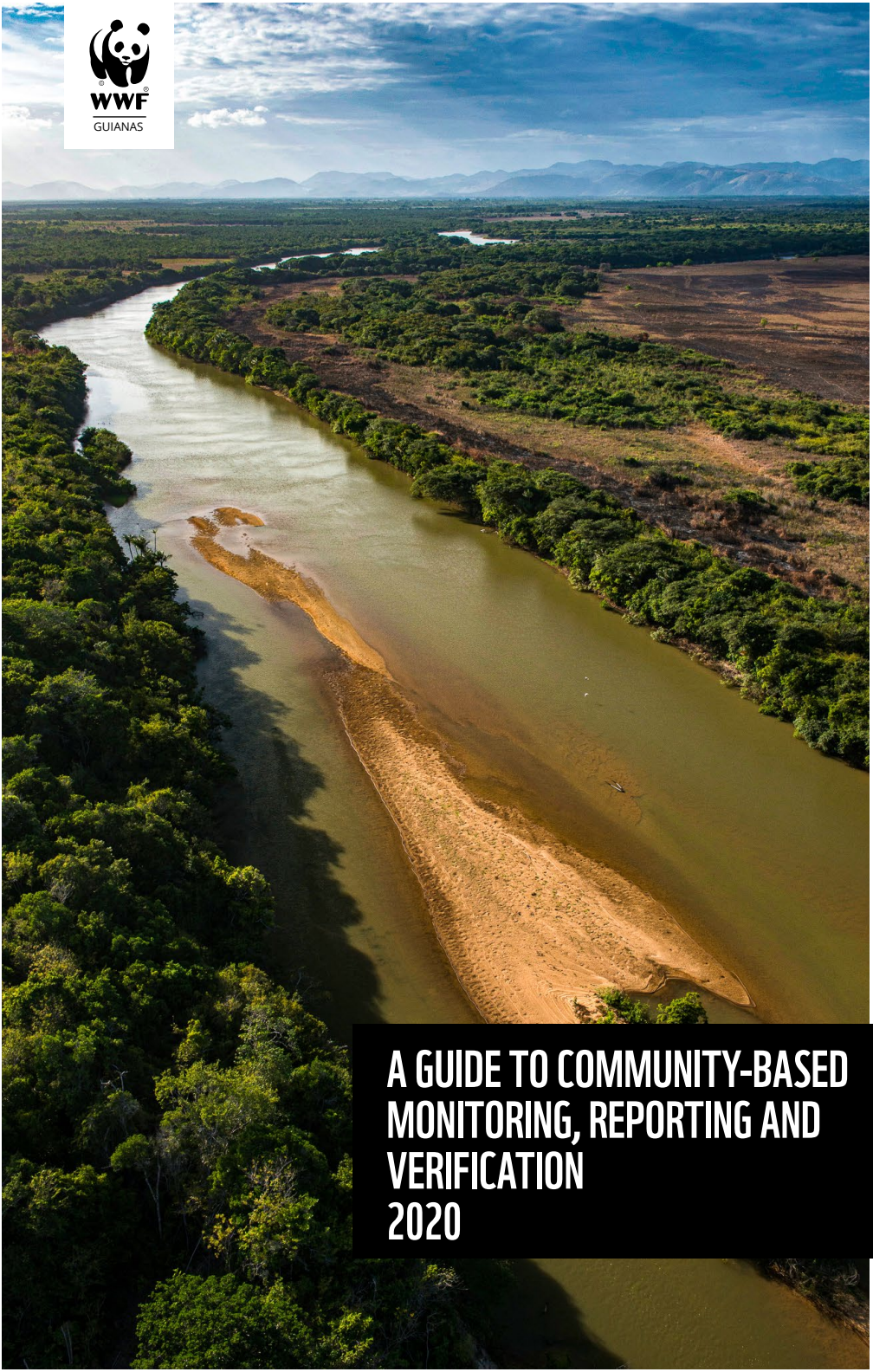

WWF GUIANAS

A GUIDE TO COMMUNITY-BASED MONITORING, REPORTING AND VERIFICATION

2020

This guide has been produced with funding from the Norwegian Agency for Development Cooperation (Norad) and IUCN NL and WWF-NL through the Shared Resources Joint Solutions (SRJS) Programme. The SRJS programme is financially supported by the Dutch Ministry of Foreign Affairs, Directorate-General for International Cooperation (DGIC). The WWF-Guianas Conservation Programme is co-funded by the Embassy of the Kingdom of the Netherlands in Suriname, WWF-Netherlands, WWF-Belgium, WWF-US and WWF International.

WWF's mission is to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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Cover photographs (front and back) of the Rupununi savannahs
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Suggested citation: Bollers, R., V. Antone, P. Fredricks, A. Williams, P. Rampersaud and J. Persaud. 2020. A Guide to Community-based Monitoring, Reporting and Verification. WWF-Guianas, Guyana Office, Georgetown, Guyana.

Contents

Foot and cattle trails in the Rupununi Savannah

Acronyms

CBM	Community-based Monitoring
CG	Core Group
CREWs	Community Resource and Environment Workers
CSEC	Caribbean Secondary Education Certificate
FPIC	Free, Prior and Informed Consent
GCP	Global Canopy Programme
GFC	Guyana Forestry Commission
GPS	Global Positioning System
KMCRG	Kanuku Mountains Community Representative Group
MRV	Monitoring Reporting Verification
NGO	Non-Governmental Organization
NMRV	National Monitoring Reporting Verification
NRDDB	North Rupununi District Development Board
ODK	Open Data Kit
RDC	Regional Democratic Council
REDD+	Reducing emissions from deforestation and forest degradation, conservation of existing forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks
SCPDA	South Communities Peoples' Development Association
SDG	Sustainable Development Goals
SMAP	StreetMap
SRDC	South Rupununi District Council
VC	Village Council
VIP	Village Improvement Plan

Foreword

The systematic monitoring and documenting of natural resources strengthen a community's capacity to safeguard their land and the resources therein. By taking a community participatory-based approach to conservation, we can secure numerous benefits not only for our environment but also for the people who depend on the services provided by nature.

Monitoring, Reporting and Verification (MRV) at the community level is an essential aspect of the REDD+ programme that communities must adopt so to develop their own sense of responsibility for their resources. WWF will continue to work towards leaders and members of communities gaining a firm understanding of how technology can be used to save our environment.

This guide is seen as an important step towards safeguarding our environment against overexploitation and degradation. It will provide the basis for which the Community-based Monitoring, Reporting and Verification (CMRV) programme can be sustained and later expanded to more communities. It is our desire for individuals to realize and embrace the usefulness of the data gathered, so that they can report on that data to village leaders, as well as to policymakers at the regional and national levels.

Aiesha Williams.
Country Manager, Guyana
WWF-Guianas

A Guide to Community-based Monitoring, Reporting and Verification

Acknowledgments

WWF recognises the invaluable work, contributions and the shape of the successes of this phase of the CMRV programme within Region 9 communities, specifically North Rupununi, South Central and South Rupununi. The toshaos, councillors and leaders have invested their time and intellect into the CMRV programme.

The development of this guide would not have been possible without the valuable contributions from those involved in the data collection process - the community monitors and core monitors.

Finally, special thanks are extended to the project management teams, leadership and members of the South Rupununi District Council (SRDC), the South Central Peoples' Development Association (SCPDA), the Kanuku Mountains Community Representative Group (KMCRG), and the North Rupununi District Development Board (NRDDB).

