THE TROPICAL AGRICULTURAL RESEARCH
AND HIGHER EDUCATION CENTER

EDUCATION DIVISION

GRADUATE SCHOOL

WATERSHED MANAGEMENT

A ROADMAP TO THE PROTECTION AND MANAGEMENT OF COLUMBIA RIVER FOREST RESERVE IN BELIZE WITH THE FULL PARTICIPATION OF THE TWELVE BUFFERING COMMUNITIES OF THE FOREST.

FINAL GRADUATION PROJECT SUBMITTED FOR CONSIDERATION BY THE DIVISION OF EDUCATION AND THE GRADUATE SCHOOL AS A REQUIREMENT TO QUALIFY FOR THE DEGREE OF

VIRTUAL MASTER'S DEGREE IN MANAGEMENT OF HYDROGRAPHIC BASINS

VICTORIA CAWICH

TURRIALBA, COSTA RICA

2021

This graduation work has been accepted in its present form by the Graduate School of CATIE and approved by the student advisory committee, as a requirement to opt for the degree of

Master in Watershed Management

SIGNATORIES:

Cornelis Prins, M.A.
Director, Graduation Work

Laura Benegas Negri, Ph.D.
Member of the Advisory Committee

Roberto Quiróz Guerra, Ph.D.
Dean, Graduate School

Victoria Cawich
Candidate

DEDICATION

This final project is dedicated to my sons Celso and Victor, my mom Rosita and dad Ernesto Chi who have always been supporting me during my study. Mr. Kees Prins and Dr. Laura Benegas for being my mentor throughout my study.

ACKNOWLEDGEMENT

My appreciation and profound gratitude goes to my supervisors, Mr. Kees Prins and Dr. Laura Benegas whose encouragement and support has made me get this far. A Special thanks to all 2020 Máster en Manejo y Gestión de Cuencas Hidrográficas faculty members.

I am grateful to the Maya Leaders Association and the Toledo Alcalde's Association for facilitating my data collection process by providing me with the relevant information, support and documents. I particular thank the Machaca Staff, member of the Belize Defence Force, community member of the twelve villages for helping in the collect of my data.

Finally, I acknowledge the Forest Department through the IUCN-Selva Maya Natural Resources Protection Project for providing the financial support that has enabled me to take a step higher in achieving my goals and objectives.

SUMMARY IN SPANISH

El propósito de esta investigación fue desarrollar una hoja de ruta para el manejo colaborativo de los bosques y el agua en una de las áreas protegidas clave de Belice: la Reserva Forestal del Río Columbia, aumentando los beneficios futuros de las áreas protegidas para las comunidades locales. Esto se logró mediante la participación de las doce (12) comunidades indígenas que protegen el área protegida e integrando sus aportes en el desarrollo de los primeros pasos hacia su participación como socios de cogestión. El proceso de participación también brindó la oportunidad de abrir la comunicación y comenzar a generar confianza entre el Departamento Forestal, la Alianza de Líderes Mayas y las comunidades y la gestión del agua.

El manejo de los recursos forestales en Belice recae principalmente en manos del gobierno, y las comunidades adyacentes a estos recursos son reconocidas como partes interesadas clave. A pesar de su proximidad a los ricos recursos forestales, las comunidades que viven alrededor de estos recursos tienen una alta pobreza, generalmente compuesta por agricultores y pequeños comerciantes. Su interacción con la Reserva Forestal del Río Columbia ha sido limitada desde su establecimiento en 1954, y el acceso a los recursos naturales ha sido restringido. El área protegida es clave para el mantenimiento de la seguridad hídrica en el sur de Belice, y tanto el Gobierno como las comunidades reconocen la importancia de mantener este y otros servicios de los ecosistemas en el futuro.

La hoja de ruta busca allanar el camino para la participación comunitaria en el manejo sostenible y el uso de los recursos basándose en la administración comunitaria de los recursos naturales de las comunidades mayas, y el nuevo marco de participación en los beneficios a través de asociaciones de colaboración que se basan en las prácticas de uso consuetudinario de estos. comunidades indígenas e integra permisos de uso consuetudinario. Los planes de gestión desarrollados para las áreas de gestión comunitaria se centrarán en la distribución de beneficios económicos, socioculturales y ambientales, ayudando a mejorar los ingresos, las oportunidades y la calidad de vida de la comunidad.

Las consultas con las comunidades demostraron la voluntad de ayudar en el manejo de la Reserva Forestal, pero también la necesidad de orientación de las agencias relevantes sobre cómo pueden participar y cómo asegurar el manejo sostenible de sus recursos. Las comunidades entienden la importancia del área protegida y por qué necesita ser protegida y manejada de manera efectiva, pero tienen una estructura organizacional limitada para administrar adecuadamente la reserva. La investigación también destacó algunos de los conflictos que han surgido debido a la falta de manejo de los recursos forestales en el pasado y brinda recomendaciones sobre formas de mejorar la participación de la comunidad en la toma de decisiones para mejorar la efectividad del manejo, con la necesidad de contar con mecanismos para mejorar la comunicación. y diálogo. El proceso de desarrollo de la hoja de ruta proporcionó una plataforma para la planificación colaborativa y un punto de partida para la implementación futura de la hoja de ruta.

ABSTRACT

The purpose of this research was to develop a road map for collaborative forest and water management in one of Belize's key protected areas - the Columbia River Forest Reserve, increasing future protected area benefits for local communities. This was achieved by engaging the twelve (12) Indigenous communities that buffer the protected area and integrating their input into the development of the first steps towards their participation as co-management partners. The engagement process also provided an opportunity to open communication and start building trust between the Forest Department the Maya Leaders Alliance and the communities and water management.

The management of forest resources in Belize falls mostly in the hands of the government, with communities adjacent to these resources recognized as key stakeholders. Despite their proximity to the rich forest resources, the communities living around these resources have high poverty, generally composed of farmers and small traders. Their interaction with the Columbia River Forest Reserve has been limited since its establishment in 1954, and access to the natural resources has been restricted. The protected area is key in the maintenance of water security in southern Belize, and both the Government and the communities recognize the importance of maintaining this and other ecosystem services into the future.

The roadmap seeks to pave the way for community participation in the sustainable management and use of the resources building on the communal natural resource stewardship of the Maya communities, and the new framework of with benefit sharing through collaborative partnerships that build on customary use practices of these indigenous communities and integrates customary use permits. The management plans developed for the community management areas will be focused on economic, socio-cultural and environmental benefits sharing, helping to improve community income, opportunities and quality of life.

The consultations with the communities demonstrated a willingness to assist in the management of the Forest Reserve but also a need for guidance from the relevant agencies as to how they can participate, and how to ensure sustainable management of their resources. The communities understand the importance of the protected area and why it needs to be protected and managed effectively but have limited organizational structure to properly manage the reserve.

The research also highlighted some of the conflicts that have arisen due to the past lack of management of forest resources and provides recommendations on ways to improve community participation in decision making towards improved management effectiveness, with the need for mechanisms to be in place for improved communication and dialogue. The process in developing the road map provided a platform for collaborative planning, and a starting point for future implementation of the road map.

TABLE OF CONTENTS

INDEX OF TABLE

INDEX OF FIGURES

LIST OF ACRONYMS

Belize Defense Force	BDF
Caribbean Court of Justice	CCJ
Columbia River Forest Reserve	CRFR
Columbia River Forest Reserve Strategic Management Plan	CRFRSMP
Columbia River Forest Management Committee	CRFRMC
District Association of Village Councils	DAVCO
Friends for Conservation and Development	FCD
Forest Department	FD
Forest Customary Use Permit	FCUP
Forest Department Strategic Action Plan	FDSAP
Forest Planning and Management Project	FPMP
Global Environmental Facility	GEF
Government of Belize	GoB
Julian Cho Society	JCS
Key Biodiversity Area	KBA
Maya Leaders Association	MLA
Maya Mountain Massif	MMM
Maya Mountains Marine Corridor	MMMC
National Association of Village Councils	NAVCO
National Climate Change Policy and Strategy	NCCPS
National Protected Areas System	NPAS
National Protected Areas Policy and System Plan	NPAPSP
Non-Timber Forest Produce	NTFP
Protected Areas Conservation Trust	PACT
Ya'axche Conservation Trust	YCT
Terms of Reference	TOR
Toledo Alcaldes Association	TAA
Toledo Institute for Development and Environment	TIDE
Terms of Reference	TOR

1 INTRODUCTION

1.1. BACKGROUND

Belize is recognized as being committed to the conservation and sustainable use of its natural resources through the designation of a suite of protected areas that form the National Protected Areas System. These include high protection Nature Reserves (equivalent to IUCN Category 1a) to Forest Reserves established for watershed protection and the sustainable extraction of timber (IUCN Category VI). The sustainable management of Belize's rich natural resources base is critical to the sustainability of the country's productive sectors and to the maintenance of Belize's biological diversity. Therefore, it is important that Belize's forests are managed to continue to provide the range of goods and services that are critical to supporting the health of its economy and well-being of its small national population. Columbia River Forest Reserve is considered an important component of Belize's National Protected Areas System and is included in two system-level planning units - the Maya Mountain Massif (MMM), and the Maya Mountains Marine Corridor (MMMC).

The Columbia River Forest Reserve (CRFR) is a national protected area situated in Toledo District, in southern Belize, and is the most southerly of the protected areas within the Maya Mountains Massif system. Encompassing approximately 60,000 hectares (148,357 acres), CRFR contains the headwaters of 6 watersheds (the Deep River, Golden Stream, Moho River, Monkey River, Rio Grande and Usumacinta watersheds) providing water for communities downstream in both Belize and Guatemala (Figure 1). Columbia River Forest Reserve, is considered one of the most important protected areas in Belize in terms of provision of water security, based on the rural population, which is highly dependent on the creeks and rivers flowing from the protected area, both for home use and agriculture.

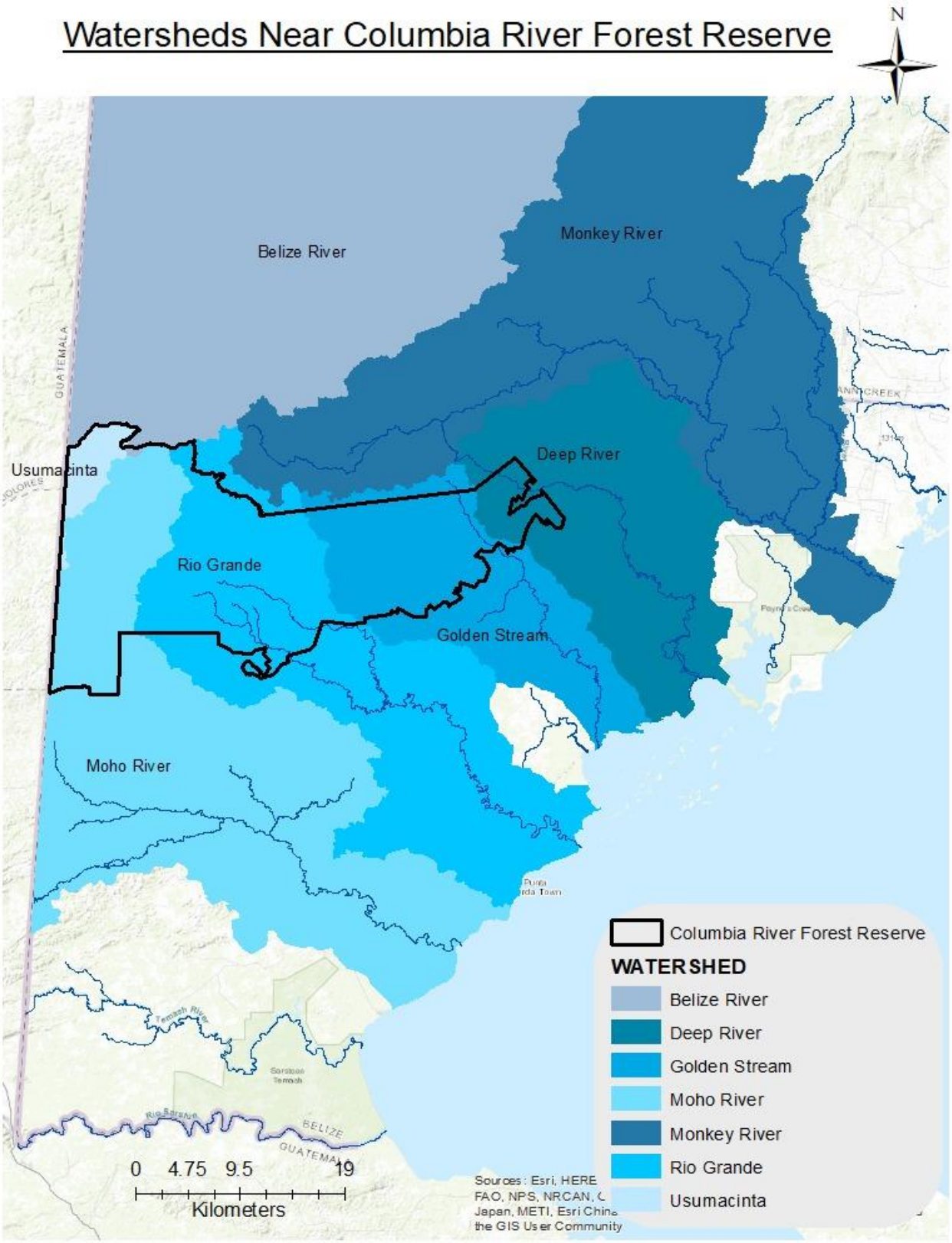


Figure 1: Six Major Watershed within Columbia River Forest Reserve

Columbia River Forest Reserve has been managed in the past primarily as a timber extraction resource, with restricted access and few benefits to the local communities. The nearest communities to Columbia River Forest Reserve are spread along its southern border– twelve Maya villages highlighted as important stakeholders, many still reliant on forest resources for house construction, medicinal plants, subsistence hunting and other food supplements. There are also communities on the Guatemala side adjacent to the international border, with illegal incursions placing significant pressure on the natural resources and integrity of the Forest Reserve. Land tenure in the adjacent Belize villages includes lease land holdings and informal community lands, with traditional village boundaries and land use practices still respected by most of the community members. Households often use 25 to 50-acre parcels for small scale agriculture, and any unallocated national land is used for resource extraction in a communal manner, based on customary systems, with the Alcalde and the Chairman exercising some management over the resources. National lands adjacent to the villages (including Columbia River Forest Reserve) are used primarily for hunting, fishing, and house material extraction, though in the past, many Belizean communities stated that CRFR is too far from the communities for significant extraction to take place. Recently, however, encroachment into the reserve has increased, with communities demanding land for agriculture. Both community and private lands are gradually encroaching into the buffering forest from the southern margin of the Forest Reserve, increasing accessibility, and with some agricultural incursions into the Forest Reserve itself. CRFR has been identified as key for water security for the communities in southern Belize but has no on-site management presence. Overall, management effectiveness has seen a decreasing trend since 2006, from 2.10 to 1.95 in 2009 and from 1.95 to 1.87 (out of a possible score of 4). This was considered a reflection on the limited staff availability, the lack of effective and sustainable management of the timber resources, limited engagement of stakeholder communities, and absence of a management plan (Wildtracks, 2010). In the most recent national management effectiveness assessment, CRFR was identified as of very high prioritization score but poor management effectiveness, as and needing significant strengthening through increased on-site management presence to improve protection of the natural resources and ecosystem services (Wildtracks, 2019). Stakeholder community engagement has increased through the years, with the Forest Department and the Maya Leaders Alliance moving towards a system of 'customary use.'

