 page report describing plan progress against workplan
Financial and progress report	Steering committee	Quarterly	5 page report describing progress against workplan and current financial situation against budget
End of learning cycle report	Steering committee	Annual or longer depending on length of time of learning cycle iteration	Detailed report describing the implementation of the plan against the workplan and financial implementation against budget

SESSION 4.4: MODULE EVALUATION

Topics to be Covered: - Individual, Facilitator and Course Evaluations

Knowledge developed: Understand basic concepts of evaluation and reflection.

Skills Developed: Reflection, Critical awareness, written communication

Duration of: - 45 min

Resource Sheets for Lesson: -

- EO/Ranger Course Evaluation Form
- What is Evaluation (Session 1.1)
- How to be a good listener (Session 1.1)
- What does reflection mean? (session 1.1)

SESSION PLAN 4.4: MODULE EVALUATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will complete an entry into their reflective diary and daily evaluation form ***15 mins*** - Students will also post views on the graffiti board ***10 mins***	Basic Stationery Exercise book, pens, pencils, graffiti board, chalk, markers	Individual Reflection and critical analysis of information gathered and learnt for that day	Trainer will explain concepts of reflection, critical analysis and evaluation. ***15 mins*** Wrap up for the day ***5 mins***

MODULE 5 - ASSESSMENT

SESSION 5.1: RECAP SESSION & PLAN FOR MODULE 5

Topics to be covered:

- Review of key concepts and ideas
- Plan for the day

Knowledge Developed: Understand the key concepts and ideas from previous session

Skills Developed: oral and written communication, reflection and listening

Duration of Session: 45 min

Resource sheets for session

- Session Plan 5.1
- Agenda for Module 5

SESSION PLAN 5.1: RECAP SESSION & PLAN FOR MODULE 5

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will work in pairs to list five most important points from the day before. ***10 mins*** - The entire class share and discus the most important points of the previous day. ***10 mins*** - Students will assessed on work done in Module 1 ***25 mins***	Basic Stationery Exercise books, pens, pencils,	Group work, class discussion, lecture	Trainer will outline plan for the day. Trainer should stress the the importance of - planning before starting an activity - making observations throughout the day and recording them - participants to be reflective learners ***15 mins***

MODULE 5 AGENDA

8:00	Recap and Plan of Day
9:00	Assessment: Development of Action Plan
10:00	Break
10:15	Assessment: Development of Action Plan
12:00	Lunch
13:00	Assessment: Development of Action Plan
14:00	Break
14:15	Assessment: Development of Action Plan
15:30	Evaluation
16: 15	Wrap Up

SESSION 5.2: DEVELOPMENT OF MANAGEMENT PLAN

Knowledge Developed:

- Understanding how to use the NRAMP learning cycle in detail for a natural resource management project

Skills Developed:

- oral and written communication
- holistic thinking, group working
- problem solving, project development
- reflectiveness, work independently, plan and execute project

Duration of session: - 6 hrs

Resource sheets for session: -

- Ranger/Environmental Officer Course Student Manual

SESSION PLAN 5.2: DEVELOPMENT OF MANAGEMENT PLAN

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will be divided into groups and would be given a natural resource management scenario - Students will be expected to use the NRAMP learning cycle and concepts to produce a plan of action for the problem. ***6 hrs***	Basic stationeries: Flip chart, markers, Computer Students Manual	Group working Oral presentations	Trainer will assist students with any clarification of course material.

The Facilitator can develop a case study for students to apply the learning cycle and NRAMP principles/concepts. These case studies can be geared to suit the background of the students in training. The case study developed should provide necessary information (e.g. maps, data) and clear instructions.

Below are examples of scenarios that can be used to guide students in drafting their management plan.