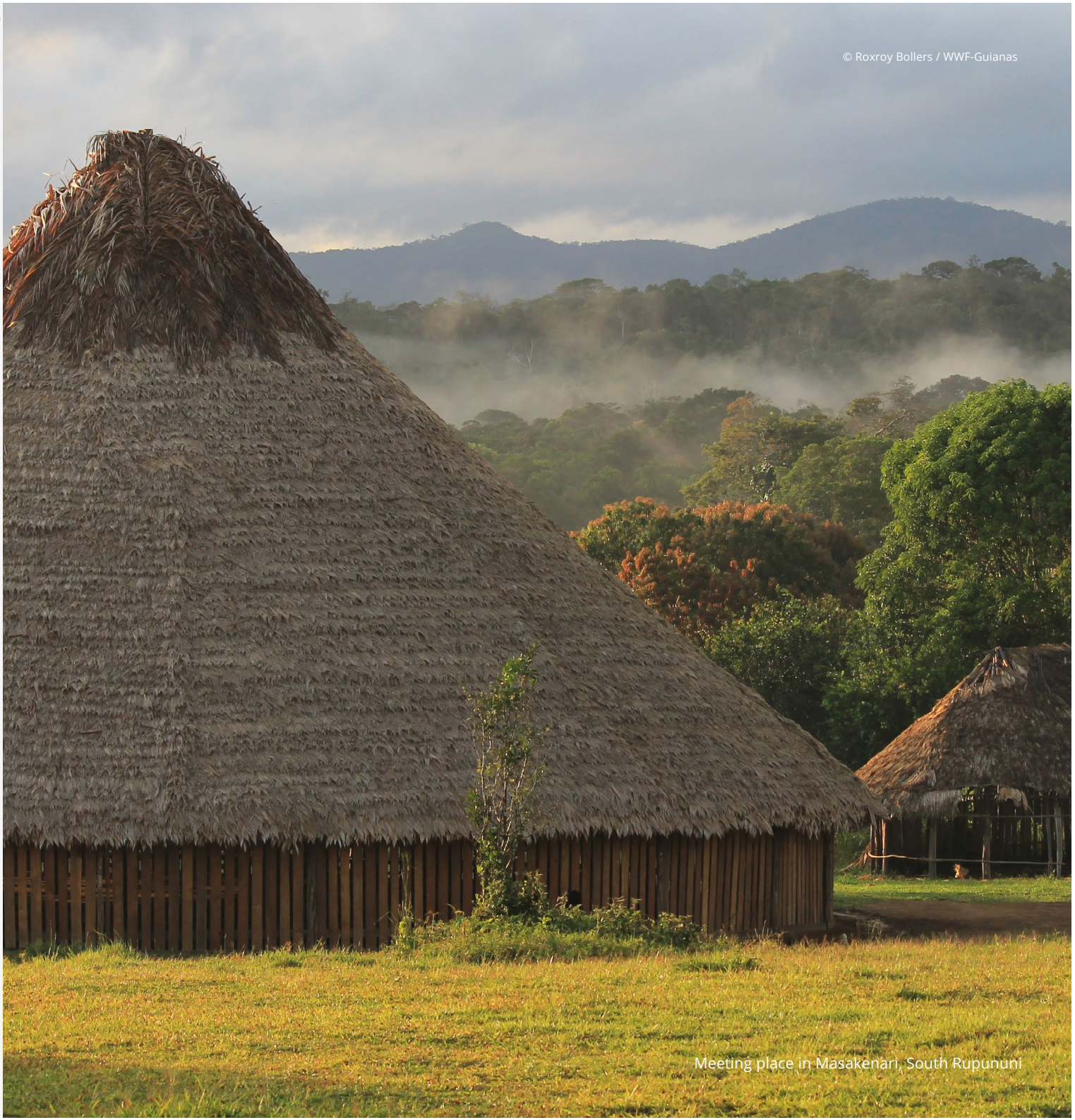
Purpose of the Guide

This publication serves as a guide for indigenous and local communities who wish to participate in a CMRV process. It provides information to help communities to understand the process, and how, as a tool, the guide can be used to improve planning at the local level. In particular, it will help to strengthen decision-making and rights-based mechanisms in order to achieve an effective and evidence-based management of a community's resources, livelihoods, and well-being.

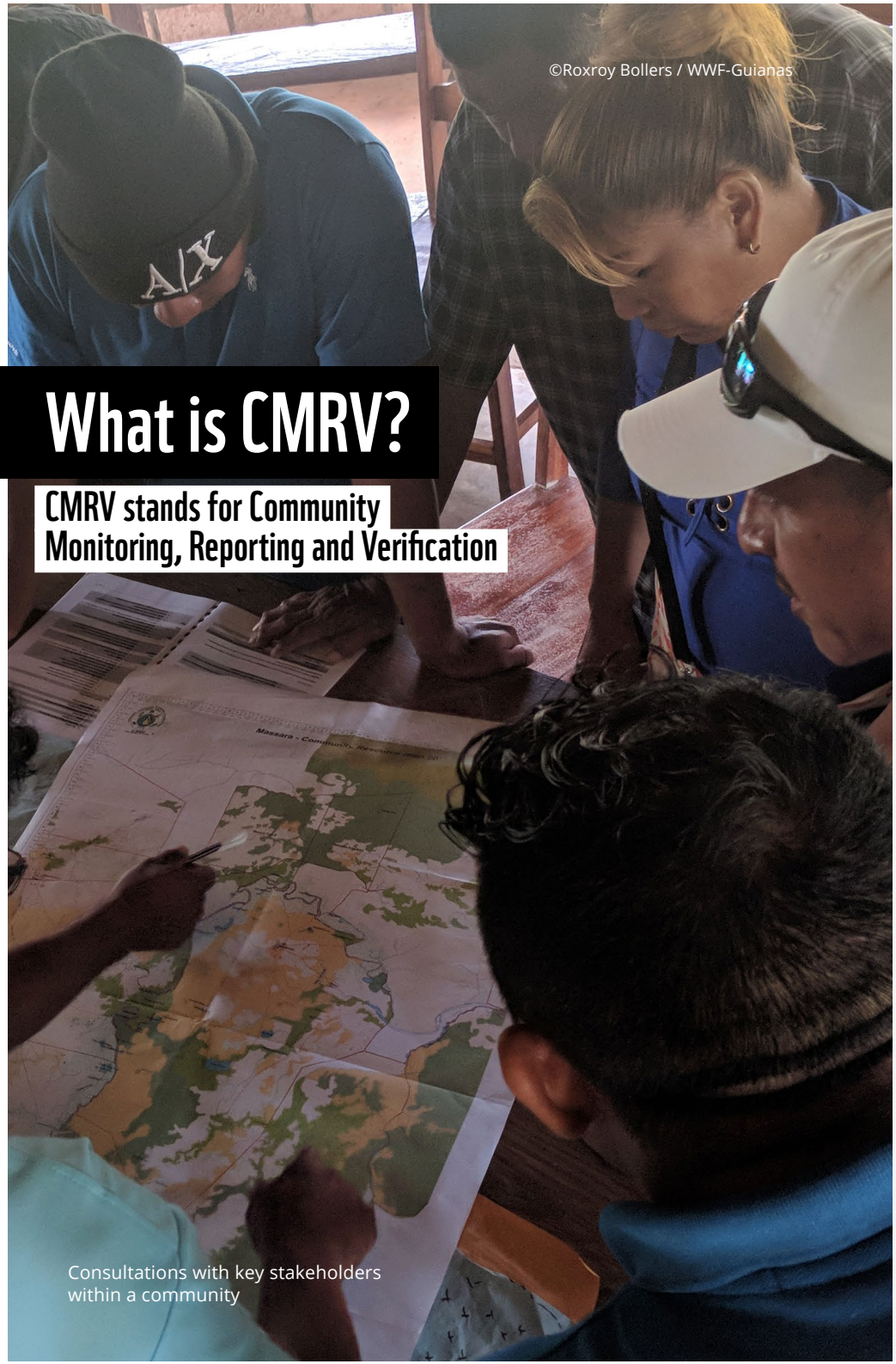
The guide therefore provides key information and practical guidelines on how communities can design a framework for monitoring their resources in a manner that will achieve their developmental and resource management goals.

This guide can be used by village leadership, indigenous educators, trainers and facilitators working with indigenous organizations and communities. It can also serve as a starting point to create any future village improvement/developmental plans. This helps the community to identify and achieve the village goals and targets, as well as contribute to regional, national and, to some extent, international targets.

More specifically, this publication includes guidelines on how to gather, analyse and present data on important resource uses and social issues.



Meeting place in Masakenari, South Rupununi



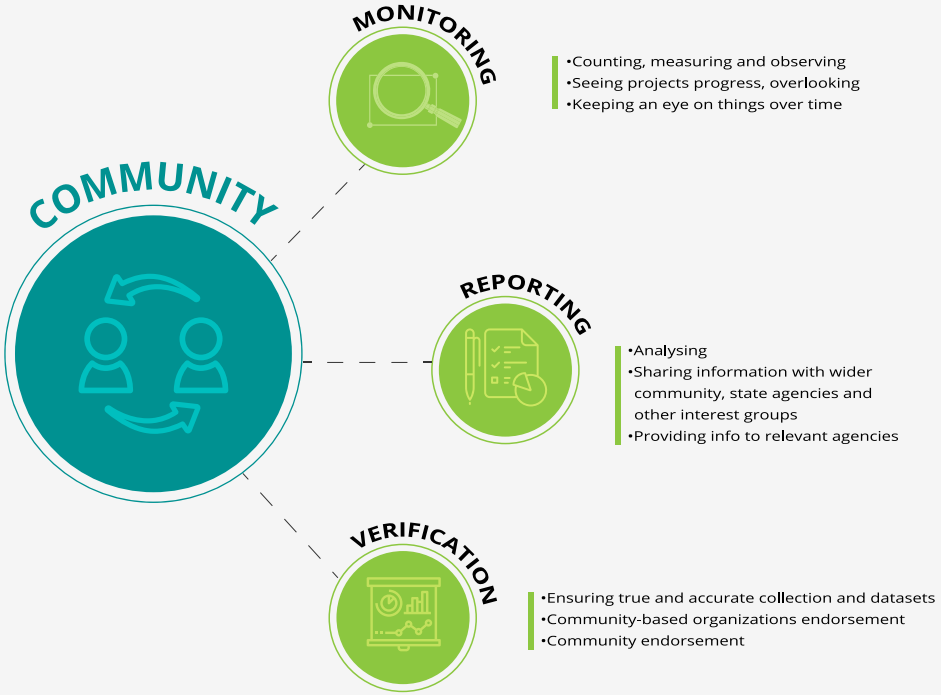
What is CMRV?