There is currently a land tenure conflict that has implications on the management of Columbia River Forest Reserve, with the Maya Leaders Alliance leading the movement towards an equitable land governance system for the traditional Maya communities, with control of resource use for sustainable development (Wildtracks, 2010). In April 2015, the Consent Order adopted to affirmative measures to create an effective mechanism to identify and protect the property and other rights arising from Maya customary land tenure, in accordance with Maya customary laws and land tenure practices. In relation to this, the GoB further committed to the demarcation and registration of all property rights that each of the Maya villages of the Toledo District holds over the lands in accordance with their customary land tenure system. Delimitation will involve the identification of the lands and territory traditionally owned by indigenous peoples, which, in turn, entails "establishing borders and boundaries, as well as its size." Lands 'traditionally owned' are those encompassed by the Maya people's customary tenure system, in accordance with Maya customary laws and land tenure practices (Kaliña, 2006). Therefore, in good faith and demonstrating mutual respect, the GoB and the MLA initiated the process through the development and implementation of the Forest Customary Use Permit in all the Mayan Communities. As part of the Principles of Customary Use of Forest Use for sustainable management of natural resources within the 'Maya traditional land use areas' it is believed that these Maya Communities should have equitable distribution of benefits amongst each community; protection of Maya cultural practices and management of Maya cultural heritage; reform and status of community governance institutions embedded and recognized under national law. Under the Maya Customary Tenure and law these communities have been

granted permission by the Forest Department to manage their forest resources through the use of a Forest Customary Use Permits.

The implementation of a socio-economic assessment serves as the principal guide for the preparation of a management plan for CRFR. The socio-economic assessment is seen as a precursor to the management plan, analysis of the feedback obtained from the community consultations form a part of the social and livelihood assessments of communities adjacent to the CRFR, providing the information needed on historical and current use of the area and the context in which CRFR is being managed.

1.2 JUSTIFICATION

This project contributes to improving community participation in management of Columbia River Forest Reserve and the socio-economic benefits it provides to buffer communities. This is achieved through the identification of confidence-building measures to increase the level of trust between the Forest Department, Maya communities and other relevant organizations working in the area. This trust is needed if collaborative, coordinated sustainable management of the Forest Reserve is to succeed as a model of Indigenous community management. Building the capacity of the Forest Department to understand this need through this project has been an important step in the process, laying the path to improved communication and collaboration with the twelve CRFR stakeholder communities towards the development of a road map for improved management of the Forest Reserve and its resources.

The first Forest Management Plan for the Columbia River Forest Reserve was drafted by Bird under the Forest Planning and Management Project (FPMP) in 1994. At that time, the communities were small, and relatively distant from the protected area, with adequate natural resource on the community lands to provide community needs. The Plan focused on regulation of the ongoing logging activities and recognized the need to base management on sound scientific footing. As the (National Protected Areas System (NPAS) has evolved over the years, however, there has been increasing recognition of the need to improve not only sustainability of natural resource extraction, but also strengthening provision of ecosystem services, biodiversity protection and improve socio-economic benefits for local communities. The National Protected Areas Policy and System Plan (NPAPSP, 2015) supports an integrated and holistic approach to the sustainable management of natural resources. It accepts that Maya archaeological sites and cave systems are important tangible cultural assets and recognizes the importance of indigenous community knowledge. The Plan also promotes the use of legally binding conservation management agreements with community-based organizations, which aim to build partnerships to ensure the sustainable management of natural and cultural resources. This framework offers a point of departure for negotiating roles and responsibilities for the management of natural and cultural resources within clearly defined areas. The NPAPSP forms the key foundation of a functional NPAS. The National Climate Change Policy and Strategy (NCCPS, 2014) opens space for dialogue and partnership with the Maya people, whose traditional practices can contribute to, and benefit from, actions aimed at building resilience to climate change. Consistent research in various regions of the world “reveals a strong correlation between indigenous presence and the protection of natural ecosystems,” not the least because “traditional ways of using and managing biodiversity are grounded in progressive principles of sustainability (NCCPS, 2014).”

CRFR is managed directly by the Belize Forest Department, under the framework of the National Forest Policy-Belize (2015). This is focused on developing a thriving and integrated forest sector, where the forest of Belize is valued for their significant economic, socio-cultural and

environmental benefits, and are sustainably managed for the lasting benefit of the nation. The current Forest Policy focuses on issues such as forest dependent people and their livelihoods; climate change impacts and mitigation; hurricane damage; watershed and biodiversity protection and management, national security and indigenous rights. This project seeks to strengthen these areas through Objective II: Encourage the participation of all stakeholders in the planning and decision-making process for effective protection, security, management and development of the forest resources.

In Belize, we have a diverse range of stakeholders who are impacted by the forestry activities in the CRFR landscape. The government recognizes that these stakeholders, and their interests are not fully addressed. It also recognizes the need for strengthened definition and coordination of roles and responsibilities. Co-management has been a long-standing recommendation for the CRFR but given the dynamics of the Maya Land Rights Claim, suitable co-management partners must be identified to provide greater stability. Improving CRFR management effectiveness to a rating of MODERATE (>50%) in the next five years will only be achieved if such an on-site management presence can be established and maintained. A number of options have been identified for achieving this - through a full co-management partnership with a community-based NGO, a tourism concession, or through investment in an increased number of Forest Department staff on the ground dedicated to management of this protected areas, as a management committee, or other identified mechanisms.

Approximately 54% of Belize's population is rural (World Bank, 2020) and a great many rural livelihoods are dependent on private and national lands for subsistence and income. In rural areas, forests have been traditionally utilized as sources of game meat, edible and medical plants and timber and non-timber forest products for construction. The relationship of Maya communities in southern Belize to the land is embedded in their culture and livelihood systems. These communities have long-standing cultural and historic claims to the land, but no legal title, with land claims overlapping with large government holdings such as the CRFR. The Maya have expressed the wish to set aside forest reserves in their community lands to ensure continued access to timber and Non-Timber Forest Produce (NTFP), as well as other ecosystem services provided by forests.

Based on the concept note: "Development of a community stewardship strategy," commissioned by the Maya Leaders Alliance/Toledo Alcaldes Association and Julian Cho Society (JCS) with technical support from Friends for Conservation and Development, this project seeks to develop and present a strategy aimed at supporting community involvement in addressing illegal natural resource extraction in the Columbia River Forest Reserve, particularly those of a transboundary nature. The concept note, funded by Wildlife Conservation Society (WCS), takes into consideration the following: the need to provide participating communities with the capacity to properly care for forested lands and resources and through the building of appropriate and relevant partnerships and to pay attention to the potential role of existing community capacities in the future management capacity community forested lands – such as the traditional leaderships system. This concept note submitted to WCS is in line with one of the program areas of work of the JCS which is "Sustaining and Caring for Lands and Resources." This program aims to safeguard the land and its resources for future generations just as it has cared for the Maya people to date. This involves protecting the integrity and wellbeing of the land by revitalizing the notion of 'Ral ch'och' (Children of the Earth), revitalizing core values and practices that sustain the wellbeing of the land, innovating, learning new technologies, creating new practices and institutions, and participating in global efforts to care for the planet.

The Forest Department Strategic Action Plan (FDSAP, 2019-2023) represents the Department's focus for the next five years towards achieving its mandate: a proactive and harmonized response to local regional and global sustainable development challenges geared towards achieving the departments vision and mission while contributing to the achievement of Belize's Growth and Sustainable Development Strategy (2016-2019), and in particular, Strategic Objective #2: Enhance economic, social and environmental benefits of forest through sustainable utilization of forest resources by stakeholders, highlighting the Department's desire for strengthened community stewardship. The Forest Department's desire is that targeted forests are well managed and delivering good and services for the benefits of its users and community. This can only be accomplished if we identify viable sustainable use options and work with the communities to develop them to meet community interests and needs. Strategic Objective #5: Enhance collaboration and stakeholder participation for improved efficiency. The desired result is that the Department's communication efforts and partnerships are effective in improving efficiency. This can only be obtained by increasing the number of partnerships that support forest management e.g., co-management agreements and private-public sector partners.

The absence of a clearly defined road map for CRFR to organize all the existing efforts has caused past efforts to be futile with nonexistent outputs. Therefore, the development of this road map will seek to ensure the sustainability of the Forest Reserve through increased participation from and partnership with the stakeholder communities, with the goal of increasing both sustainability of natural resource use, and social and economic benefits. Interviews were conducted with key stakeholders/leaders from each community to identify the impacts of the communities within the CRFR area, the socio-economic benefits they currently derive from the area, and the potential for future benefits.

The entire planning process depended heavily on stakeholder participation, as a prerequisite for transparency, respect, acceptance, participation sustainability and the long-term success of strategies. This process-oriented approach allowed stakeholders to participate fully in the analysis of the key factors and issues, that lead to the formulation of the key elements of the road map, as well as the creation of an environment for the sustained implementation of the resulting strategies. The use of the participatory approach facilitated the integration of local knowledge into the planning process, both from the communities, and from the knowledge and experience lodged with staff of the Forest Department Machaca Station.

The stakeholder consultations addressed the socio-economic issues and assisted in developing the composition, roles, and responsibilities of the management organization towards improved community stewardship. It is proposed that a management organization be established for Columbia River Forest Reserve in order to ensure the coordinated and effective participation of all the relevant stakeholders in the management of the Forest Reserve within an approved and accepted management planning framework. This proposal looks at the development of individual and institutional outlooks that maintain mutual supportive and respectful relationships based on clearly defined roles and responsibilities.

This project has also provided an opportunity to build my personal capacity, as a member of the Forest Department, in understanding and working with stakeholder communities and organizations in southern Belize, and in developing a full understanding of the implication of the Maya Lands Rights and how the Forest Department can best work with communities to ensure CRFR can provide the environmental, ecosystem services and socio-economic benefits it was established to protect.

1.3 IMPORTANCE

The Government of Belize recognizes that the country's forest plays a significant role in its social and economic development and is a significant contributor to the daily livelihoods of the local rural, indigenous and immigrant population. Maintaining the ecological integrity of Belize's forest resources provides many benefits: firewood, forest and tree products; employment through forestry and tourism; subsistence livelihood support such as game meat, medicinal plants, and other NTFPs; government revenues; business opportunities; environmental functions and services (such as regulation of climate, water security and air purification, soil conservation, and maintenance of biodiversity and its genetic pool). The Forest Reserve also encompasses perhaps the most important part of Belize's Key Biodiversity Area – Little Quartz Ridge, and the old growth tropical forest with the highest biodiversity records for Belize.

Columbia River was first established as a Forest Reserve in June 1954 (SI 33 of 1954) with an area of 110,720 acres, in recognition of both its importance for watershed protection and its timber resources whilst also conserving soils and biodiversity. It has undergone many changes during the past years. In May 1977, it was reduced to 102,965 acres (SI 40 of 1997). In 1997 (SI 115 of 1997) the original CRFR and the Maya Mountain Forest Reserve South (MMFRS) were consolidated into one Forest Reserve (Columbia River Forest Reserve) with a total area of 148,357 acres to facilitate improved timber management and to allow for community farming extensions. The Forest Reserve is equivalent to an IUCN Category VI area – a protected area managed primarily for the sustainable use of natural ecosystems (IUCN, 1994). The Forest Reserve protects the headwaters within a landscape spectrum that stretches from tropical broadleaf forest, through agricultural lands, urban areas, coastal strand, and shallow coastal waters, to seagrass and coral reef, interconnected by rivers that flow from the Forest Reserve to the sea. As a Forest Reserve, CRFR has always been managed for timber extraction, with restricted access and benefits to local communities.

Whilst past management concentrated on forestry extraction, future management goals must also include mechanisms to assist local communities to benefit from these resources.

It is recognized, however, that if traditional use is to continue, there needs to be mechanisms in place to balance this with sustainability, and a concerted effort to exercise control over illegal incursions from Guatemala. In order to manage the CRFR resources, stakeholders must balance sustainable use, resource protection and conservation with their community needs for food security, livelihood and the fair use of resources. It is critical to recognize the close link between how a community uses natural resource and the socioeconomic context of the community.

The socioeconomic information from this study provided an understanding of the social, cultural, economic and political characteristics and conditions of individuals, households, groups, organization and communities. The assessment tool included a socio-economic criteria indicative of community interest and capacity to benefit from and participate in the management of a particular forest area within CRFR and the type of forest resources that the community or communities wish to manage, help identify potential issues and focus management strategies accordingly.

The main outputs of this study are to provide the foundation for planning and a road map that sets in place a positive environment for the development of a mutually acceptable, participatory management strategy, ensuring the communities benefit from support for sustainable livelihood options

that enhance their socio-economic existence and, at the same time, contribute to the sustainable management of the natural resources, to address incursions and challenges faced in CRFR.