CASE STUDY 1

ENVIRONMENTAL OFFICER/RANGER COURSE

"Problem-solving for Natural Resource Management"

The 16 communities of the North Rupununi (as shown on map in Module 3) utilize Tapir a natural resource for several purposes. Below is a case study/fact sheet on the tapir. Using the NRAMP style of management, develop a management plan for Tapirs in the North Rupununi District. This Plan must reflect the NRAMP principles and concepts as well as the learning cycle.

Oral presentations should follow the format below, each person in the group will present one aspect of the plan.

1. Introduction of Plan : (background, area of study, goals and objectives)
2. Key concepts of the Plan
3. The Management Process : Using the L - Cycle – Observation and Evaluation
4. The Management Process : Using the L - Cycle – Planning and Acting
5. Implementation of the Plan and Conclusion

The IUCN Red List of Threatened Species

Tapirus terrestris – Vulnerable

Major Threat/s:

- Habitat Loss/Degradation - Agriculture - Wood plantations (ongoing)
- Habitat Loss/Degradation - Agriculture - Non-timber plantations (ongoing)
- Habitat Loss/Degradation - Extraction - Wood (ongoing)
- Harvesting (hunting/gathering) - Food - Subsistence use/local trade (ongoing)
- Harvesting (hunting/gathering) - Food - Sub-national/national trade (ongoing)

Conservation Action/s:

- Policy-based actions - Management plans (needed)
- Policy-based actions - Legislation - Development - International level (needed)
- Habitat and site-based actions - Protected areas - Identification of new protected areas (needed)
- Habitat and site-based actions - Protected areas - Establishment (needed)
- Habitat and site-based actions - Protected areas - Management (needed)
- Habitat and site-based actions - Protected areas - Expansion (needed)

POPULATION

T. terrestris is considered Vulnerable across its entire range. In Brazil good populations only exist in Mato Grosso and Mato Grosso do Sul states. In Amazonia there currently is abundant forest, but deforestation is increasing and it is suspected that in time the region will experience the same population fragmentation and reduction already experienced by tapir habitats in other regions. This is especially true in the Atlantic Rainforest and Cerrado Ecosystems.

Although *T. terrestris* may be common in some areas of Argentina, it is sensitive to deforestation and human activities and the species has already disappeared in many areas of transition between montane and Chaco forests in Anta (a department of Salta Province).

Although control has been more effective during the past year in this province, tapirs are still affected by illegal timber activities, hunted, chased by dogs, and negatively impacted by competition with cattle.

Little information is available for the population in **Guyana,** however, tapirs are not protected here at present and are hunted by subsistence hunters as well as by a developing bush-meat industry as roads are cut into the forest for logging.

In Bolivia, tapirs are susceptible to hunting, and habitat degradation. While they may well be more common than expected in protected areas, as was found out in Costa Rica and elsewhere, they do not fare well in the presence of hunting. In Amazonian Bolivia, densities are estimated at 0.25 to 1.5 tapirs per sq. km in good habitat.

HABITAT AND ECOLOGY

T. terrestris inhabits lowland South American forests. Habitat association varies extensively, although the most important habitats tend to be moist, wet or seasonally inundated areas (Bodmer and Brooks 1997).

THREATS

Main threats to the species include loss of habitat through deforestation, hunting for meat and competition with domestic livestock.

Reference:

1. http://www.iucnredlist.org/search/details.php/21474/all
2. **North Rupununi Adaptive Management Plan (NRAMP)**
3. **Ranger/Environmental Officer Course-Student Manual, 2007**

Students developing their management Plan: NRAMP; Ranger/Environmental Officer Course, November 2007

CASE STUDY 2

ENVIRONMENTAL OFFICER/RANGER COURSE

"Problem-solving for Natural Resource Management"

The community of Hope (East Coast Demerara) is dependent on their mangrove resources as a means of their livelihoods. A major section of their mangrove area has been removed to accommodate expansion of an Auto works establishment. After consultations amongst villagers, they have agreed to the development of a Community Management Plan for the Mangroves. Below is a fact sheet on mangroves. Using the NRAMP style of management, develop a management plan for Mangroves in the Hope Community. This Plan must reflect the NRAMP principles and concepts as well as the learning cycle.