CMRV stands for Community Monitoring, Reporting and Verification

Consultations with key stakeholders within a community

Community-based Monitoring, Reporting and Verification

CMRV is a participatory tool used in a process to design, plan, collect and analyse information on natural resource use and community well-being for decision-making. It commences with building the knowledge of local community experts and enhancing their input into designing the process, including identifying monitoring parameters.. The process is led by the community and their experts, and facilitated by external technical support. The information collected is stored and managed by the community, inclusive of how it is shared and used.



Objectives of CMRV

Decisions about community development and land-use, including forest management, should be based on information about the current status of natural resources, land cover and well-being in the community or region under consideration. CMRV, through collecting data to keep track of changes in these factors and in improving understanding of the local situation, can support such decisions.

1. To strengthen and **build capacity** of communities with the use of technology to **measure, record and analyse** information on natural resources (forests, freshwater, wildlife), livelihood activities (logging, mining, hunting, farming and fishing), and social well-being (health, education, culture).

2. To **monitor, and collect** a range of information on the community's natural resources and other details important to the livelihood of the community.

3. To enhance village leadership and decision-makers to better help manage their community resources, development and well-being, through delivery and use of key information in an understandable way.

4. To build a local intranet platform so that communities can view and share information with external stakeholder, such as Government of Guyana.

5. To prepare communities to produce reliable information on their villages which can feed into regional or national data needs, including for planning, management and development purposes, as the community chooses.

6. To contribute to community readiness to participate in REDD+ and other results-based payment schemes through clear and systematic monitoring, reporting and verification systems, and to understand concepts of climate change and REDD+.

Why CMRV?

CMRV allows for systematic monitoring of land and resources at the community level for local decision-making. It allows the communities to effectively contribute to the management of their natural resources and determine how the resources can be utilized in a sustained way. This is important since communities are dependent on their lands to sustain their livelihoods.

Monitoring is an important component of land and resource management, and should be integrated into any development planning that utilizes resources. With monitoring in place, we will know how we are affecting the quality of our resources, and if we are achieving the results intended in order to achieve our developmental and conservation goals.

Technology has made it easier to conduct a quality data collection process within an operational CMRV. This provides communities with the relevant knowledge that will allow leaders to make informed decisions for the long-term benefit of their people and resources.

This requires resource users and managers to have updated information on the quality and quantity of the resources to be able to plan for sustained use. Therefore, a well-designed CMRV is a tool that can be used by local communities to raise awareness about improving community natural resource management.

This means that CMRV should cover all natural resource use, as well as include social aspects and other drivers of change. It should not only target the outside drivers that influence or affect community resources, but also the internal drivers that are within the villages that could disrupt any form of life and activities.

When participating in a CMRV exercise, it is important for communities to:

- *Work out what they think is important to monitor – a list*
- *See how this list relates to other schemes e.g. what information is being sought by VIP, SDG, or others?*
- *Develop their monitoring scheme together – how to monitor*
- *Ensure community monitors are able to carry out monitoring using handheld devices*
- *Train monitors to share their information with others: village councils, government, etc.*

Benefits of CMRV

Provides wealth of knowledge and information

A key benefit of applying CMRV is the development of a **community data bank** generated from the CMRV activities. The data bank is located in the community and managed by local community experts, overseen by the Village Council/District Council. This allows communities to have first-hand information on the state of key natural resources and the social factors for use, such as culture, education or health.

With the availability of this knowledge, community leaders can be better informed and prepared to deal with issues, and can take immediate and informed action to eliminate or reduce these, or, on the other hand, can provide the facts and evidence to the relevant authorities so that issues can be addressed. The information can also be used to support requests for yearly budgetary allocations for community projects which may improve any area or curb any problem.

Enhances wise use of resources

The CMRV process and the data collected put communities in the position to serve as citizen scientists, generating information for evidence-based decision-making, and contribute to what could be considered a local 'early warning system' which detects early threats or drivers affecting resources. From the information gathered on the ground and through field observations, a strong indication of how community resources may be sustainably used will be obtained.

This will assist the Village Council in deciding on and implementing good management systems for such sustainable utilization. Furthermore, the methodology applied is so simple that it can be used or adapted for any other resource use or issue that the community wishes to pursue, such as forest/savannah fire management, or water-quality monitoring.

Other major benefits

Through use of the monitoring toolkit, communities will have baseline master reports on their own well-being and on other natural resource usage, which can assist them in keeping a keen eye on the state of their community in the long term.

Living detailed Village Resource Maps will be created, which can detect shifts in land use, such as whether farmers are moving further into the forest or closer to the village homestead.

Communities can also use CMRV to determine, quantify and/or estimate the carbon content of their forest. This makes it easier to assign a monetary value to it and use the information to negotiate better deals for their communities.

Local community experts (in technology and knowledge transfer) are developed through the CMRV training, who become valuable community resource persons who can assist leadership groups with reports etc.

CMRV SPIN-OFFS

1. Use of the newly trained CMRV monitors to assist with village council project implementation, such as using their devices to measure agricultural plots, airstrips or sports grounds.
2. Creating new Open Data Kits (ODKs) for any other information the Village Council wishes to obtain, and producing that information for the VC in an understandable manner.
3. Using the knowledge of the monitors to improve other economic activities, such as logging, by keeping good records. For example, one villager created an ODK to calculate the volume of logs sold from village lands for accurate documentation for the GFC log sheet and permit submission. This is very important in that it minimizes errors and avoids false declarations, for which you can be heavily fined.
4. Developing the CMRV monitors into good resource persons for their own community CSEC students. They can assist with SBA data collection and analyse data in a prompt and efficient manner.

How Do Communities Get Involved?

Any community that is legally titled either individually or as a district can participate in the CMRV process. A decision to participate in the process is made at the community level following the principles of Free Prior and Informed Consent (FPIC). Communities can participate individually with their own management, or in clusters under the management of an umbrella organization such as the North Rupununi District Development Board (NRDDB), the Kanuku Mountains Community Representative Group (KMCRG), or the South Rupununi District Council (SRDC).

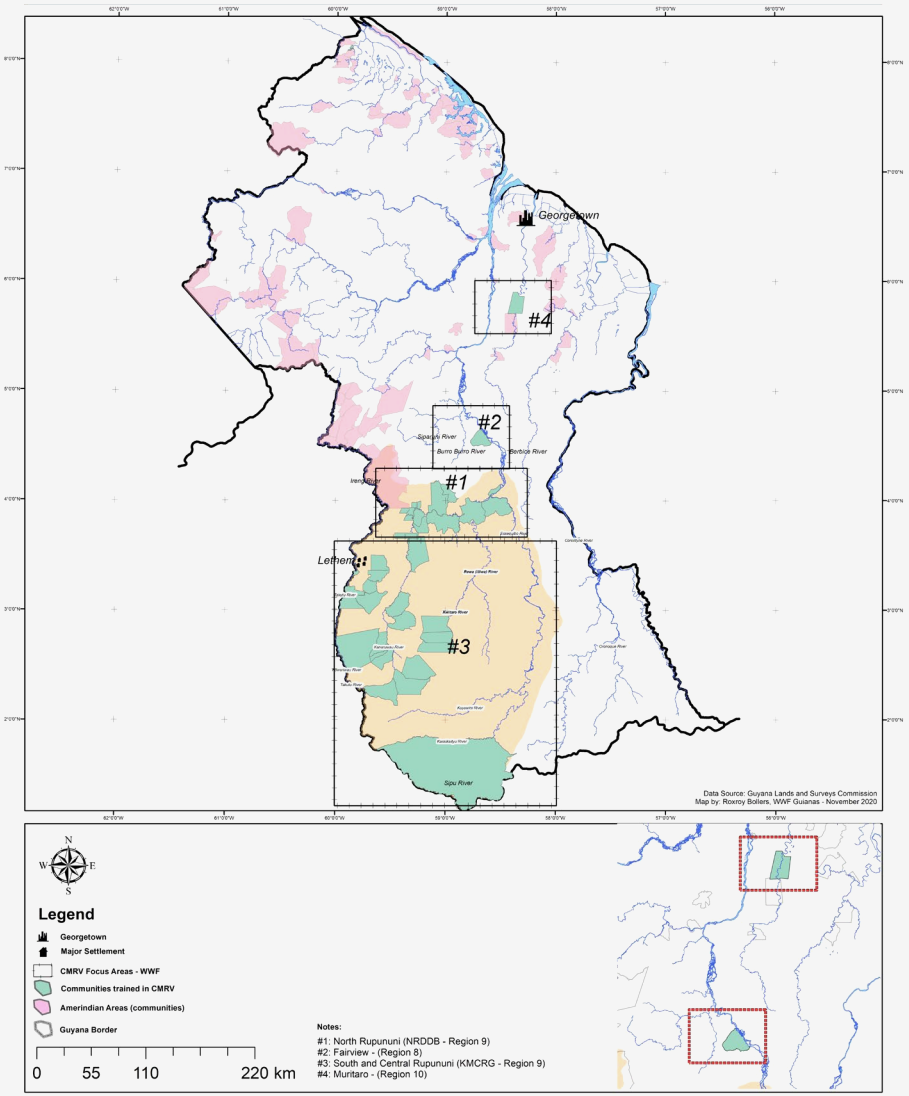
Once the interest is generated, the leadership as well as members of the entire community/ies will be engaged by an external CMRV technical team to provide information and to ensure that the community fully understands the process. Clear roles and responsibilities will also be outlined for the various players, inclusive of community involvement from the start.