2 OBJECTIVE

The objective of this project is as follows:

General

- Contribute to future benefits for local communities by engaging twelve (12) Indigenous communities in the development of the road map for forest and water management.

Specific

- Analyze current knowledge of the communities and CRFR, current use and perceptions on the potential for participatory management, through structured community meetings and surveys.
- Develop a road map to Community Forest Management in Columbia River Forest Reserve for forest and water management.

3 FRAME OF REFERENCE

3.1 THE CRFR LANDSCAPE CONTEXT

Regionally, Belize ranks high in terms of percentage of the country's land area under forest cover and forest area per capita, attributable to its small population size and large terrestrial territory under protection. Belize's total forest cover is currently approximately 1.4 million hectares - around 61.75% of the land (Forest Department, 2018). About 36.6% of the national forest is under protected area status, and the other 60% is privately owned or situated on public lands that are not directly managed for forestry purposes. Of the publicly owned and managed forests, 65% are set aside for timber production (Forest Reserves), and the remaining areas are managed for non-extractive purposes. Belize has a total of 16 Forest Reserve, of which Columbia River Forest Reserve is the largest.

Forest Reserves that protect large tracts of intact forest are recognized for their importance for providing environmental services, particularly for watershed sustainability and water security. However, there are increasing pressures, with constant pressure for access due to higher agricultural potential than the more disturbed and previously farmed areas outside of the protected areas. Poor crop and livestock management practices, including the cultivation and over-grazing of steep slopes and riverbanks, have contributed to extensive soil erosion in the landscape, and resulted in landslides in some areas. The destructive harvesting of forest resources in forested watersheds is further contributing to soil erosion and sedimentation, and to a reduction in the quality of water. The removal of forests within the larger landscape is also changing rainfall patterns, impacting water security, with creeks and springs drying up.

The UN Food and Agriculture Organization defines sustainable forest management as "the stewardship and use of forest and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems (FAO, 2000)." Sustainable forest management offers a holistic approach to ensure forest activities deliver social, environmental and economic benefits, balance competing needs and maintain and enhance forest function now and in the future. It takes into account the differences

between communities and community natural resource use and addresses the needs and knowledge of local dependent communities. The three pillars of sustainability are defined as being socially just, ecological sound and economically viable. If one pillar is missing, we cannot protect our forest, forest dependent communities and rural economies cannot thrive, illegal logging will not be decreased, and development opportunities will not be secured. is essential to ensure that community demands do not compromise the resources. In the National Protected Areas Policy Declaration, the Government of Belize states that it "shall promote the sustainable use of Belize's protected areas by educating and encouraging resource users and the general public to properly conserve the biological diversity contained in these areas in order to maintain and enhance the quality of life for all. This shall be achieved by facilitating the participation of local communities and other stakeholders in decision making and the equitable distribution of benefits derived from them, through adequate institutional and human capacity building and collaborative research and development (NPAPSP, 2005)."

Columbia River is designated as a Forest Reserve, one of six distinct categories of protected area managed under the mandate of the Forest Department (under the Ministry of Sustainable Development, Climate Change and Disaster Risk Management), which together with the Marine Reserves, form Belize's National Protected Areas System (NPAS). Each protected area category has specific restrictions strictly defined by law. Of the six established and managed under the Forest Department, Forest Reserves are the ones of the only ones to be designated under the Forests Act (1927), and the only ones permitting non-traditional extractive activity. The Forest Reserve designation is for the protection of forests for management of timber extraction, whilst also conserving soils, watersheds and wildlife resources. It allows for research, tourism and education and, unlike the categories that fall under the National Parks System Act, also for extractive activities, if conducted sustainably.

The Forest Reserve is part of the Maya Mountains Massif (MMM), one of the largest remaining contiguous blocks of forest in Central America. The Maya Mountains Massif is recognized for its role in maintenance of the matrix of tropical broadleaf forests characteristic of northern Mesoamerica and the ecosystem services it provides and until recently, the area was considered to be maintaining the full range of natural processes and disturbance regimes, and to be functioning within the range of acceptability, with minimal human intervention. However, these regional forests are now greatly diminished in comparison with their historic range. Columbia River Forest Reserve is considered critical in the maintenance and viability of water security and biodiversity on the southern coastal plain, providing there is connectivity for species movement through forest corridors such as that envisioned and created under the Golden Stream watershed initiative through Ya'axche Conservation Trust (YCT), and the Toledo Institute for Development and Environment (TIDE) private lands, linking them with the CRFR and MMM.

3.2 INDIGENOUS PEOPLE IN THE CRFR LANDSCAPE

There are thirty-eight Indigenous Maya (Q'eqchi and Mopan) communities in southern Belize. Of these, twelve are associated with CRFR. These communities are part of the larger indigenous Maya people of Mesoamerica who are descendants of a pre-Colombian civilization. The Mayas of the southern Belize are traditionally a "forest people" whose land use patterns are governed by a system of mostly unwritten customary rules and values that form part of the social, cultural, economic and political organization of each community. Within this customary land tenure system, Maya villages hold land collectively, while individuals and families enjoy derivative, subsidiary and usufruct rights of use and occupancy. Maya villagers generally farm corn, beans, rice, tree, and ground crops in rotating fields, as

well as hunt and fish in the forest for subsistence. Often times subsistence farming is complemented by wage work outside of their communities.

In order to consult these communities, it is necessary to go through a consultation process that must be transparent and conducted in a participatory process, with the rights of Indigenous communities, and their views and ideas then informing the development of the road map. The process of achieving this is through the principle of Free, Prior and Informed Consent as articulated in the United National Declaration on the Rights of Indigenous Peoples; the World Bank's Operational Policy 4.10. Clear channels and basic protocol for engagement with the recognized leaders of the Maya People that is based on Maya Tradition and practices. The protocol has been used for all the consolations workshops.

3.3 INSTITUTIONAL AND LEGAL FRAMEWORK OF THESE COMMUNITIES

The following section discusses the institutions who have formal responsibilities in terms of the development of communities adjacent to CRFR. The village councils generally apply to all rural communities while the Alcalde System is specific to the indigenous Maya communities. Both the Alcalde Councils and Village Councils belong to regional or national governing bodies. All village councils belong to a District Association of Village Councils (DAVCO) corresponding to the administrative district where they are geographically located. The six district associations form the National Association of Village Councils (NAVCO).

3.3.1 MAYA CUSTOMARY LAW AND PRACTICE

Maya villages are generally organized, peaceful and responsible. Members of the village must fulfill their village obligations and the village leaders play a key role in ensuring that there is confidence and trust in what the village does together. A large part of the responsibility is based on how they live on the land, what they do with the land and how they take care of what is on the land, including the forests. It is these long-standing characteristics of the Maya people that has given rise to Maya Customary Practices. It is important to note that Maya Customary Practice and law is constantly evolving as the reality of the Maya people evolves, but it is expected to remain rooted in the way of life of the Maya village and the Maya governance system of the Maya people. The Alcaldes represent the customary system of governance in each Maya village and are elected in accordance with Maya customary practices. They are responsible for sustaining customary governance, facilitating collective decision, making and ensuring that customary law is honored. The Alcaldes work hand-in-hand with the Village Council to uphold customary practice. The village councils play a critical role in the good governance of the community. Together the Alcalde and the Village Council are expected by the village to represent their collective voice and will, but this is not always the case, in some village's rivalry exist and this prevents the resources from being managed sustainably.

Maya Customary Practice and Law forms part of the existence of the Maya villages in Belize. Customary Law is recognized under national, international law and agreements made by the government of Belize such as the United Nations Declaration on the Rights of Indigenous Peoples. The Maya Customary Practice and Law Recognized the need to care for the forest and land through good governance and management and started the development of a guide that encompasses the eight principles for managing common-pool resource by Elinor Ostrom (2010) through the development of the Maya Customary Use of Forest Resources Guide which is the same for all the Maya villages and it must be applied if the Forest Customary Use Permit is to be valid. (Table 1).

3.3.2 LOCAL GOVERNMENT- VILLAGE COUNCILS

The local governance system of all rural communities is through a Village Council. The Government of Belize passed the Village Councils Act (VCA) in 1999, Chapter 88 of the Laws of Belize, which was revised in 2003. As a result of this Act, Village Councils have the legal authority to govern their own communities. The Act allows community members to establish a village council through democratic elections that serves for a period of three years as long as there is a minimum of 200 eligible voters. The Village Council is responsible for the general wellbeing of the community including the care and maintenance of public property and to make regulations to improve the quality of life for residents.

The Village Council is comprised of seven members. The head of the council is the Chairperson, who is supported by six councilors who may hold the positions of deputy councilors, secretary and treasurer. Councils have to conduct public meetings at least quarterly.

The Village Councils Act (Cap**.** 88) does not address the Maya people's rights over their ancestral lands and their customary governance systems, including as related to the management of land and natural resources. Therefore, it is necessary to amend this law, especially section 47 (Duties and responsibilities of the Council with respect to lands), to clarify the functions and powers of the GoB institutions and that of the Maya governance institutions in order to guarantee respect for the right of the Maya people to effectively control and manage their collective lands through their customary governance institutions and systems.

3.3.3 TRADITIONAL LOCAL GOVERNMENT- ALCALDE SYSTEM

As well as, and apart from the Village Council, most indigenous communities also elect a Maya Traditional leader, or Alcalde, appointed to their petty magistrate office by the Attorney General in accordance with the Inferior Courts Act (Cap. 94). The Alcalde system is officially recognized as part of the local government structure of Belize, under Chapter 77 of the Laws of Belize. The primary focus of the Alcalde Council is to act as an inferior court (under the Inferior Court Act Cap. 94) to oversee judicial matters within a determined judicial district (normally within the boundaries of the community). These issues include maintaining law and order and hearing and passing judgment on petty crimes and disputes. Aside from the judiciary duties of the Alcalde Council, they also traditionally govern the community lands and resource management, call for communal cleaning of the village (fajina), perform duties as school officers and even decide who can live in a village, and are responsible for ensuring the wellbeing of the community. Alcaldes by and large maintain the trust of the community and along with the Village Councils, they are recognized as legitimated representatives of their Maya communities. The Alcalde is assisted by four other members who act as the village police officers, all of whom are elected every two years.

The Inferior Courts Act (Cap. 94) provides for the Alcalde Jurisdiction Court, which has both civil and criminal jurisdiction over petty crimes and disputes involving "debts, damages claimed or the value of chattel" but not disputes over possession of land or title to property, which issues, under the Maya customary system, is ultimately the decision of the village collectively. The Alcalde system is one of the most important governance structures in the Maya communities. However, the Inferior Courts Act falls short of recognizing the right of the Maya people to control and manage their collective lands through their customary governance institutions and systems. In 2011, at the request of the Local

Governance Ministry, the TAA drafted a new Alcaldes Jurisdiction Bill that incorporated more of the traditional functions and powers of the Alcaldes. This Bill was never tabled and remains in draft form today.

3.3.4 THE TOLEDO ALCALDE ASSOCIATION

The First and Second Alcaldes from each of the thirty-eight Maya Villages are organized into the Toledo Alcaldes Association (TAA), giving the TAA a membership of 76. The TAA was convened in 1992 to addresses issues of concern of its members. The TAA also campaigns for recognition of the traditional system of local government, both with the government and internationally. From each village there is a First and a Second Alcalde Alcaldes.

The vision of the Maya Q'eqchi and Mopan is to be peaceful, united, hardworking, and self-governing with secure land rights, who practice their culture and prosper by leveraging their culture and natural resources. This is done through the Julian Cho Society which is the technical arm to the Maya Leader Alliance and TAA. They collectively have the mission to support the 39 Maya villages to achieve the protection of their rights and natural resources, and to promote their cultural, social and economic development. This is done by making sure that the rule-making rights of the community members are respected by the outside authorities.

3.3 PRINCIPLES OF CUSTOMARY USE OF FOREST RESOURCES

The Maya people have lived off the land, relying on the resources around them to feed their families, build their houses, and make a living for many generations. In order to continue using the resources, rules governing use of common goods to local needs and conditions must be established to govern the resources sustainability and equitable use in the communities. The current practice being followed is that permission must first be granted by the village leaders before a villager can go and cut a tree for their personal use. However, over time the process to use for customary purposes became complicated and more complex. In some instance the forest resources were being abused without control. There have also been times when a villager must apply to the Forest Department for a permit to use forest resources for customary use. However, this process had its own complication including the abuse of the permit. All of this affected the Maya village's ability to be organized, peaceful and responsible.

Therefore, under the leadership of the Toledo Alcaldes Association, in 2015, after the final decision of the Caribbean Court of Justice affirmed that the Maya land rights, the assembly of Alcaldes of the Maya villages voted to put in place a process that would strengthen the management and use of forest resources. This was the beginning of the Forest Customary Use Permit that establishes a standard set of rules to be applied across all Maya villages. This permit not only improved the village level management of the customary use of forest resources, but it also takes into consideration that all members of the Maya Villages have equal access to the forest resources.

The Ostrom theory proposes that communities can create their own rules and institutions to manage their common pool of resources in a sustainable manner as opposed to the conventional solutions that typically involve centralized governmental regulation or privatization of the resource (Ostrom, 2010). When no one owns a resource, it becomes over-used resulting in, for example, deforestation-people use and benefit from a common pool resource such as the Forest Reserve without regard to the effects it has on others. The over-use of the resource can lead to a long-term decline in the maximum

sustainable yield and is often referred to "the tragedy of the commons." This metaphor is used to reflect the problems of overuse and degradation of natural resources including the overharvesting of timber and the degradation of water resources. Columbia River Forest Reserve is a good example of the tragedy of the commons, with over-harvesting of timber and non-timber resources, with weak management or regulation in place. Over-use of this common pool resource happens because people within these buffer communities are acting in their own self-interest without any regards to the impacts it has on others in the community. This act is a major cause of environmental failure. Ostrom uses game theory skillfully and effectively in formulating and describing the problems that arise with common pool resources. A common-pool resource, a forest, is a natural resource from which it is difficult to exclude or limit users once the resource is provided, and one person's consumption of resource units removes those units from those available to others. The trees harvested by one user are not available for others. The difficulty of excluding beneficiaries is a characteristic that is shared with public goods, while the subtract ability of the resource units is shared with private goods. For example, Maya villages enjoy a public good such as the government-provided road system without contributing to paying for it yet demand that the government agencies request permission to access the road through their communal lands. When the resource units produced by a common-pool resource have a high value and institutional constraints do not restrict the way resource units are appropriated, individuals face strong incentives to appropriate more and more resource units, leading to congestion, overuse, and even the destruction of the resource itself.