MANGROVE PROTECTION IN GUYANA

Mangroves are an important economic resource used by coastal people of the tropics for thousands of years and for this reason are regarded as being the most important of wetland habitat types, unfortunately however, a large portion of the global mangrove resource is threaten by destructions a result of rapid increase in the rate and variety of human influences. As a result the development of strategies for sound management and conservation of mangroves are now seen as having crucial importance. Much of the destruction of mangroves results from the view of these resources as wastelands (Saenger et al, 1983).

In Guyana, mangrove ecosystems perform a variety of functions which include protection against erosion and habitat for shoreline and marine life. These ecosystems are, however under threat as a result of human activities such as cutting for firewood, construction of dams as well as agrochemical run-off. Illegal removal of mangroves has caused erosion of the shoreline and breaches of the sea walls resulting in flooding of important agricultural lands. In creasing investment in artificial sea defense to protect the coast, most of which is below sea level, is becoming more necessary and has contributed negatively to an already struggling economy.

There are three main species of mangrove noted in Guyana: *Avicennia germinans* (black mangrove), *Rhizophora mangle (*red mangrove), and *Laguncularia recemosa* (white mangrove). A *gerninans* locally known as "Courida" is accepted as the main species in the region.

Distribution

Geographical distribution of mangrove species along the coast of South America is different from Caribbean. In Guyana large areas of the Atlantic Coast from the Corentyne to the Essequibo Rivers are dominated by Avicennia. This species is found to be more tolerant to saline condition and longer periods of inundation.

The Mangal (ecosystem of Mangrove) -provide habitat for a number of species, many of which are either vulnerable, endangered, or have high commercial value. E.g. Phytoplankton, shrimp, crab, manatee, caimans, turtles, birds, fish.

More political will needed here for mangrove protection

FAO report Monday, March 3rd 2008

Guyana has to show more political will in protecting mangroves for their habitat and environmental richness, a report by the Food and Agriculture Organisation (FAO) has said.

The report, entitled, 'The World's Mangroves 1980 to 2005', acknowledges that afforestation and reforestation activities have taken place in Guyana. But it says also that all South American countries with the exception of Guyana have at least one Ramsar mangrove site, indicating added political will to protect these habitats and their environmental richness.

The Ramsar Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty providing for national action and international cooperation for the conservation and judicious use of wetlands and their resources. Guyana is still to sign on.

"â€¦More efforts could be undertaken at the national and regional levels to implement appropriate strategies and effectively protect these ecosystems," the report points out. It further states that for Guyana, updated inventories would contribute greatly to a better estimate of the extent of mangroves.

Awareness is slowly building among coastal residents as to the importance of mangroves to sea defence and work at the level of government is progressing apace in Guyana's drive to regenerate and conserve mangrove stands along the coastlands.

The FAO states that the world has lost around 3.6 million hectares of mangroves since 1980, equivalent to an alarming 20 per cent loss of total mangrove area, according to a recent mangrove assessment study. However, the study also indicates that the rate of mangrove loss is slowing around the world.

According to the report, the total mangrove area has declined from 18.8 million hectares in 1980 to 15.2 million in 2005, according to the report. "There has, however, been a slowdown in the rate of mangrove loss: from some 187,000 hectares destroyed annually in the 1980s to 102,000 hectares a year between 2000 and 2005, reflecting an increased awareness of the value of mangrove ecosystems," the FAO said.

Although Guyana has commenced pilot projects across the country for the regeneration of mangroves, a lot is still to be done on the social side of things as it relates to people squatting on mangrove lands. **- Stabroek News, March 20, 2008**

The causes of mangrove destruction around the world are many:

- Overexploitation by traditional users
- Conversion of the forested area to aquaculture
- Conversion of the forested area to agriculture
- Conversion of the forested area to salt pans
- Conversion of the forested area to urban development sites
- Construction of harbours and canals through the forested area
- Use of the forested area for the mining of minerals
- Use of the forested area for solid and liquid waste disposal
- Spillage of oils and other hazardous chemicals

SESSION 5.3: MODULE EVALUATION

Topics to be Covered: - Individual, Facilitator and Course Evaluations

Knowledge developed: Understand basic concepts of evaluation and reflection.