The first task is to select a pair of monitors to work as a team directly under the supervision of the Village Council. The Village Council may decide to assign a special Councillor with that responsibility, such as the Environmental or Forestry Councillor.

This does not mean that by consenting to be part of a CMRV system, communities are giving up their titles or ownership of their lands and resources.

However, before the decision to participate in the CMRV process can be made, it is important that the community meets, and through two-thirds majority representation, approves the decision as stipulated in the **Amerindian Act (2006).**

CMRV Areas of Focus



Data Source: Guyana Lands and Surveys Commission
Map by: Roxroy Bollers

Key Steps in a CMRV Process

An overview of the actions and considerations required to set up a successful CMRV process

The above graphic depicts the three key areas required for a successful CMRV implementation. It is a step by step process, from 'initiation' with the primary community stakeholders, to 'training and development' with the selected monitors, and finally 'sustainability' which sees the complete handing over of the process to the individual community or to the main community-based organization for continuity.

Initial Community Engagements

This is usually the first step in the actual engagement with the communities. It is particularly important to have a knowledgeable team conducting this exercise. The team should comprise at least three persons: a local person with knowledge of the language, land and its people, a community engagement specialist, and a CMRV specialist.

The first engagement normally takes the form of a public meeting where the entire village is invited, including the resource-users, as they are the ones with the most knowledge about the resource-use areas. The idea is to raise awareness about CMRV so that the community fully understands the process.

This will make it easier for the activities to be executed by having everyone on board and participating fully without any fear. It would also give the facilitators an understanding of the community layout and management structure in planning for the CMRV process.

At this very first meeting, the management structure of the CMRV is considered. Since it is a community process, it means that it should fit within the existing management structure. By placing it as a part of the village leadership management, it means that the monitors will be answerable to the Village Council, with mandatory reporting to the public about their data collection at general/public meetings. This means that the CMRV team will be a reporting unit to the Village Council. Therefore, from the start it is clear who these monitors are working for and who is responsible for their management.

Build capacity for monitoring:

- *Forests sample plots and Biomass measurement*
- *Natural resources*
- *Wildlife*
- *Well-being*
- *Water quality*
- *Impacts of development interventions*

On the Ground Capacity Building Process

Classroom Training and Field Work

The actual classroom and field training exercise is a threefold process.

1. The first training period builds foundational knowledge and gives participants an opportunity to learn about the devices used in collecting sample data, which leads to the second training session.

2. The second training period uses data from the first field activity to give trainees a chance to do basic data processing, which leads into the third training session.

3. In the third training period, the trainees learn how to share the information using different tools, and how to receive feedback. This provides the basis for more important data collection since the CMRV activities target the real issues of the communities.

Task of Toshao and Village Council

- Provide vital support to the community monitors
- Make public announcements about CMRV work plans
- Endorse and stamp letters of authorization to conduct data collection
- Sign and approve reports and time sheets
- Oversee and guide monitors' work plans and equipment (phone)
- Assist with any conflict resolution and accompany monitors when possible

Capacity Building and Training

The capacity building and training activities build on and adapt the modules from the first CMRV session introduced in the North Rupununi in 2012.

The goals of the training are, but not limited to:

- Enhancing the capacity of local experts and developing strategies and protocols for implementation
- Understanding the concept, technology and role of the CMRV process, focusing more on natural resource management and community well-being
- Understanding interview techniques and data collection methodologies using smartphones
- Demonstrating/explaining technology concepts and data processing.

The complete training is done over a three-month period, with classroom sessions at a specific training location, and two weeks of field assignments per month in the monitors' respective communities. It comprises three main training sessions, which depend on the successful completion of the first field assignment, to lead into the second and third trainings. The data collected during the first training period is used to conduct the second training session, which is further built upon in the third training period, which then completes the training. At the end of the third training, core monitors are selected from the trainees based on the merit of their performance. These core monitors receive further training to run and manage the data lab.

The actual classroom training consists of two parts which complement each other. The first part is the fundamental aspect which includes important CMRV-related terms and concepts, communication and interpersonal skills, interview techniques, data collection techniques, community engagement protocols, FPIC principles and data sharing protocols, use of field equipment such as GPS, compasses, clinometers, DBH tapes, and measuring tapes.

The second classroom part deals with computer skills and technology concepts. This includes basic Microsoft Word, Excel and PowerPoint, Open Data Kit (ODK) creation, use of the GPS and smart phone, questionnaire design, data processing and management, creating community reports, and advanced training for core monitors on ODK design and data processing.

Conducting Field Assignments

Monitors receive their first field assignment at the end of the training session. They are required to conduct this assignment in their respective communities for a period of ten days before returning to the next training session. This first assignment serves as an opportunity for the monitors to get acquainted with the use of the devices and the monitoring techniques and methods. The first assignment is usually a simple one, such as mapping community infrastructure. As the monitors become more familiar with the devices and methods and gain experience, further more complicated assignments are given to them.

Methods and approaches in gathering data include:

- *Household visits*
- *Individual interviews with councillors, youths, adults, resource persons*
- *Checking village council reports*
- *Field observations and measurements (continuous or over a limited time period)*
- *Focus group meetings*
- *Field estimations*
- *Using existing reports or records (such as population data from the health centre)*

To avoid conflict and controversy between the CMRV process and the members of the community, the monitors should follow and abide by the community engagement protocols that exist or have been established, and behave in a socially acceptable manner when conducting CMRV work. Data confidentiality is crucial, since if it is not maintained, this could completely jeopardize future data collection work.

It is important before going into the field that awareness materials on CMRV, including specific or adapted jargon, are created and shared with all monitors. This allows everyone to speak/share the same narrative and purpose in the process. This should be accompanied by official permission letters from the Toshao to further boost the confidence of the monitors and allow for legitimacy of the process.

In cases of small communities with less than 50 households, all households should be targeted during the household data collection process. For larger communities, a representative sample should be used to give a good estimate of what is going on in the community.