Sharing the same opinion on regulations on resource management and how to put into effect conformity is an essential component of participatory resource management (Pound 2003). The buffering communities within which the resource is found must value it as such. The Ostrom theory entails those common resources are well managed when those who benefit from them the most are in close proximity to those resources. The managing of resources by the pertinent stakeholders dictates the discussion on objectives and suitable tradeoffs among the various stakeholders. It also includes participatory problem description, discussions on future issues and structuring a shared program for action.

The ability of the communities to benefit from the resource enables them to appreciate that resource and work together towards using it sustainably. This can be achieved most successfully when the communities are engaged in the management of the forest resource, with regulation being addressed at the local level, through the communities, local authorities and NGOs to improve community livelihoods whilst sustainably managing natural resources (Ostrom, 2010).

In line with this vision the Maya people have joined together to define a process that does not disenfranchise community members from the common pool resource. The Maya Customary Use of Forest Resources Guideline stipulates the rules of the game for each Maya Village so that the resources are equally shared amongst community members as seen in table 1. minimizing the free-rider problem by reducing appropriation and improving the long-term outcomes achieved from the use of the common-pool resources.

Table 1: Eight core principles of Ostrom and its contents on the rules and guidelines of the Forest Customary Use Permit.

Eight Core Principles to avoid the tragedy of the commons (Ostrom 1990, 2010)	Forest Customary Use Permit Sections (Applicable only in M
1. Clearly defined boundaries. In particular, who is entitled to access to what? Unless there's a specified community of benefit, it becomes a free for all, and that's not how commons work.	1. The application form will ask for the following informat responsibility of the applicant to provide all the necessar Incomplete application forms can cause delays or rejecti a. Name; b. Contact information; c. Village of residence; d. Village of harvest; e. Purpose of harvest (housing, poles, etc.); f. Building dimensions (if applicable); g. Location of harvest within village customary lands; h. Expected date to start harvest i. Type of tree requested, number requested, size request j. Type of general materials requested; k. Amount of material requested; l. Chainsaw operator name; m. Chainsaw information; n. Any other relevant information that may be requested 29. Where allowed by the village rules an applicant from wishes to harvest forest resources for their personal use and stamped letter from their own village alcalde and that the forest resources being requested will be used fo other purposes. If the person presents such a valid letter, to apply. If they don't have a valid letter they cannot app letter will be determined by both the alcalde and chairpe 30. If a village allows for persons from outside of the village the purpose must only be for personal use specifically traditional Maya house or for a public good. 31. The non-resident applicant must follow the process for a required fees and abide by all the rules associated with t 34. Those trees listed under the Primary Trees category are issued to non-residents or persons from another village

2. Match rules governing use of common goods to local needs and conditions. Rules should fit local circumstances. There is no one-size-fits-all approach to common resource management. Rules should be dictated by local people and local ecological needs. Make sure the rule-making rights of community members are respected by outside authorities.	4. Permits are only issued to the applicant. A permit cannot to another person. 5. For the purposes of building a traditional Maya house a trees can be issued. 6. For the purposes of building a non-traditional Maya hou lumber, the applicant must submit along with the applica total lumber needed to justify the number of trees beir purpose, the number of trees cannot exceed a maximum type of application MUST be presented before a quorum council for approval. (Alcaldes and Chairperson do not approve the application where the request is more than quorum). 9. When an application is made for Salvaging timber, t community forester must first inspect the timber to det criteria of the salvaged category. If it does, then the appl final decision. When salvaged timber is available for ha the community must be met first before the needs of the the use of these materials is to be given to the elderly and construction of schools).
3. Ensure that those affected by the rules can participate in modifying the rules. Collective choice arrangements. There are all kinds of ways to make it happen, but people will be more likely to follow the rules if they had a hand in writing them. Involve as many people as possible in decision-making.	11. The village leader having verified that the land under con indeed has many large trees and on that basis the reques brought before the village meeting for approval. The sol a balance between the protection of primary forest practices, especially those related to food security. 12. Where the village meeting grants permission for the clea the village leaders must announce to the villagers an opp permit to harvest those trees that would otherwise b harvested must be for the sole purpose of home use. 14. If villagers after being notified, do not make use of the op then the villager who intends to do the agricultural c permission to harvest the trees for personal use only.

4. Monitoring. Once rules have been set, communities need a way of checking that people are keeping them. Commons don't run on good will, but on accountability.	15. The Permit is valid for 14 days when cutting up to three one (21) days when cutting four or more trees. The star written on the permit. 16. In circumstances where the permit-holder does not c within the period specified on their permit due to sit control (e.g., due to rain, chainsaw damages, death in t holder must request for an extension. After listenin requesting an extension, the Alcalde and chairperson joi can grant the extension. The end date for the extension r permit accompanied with the signature of the Alcalde an 17. The Alcalde and Chairperson or the community fores cutting site at any time. The permit holder must carry th while cutting lumber. The permit holder must produce for when requested. 18. Relevant government authorities namely the Forest De Belize Défense Force may request the permit for inspect 33. The lumber and or materials must first be stocked in on checked and released by the Community Forester/Alc moved. 36. For the movement of forest produce, granted under se village of origin onto public roads, an FCUP waybill is i of the forest produce as required under section 33. The p any additional fee required. 39. All activities under the waybill must be carried out fro during the hours of 8am to 5pm. Any activities outside o is prohibited and illegal. 43. All activities under the permit must be carried out durin 6pm. Any activities outside of these hours is prohibited a 45. The Community Forester will have the primary respons to ensure that requirements are met before a tree/s is cu has been completed and to plant the replacement trees. 46. The Community Forester must file a report using the repo with the permit by the Alcalde. The Forester is to atten the Toledo Alcaldes Association on the Forest Customar other forest management related trainings

5. Graduated sanctions. Ostrom observed that the commons that worked best didn't just ban people who broke the rules. That tended to create resentment. Instead, they had systems of warnings and fines, as well as informal reputational consequences in the community.	51. Individuals who are found a. to have cut timber without a valid permit, b. has cut more timber than what is specified on the perm c. has cut in a different area than what was approved by d. has cut the wrong size or species of treeswill have thei lumber or material confiscated and will be summoned t to be charged for mischievous acts. The chainsaw operato Confiscated lumber will be used for community develop 52. The first time an individual has been found in co regulations, they will be charged in the Alcalde's Co lumber and materials that were not specified on their perm The second time they are found in contravention of these be charged in the Alcalde's Court and all lumber a confiscated. The third time an individual has been foun these regulations, they will be charged by the Forest Depa and materials will be confiscated. 53. Individuals engaging consistently in illegal harvesting m qualifying to applying for a permit for six to twelve mon
6. Fast and fair conflict resolution; When issues come up, resolving them should be informal, cheap and straightforward. That means that anyone can take their problems for mediation, and nobody is shut out. Problems are solved rather than ignoring them because nobody wants to pay legal fees.	51. Individuals who are found a. to have cut timber without a valid permit, b. has cut more timber than what is specified on the per c. have cut in a different area than what was approved b d. has cut the wrong size or species of trees wi discontinued, lumber or material confiscated and wil Alcalde's Court to be charged for mischievous acts. T can also be charged.
7. Local autonomy. Your commons rules won't count for anything if a higher local authority doesn't recognise them as legitimate.	• Was developed in partnership with the Forest Dep support of the Forest Department for its implem Department and Belize Defence Force are fully awar the permit being used within the villages only for cus Chairman and Alcalde are respected and have the d issuance of these permits.
8. Appropriate relations with other tiers of rule-making authority (polycentric governance). Commons work best when nested within larger networks. Some things can be managed locally, but some might need wider regional cooperation.	• Recognized by the Forest Department as the only le forest produce for customary use within Maya Villa have been breached by the Alcalde's and Chairman called upon to deal with these said individuals accord 37. The holder of the waybill is to present the waybill at M for inspection and record keeping prior to the movem public roads. 54. Confiscated lumber or materials by community lead community development. The community leaders must r proposed use of the material. This information can be s Department.

3.4.1 COMMUNITY NATURAL RESOURCE NEEDS

Table 2: Five key natural resource use needs have been identified in both literature review and focus groups.

COMMUNITY NATURAL RESOURCE NEEDS	
FOOD	In the buffer communities, meeting food expenses is highlighted as the greatest financial difficulty, with three out of five households expressing difficulty (Catzim, 2008). The majority of Maya households grow their own rice, corn and beans, and many rely on hunting and fishing to provide an important protein source for families, primarily targeting the two species of peccary, deer and gibnut (paca), as well as freshwater fish, crayfish, and jute snails. A number of broadleaf forest plant species are also harvested for their nutritional properties – for example cabbage palm (*Euterpe precatoria*) and pacaya (*Chamaedorea tepejilote*). Women harvest Jippi Jappa (*Sabal mexicana*) and cohune cabbage (*Attalea cohune*) for food preparation at the household level. Currently, some of these natural resources are still being harvested from national lands, outside of the Columbia River Forest Reserve, and no community is currently solely dependent on these specific natural resources from within the protected areas.
BUILDING MATERIALS	Buffer communities utilize bush sticks for construction, bay leaves or cohune leaves (*Attalea cohune*) for roofing, hard woods for siding and vines for tying, and depend heavily on these materials, harvesting them from the forests. This is currently primarily from outside the protected area but increasing forest clearance has led to reduced availability in the community landscape, and increased incursions into Columbia River Forest Reserve. The legal cutting of building materials is not permitted within this extractive reserve, but illegal extractive activities is difficult to monitor with the limited staff and financial resources available.
MEDICINAL PURPOSES	All communities indicated that they still depend on medicinal plants for basic illnesses such as headache, cough, cold or fever, with extraction from forest areas.
WATER	The Columbia River Forest Reserve is considered particularly important in its role of watershed protection, with the headwaters of five river systems originating within the protected area, supplying the coastal plain communities and agricultural areas of southern Belize, as well as a portion of Guatemala. Two out of the three upper watersheds that appear to be of critical biodiversity importance occur within Columbia River Forest Reserve - the upper reaches of the Moho River and Rio Grande (the Central River). These water catchments provide water security for the communities and agricultural areas in the watersheds of the protected area. The water is heavily used by the communities for bathing and washing clothes and household dishes. Watershed functionality has been affected by poor practices by salvage logging companies following Hurricane Iris, with blocked creeks and damaged creek banks. Water flow and quality have also been affected by the HydroMaya facility on a tributary of the Rio Grande, 750m south of CRFR.

TOURISM AND RECREATION USE

The Columbia River Forest Reserve has a high potential for tourism, with its extensive karstic scenery, numerous sinkholes, arches and cave systems. Though information is very limited, it is known that Maya ceremonial sites are associated with some, or most of these. The intact tropical forest, limestone cliffs and clear rivers north of Little Quartz Ridge have exceptional aesthetic value., Security issues associated with illegal Guatemalan incursions into the area have effectively prevented meaningful recreational (or other) use. Before the increasing pressures within the area from the Guatemalan side of the border, expeditions had historically been conducted out of San Jose, with local guides leading groups such as Trekforce across the Main Divide to Caracol.

All community tourism stakeholders have expressed concern on taking tourists into the area whilst there is still a significant Guatemalan presence. However, small groups continue to trek to Doyles Delight and the Main Divide, led by Sun Creek Lodge and IBTM Tours, unaccompanied by the recommended Belize Defense Force (BDF) support team, despite the security context of the Forest Reserve.

Many of the stakeholder communities have expressed interest in use of the natural and cultural resources of the Columbia River Forest Reserve for community tourism initiatives. The last developed community vision was that of Medina Bank, which was seeking a partnership with the Institute of Archaeology to re-establish La Sierra, first established as a base for archaeological explorations, and now lying within the Medina farming enclave, as an archaeological field station and tourism destination, but this has not materialized.

Table 3: Identified Community Tourism Resources

Community	Identified Tourism Resources
San Jose	Maya Divide, Doyle's Delight
Na Lum Cah	Waterfall on Crique Negro
Crique Jute	Mountain Cow Creek, Tzimin Che, Quail Bird Creek
San Pedro Columbia	Sosil Ha (archaeological site), Chan Pon (cave close to large sink hole), La Cumbre (sink hole), La Lagunita and associated sink hole
Medina Bank	Tziminche (archaeological site)
Indian Creek	Source of Billum Creek

3.4.2 FOREST CUSTOMARY USE PERMIT

The Forest Customary Use Permit (FCUP) underwent revision in 2020 and ensured that those affected by the rules could participate in modifying the rules by taking into consideration lessons learnt since 2015, establishing a standard set of rules to be applied across all the Maya villages. Some of the lessons learnt for the 2015 FCUP were the following:

- The abuse of the permit for commercial purposes, with the same individuals would be obtaining a permit over and over. The amount requested exceeded three trees at times.
- The request for more than three trees to up to twenty-five (25) trees under the excuse that they were clearing land for agriculture purposes.
- The species of trees being request (Mahogany, Cedar, Sapodilla, Barbajolote, Salmwood, Ormijo and Wild Mammee) were trees not customarily used for building of house such as. These species are in demand due to their high value in the furniture market and are extracted for commercial purposes. The revised FCUP therefore lists these species as primary trees and states that primary trees are not to be issued or granted for the building of traditional house or non-traditional house.
- The issuance of commercial, high value Rosewood and Sapodilla trees under the 2015 FCUP was an issue, as Rosewood is under moratorium and can only be harvested legally if it harvested under a sustainable community logging license from a sustainable community logging area. The updated FCUP permit now states that Rosewood and Sapodilla can only be harvested and will only be permitted for the sole purpose of building traditional homes. It goes further to specify that only dry Rosewood can be extracted, and the cutting of living Rosewood is not permitted. Dry Rosewood can be extracted under the permit on a case-by-case basis for Maya artisanal purposes.
- Issues also arose with the extraction of Non-Timber Forest Produce from adjacent community lands. The revised FCFP addressed this issue by adding a section on how a non-resident villager can acquire forest resources from other villages and the contribution needed to be made to the village where the material is harvested.
- The movement of forest produce was also an issue in the 2015 FCUP and in the update permit, a section was added to control the movement of forest produce on public roads.