Skills Developed: Reflection, Critical awareness, written communication

Duration of: - 45 min

Resource Sheets for Lesson: -

- EO/Ranger Course Evaluation Form
- What is Evaluation (Session 1.1)
- How to be a good listener (Session 1.1)
- What does reflection mean? (session 1.1)

SESSION PLAN 5.3: MODULE EVALUATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will complete an entry into their reflective diary and daily evaluation form ***15 mins*** - Students will also post views on the graffiti board ***10 mins***	Basic Stationery Exercise book, pens, pencils, graffiti board, chalk, markers	Individual Reflection and critical analysis of information gathered and learnt for that day	Trainer will explain concepts of reflection, critical analysis and evaluation. ***15 mins*** Wrap up for the day ***5 mins***

MODULE 6 - ASSESSMENT

SESSION 6.1: RECAP SESSION & PLAN FOR MODULE 6

Topics to be covered:

- Review of key concepts and ideas
- Plan for the day

Knowledge Developed:

Understand the key concepts and ideas from previous session

Skills Developed:

oral and written communication, reflection and listening

Duration of Session: 45 min

Resource sheets for session

- Session Plan
- Agenda for Module 6

SESSION PLAN 6.1: RECAP SESSION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
- Students will work in pairs to list five most important points from the day before. ***10 mins*** - The entire class share and discus the most important points of the previous day. ***10 mins*** - Students will assessed on work done in Module 1 ***25 mins***	Basic Stationery Exercise books, pens, pencils,	Group work, class discussion, lecture	Trainer will outline plan for the day. Trainer should stress the the importance of - planning before starting an activity - making observations throughout the day and recording them - participants to be reflective learners ***15 mins***

MODULE 6 AGENDA

8:00	Recap and Plan of Day
9:00	Assessment: Oral and Written Presentations
10:00	Break
10:15	Assessment: Oral and Written Presentations
12:00	Lunch
13:00	Assessment: Oral and Written Presentations
14:00	Break
14:15	Assessment: Oral and Written Presentations
15:30	Evaluation
16: 15	Wrap Up

SESSION 6.2: PRESENTATION OF MANAGEMENT PLAN

Knowledge Developed:

- Understanding how to use the NRAMP learning cycle in detail for a natural resource management project.

Skills Developed:

- Presentation styles, holistic thinking, group working, participation, project development, ability to work independently

Duration of session: - 5 hrs

Resource Sheets:

- Oral Presentation mark scheme
- Witten Presentation mark scheme

SESSION PLAN 6.2: PRESENTATION OF MANAGEMENT PLAN

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Each group will submit a written report, outlining in detail, the application of NRAMP concepts within the plan. - Each students will be expected to give an individual oral presentation on one aspect of their plan ***5 hrs***	Basic stationeries: Flip chart, markers, Computer Students Manual	Group working Oral presentations	Trainer will grade oral and written presentation and give feedback on students performances

SAMPLE MANAGEMENT PLAN

(Prepared ***by students of previous training course)***

Management Plan for the Tapir (*Tapirus Terrestris)* of the North Rupununi Group 2

Background

In the North Rupununi the Tapir, *Tapirus terrestris,* commonly called Bush Cow, has been used for many decades by the local communities as food by subsistence hunting. In recent years, Tapirs have been over-exploited due to the developing bush meat trade industry and other activities which contribute to easier access to habitats, e.g. road construction for logging, mining, wood plantations, non timber plantations, etc. As a result, the population of the tapirs is classified as vulnerable.