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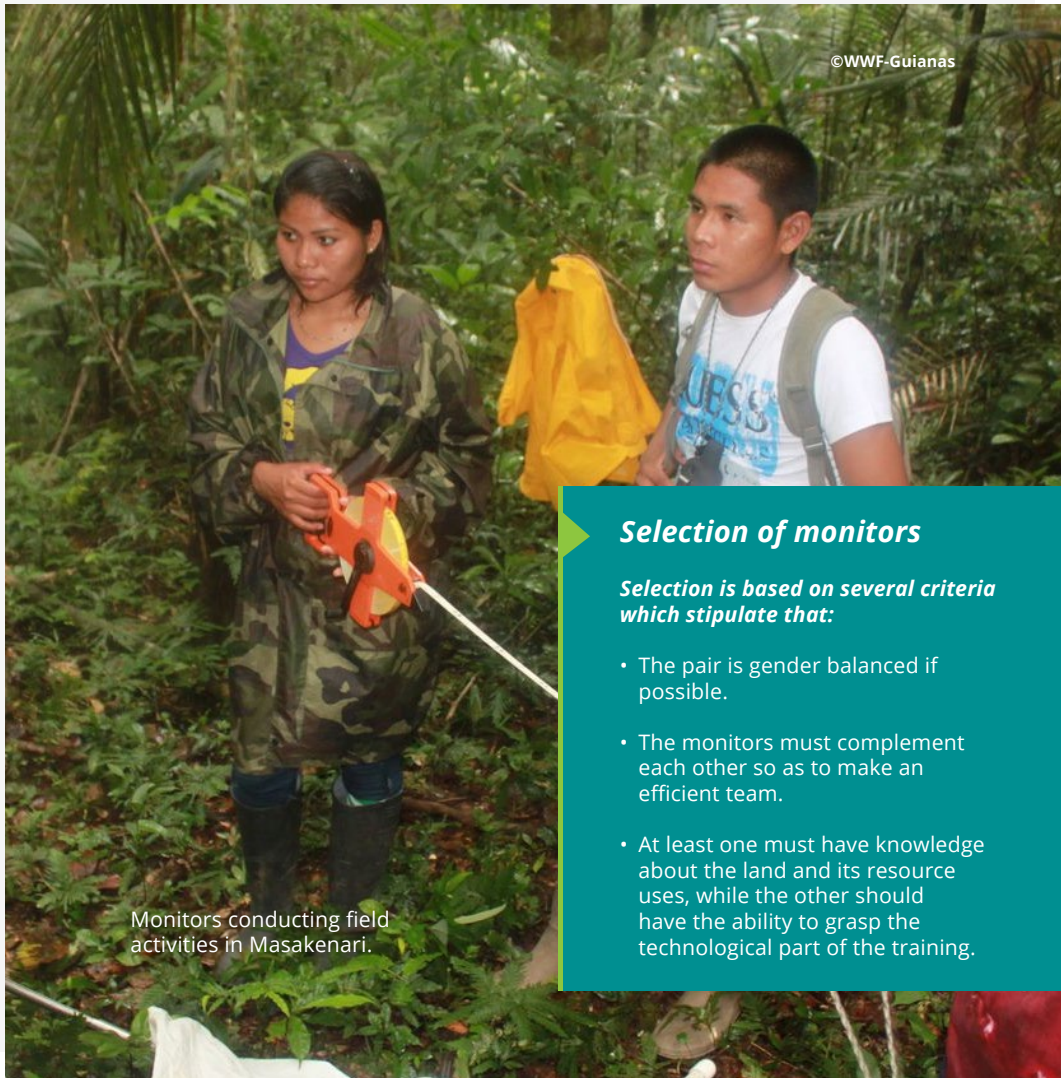
In some cases, such as for data on declining species, it is not possible to get everyone in the community to answer the questions, because not everyone is a hunter or fisherman. So, in this case it is better to set a quota for all communities, such as the top 20 huntsmen, if that is possible, to allow for a more strategic approach.

Monitors should always be prepared to share as much information as possible to obtain the true and best answer which really represents what is happening within their community. This may even mean translating the questions into the respective local languages.
When possible, field gear should be provided for the monitors to conduct their field work. For far-flung areas, some form of support should be issued to the monitors, such as fuel for motorcycles or outboard engines.



Monitors conducting field activities in Masakenari.

Selection of monitors

Selection is based on several criteria which stipulate that:

- The pair is gender balanced if possible.
- The monitors must complement each other so as to make an efficient team.
- At least one must have knowledge about the land and its resource uses, while the other should have the ability to grasp the technological part of the training.

Community Reporting

Repatriation of community reports is very important in the line of CMRV work. It ensures that the monitors are working diligently and collecting accurate and quality data. This is because the members of the community can tell if the information was gathered from them, or was fabricated.

Ideally, community reporting should be done after data collection and compilation of each data set. However this can become an overwhelming process for communities, since it will take up a lot of their time, leading to meeting fatigue.

This could also further put pressure on the community, since they may already be experiencing interview fatigue from data collection activities. Hence it is better to schedule reporting to be a part of the agenda of general public meetings which are held quarterly in communities. If not, reporting can be scheduled separately, but with enough time to go through the data thoroughly.

Have printed copies along with the presentation, as people can read the document in their own time for better understanding.

Doing the presentation in local languages has proven to be more productive when sharing the information. Persons, especially elderly women and men respond better. The presentation process helps to clarify any doubts or issues raised during the presentation, and before the report is finalized.

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The information collected and stored in the system must be classified before it can be shared. The community develops and agrees on a data-sharing classification system, following a simple colour-coded system similar to the 'traffic light' system.

RED

STOP

Red means it cannot be shared with the general public at all, because it is sensitive data. This includes data such as resource-rich community areas, timber areas, hunting grounds, fishing lakes and ponds, or mining areas, or sacred sites.

AMBER

CAUTION

Amber/Yellow means caution should be taken and further discussion held to arrive at a decision on whether the data can be shared or not.
Data regarding social issues in the community falls into this category.
If requested by the Social Welfare Division, it can be shared, but not to any other outside researcher/student for their own purposes.

GREEN

GO

Green means it's been agreed and approved by the community as free to be shared with the general public.
This is data such as village population, household numbers or number of community farms.
A common data request from the Ministry of Agriculture and the RDC is the number of farms affected by floods, drought or pest, so that aid can be provided with some means of pest control support.

Data Lab

The CMRV data lab is a designated place, identified by the community leaders, where all the data collected from the field is stored and managed by core monitors from the community.

The core monitors receive additional and advanced training on data processing and management, which builds their capacity to manage the centre to produce quality reports. The data labs are established so that communities can have greater control of the data through their own data managers. This strengthens the technical capacity within the communities and reduces dependence on the implementers or external technical experts. It also allows for continuity of the process, especially when the external implementers hand over the process to the communities.

Furthermore, this avoids further experiences as in the past, where some researchers might have taken information from communities without respecting their rights or ownership and never returned or repatriated it to the community. The data lab in the community allows the leaders to receive reports and other documents from the process in a timely manner, and to act on any concerns arising from the reports.

The way this works is that the core monitors are solely responsible for the retrieval, manipulation and production of the data. There are two types of units, one stationary and the other mobile. The stationary unit works well for communities who do not have any challenges to reach the lab. However, for communities that are geographically spread out, the mobile lab is ideal. The core monitors go out to the locations on appointed days and meet with the monitors and retrieve their data.

Upon data retrieval completion, the core monitors process the data in the lab to produce summary reports, using pre-determined templates, which can be shared with the village leaders for their endorsement before these are shared with the general public. This is also a way of verifying the information and preventing the monitors from just sitting in their hammocks and filling in the data.

Local language translation

- *There is no word for 'monitoring' in Makushi for instance, so the words to use are 'checking', 'changing over time' and 'observing'. The Makushi example would be if you are keeping animals, you 'check' to see how they are growing.*

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Data in Action

Complementing Village Improvement Plans (VIP)

Mapping of community resource-use areas both within and outside of an official titled area is an integral part of the CMRV process. This means that with guidance from knowledgeable resource persons within the community, the monitors have to go out into the field to map out all the farming areas, the main resource-use areas, other important and sacred sites, and any other relevant data to find out how the community land is being used. The data collected is processed and a preliminary community resource map is produced. This information is shared with the broader community for their corrections, additions and endorsement before it is finalized.

This community resource map is a part of the first step in building the Village Improvement Plan (VIP), which is a 10-year plan mandated by the Ministry of Amerindian Affairs. Communities use the information from the CMRV map to design or improve their community Zoning Map which is a part of the VIP process. Once this is established, updated information from current resource-use activities can be overlaid from time to time on the zoning map to check if the community members are adhering to the rules of the zones and are using their resources accordingly.

As part of the CMRV, the well-being survey looks at specific well-being questions related to community relationships, income and assets, culture, education and health, all of which can clearly bring out the perceptions of what the current status of the community is, and what issues/problems are urgent. This could then help in the preparation of annual projects for submission to the different agencies, based on community urgencies and funding opportunities.

Supporting NMRVS with the provision of reliable information

The National MRV system has two components that the CMRV supports every year. These are the Forest Area Change Assessment unit and the Forest Carbon Monitoring System component. Under the Forest Area Change Assessment, every year the Guyana Forestry Commission assesses Guyana's forest using satellite imagery from Landsat, RapidEye or

GeoVantage, which are not 100% accurate because of cloud cover etc. When that image shows signs of disturbances on community lands, the CMRV monitors in the specific area are tasked with ground truthing that image to determine what the disturbance is, if it is not clear. The points of interest are entered into phones using the Avenza Map application to locate the points. Once these points are located, the monitors use Field Task to record information about the point. After this is done, the monitors log into a special website designated for this process and upload the information to the GFC, where an officer can access it and transfer it into their system.