One of the major additions to the process is the development of an application form that needs to be properly completed and handed over to the Alcalde and Chairman prior to any permit being issued. The form clearly states that:

- For the purpose of building a traditional Maya house a permit for a maximum of three (3) trees can be issued.
- For the purpose of building a non-traditional Maya house that requires more lumber, the applicant must submit, along with the application, an estimate of the total lumber needed to justify the number of trees being requested and measurements of the kind of house to be built with the lumber.
- By submitting the application, the applicant undertakes to comply with the rules of the Forest Customary Use Permit and agrees to replant a tree for every tree that is cut.

The FCUP itself now stipulates that:

- All activities under the permit must be carried out during the hours of 6:00 am to 6:00 pm. Any activities outside these hours are prohibited and illegal.
- The permit is subject to inspection. The permit holder must have their permit on them all the times during logging.

In order to ensure that the rule-making rights of community members are respected by outside authorities a Maya Customary Use of Forest Resources Guide and Toolkit was developed to improve the village level management of the customary use of forest resources and takes into consideration that all members of Maya villages have equal access to forest resources. The guide outlines the steps and elements that must be applied for the Forest Customary Use Permit to be valid. It stipulates the role and responsibilities of community members and monitors members' behavior. It also makes clear sanctions for rule violators. The guide builds responsibility for the governing of the common resource and ensure that it nested in all the tiers from the lowest level up to the entire interconnected system. It guides the village Chairman and Alcalde when issuing permits, to avoid free riders and abuse of the permit. This FCUP process benefits both the community and the environment, helping to curb illegal extraction, strengthen village-level governance over forests, especially the forest reserves buffering their community, and encourage good faith collaboration between the Government of Belize and the Maya people.

Moreover, it also contributes to the Forest Department national targets and global commitments as they relate to better forest management, Belize's climate change mitigation activities related to reducing forest cover loss and achieving the sustainable development goals related to combating marginalization and poverty in vulnerable/Indigenous communities.

3.4.3 THE CONCEPT OF COMMUNITY PARTICIPATION IN FOREST RESOURCE MANAGEMENT

Community participation is believed to bring many lasting benefits to people, not just as a means of getting things done. Many definitions have been given to community participation in reference to forest resource management, including active participation, local participation, people's participation, integrated management and the like. All these however denote that there is an interaction of a particular group with others to achieve certain specific outcomes. Local participation is when people are given the power to gather their own efforts so that they become public actors rather than inert subjects (Cernea and Akitanda, 1994), and take care of their resources, making decisions and organizing the resource management activities that affect their lives.

The extent to which power is shared in decision-making varies according to type of participation. Sayer (2004) views community participation as a deliberate procedure of bringing together the various aspects of natural resource utilization into a structure of sustainable management to meet the expectations of those who utilize resource, managers and others who have a share in the resource. To accomplish its objectives, an incorporated natural resource management strategy is essentially adaptive, with representation from various disciplines and includes multiple groups of stakeholders. Kelly (2001) defines participation as a range of processes through which local communities are involved and play a role in the management of issues that affect them.

Charles Abrams defines community participation as, "[t]he theory that the local community should be given an active role in programs and improvements directly affecting it", based on the premise that it is only rational to give control of affairs and decisions to people most affected by them. In Belize, as in other countries around the world, it is also recognized that no government or authority has the means to solve all the public problems adequately, and it is therefore necessary to involve people in matters that affect them (Abrams, 1971).

The best way to explain the different levels of participation in terms of community involvement is by understanding what Sherry R. Arnstein calls "A ladder of Citizen Participation." The ladder has three (3) main typologies (Figure 1).

1. *Non-Participation*: the absence of negligible amount of power exercised by the "have not" citizens in the process of their involvement. This typology is located at the lowest part of the ladder and includes *manipulation* and *therapy*.
2. *Tokenism or Token Participation*. This is located at the middle of the ladder. The symbolic participation includes *information, consultation* and *placation.*
3. *Real Participation or Citizen Power* is the highest level of participation, and the most genuine, where the "have nots" exercise great amount of power or is already fully autonomous. This includes *partnership*, *delegation* and *citizen control*. The last three rungs are where true meaningful participation takes place and was used for this study.

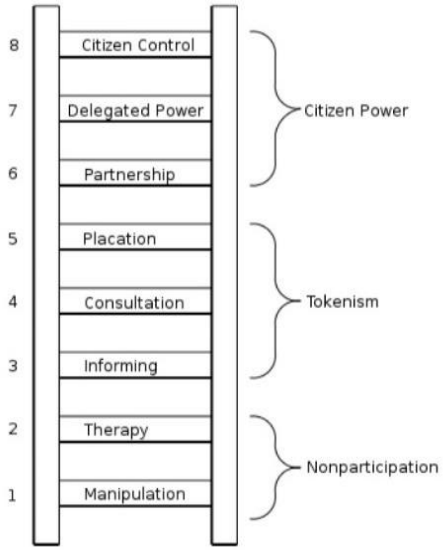


Figure 2: Ladder of Citizen Participation, illustration from Sherry R. Arnstein, 1969

3.4.4 THE NEED FOR COMMUNITY PARTICIPATION IN RESOURCE MANAGEMENT

A lot of co-management plans and programs are in progress in the field of natural resources management, particularly in the departments of fisheries, wildlife, protected areas and forests. In Belize, we too have adapted co-management agreements with both community-based organization and Non-Governmental Organizations for the management and protection of our Protected Areas System. These co-management agreements are a distribution of authority and responsibility among the government and the local communities who utilize the resources.

There is the need for communities to get involved in the management activities so as to learn new innovation and techniques in resource management from other stakeholders the. Therefore, in the last decade there has been an increasing shift towards indigenous Maya concepts of sustaining and caring for the land and nature through good stewardship, managed under modern-day regulation, and grounded in the privileges that communities have over land and its resources. The approach is geared towards community-based development and their active involvement, targeted at the people, their means of living and local associations, native ideas and local organizational structures.

Community participation teaches communities how to resolve conflict and allows for different perspectives to be heard and increases the significance of the resource management in numerous ways in order to avoid "free riders." Since it is difficulty to exclude beneficiaries, the free-rider problem is a potential threat. Free riding was a major problem in the 2015 FCUP since villagers were utilizing goods and accessing the forest resources without paying for use, while others would willingly pay for the service. The update FCUP stipulates a standard fee that is collected per tree species across all Maya villages and standard penalties for perpetrators.

These include the following:

- Community management of natural resources enhances social cohesion because communities recognize the value of working in partnership with each other and with agencies.
- Community management of natural resources enhances effectiveness as communities bring understanding, knowledge and experience essential to the process.
- Community management of natural resources promotes sustainability, community members gain ownership of their communities and develop the confidence and skills to sustain developments once the 'extra' resources have gone (Burns, D., F. Heywood, et al. 2004).
- Community management of natural resources ensures that those affected by the rules can participate in modifying the rules (Ostrom, 2008)
- Communities need to match the rules governing use of common goods to local needs and conditions (Ostrom, 2008).
- Communities need to assess their own situation, organize themselves as a powerful group and work creatively towards changing society (Baum, 1999)
- Communities need to mobilize and help themselves to minimize dependencies on the government, leading to a bottom-up approach (Nampila, 2005).
- Communities need to build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system (Ostrom, 2008).
- Community management can make sure the rule-making rights of community members are respected by outside authorities (Ostrom, 2008), improving democratic and service accountability.
- Community management can develop a system, carried out by community members, for monitoring members' behaviour (Ostrom, 2008).
- Community management can use graduated sanctions for rule violators (Ostrom, 2008).
- Community management can provide accessible, low-cost means for dispute resolution (Ostrom, 2008).

In order for co-management to function effectively, the government and the communities must work jointly in the directions of the issues that have been agreed on and build self-assurance amount and within the groups to improve efforts at partnership.

3.5 MANAGEMENT OF CRFR

3.5.1 PREVIOUS MANAGEMENT PLANNING FOR CRFR

A draft CRFR management plan was produced in 1994 (Bird, 1994), and the sustained timber management component began to be implemented by the Forest Planning and Management Project. One of the achievements of the 1994 CRFR Forest Management Plan supported by the FPMP was the re-

engagement of the communities on the fringes of the CRFR to discuss the importance of maintaining the integrity of the boundaries of the CRFR. Community involvement in cleaning the boundary line was one activity that ensures that the communities were aware of the location of the boundary lines. Unfortunately, in recent years it appears that this community engagement has waned. This is highlighted by a recent incident involving community cultivation over a period of continuous cultivation for 10 years or more by small number of members of one CRFR fringe community. There has also been a lack of oversight and border monitoring by the Forest Department. The new forest management plan will have to address a mutually agreed on and viable approach to maintaining forest cover permanence in the CRFR in the context of these past, long term and un-addressed incursions.

The implementation of the 1994 Plan was undermined by the government, with controversies regarding the terms of the long-term concession given to a Malaysian logging company, Atlantic Industries Ltd. Hurricane Iris passed through the area in 2001 causing widescale destruction and resulting in the termination of the long-term forest license in 2002, as the original forest management objectives were no longer viable. Very intense forest fires after Hurricane Iris and subsequent uncontrolled salvage logging had severely weakened the natural mechanisms that allow forest recuperation in mixed tropical broadleaved forests adapted to frequent tropical storm events. Post-Hurricane Iris, the use of chain-saw mills to convert logs to lumber in-situ has become more frequent, both for the construction of traditional houses and for commercial purposes.

In 2014 the Forest Department issued a Long-Term Forest License to Mr. George Hanson for the sustainable yield working of timber in the CRFR. The duration of the license was for forty (40) year commencing in 2014 and expiring in 2054. As one of the conditions, the license holder was required to develop a Sustainable Forest Management Plan (SFMP) for the license area, bearing in mind sustainable forest management principles, and with technical guidance from and in collaboration with the Forest Department. The SFMP was to guide the conduct of activities during the entire period of the license, and based on a concrete forest inventory, with a division of the area into stands, defined cutting cycles and annual allowable cutting, harvesting methods and standards for harvesting infrastructure, forest protection requirements and silvicultural intervention. However, this SFMP was never developed or presented to the Forest Department and the license is now considered inactive, though is still valid until 2054.

The 1994 management plan was revised and updated in the CRFR Strategic Management Plan 2011- 2015 (CRFRSMP) (Wildtracks, 2010). This second management plan for the Forest Reserve sought to protect the sources of the Reserve whilst also exploring options for economic benefit of adjacent communities through sustainable resource use and community-based management in close liaison with the Forest Department. It provided a five-year framework for strategic management actions to be implemented by the co-management partners to maximize biodiversity conservation and provide mechanisms for buffer communities and other stakeholders to benefit through sustainable resource use. In order to achieve its objectives, a series of community workshops were held in the 12 buffering communities, were held, providing forums for participatory input into the development of a vision, goals and objectives for future management. These were based on sustainable use of natural resources for short-, medium- and long-term community benefits, whilst also maintaining the environmental services of the management area (watershed protection and protection of natural and cultural resources). Three important topics were discussed in these workshops:

- What is the Value of the Forest Reserve?
- What are the Concerns of the Stakeholders?

- Recommendations for Improving the Areas of Concern

The CRFRSMP recognized that there is a land conflict within the area, with a number of the buffering communities with rapidly increasing populations wishing to expand their agricultural areas into the Forest Reserve. This was further complicated by the Maya Land Rights issues and now overshadowed by the Caribbean Court of Justice (CCJ) Ruling, which recognizes Maya rights to the lands they occupy, and rights to continue to use other lands such as CRFR for traditional activities such as hunting, fishing and gathering foods, medicinal plants and materials used in the construction of houses, and for sustaining the Maya culture and economy.

The CRFRSMP also sought to ensure integrated landscape management, with recognition of the landscape values of the Forest Reserve, particularly in ensuring continued water security and improved local livelihoods for Toledo, through planning that was set within a framework of landscape-scale sustainable development objectives, to build consensus towards sustainable use.

A series of recommendations for improving management, including:

- The need for a dedicated management organization with skilled staff for coordinating management.
- Establishment of a management committee consisting of Forest Department and stakeholders (community and other relevant stakeholders) responsible for oversight and management decisions.
- Site-level annual operational plans for Columbia River Forest Reserve, guided by the management plan, and implemented by the CRFR coordinator/manager and dedicated staff.
- Engagement and participation of community stakeholders through community management committees and defined, regulated sustainable use areas under concession agreements.
- Development and implementation of a Transboundary Enforcement Plan with input from multiple stakeholders (for example, BDF, FCD, Police, Department of Immigration, Department of Foreign Affairs).

This CRFRSMP was unsuccessful in its implementation as a forest management plan as it required the political will and finance for the establishment of the organizational structure required for effective implementation and oversight. It also lacked a mechanism that allowed for the objective monitoring and reporting on the effectiveness of plan implementation and evaluation of whether the implementation was achieving the management objectives.

In 2015, the Key Biodiversity Project (KBA) identified the development of a CRFR management plan as a priority. But was put on hold in July 2015 when the CCJ ruled on the Consent Order, and the TAA/MLA (Toledo Alcaldes Association / Maya Leaders Alliance) KBA Steering Committee requesting that the CRFR Management Plan consultancy be put on hold until after the consultation framework had been agreed to - particularly the Maya Consultation Framework component. From the onset of the first Committee meeting, the representatives from the TAA pointed out that the consultation process did not reflect Maya land rights tenure, and that the Maya land rights needed to be clearly articulated for the project to proceed. It was also noted that the buffer communities had not given their free prior and informed consent.

The TAA/MLA also proposed that Indigenous Peoples of the area be the co-managers of the CRFR, as experience had shown that there has been a tendency for conflict between external co-managers

and the local communities. The concept of Indigenous Communities Conserved Areas (ICCA) was raised as an alternative, exploring the strengthening of Maya communities' roles in the governance and management of areas within the CRFR. They expressed their desire, as Indigenous Peoples, to have continued access for the use and enjoyment of the resources, within an agreed-to framework.