Efforts are being made to manage species loss and habitat degradation through the establishment of a Protected Areas Systems (PAS). This management plan seeks to identify, establish, manage and expand a PAS to support the sustainability of this vulnerable species in the North Rupununi.

Study Area

The North Rupununi Wetlands is a drainage system formed by the Rupununi, Rewa and Essequibo Rivers. Many smaller creeks and rivers are also part of this drainage system. This area is home to many species of birds, reptiles, mammals, fishes and amphibians. One of the most spectacular species found in this region is the *Tapirus terrestris*. The Tapirs in Guyana mostly inhabit lowland forests. Habitat association varies extensively, although the most important habitats tend to be moist, wet or seasonally inundated areas. The Tapirs may also be found in high lands of the forest such as farms and other plantations. The study area would be in the North Rupununi along the Rupununi, Burro Burro and Rewa rivers, since with its many creeks and lakes, it provides a suitable habitat for the Tapir.

The sixteen Amerindian communities of the North Rupununi are also located in this region. Farming, fishing and hunting are the main local economic activities. There is also some local commercial exploitation of wildlife for the meat and pet trade. The Tapir has been one of the species hunted to support the wild meat trade industry. Since the highway from Georgetown to the Brazil passes through this area, it has given road users' access to the Tapir for personal and commercial use. This has resulted in a significant decrease in the population of this species in the North Rupununi. Reduction in the abundance of this species has been a cause for concern for the people of the North Rupununi.

Plan Development

The need for a management plan

The Tapir populations in the North Rupununi have declined over the last 15 years. Consultation was done between two leading agencies, Iwokrama and the North Rupununi District Development Board (NRDDB) to carry out surveys on the population of Tapirs in the North Rupununi. Between the years 1999-2000, a survey was done on the population on tapirs in areas along the Burro-Burro River and other parts of the North Rupununi, with representatives from various communities. The survey showed that the population was at a declining rate *(D.jafferally2000.)* As a result, the local communities have seen the need to develop and implement a management plan for the Tapir.

Aim

The aim of the project is to manage the population of the *Tapirus terrestris* in the North Rupununi.

Goal

The goal of this project is to implement a Protected Area System to manage habitat loss and species degradation of the *Tapirus terrestris*.

OBJECTIVES

Ecological Objectives:

- To conduct inventory surveys to obtain data status of the ecosystem;
- To reduce habitat loss by identifying boundaries for protection; and
- Conduct surveys to determine the fate (threats, status, and population.) of the tapir in the North Rupununi.

Social Objectives:

- To promote a sense of conservation and protection of tapirs the among members of local communities members;
- To empower locals with monitoring and management skills in the implementation of a Protected Areas System;
- Work in collaboration with key stakeholders (plantation farmers, loggers, miners) in implementing a Protected Areas System; and
- Identify the relevant institutional frame work for the implementation of a Protected Area System.

Economic objectives:

- To identify alternative income-generating activities for those who depend on the bush meat trade industry for income;
- To expand the tourism section so as to have more locals in the streamline of promoting conservation; and
- Introduce means of compensation from violation of rules and regulation of a Protected Area System.

Management Plan for Tapirs in the North Rupununi:

Concepts

Adaptiveness:

We believe that management plans for the aspect of tapir management must not be comprised of static instructions but must change with changing circumstances. The plan will improve problematic situations during the project implementation stages. In this, the project plans for future actions, allocate responsibilities and resources, observe changes that are taking places and evaluate these changes in a continuous learning cycle.

Participative:

The participative approach of the tapir management plan will seek to include base line information from local community members, existing NGO's and government agencies, key stakeholders threatening the population of tapirs and other interest groups, so as to formulate decisive actions.

Holistic:

Managing resource utilization in the North Rupununi will promote a balanced relationship with traditional forms of exploitation and conservation. Therefore, the plan aims to benefit both the ecological and socio-economic situation of other resources in maintaining healthy populations of the Tapirs.