Under the Forest Carbon Monitoring System component of the NMRV, permanent sample plots are established on community lands to estimate their forest carbon contents. The monitors have demonstrated that they can do quality work just like any other professional. Once more, random sample plots are assigned to them in the less accessible areas and the more accessible areas. With support from the village and the GFC, the monitors are tasked with establishing the number of plots assigned to them. All samples are sent to the GFC monitoring unit for testing.

Initiation of CMRV with communities under the South Rupununi District Council

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Expected Outputs

Living Community Resource Maps are created for each community, reinforcing outdated title maps which may seem to appear bare and dull. Other outputs include:

1. Community reports with facts on the community
2. Highly trained Community Monitors as invaluable resource persons to their respective villages
3. Community equipment that could be used to support other non-CMRV related activities
4. Natural resource inventory of the main species being utilized by the community
5. Carbon stock of the community forest calculated
6. Accuracy enhanced of the National MRV system
7. Grounds for VIP and other plans for development- form the basis for annual project proposals

Harnessing Technology

An important and key element to a CMRV process is the adoption of technology. This section provides a bird's eye view into several areas which complement the technological facet of a successful CMRV exercise. It explains the technologies, discusses important considerations related to capacity building, and provides an understanding of the technologies, data management and sharing.

Readers can expect to gain understanding of the following:

1. **Monitoring system**
   a. Monitoring framework
   b. Decision on the type of technologies
   c. Local capacity building and monitoring cycle

2. **Monitoring methodologies and activities**
   a. Data collection
   b. Community mapping
   c. Challenges with data collection
   d. Data management
   e. Data sharing and reporting

Monitoring framework

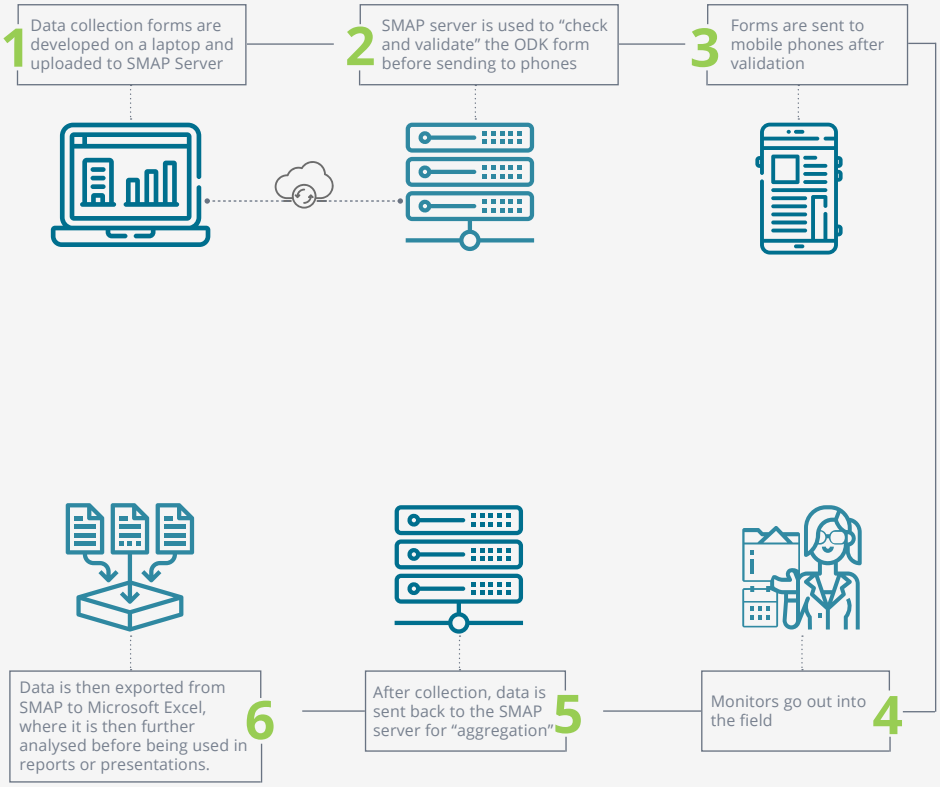
A key step in the process of implementing a monitoring system is to define and understand the monitoring indicators, and identify and prioritize the information most relevant to all stakeholders. It is in this light we proposed adopting the Monitoring Framework developed during the first CMRV process in the North Rupununi in 2012. This monitoring framework was developed through a community-led process, and covers all aspects relevant to communities when considering community-based monitoring (CBM). The plan outlines what, how and when to monitor. (See: Global Canopy Programme, 2014. *Community monitoring, reporting and verification for REDD+: Lessons and experiences from a pilot project in Guyana,* Global Canopy Programme: Oxford.)

Outline of monitoring framework

	INFORMATION GATHERED
NATURAL RESOURCES	**Community resources mapping** Mapping of land use, vegetation cover and natural resource extraction locations
	Natural resource use and availability – game, fish, timber, non-timber forest products (NTFPs) Trends in extraction, frequency of extraction, availability of species, amount extracted, seasonality, commercialization and changes in use with a focus on declining species, level of understanding of management plans
	Freshwater quality and quantity Water sources, use, sources of contamination, treatment, and perceptions of change in water resources and impacts
FOREST CHANGE	**Traditional and commercial farming** Indigenous farming practices and trends; emergence of commercially-oriented farming activities (location, area, quantity produced and sold, crop types, destination, farm inputs)
	Drivers of forest change – primary and secondary road impacts; forest fires; logging Type, location and area of deforestation and degradation, per year
	Biomass Carbon stock in different fallow and primary forest
	Ground-verification Ground-truthing of forest changes detected by satellite imagery
WELL-BEING	**Well-being** Status and changes in community well-being, including health, education, wealth, social issues, cooperation, happiness, community relationships (cooperation, sharing, participation), faith and beliefs, income and assets, culture (language, activities, household design), community safety/stability (stealing, alcoholism, migration, resource exploitation), food and family (relationships, family support, sufficiency of food), emotional well-being, education, health
	Mapping of community infrastructure Location of houses, schools, churches, health clinics, businesses, roads, landing strips and other infrastructure
IMPACTS	**Impacts** Evaluation of changes in knowledge, technical capacity and well-being as a result of CMRV

The 3-month approach

The System Flow Chart – the technology used and the flow of data within the monitoring system are illustrated below.



Decision on the type of technologies – hardware and software.

Implementing a technology-based methodology can become more time-consuming, expensive and complex than conventional approaches (pen and paper). While the technical complexity required in a monitoring scheme may initially limit the participatory involvement of local peoples, studies have shown that communities are often more capable in using technologies than is assumed, although some of the technical work involved inevitably cannot be undertaken by community members at first.
To maximize the benefits of technology-use in community-based monitoring, appropriate hardware and software must be selected. Criteria around which these are determined may involve financial, usability and availability constraints.

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LIST OF HARDWARE AND SOFTWARE TO CONSIDER FOR THE EXECUTION OF A CBM SYSTEM

HARDWARE	
Mobile phones or Tablets	• Screen size – 5.5 inches and these should have sufficient internal storage 8 – 16 GB. **Do not recommend phones with external storage.** • 8MP camera is just fine
Global Positioning System (GPS)	This would be determined by your budget – eTrex 10 has worked well in previous projects.
Laptop Computer	This computer would be used as your Server and Data Analysis system.
Mobile Hotspot (HooToo or TP-Link)	This is just a device that enables communication between any mobile device and your server.
Flash/Jump Drives	A drive with large capacity should be purchased to help with storage and backup of community data.
SOFTWARE	
Open Data Kit (ODK)	ODK is a suite of software; however only the ODK Collect application in the suite is used.
SMAP	The SMAP Server is the aggregation server which allows for the retrieval of data from the mobile phones in computer terms, and provides you with an avenue of exporting in various formats that you can use in Windows.
Windows OS	The computer will come with a version of Windows pre-installed (more than likely, Windows 10).
UBUNTU OS (Linux based 9	UBUNTU is a LINUX-based Operating System (OS) that is needed to enable the installation and configuration of the SMAP Server.

USING DIGITAL TECHNOLOGY FOR COMMUNITY-BASED MONITORING – APPROACHES

Activity	Content	Comments
Research	An assessment of the technology options for the CMRV process should be made.	Criteria for selecting the handheld devices should include: screen readability; ease of use; battery life; GPS capability; camera; voice recording; possible shock resistance.
Training	Introduction to the technology used for CMRV	A wide range of software platforms are available to support and simplify mobile data collection, management and analysis. Key reasons for recommending Open Data Kit (ODK) include the fact that it is (1) Open Source and free; and (2) widely-used, including by other community-based monitoring initiatives, but not limited to these, and also the learning curve is not a steep one.
Training / Technology	Training CREWs to use and manage the phones, including the installation of software, issuing of devices, and auditing of phones	
Training	Creating and using ODK data collection forms	
Technology	Internet	NOT REQUIRED
Technology	Set-up cloud storage – SMAP (Data Lab)	All data collected should be stored in the Data Labs which are established at the end of the three months.