Since 2015 (the court decision about Maya land tenure and use right, the relation between the Forest Department and Maya organizations (and Julian Cho society) have improved and the former accepts and backs applying the Maya customary law & practice and community stewardship strategy through among other the Forest Customary Use Permit.

In 2017, the Forest Department therefore restarted the process for development of the CRFR Management Plan, with integration of information on the interests and needs of the communities around CRFR, and to ensure participation and engagement of all relevant stakeholders throughout the planning process. This process, too, came to a halt, this time as a result of 'Operation Thunderbird' a joint enforcement exercise conducted by Belize security forces and the Forest Department targeting illegal activities within CRFR, including the cultivation of illegal crops in hotspot areas. Several traditionally constructed structures in these areas were destroyed by the authorities, including stored food crops, personal belongings and temporary dwelling facilities, as well as the confiscation of horses found at the site, all belonging to two Maya farmers from the nearby San Pedro Colombia Village, with significant impacts on the families.

As the Key Biodiversity Areas project was being funded by the Global Environmental Facility and implemented by the World Bank, the Bank's policy on Indigenous Peoples and Resettlement Policies was applicable. These policies stipulate specific guidelines and protocols that must be followed in order to ensure that no harm is done to indigenous peoples by projects being funded by the Bank. The GoB had duly accepted the conditions and commitments required by the Bank and was required to facilitate the restoration of the farmers' livelihoods and sense of well-being for their families through compensation. As a result of the conflict, Free Prior Informed Consent was not given by the buffering communities, and the CRFR management plan was never accomplished.

4 METHODOLOGY

4.1 STUDY AREA

Columbia River Forest Reserve is situated in Toledo District, in southern Belize (Figure 2), and is the most southerly of the protected areas within the Maya Mountains Massif system. It occupies approximately 148,303 acres (60,015 hectares), is centered on UTM coordinates 282923 East and 1811974 North (UTM Zone 16N, NAD 1927), and is currently managed directly by the Forest Department, though with no on-site management presence. The western boundary of the Forest Reserve follows the Belize-Guatemala border, and it is bordered to the north by the Chiquibul National Park and Bladen Nature Reserve. To the east, the border is contiguous with that of the Deep River Forest Reserve, whilst to the south lies a landscape of agriculture, forest, and villages.

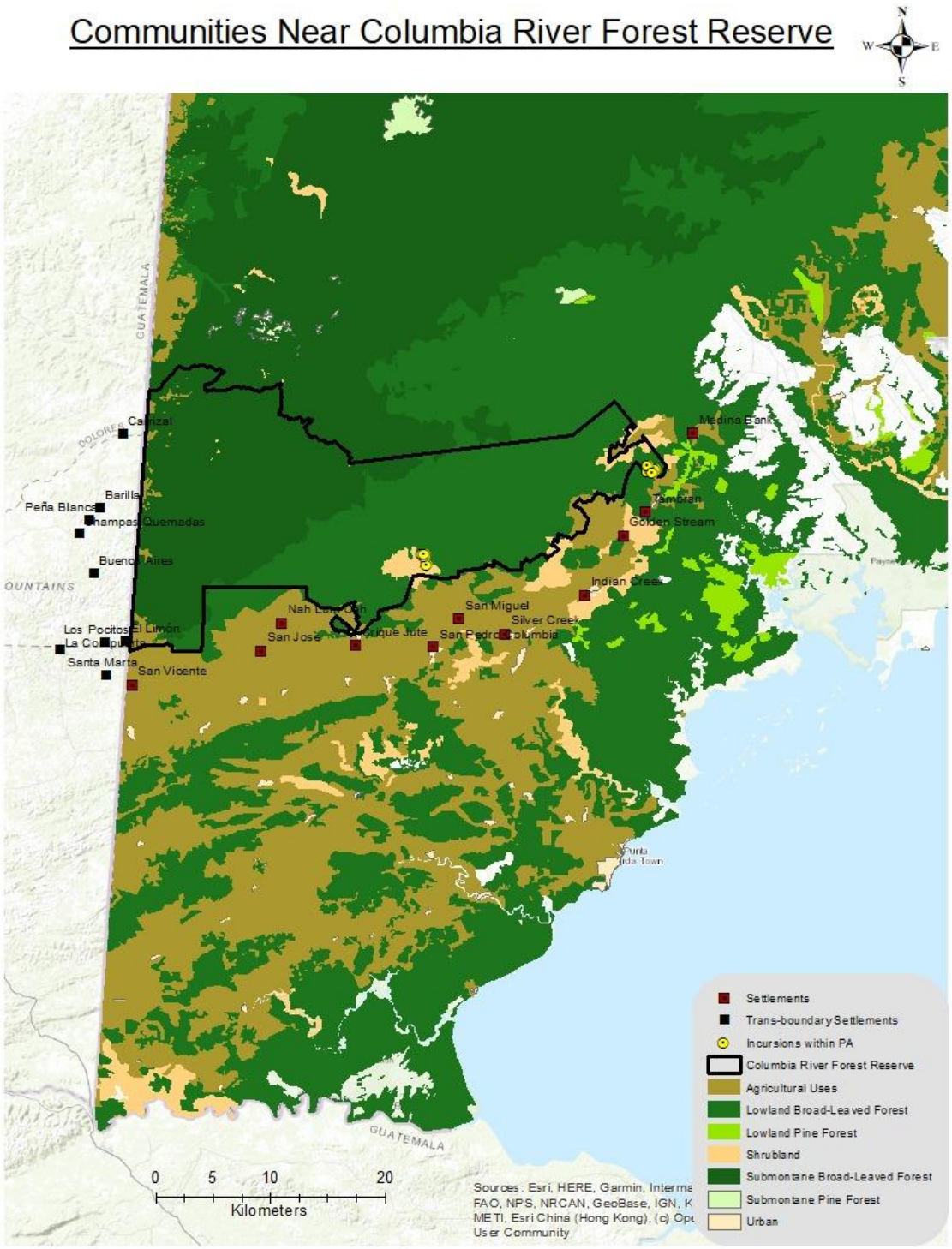


Figure 3: Columbia River Forest Reserve: Land Use

4.2 GENERAL DESCRIPTION

CLIMATE: Columbia River Forest Reserve lies within the wettest half of the country, with an annual rainfall averaging between 330cm and 406cm per annum. Rainfall is further influenced by the

protected area's location on the east-facing slopes of the Maya Mountains, with the northeast trade winds picking up moisture over the Caribbean Sea, then depositing it as heavy orographic precipitation, as the moist air is forced higher as it moves eastwards over the higher regions of the Maya Mountains. There is a noticeable dry season that stretches from February through to mid-May. During this period, the minimum monthly rainfall is as low as 0.24cm. The dry season is followed by a wetter season (June to December / January), with rainfall reaching a high of 55cm in July. The wet season is not punctuated by the mini dry season seen in the more northern areas of Belize in the month of August, possibly due to the location of CRFR on the eastern slope of the Maya Mountain, catching orographic rainfall as the trade winds blow inland. Belize has an average annual temperature of approximately 25°C, with cooler temperatures between November and February associated with weather systems from the north, and warmer between April and June. Temperature is also affected within the Columbia River Forest Reserve area by altitude, with cooler temperatures in higher parts of the Maya Mountains.

GEOLOGY: The majority of the bedrock of the Columbia River Forest Reserve is composed of limestone, laid down between 65 and 136 million years ago during the early Cretaceous Period, when oceanic waters flooded the area depositing the fossiliferous limestones over the entire Maya Mountain. In all but the northwest corner, the limestone topography is rugged - steep, conical hills pocked by vertical-sided sinkholes, underground streams and caves. Water is scarce in this karst landscape, especially during the dry months, resulting in the presence of a vegetation type adapted to seasonally drier conditions, and a seasonal migration of wildlife to the lowlands. Smaller streams emerge as springs within the hill slopes then disappear underground again after flowing a short distance – characteristic of this limestone topography. The more undulating limestone scenery of north-western Columbia River Forest Reserve forms a plateau at around 700m elevation, and is a far wetter system, supporting plant and amphibian species assemblage's unknown from elsewhere in Belize, but bearing affiliations with the highlands of Guatemala and Honduras.

ECOSYSTEMS: The Forest Reserve is considered to contribute significantly to the representativeness of the protected area system, containing over 80% of Belize's Tropical evergreen broad-leaved sub montane forest on steep karstic hills, 79% of the Tropical evergreen broad-leaved sub montane forest on rolling karstic hills, and over 50% of the Tropical evergreen broad-leaved lowland hill forest on rolling karstic terrain and Tropical evergreen broad-leaved lowland hill forest, Calophylum variant present in Belize. It harbors a diverse flora, much within largely pristine ecosystems, recognized as part of the biodiversity hotspot of Central America (Conservation International, 2005), much of which has been extensively cleared or severely degraded elsewhere in the region. The Forest Reserve has been highlighted as a key biodiversity area (Meerman, 2007), protecting a unique assemblage of species within Belize, including two Critically Endangered species – Coffeus rain frog (*Craugastor coffeus*) and the cycad species *Zamia prasina*. Given the unique flora and fauna of these forest types, and the very high proportion of their national coverage occurring in Columbia River, this reserve plays an absolutely critical role in the conservation of Belize's biodiversity.

4.3 SELECTION OF THE STAKEHOLDER COMMUNITIES

The nearest communities to Columbia River Forest Reserve within Belize are spread along the southern border of the protected area – twelve Maya villages highlighted as important stakeholders, many still reliant on forest resources for house construction, medicinal plants, subsistence hunting and other food supplements (Table 4; Figure 2). with a total population of approximately 6,028 (1,108 households) (2010, SIB; Table 1) of primarily Mopan and Q'eqchi Maya. The twelve communities (Medina Bank, Tambran, Golden Stream, Indian Creek, Hicattee (Southern Highway), San Miguel, Silver Creek, San

Pedro Columbia, Crique Jute, San Jose, Na Lum Cah and San Vicente all lies close to the CRFR southern border (Figure 2).

Table 4: Stakeholder Communities of Columbia River Forest Reserve

Community	Established	Ethnicity	Population Estimate (2010)	Household Estimate (2010)
San Vicente	1987	Q'eqchi	441	77
San Jose	1940's	Mopan	849	175
Na Lum Cah	1987	Mopan	69	12
Crique Jute	-	Mopan	223	50
San Pedro Columbia	1930	Q'eqchi, Mopan + Hispanic	1703	317
San Miguel	1950's	Q'eqchi + Mopan	537	96
Silver Creek	1969	Q'eqchi	473	83
Hicattee (Southern Highway) Settlement	-	Q'eqchi	363	65
Indian Creek	1969	Primarily Mopan & Ketchi	721	134
Golden Stream	1970	Q'eqchi	349	52
Tambran Settlement	-	Q'eqchi	150	10
Medina Bank	1920	Q'eqchi, Mopan + Hispanic	237	34

There are also nice adjacent communities on the Guatemala side, with illegal transboundary incursions into CRFR, placing significant pressure on the natural resources and integrity of the Forest Reserve (Figure 2).

4.4 METHODOLOGIAL PROCESS OF DATA COLLECTION

This section presents the methods and materials used to collect relevant data f the research objectives. It also presents the research sampling processes, sources of data, selection of communities to be sampled, organization and presentation of the result as well as the limitations to the study are presented. The specific data collected and its usefulness to the research is explained within each methodological stage.

4.4.1 PREPARATORY STAGE

Twelve communities were identified as users of the traditional natural resources of the Columbia River Forest Reserve under the previous management planning process, and contact was made with stakeholder groups: the Forest Department, key community members, the Maya Leaders Alliance

(MLA) and the Toledo Alcalde Association. The questionnaire was designed, based on the foundation of elaborated previous to field work at this stage with the input from Friends for Conservation and Development, the Maya Leaders Alliance, the Toledo Alcalde Association and the Wildlife Conservation Society.

4.4.2 PRE-TESTING OF QUESTIONNAIRE

The questionnaire (Annex 1) which was tested with respondents in San Jose Village, Na Lum Cah and San Vicente, to ensure that the translated questions conveyed a similar meaning to the respondents in Q'eqchi. The pre-testing also assisted in identifying any amendments required to ensure the questions suited the local context, that the questions were understood by the participants, and the effectiveness of the questions in eliciting the response required from the participants Furthermore, it provided information on the time required to complete the questionnaire.

4.5 VARIETY OF METHODS OF DATA COLLECTION AND INTERPRETATION

4.5.1 DATA COLLECTION PROCEDURE

Due to the complexities of the issues, one research approach was considered insufficient to investigate the topic at hand therefore, so both qualitative, and quantitative research methods were used in order to obtain the benefit of each method, considering the type of information that is generated, if the research seeks to produce new theories, whether it seeks to attain a detailed understanding of phenomenon, and whether the research would be used for generalization. These methods were employed to collect, organize and analyze all information for this study and to derive a detailed understanding of the topic. The information was collected using questionnaire, focus group discussions, and from direct observation.

Qualitative research allows for a detailed explanation of events and assisted in uncovering traditional practices for protecting the forest, the reasons why respondents participate or do not participate, areas of participation, and the challenges faced. Quantitative research is good at summarizing larger quantities of data and was collected using structured questionnaires, generating useful baseline information on household variables such as age of respondents and number of respondents who participate, or would like to participate, in the management of the forest and how they would like to be involved.

4.5.2 DATA COLLECTION

Systematic sampling was used in collecting the data. Systematic sampling is similar to simple random sampling, but it is usually slightly easier to conduct. Every member of the population is listed with a number, but instead of randomly generating numbers, individuals are chosen at regular intervals. From all the twelve communities, every third house was selected, and a representative of the household, whether male or female, was interviewed. The representative of the household was defined as a member of the house who is aged 18 years and above and whom we met in the house. This method was used to prevent the work from being biased.