Because there will be changes, locals who depend on this for generating income will be the first to feel the effects.

Evidence based

Ecological and social monitoring will provide the necessary evidence that will support the plans deliberations and recommendations. Efforts will be made to identify the appropriate types of information which can be collected at a low cost with limited training. The information will be easily compiled, provided in format that is easy to understand and access is straightforward, to up date, and any analysis which identify cause and effects will be explained in clear and transparent terms. Without reliable information, the process will soon loose credibility and stakeholders.

Practicality:

The management process has been separated into various phases. One of these includes the learning cycle so as to facilitate a straightforward understanding of the management plan. The learning cycle is comprised of four parts namely; planning, acting, observing and evaluating. This process will be described according to the basic level experience and understanding of each stakeholder.

The management process- *The learning cycle.*

Observation: From observing the status of Tapirs in the North Rupununi, the following findings are presented which contribute to species loss and habitat destruction:
- Human consumption (over-harvesting by communities for daily use);
- Bush meat trade industry;
- Roads construction in areas of populated with Tapirs;
- Plantation framing (Timber harvesting, NTFPs); and
- Mining.

Evaluation: To stem these effects, an evaluative assessment of the situation has produced the following:
- Assessment of the socio-cultural and economic activities in the North Rupununi,
- Identify alternative sources of livelihood; and
- Establish a Protected Area System to manage and increase the population of Tapirs.

Planning: In assessing the status of the Tapir population and the threats to this vulnerable species in the North Rupununi, the following activities have been deemed important in implementing a plan to manage and protect the *Tapirus terrestris:*
- Consultation with communities, stakeholder and other leading agencies;
- Data collection to obtain information to be used in management of the Tapirs; and
- Establishment and management of Protected Areas for the Tapirs.

Acting: In carrying out the steps to implement this plan, the following would be put in place:

- Regular communication and meetings between agencies and stakeholders and communities;
- Steering committee - Would be responsible for overseeing that the plan is implemented, to assess the quality of the outputs, to make annual budgets and resourcing and appointing of a manager for implementing the management plan;
- Manager – would be responsible for the implementation of the plan in a timely manner, according to the budget and to the satisfaction of the steering committee. This person would be responsible for the day – to – day decisions, financial management, reporting, staff management and communication. The manager would report directly to the steering committee; and
- Staff – Would be responsible for assisting the manager in the implementation of the plan including the appropriate reporting and communication. They would report directly to the manager.

Log frame for the Implementation of a Management Plan for the *Tapirus terrestris*

Project Summary	**Measurable Indicators**	**Means of Verification**	**Important Assumptions**
Goal			
The goal of this project is to implement a Protected Area System to manage habitat loss and species degradation of the *Tapirus terrestris*.			
Outputs			
To obtain data status of the ecosystem	− Inventory surveys conducted	− Data sheets − Data entries − Reporting	− Species distribution determined
Identify suitable areas to be classified as protected areas	− Consultation among sector agencies and international bodies and other support groups	− Surveys conducted and feedback from communities − Data obtained from Project Fauna on Tapir sightings in the different communities.	Inter – Agency Collaboration
Establishment and Management of Protect Areas	− Identify leading agencies to assist in the management of the protected area in the North Rupununi − Community and stakeholder consultation	− Establishment of steering committee − Formal commitment among communities and government agencies − Meetings and seminars	− Allocation of funding to implement activities − Adequate attendance by stakeholders and community members
Alternative income generation activities	− Community consultation	− Timely submission of reports	Agreeable commitments