Local capacity building and training

Training and skills development
The task of building local capacity to independently run a monitoring system can be strenuous in the process. However, it should be noted that this is a critical component to the implementation of CBM. If there are active management teams within the communities, technical training for these in managing and using the hardware and software, and in processing and analysing data should be considered. The persons selected by the community should be thoroughly trained in data collection methodologies for the various areas outlined in the monitoring framework, and there should also be some training in techniques for conducting group discussions and household interviews on well-being (or human capital) and resource-use monitoring. Training could also be centred on building the monitoring personnel's capacity to communicate about the process, and to monitor results in their communities.

Monitoring steps

Throughout this proposed monitoring cycle, there are a series of steps and management roles. Developing a monitoring workflow could help clarify the different steps, roles and tasks of each team member. The development of protocols and procedures for each of the main stages will help to improve the efficiency and management of the monitoring system and field coordination. This monitoring cycle has been adapted from the GCP-NRDDB CMRV project that was implemented in Guyana in 2012.

STEPS AND PROCESSES IN A MONITORING CYCLE

Monitoring cycle explained

1 DEVELOP METHODOLOGY
Developing the methodology and time frame for each aspect of monitoring means that understanding data collection needs, logistical barriers, and defining the questions and architecture of the questionnaire form are critical.

2 BUILD AND TEST DATA COLLECTION FORM
Through a process of consultations and testing with local team members, more contextualized and easier-to-use ODK survey questionnaires can be produced. While the process of building ODK forms could initially be led by WWF or other person/s capable of designing the forms, over time the local team should be trained to acquire the skills and knowledge to lead on this in future processes.

3 PLAN AND DELIVER TRAINING WORKSHOPS
Training workshops should be held, to provide the monitoring personnel with the capacity to understand the use of the hardware and software necessary for the implementation of the CBM.

4 DATA COLLECTION
Data collection will then be undertaken by monitoring personnel.

5 PROCESS REPORTS AND DATA AUDITING
Data auditing and processing will take place once data is uploaded. After identification of data repetitions and flaws, progress reports will then be compiled to track ground activities.

6 DATA PROCESSING AND ANALYSIS
Analysis of the data can be done through collaboration with an NGO (such as WWF). During this process, there is a knowledge-sharing exercise, which allows the monitoring personnel to understand and perform this exercise.

7 DATA REPORTING AND OUTREACH
Reporting back to communities on the results of each monitoring cycle should be done by the local management team and monitoring personnel as a part of their communication and outreach activities. However, when reporting back to government and external entities, technical support should be provided by the collaborating NGO and other facilitators of the process.

Monitoring methodologies and activities

Data collection
Tailored ODK questionnaires are created to collect data on the following broad key areas: forest change, natural resources, well-being, and impacts (see monitoring framework for details).

Community mapping
Community mapping has to do with identifying and documenting community lands in terms of land use, identifying burial sites, tourism zones, community infrastructure (e.g. roads, schools, and health posts), hunting grounds, fishing areas, farms, forest conservation areas, and titled land boundaries. As the process progresses, new data can be collected and added to the maps.

Drivers of forest change
A key deliverable under the agreement with the GFC is greater understanding of local drivers and processes of forest change. Farming activities within indigenous lands are identified as the most immediate cause of forest change, while other data on logging and community infrastructure should also be collected.

Ground-truthing
In developing its national MRV system, a key government focus is on improving the use of satellite data to increase the accuracy of forest change measurements. In this context, communities have the potential to play an important role in validating satellite data on forest change. Community monitors will ground-truth government maps of forest change based on satellite imagery. This activity is carried out using ODK forms provided by Guyana Forestry Commission (GFC) personnel.

Natural resources monitoring
Understanding natural resource availability and trends in extraction are of interest to indigenous communities who rely on these resources for their livelihoods. Information should be gathered on seasonality for hunting, fishing and harvesting; the importance of certain resources; preferred species; extraction methods and illegal activities. Among these areas, hunting, fishing, non-timber forest products and timber are identified and suggested as priorities for monitoring.

Well-being monitoring
Well-being speaks about understanding current socio-cultural issues in the communities, the negative and positive impacts from current infrastructure developments, as well as wider environmental policies such as REDD+. Beyond informing local development plans and development programmes, this information is valuable as safeguards. The main activities carried out to monitor well-being are described below:

- Defining the concept of well-being
- Training in interview techniques for the collection of well-being data.

Data management

Data processing and analysis
Before data collection, understanding the knowledge level of the locals within the community is necessary in order to ascertain what level of training is required to aid in the collection of data, whether it be with pen and paper or with mobile phones. The data collection within a community-based monitoring process should be carried out by the community members, and the data processing and management be undertaken by the trained community monitors.

This will guarantee transparency and clarity about who has access to and control of the information collected, which is essential for effectively managing the large amounts of data collected, and to address data sensitivities.
The main activities to be carried out for data processing and analysis are shown below.

Activity	Content	Who	When	Comments
Desk work/ research	Data processing methodology			Methods used to analyse and process the data include: • Downloading data from SMAP Server (Data Lab) • Basic synthesis, filtering and initial auditing of data using MS Excel • Top-level data assessment, with options for feedback • Data presented at community meetings for discussion, and determining decisions on sharing, in accordance with the data-sharing protocol
Desk work/ research/ training	Automatic templates for initial data visualization			Automatic templates for instant conversion of data into graphs and maps will be created for some datasets, using MS Excel. The synthesis of raw data into a more accessible visual format prior to analysis helps to identify incorrect data, anomalies and outliers.
Training	Reviewing process for data collection, auditing, synthesis, reporting, feedback and sign-off.			

Note: The 'Who' and 'When' columns listed in the table can only be determined and filled in during the planning and execution stage of the project.

Data sharing and reporting

Reporting and sharing monitoring results are the final key steps in the monitoring system. Key activities are shown in list below:

1. **Reporting results with community leaders and project partners:** these would be the preliminary results for the areas that were initially chosen to be monitored.
2. **Sharing of interim results at public meetings in each community:** sharing of results with participating communities. This will increase visibility and understanding of the project within the communities and provide opportunities to address local concerns, and communicate aims, outcomes and benefits to communities.

3. **Multimedia reports to communities:** these would include posters, newsletters, radio communication or any other means of reaching the communities with this information.
4. **Progress report to Government:** a technical report should be presented to the government agency attached to the CMRV process, if any.

Note: For further explanation and use, please refer to: Sabogal, D. 2015. *Data sharing in community-based forest monitoring: lessons from Guyana*. Global Canopy Programme: Oxford.

UBUNTU, SMAP, Windows – understanding and use

The work environment
Your work as CMRV monitors from now on will be conducted in the villages in these respective offices:

1. *Aishalton – Cluster 1 – Aishalton village office*
2. *Shulinab – Cluster 2 – Shulinab SRDC office.*

Ubuntu - what is it?
Ubuntu is an open source operating system for computers. It is a Linux distribution based on Debian architecture. To make all this simple, It's just another operating system for computers like **Windows** or Mac OS. A key difference between the two is that everything you did in **Windows** is different in **Ubuntu**. In Windows, we are used to closing programmes by clicking the **red X** at the top right-hand corner of our screen. In Ubuntu, it is the opposite side. This **X** is now in the top left-hand corner of your screen.

SMAP – what it is?
SMAP is a robust, flexible and standards-based data collection tool. This data can be applied to the core systems that manage your business. The SMAP Server as we know it, runs in the UBUNTU LINUX environment.