A questionnaire was administered to the selected community members. In the initial planning phase, only 110 questionnaires were planned to be administered. However, during planning of the first workshop, the number of questionnaires was increased to ensure robust data for analysis. A total of 379 household surveys were implemented out of a total of 843 households in the target communities. This sample size was calculated using a raosoft sample size calculator software to reflect the total population size with a confidence level of 95% making the information gathered vital and true. The margin of error used is of 5% allowing for error that occurs due to human nature. The implementation of this margin of error allows for the data collection true and vital for data interpretation.

Research assistants were engaged from the communities to assist in gathering data in the communities of San Vicente, Na Lum Ca, San Pedro Columbia, Crique Jute and San Jose. Community members were more interested in responding to the questionnaire when they were approached if they saw someone from their community conducting the questionnaire. For the other villages, Forest Department staff assisted in data gathering.

4.6 PRIMARY DATA COLLECTION

Collection of primary data was based on structured questionnaires, with a set of fixed questions with open and closed answers and also an open section to allow for comments by the interviewees. Data collection was conducted mainly through interviews with the different stakeholder groups, including household and village leaders. Other sources of primary data were gathered during Focus Group Discussions and observations.

4.6.1 HOUSEHOLD SURVEY (ANNEX 1)

The household questionnaires were used to assess the current and potential level of community participation in forest management in the communities. to the data provided a more accurate picture of forest reserve-related social impacts, and the diversity of views within and across communities. The definition of a household used was “people who live under the same roof and eat from the same pot”. In practice, a household was considered to comprise of all the individuals living in the same compound. When there were no members of a household present, the adjacent household was approached. The questionnaire consisted of six sections with a total of forty-one questions. The first section sought the general background of the respondents including age and sex, which are important during decision making and policy implementation. The subsequent sections sought respondent’s knowledge about the forest and the activities there, their participation, income level, ways to participate as well as issues on conflicts.

Survey was carried out mostly between 1:00 to 5:00 pm since most residents and household heads are in their farm in the morning given that consideration the said time was set. When the household representatives were encountered at home, they were busy constructing sheds or cleaning their property (Figure 4). When a resident was approached, an introduction was made to familiarize them with the objectives of the survey and how their responses would be used. This encouraged some respondents to elaborate further on a particular topic is of interest to them, resulting in lengthening the time taken for the survey resulting in work being extended until 5:00pm.

Figure 4: Interviewing a member of a household in Silver Creek Village.

Information from the household questionnaires was adapted to Survey Monkey in order to analyze the data, acquire percentage and figures for the results. Frequencies derived from the categories were computed and presented in the form of tables and bar, cone and pie charts).

4.6.2 FOCUS GROUP DISCUSSIONS

A Focus Group meeting were held to gain an understanding of issues affecting community participation in forest resource management and identify effective mechanisms to facilitate communication and collaboration between communities and the Forest Department, towards future community participation in sustainable resource management and benefit from Columbia River Forest Reserve. The criteria used for the selection of the various groups participating in the focus group Discussions was based on the level of influence, benefit and current uses of forest products, and relevance for community involvement. The focus group was composed of the village leaders from each community: The Chairman and Alcalde (Figure 5). The leaders were chosen as they represent their communities and have first-hand insight into the real issues being faced by their community members.

A letter was submitted to the Maya Leaders Alliance (MLA) requesting their support in convening a meeting with the leaders of the Medina Bank, Golden Stream, Indian Creek, San Miguel, Silver Creek, San Pedro Columbia, Crique Jute, San Jose, Na Lum Cah and San Vicente resulting in meetings being scheduled at the respective community centers on the 21st and 22nd of December 2020. On the 21st of December individual meeting were held with the leaders from San Vicente, San Jose and Na Lum Cah. On the 22nd of December about 20 participants were expected to participate in the discussion, however due to concerns over Covid-19, several leaders did not attend for a controlled discussion. In the morning of the 22nd of December meeting was held at the San Pedro Columbia community center and had the participation of the leaders of San Pedro Columbia and Silver Creek village. In the afternoon of the same date a meeting was held at Medina Bank and had the participation of the leaders of Medina Bank, Golden Stream and Indian Creek village. Almost all the participants seemed to have common interests and so issues raised were discussed in a peaceful way and each participant had an opportunity to share his or her view on every topic that was raised.

The discussion was held along three structured topics, selected from the previous management Wildtracks (2008):

- What is the Value of the Forest Reserve?
- What are the Concerns of the Stakeholders?
- Recommendations for Improving the Areas of Concern

Discussions were scheduled for 9:00 am to 11.00 pm and 1:00 pm to 3:00 pm. However, the interest of the participants in the topics under discussion resulted in discussions going on for longer. A scribe was chosen amongst the leaders to write down the responses. The purpose of choosing someone from with the group enabled them to write down exactly what was said and to be objective as possible. The discussions did not religiously follow the topics that were listed, with the flexibility for asking additional questions in order to ensure a detailed understanding of the issues.

The focus group discussions were compared with the results obtained from the household surveys. Issues that were observed were used as qualitative information to verify information received from the household survey and the focus group discussions. It was also possible to compare the results with those from the 2008 management planning workshops.

Figure 5:Focus Group Discussions with the Village Leaders

4.6.3 DIRECT OBSERVATION

Field observation was carried out in order to get a brief understanding of the attitudes and a confirmation of some responses that were provided during the household survey. Direct observation was used to study the behavior of buffer communities surrounding the Columbia River Forest Reserve. Direct observation was carried out in its natural setting, providing a richer understanding of the area. Because of time limitation, direct observation was favored in gathering data on different aspects of community participation in forest management as well as other issues on village life that respondents might not be willing to discuss. “Seeing” and “listening” were key to direct observation, which offered contextual data on people, situations, interactions and the surroundings in each of the villages. Direct observation provided the opportunity to document activities, behaviors and physical aspects without having to depend

on the people's willingness and ability to respond to questions. Several visits were made to the villages to observe activities that go on around the area and went on trails to observe what goes on in the forest and farms that are established close to the Forest Reserve.

4.6.4 SECONDARY DATA

Various kinds of secondary data were collected from published as well as unpublished sources from national, regional and district levels. Information on the poverty situation in the country was retrieved from Statistical Institute of Belize whereas information on history as well as managerial activities on the Columbia River Forest Reserve was received from the Forest Department and Wildtracks. Access to information on the communities and the map of the area were also retrieved from the Maya Leaders Association at the district level. Other sources of secondary data for this research were retrieved from literature reviews and from websites. Information that was retrieved from secondary sources were qualitatively analyzed and is discussed along with the primary data.

4.7 DURATION OF THE DATA COLLECTION

The entire fieldwork was structured to last for about two months. However, it took three months before the necessary data was collected. Primary data collection from the various communities took two months, for mid-October 2020 to mid-December 2020. It also took two weeks (first two weeks of October 2020) to collect secondary materials related to the site although some secondary data were collected during the primary data collection period and another two weeks for collecting data from the Village Leaders through the focus groups (last two weeks in December 2020).

4.8 VALIDITY AND RELIABILITY

The validity of this data is considered to be relatively high, providing a good representation of the communities' thoughts on current and future participation in the forest management in the Columbia River Forest Reserve, with most of the respondents answering as honestly as possible, with the researcher probing their responses by asking further questions and crosschecking through observation and with focal group discussion outputs. It has to be recognized, however, that there can be issues of errors in using questionnaires during data collection, as respondents might not respond according to what they do but according to what is ethically or generally accepted. There is the fear that one might report them on certain actions that they undertake, and they end up providing false responses. The same can be true during interviews and focal group discussions, which may lead to poor validity and reliability of the research outputs, which might not reflect the true picture on the ground and making generalizations that might not be 100% valid. For instance, when respondents were asked to give their weekly income, some of them may not provide the accurate answer because they might think that they may have an opportunity to be assisted financially if they provide a lower income figure.

Furthermore, the validity of data also depends on other factors such as the extent to which the respondents understand and agree with the way in which the data would be put into use. At all the stages of the data collection processes, I presented myself to them as a student and the research is for my thesis, which I believed helped me to win the confidence of those who provided both the primary data. Despite the fact that there could be errors during the data collection process, the data collected so far has helped me to derive an understanding of community participation in the management of forest resources in the CRFR landscape.

4.9 LIMITATIONS OF THE STUDY

One of the main constraints the researcher encountered was related to the timing of the questionnaire implementation in the communities, which was chosen to enable the researcher to travel from the place of work to the field (between 12 km to 45km each day). This was also compounded by the distance (and therefore time used) of travel to the communities for the questionnaire administration.

The questionnaires were administered during the day from 1 pm to 4 pm. However, because the villagers are mostly farmers, it was difficult to meet them in their homes. Subsequent visits, however, were made on several occasions to ensure that the questionnaire could be fully administered.

Some members of the communities were not willing to meet the researcher in order to answer questions, claiming to have previously attended so many research questions, but not having seen any direct benefits. In these cases, adjacent households would be approached. Most of the respondents took a minimum of 30 minutes in responding to the questionnaire. with questions often having to be broken down for respondents to be able to fully understand what was being asked. During the household survey, most of the respondents could not give the exact amount of their income as this is not fixed and as they do not keep records. Due to the pandemic, some respondents were unemployed, and some were receiving government subsidies, but most were not being assisted while some of them have always been subsistence farmers. The researcher had to explain that the research is not intended to bring them jobs but for the development of a road map for future improvements of the Columbia River Forest Reserve.

The survey also illustrated a gap in the stakeholder knowledge of CRFR and its location, with participants contradicting themselves as to whether they had visited CRFR and whether they have used CRFR for harvesting natural resources (e.g., one responded stated he had never been to CRFR, but had harvested resources from the Forest Reserve). It would have been beneficial to provide an initial introduction to the project and the CRFR to the communities, to orientate and inform participants before starting the surveys. This would avoid confusion between respondents assisting in management of community forest resources outside the CRFR and participating in management of resources inside the CRFR.

The focal group sessions provided important information, but with limited time available, some important topics could not be discussed, such as the lack of clear boundaries, both of the CRFR and of the perceived CRFR community use areas identified in the 2015 management plan (Wildtracks, 2015) and ways to avoid conflict in those areas that overlap. The topic of how to define use areas and manage use by each community was also not covered, though solving these issues would be better addressed during the implementation of the road map, when there is more time available for discussion and planning with the community leaders for fair division of community management areas and resources.

The Covid-19 pandemic regulations imposed in Belize restricted gatherings of more than 10 persons. Several leaders respectfully declined the invitation to participate in the focus groups fearing for their health, even though they were informed that the meeting would follow the Quarantine (prevention of the spread of infectious disease) (Covid-19) Regulations, 2020 section:

- 4– (1) For the purposes of preventing, controlling, containing and suppressing the spread of the infectious disease COVID-19 every person shall, at all times and in every place, whether public or private, wear a face mask or other face (nose and mouth) covering.
- 5.– (1) For the purposes of preventing, controlling, containing and suppressing the spread of the infectious disease COVID-19, every person shall practice social distancing.

5 RESULTS

This chapter presents the results of the field work and is presented according to the specific objectives of this study. The data sources on which the results are based include the household's questionnaires, outcomes of the focus group discussion, direct observation and literature review.

Community participation in the management of the forest in Belize is taken to mean involving the communities in taking care of the forest. This includes participating in decision making and undertaking sustainable extraction or other uses that would not destroy the forest. Also, certain activities would need to be put in place to assist them in supporting themselves so that they do not depend solely on the products from the forest for their survival. (e.g. Jippi Jappa (*Sabal mexicana*) and cohune cabbage (*Attalea Cohune*) which they can grow at home and sell instead of going to the forest every day to collect these products). The knowledge, innovations and practices of the indigenous peoples of these communities have much to contribute to the management of the forest reserve and is reflected in the data gathered from the respondents.

5.1 HOUSEHOLD SURVEY OUTPUTS

5.1.1 AGE GROUPS OF RESPONDENTS

The ages of respondent's range between 18 and above 60 (Figure 5).

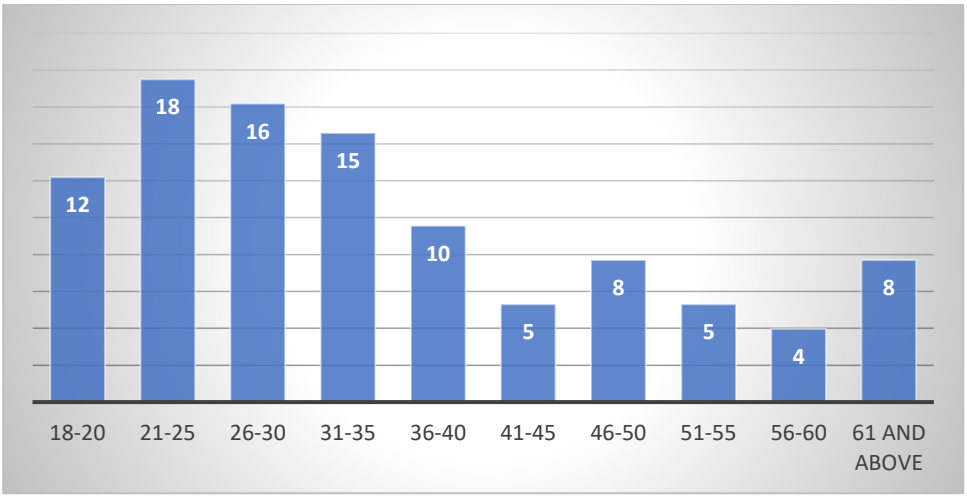


Figure 6: Ages of respondents in percentages (n=377)

Respondents ranged from 18 -61 and above with the majority being 40 years of age or younger. The highest frequency age group (18% of those interviewed) fell within the ages of 21-25, followed by those within the age category '26-30' (16% of respondents) and subsequently by ages 31-35 (15 %). The lowest frequency was for those aged 56-60 (4%. Of respondents) The 49% respondents from the three highest age categories (21 to 35 years of age) form the working labor force for the Toledo District (SIB

2020), and it is important that they are included in decision making that will affect their lives. It is also important to incorporate the ideas of the aged – those above 60 since they have had more experience living in the area.

5.1.2 RESPONDENT GENDER

The gender of the respondents was also analyzed, with men answering the questionnaires more frequently than women 57% of respondents were male, and 43% women. This (Figure 6).