Activities			
Identify location of habitats of Tapirs	− Community consultation − Consultation with researchers and other agencies who would have done research in the area and have knowledge on habitats and location of the tapirs − Make use of resource maps and other data already collected in relation to the *Tapirus terrestris,* e.g. Project Fauna	− Number of community members involved in consultation − Amount of statistical data obtained from consultation	− Local communities and agencies consulted are able to make accessible information they have obtained from previous research activities.
Conduct inventory surveys to find: − Density of population − Threats to population	− Data sheets and other records of data collected in survey − Reports on surveys done on − Identification of threats to population	− Person trained in data collection	− Members of the communities willing to be trained and get involved in conducting surveys.
Report to Communities	− Information obtained in surveys taken back to communities	− Timely reporting to communities	
Formed committee to Manage Protected Areas	− Committee to ensure that rules and regulations are adhered to −	− Proper staff structure in place to implement management plan	− Community members and road users adhere to rules and regulations.
Identify opportunities for alternative income generating activities	− Consultation with communities	− Number of community members involved in consultation and training	− Community members would be willing to use alternative income generating activities

PLAN IMPLEMENTATION

Steering Committee
This committee will be responsible for overseeing the implementation of the plan. The committee would comprise representatives from Iwokrama, the Environmental Protection Agency, Guyana Forestry Commission, Guyana Lands and Surveys Commission, Guyana Geology and Mines Commission and the North Rupununi District Development Board.

Project Manager

The manager would be selected from interviews conducted with the panel comprising members of the steering committee. The manager would be responsible for day – to – day management and decision-making and reporting to the steering committee.

Project Staff
The project staff will comprise community members (local Rangers and Environmental Officers) NRDDB representatives and representatives of the partner agencies. The staff will be responsible for assisting in the implementation of the plan and will report to the manager.

Description of Duties and Responsibilities

Duties	Actions	Person(s) Responsible
Introduce project idea to communities	Sensitize communities on the threat of the Tapir	Project Manager, Project Staff
Select members from communities to assist in data collection	Data analysis of the ecosystems	Project Staff
Training locals to conduct inventory surveys	Data analysis of the ecosystem	Project Staff
Conduct community consultation among key stakeholders affecting species decline and habitat destruction of Tapirs	Propose the Identification and establishment a protected area system	Project Staff, Protected Area Specialist
Select lead agencies to manage protected area	Identify lead agency to manage protected area through consultation with communities	Steering committee, Project Manager, Project staff, Partner organizations
Train locals as Rangers and Environmental Officers to assist in monitoring and Management of Protected Areas	Conduct training programmes in Protected Areas and management	Project Staff
Develop understanding among key stakeholders	Conflict resolution (negotiation)	Project Staff and experts in conflict resolution

(miners, plantation farmers, community members, project team)		
Identify alternative income generation activities for communities	Evaluate sustainable economic opportunities to support livelihoods of communities	Project Staff, Environmental Economist

Conclusion

Management of the Tapir species is of significant importance, as with any other natural resource, to maintain the proper functioning of an ecosystem under threat. Conservation efforts through the establishment and management of a Protected Area System have proven to reduce species decline and habitat destruction, for example in the case of Shell Beach where measures have been adopted to maintain healthy habitat for the Marine Turtles population. Through empowering of local communities with the necessary skills and techniques and constant consultation to aid in managing protected areas will promote sustainability of project implementation. A key element in the management plan of this project is the learning cycle which allows a dynamic system of project implementation fostering continuous assessment and evaluation of the project.

REFERENCE

North Rupununi Adaptive Management Plan(NRAMP); *Course Report "Environmental Officer/Ranger Course, November, 2007, Group 2*

WRITTEN PRESENTATION MARK SCHEME

MAX SCORE	GROUP # _____	TOTAL SCORE
10	1. **Structure**: clear structure, with an introduction, key content of work and conclusion	
10	2**. Content**: knowledge of subject, appropriate explanations/arguments of sub topics	
10	3. **Presentation**: General layout and style, as well as spelling and grammar.	
5	4. **Illustrations**: use of figures and tables to support text	
3	5. **Referencing**: sources of information must be identified within text	
2	6. **Originality**: original ideas/thoughts applied to report	
	FURTHER COMMENTS:	**40**