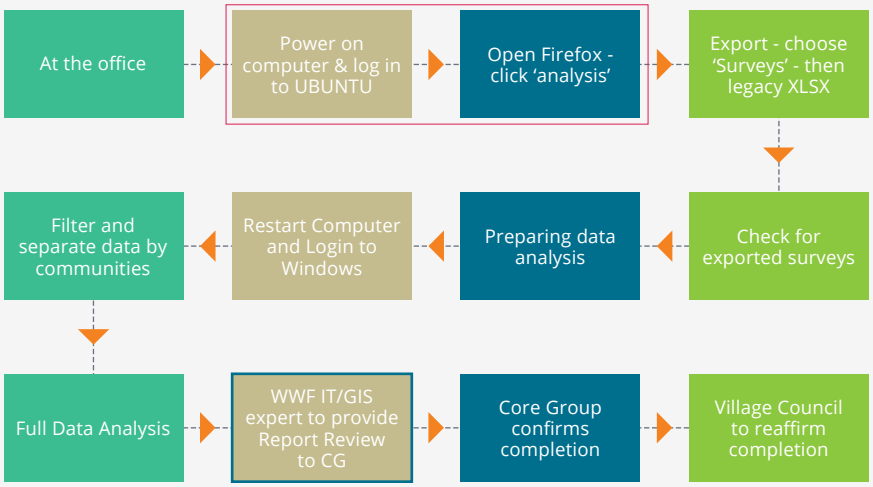
For more information on SMAP, visit - https://www.smap.com.au/index.shtml

Powering on the computer to use Ubuntu
Follow these steps to power on the computer with the SMAP Server:

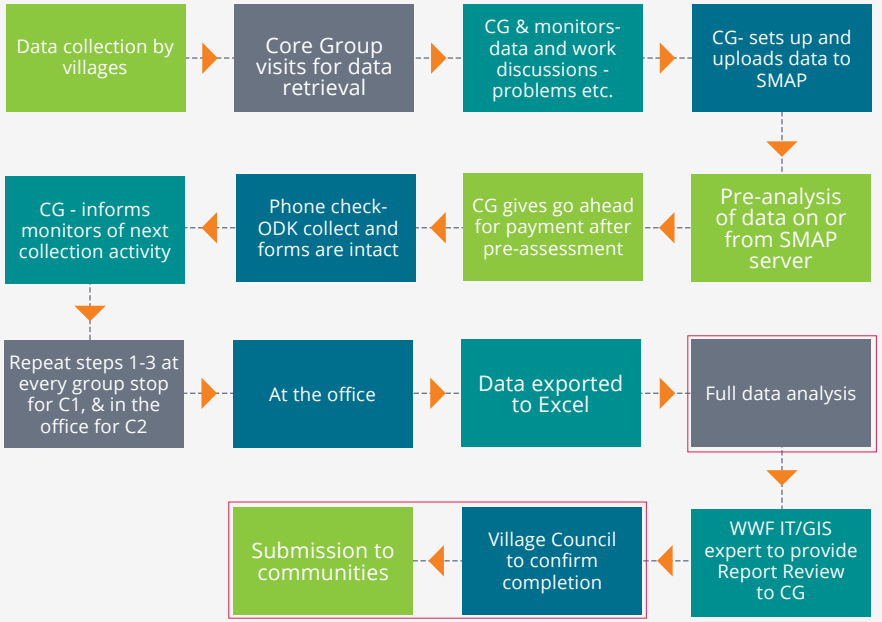
- Press the power button on the computer.
- The initial process gives you three options to choose from, two of which are the most important, as mentioned above, Ubuntu or Windows. In this case you are going to choose [Ubuntu]* - which is the default start-up option.
- Allow the computer to continue the start-up process, after which you will be greeted with the Ubuntu login screen.
- To access the computer, enter the password that is provided.
- Once the password has been entered, press 'Enter' on your keyboard to log in.
- Wait a while for the computer to finish preparing.

To get yourself familiar with the **Ubuntu** environment, we suggest you follow the steps below, after which you can play around, but don't delete or move anything that you don't know about.

CMRV office work flow

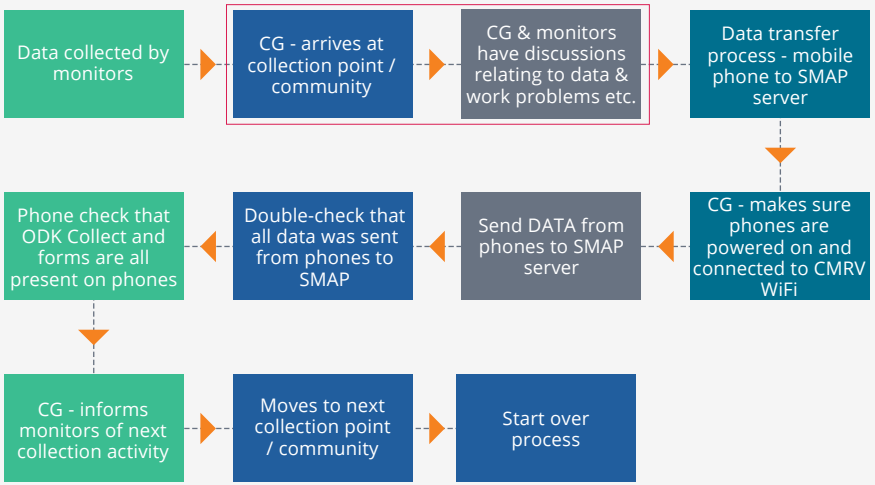


Standard CMRV work flow



Optional CMRV data collection work flow

This approach caters for areas where the data lab is established, but it is not easily accessible by communities. Mobile data retrieval work flow:



Post-CMRV Training

The continuation and sustainability of the CMRV process is based on a number of factors. These include:

1. The successful completion of the CMRV training of the two selected monitors from their respective communities.
2. The establishment of the CMRV monitoring data lab for continued monitoring work and data processing when the external implementing team leaves and hands over the process to the community/ies.
3. Full capacity built for core monitors to manage the monitors and the lab that will continue to provide vital information and knowledge to the council and community, to improve and maintain the sustainable management and well-being of the community and its rich resources.
4. Simple monitoring work plan developed to guide community monitoring.
5. Securing finances to keep the lab functioning and for stipends for the monitors by linking it to other developmental plans such as the VIP.
6. Care and safety of monitoring equipment that is solely owned by the village council.
7. Making CMRV an integral part of village administration recognized by the RDC & GoG agencies.

A Guide to Community-based Monitoring, Reporting and Verification

Recommendations

Prior to handing over the CMRV process from the external implementing team, an equipment status check should be conducted to ensure all equipment is in proper working order. An important element is deciding on how the monitoring equipment should be kept, since it belongs to the CMRV process, and this belongs to the community. It can be lodged at the community data lab or the village office, depending on which is safer and preferable.

An evaluation of the monitors is necessary to check on their knowledge retention and also to decide future monitoring plans. And finally, an evaluation of the process and its impact is executed to determine if the intervention had a positive or negative impact, so as to further improve the system.

Generally, community members are very interested in the sanitation and health data, as these are seen as a way of improving their community and lives. Communities have stated they were happy to see the data, as it clarifies why this was being collected.

The data-gathering exercise causes people to change their lifestyle or make them do things differently to improve it.

The data should be shared with relevant community authorities such as health authorities prior to sharing with the entire community. This will prevent any discrepancies during public meetings.

Notes to define terms in the forms should be added. This will assist the monitors in explaining questions from community members.

In making the reports useful and meaningful, monitors need to be more strategic in sharing the data. In order to obtain a more forceful impact, leadership groups should be targeted, although these days they may not be easy to reach, since there are so many things happening within the communities. Different methods of sharing should be used, such as creating CMRV programmes and updates in local languages for community radio programmes, or establishing community noticeboards for posting community data highlights or newsletters.

Expected Key Questions that Monitors Will Face

The CMRV process is not free from questions, issues and concerns. This information arises out of the monitors' presentations of their field assignments and from community engagements and follow-up discussions with communities.

1 Who are you working for?

Working for the community under the direct supervision of the Village Council. Not for the government or WWF.

2 How are you being paid?

We are paid through a grant from WWF which is expected to last for three months, to support the training and data collection.

3 So, how are we benefiting from giving you this data while you are being paid?

Yes, we are being paid for our time, but the real benefit is for the entire community. The data will be used to track changes occurring in our community so we can tell what is happening with our people and resources and we can come up with solutions together.

4 What is data and information?

Data refers to the raw pieces of information collected by Community Resource and Environment Workers (CREWs) using smartphones. Information is then produced from the data, such as the maps, tables and graphs which you see.

5 What is data collection?

Using smart phones to record the raw information, so that we can use it to create maps, graphs and reports for our community.

6 Who are you or who sent you to do this?

I was chosen by my Village Council to be a part of this training to do the CMRV work, so I am working for our community.

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7 Where is this data going and who will have access to it?

This data belongs to the community. It will be stored at our data lab. Our community monitor as well as the data lab technician will have access to it, because they have to analyse it and produce reports for the Village Council. Monitors are prohibited from sharing or giving out the information without permission from the Village Council.

8 What will happen to the data after you collect it?

It will be analysed at the data lab to make a community report which will be shared with community members, so that you can see for yourself what the information is. Once this is done and you agree, hard copies as reports and digital copies on flash drives will be handed over to the VC, to be used as a tool for managing and helping to solve any problems/issues that are highlighted.

All data collected is stored digitally in a computer hard drive (e.g. computer discs), and /or in computer back-up discs at the lab.

A list of all CMRV data exists, and is continuously updated to keep track of information that has been stored and that is arriving from monitors.

9 So what are you doing with the photos?

It is to verify that we spoke with you, and will not be shared or sold to anybody. So it is not to make any money for myself.

WWF

Working to sustain the natural world for the benefit of people and wildlife.

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