ORAL PRESENTATION MARK SCHEME

MAX SCORE	NAME OF STUDENT: _____ GROUP # _____ **Area of Plan Presented:** _____	TOTAL SCORE
2	1**. Subject / Topic**: Clearly stated, evidence of interest, clearly explained	
5	2**. Content**: knowledge of subject, evidence of planning, quality of evidence used,	
10	3. **Structure**: clear introduction and smooth flow of explanations	
5	4. **Audibility:** use of voice, body language (tone, clarity, eye-contact,)	
3	5. **Timing** : proper use of time for presentation and allowing questions	
5	6. **Use of audio- visual aids** (appropriateness, impact, quality of presentation)	
10	7. **Encouraging feedback and participation:** response to questions, quality of answers to questions	
	FURTHER COMMENTS:	

SESSION 6.3: MODULE EVALUATION

Topics to be Covered: - Individual, Facilitator and Course Evaluations

Knowledge developed: Understand basic concepts of evaluation and reflection.

Skills Developed: Reflection, Critical awareness, written communication

Duration of: - 45 min

Resource Sheets for Lesson: -

EO/Ranger Course Evaluation Form –

SESSION PLAN 6.3: MODULE EVALUATION

STUDENT ACTIVITY	MATERIALS REQUIRED	TEACHING TECHNIQUES	DETAILS FOR TRAINER
-Students will complete an entry into their reflective diary and daily evaluation form ***15 mins*** - Students will also post views on the graffiti board ***10 mins***	Basic Stationery Exercise book, pens, pencils, graffiti board, chalk, markers	Individual Reflection and critical analysis of information gathered and learnt for that day	Trainer will explain concepts of reflection, critical analysis and evaluation. ***15 mins*** Wrap up for the day ***5 mins***

APPENDIX 1 – Pre Training Evaluation Form

ENVIRONMENTAL OFFICER/RANGER COURSE

"Problem-solving for Natural Resource Management"

PRE-TRAINING EVALUATION FORM

Please answer each question with as much detail as you can. Use as much paper as you need.

Participant name:_____

Date:_____

1) What is your background?

2) Do you have any experience in developing natural resource management plans or any other management plan?

3) What do you want to learn from this course?

4) How do you think the course will help you?

5) How do you think the course will help your community/ organization?

6) Is there anything else you would like the course organizers to know?

APPENDIX 2: Personal Evaluation Form

ENVIRONMENTAL OFFICER/RANGER COURSE

"Problem-solving for Natural Resource Management"

DAILY EVALUATION FORM – REFLECTIVE DIARY

Please answer each question with as much detail as you can. Use as much paper as you need.

Participant name:

Date:

1) **What were your hopes for the day?**

2) How do you feel the day went?

3) What were the best moments of the day?

4) What were the worst moments of the day?

5) How do you think the day could have been better?

6) What do you need to improve for tomorrow?

APPENDIX 3 – End of Day Evaluation Form

ENVIRONMENTAL OFFICER/RANGER COURSE

"Problem-solving for Natural Resource Management"

TRAINING EVALUATION FORM

Please give a rating of 1 to 5 for the following, where **1** is **Low** and **5** is **High**. How would you rate the following?

		1	2	3	4	5
1	**Was the topic matter clearly stated in the agenda?**					
2	**Please state how well the topics stated in the agenda, were covered in the actual training**					
3	**How well was the explanation of key terms and concepts?**					
4	**Was the time allocated to the sections sufficient?**					
5	**Was sufficient opportunity given to you to participate in discussions?**					
6	**Was the delivery/explanation by the trainer clear?**					
7	**Please rate the following**					
	a. Manuals/ Modules					
	b. Presentations					
8	**How was the lay out of the room?**					
9	**How was the seating arrangement?**					
10	**Was there enough access to training materials, equipment?**					

ADDITIONAL COMMENTS:

What did you enjoy the most?

.....

What about today you didn't like?

.....

What can be improved for tomorrow?

.....

Is there any question that should be included on this form?.....