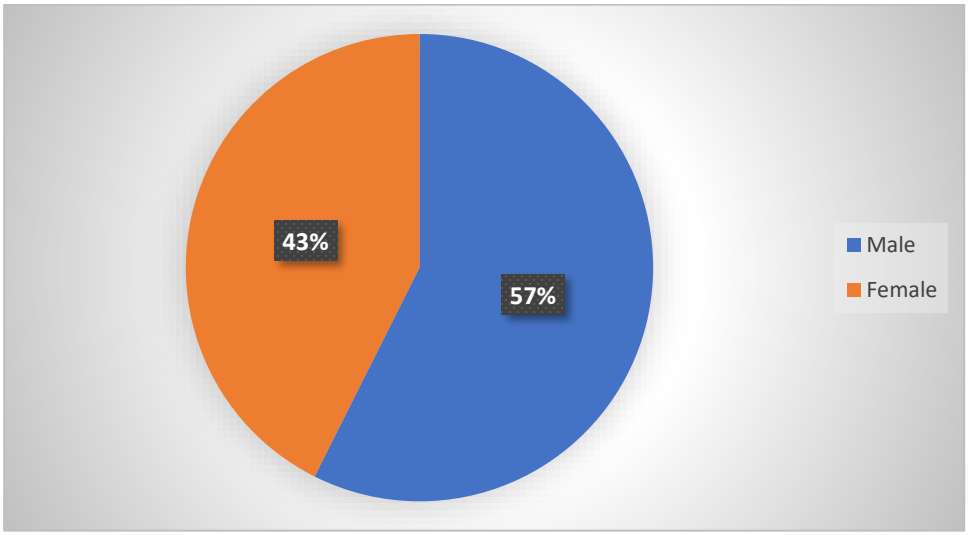


Figure 7: Gender distribution of respondents (%) (n=378).

This could be due to the fact that given the time the questionnaire was administered in the communities; the men were back from the farm and the men tend to take on the role of head of household when interacting with strangers.

5.1.3 ETHNICITY

The data on the ethnic groups of respondents demonstrated that Q'eqchi Maya is more predominant than Maya Mopan in the twelve buffering communities of the Columbia River Forest Reserve (Figure 7).

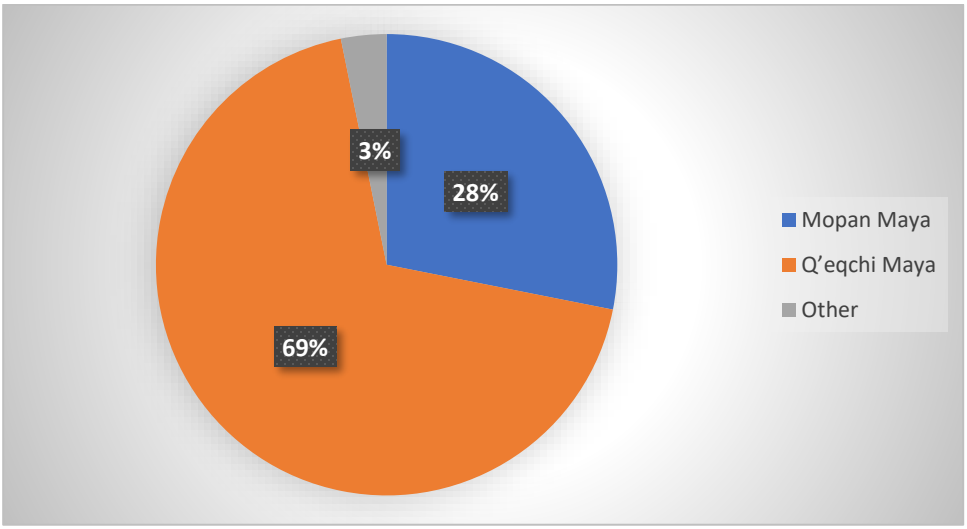


Figure 8: Ethnic group distribution of respondents (%) (n=377).

The Q'eqchi Maya constitute 69% of the respondents, the Mopan Maya, 28% and only 3% of other ethnicity such as Creole, Mestizo, East Indian and Spanish. Q'eqchi Maya are considered the largest representative ethnic group in Toledo District, arriving in Belize as part of a workforce for Cramer Estates, working on the coffee and cacoa farms. When these failed in 1914, they settled throughout the district. They make up the majority of the population in the Toledo District (30,785) with just over 45.7 % of Belize's population (SIB, 2010).

5.1.4 EDUCATIONAL LEVEL

The majority (56%) of the respondents are considered to have no or limited education, with 8% having no education and 48% completing only primary school (Figure 8).

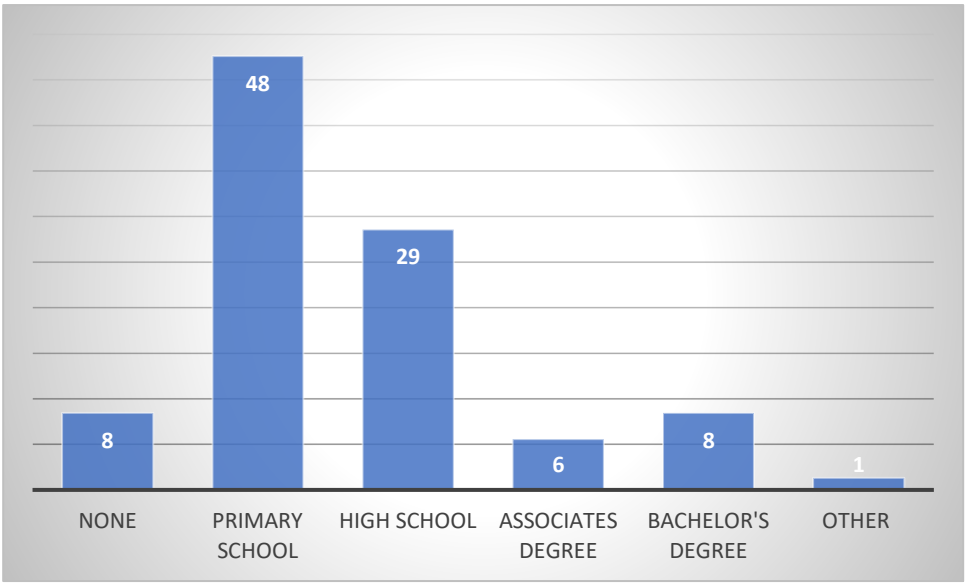


Figure 9: Educational level of respondents (%) (n= 346).

29% of respondents have a High School certificate, and 8% have University level. 6 % of the respondents have Sixth Form education, and 1 % have other, identified as vocational training.

5.1.5 OCCUPATIONAL DISTRIBUTION

Members from the twelve communities have a range of occupations from which they make their living and support their families (Figure 10).

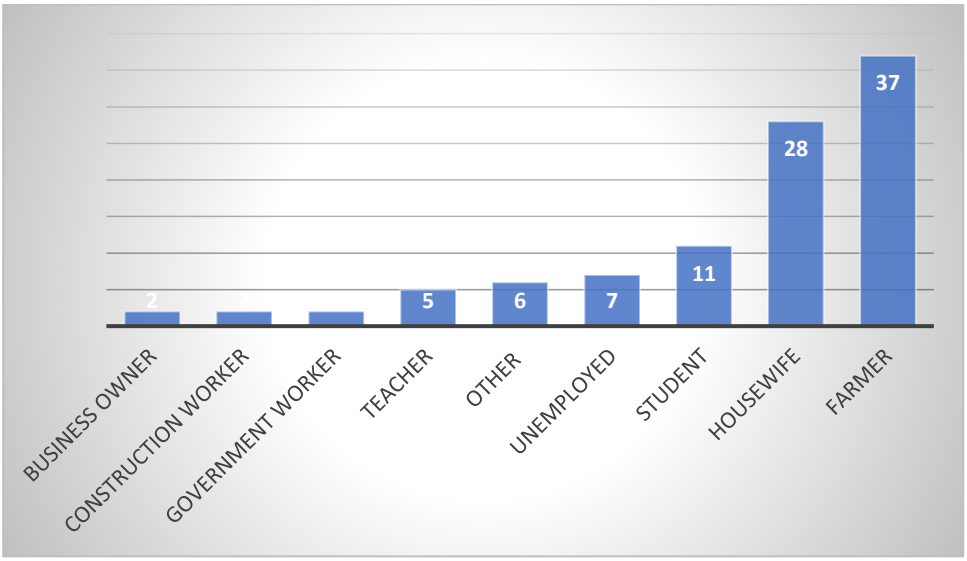


Figure 10: Occupational distribution of respondents (%) (n= 379)

The majority of the respondents are farmers (37%) or housewives (28%). For the category "other", occupations were identified as cooks, security guards, NGO workers, carpenters and shop keepers.

5.1.6 INCOME

The majority of the respondents fall within the lower-income categories. This is shown in weekly income of the respondents in pie chart 12.

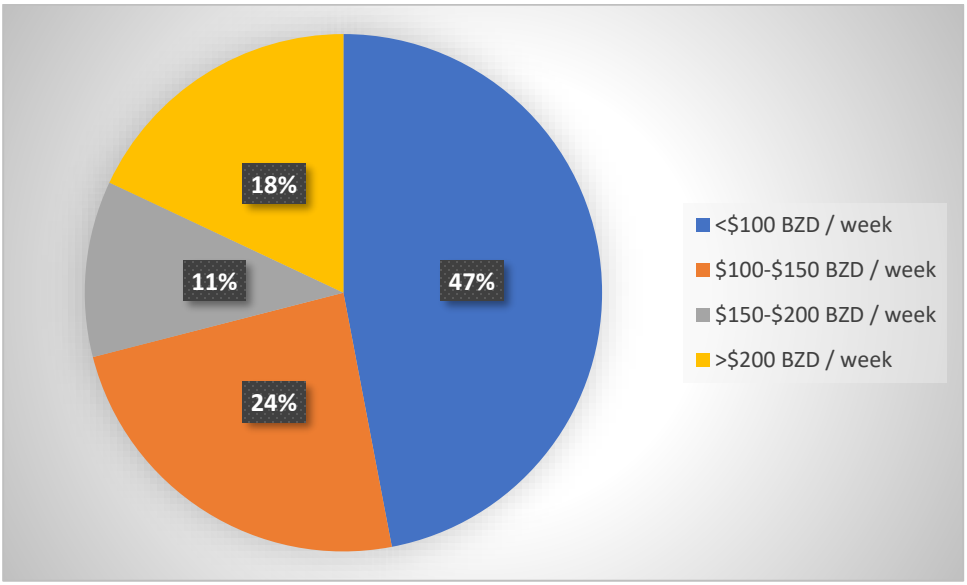


Figure 11: Weekly Income range of respondents (%) (n= 267).

The majority (71%) of the respondents have an income less than $150.00 BZD per week, with 47% earning less than Bz$100, and 24 % earning between $100.00-150.00 BZD. Given that the most community members are subsistence farmers, it was expected that they would have a low-income level, with farmers using their produce at the household level, not all farmers take their produce for sale in in Punta Gorda.

5.1.7 COMMUNITY PARTICIPATION IN THE MANAGEMENT OF FOREST RESOURCE

The intention here was to find out whether community members already participated in the protection of the forest and their reasons. The results from the household questionnaire from the twelve communities, however, indicated that few people participate in the protection of the forest and its resources. When asked what the respondents have done to protect the forest over the last 12 months the most frequent responses were 'done nothing (27%), practiced less slash and burn (18%), planted a tree and practiced traditional methods for both farming and forest resource extraction (16% respectively) (Figure 11).

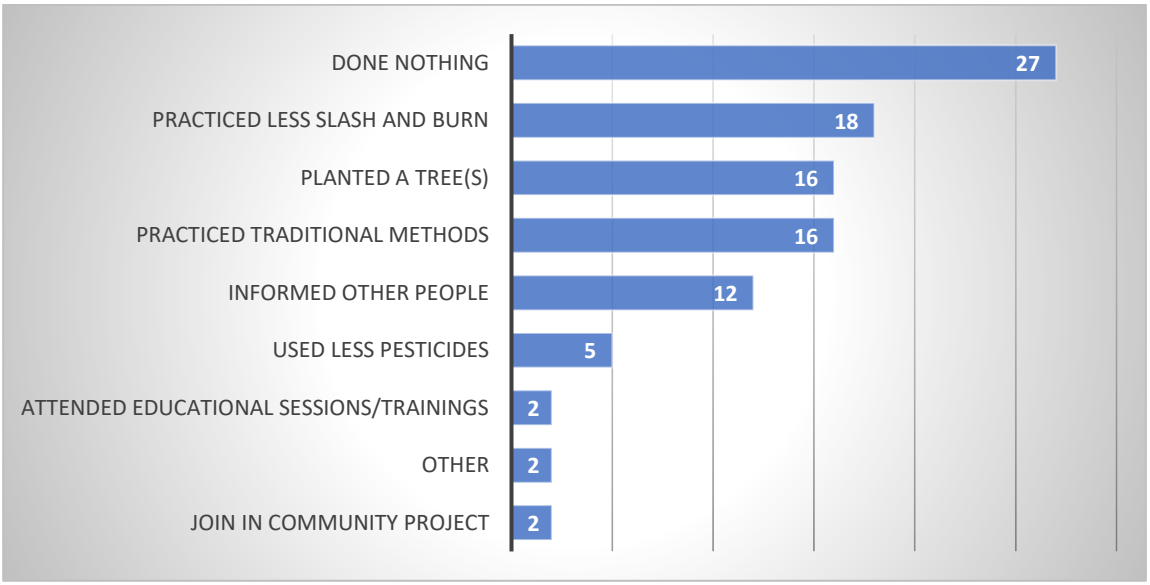


Figure 12: Participation in the protection of the forest over the last 12 months (%) (n=*379*)

A higher percentage (73%) of the community members have participated in some way in the protection and management of the forest in the last twelve months, demonstrating a willingness to be involved in some forest management activities. Local participation is when people are given the authority to gather their own efforts to take care of their resources, make decisions and manage the activities that affect their lives.

5.1.8 PROTECTED AREAS

All communities included in the assessment have been selected due to their identification as buffer communities of Columbia River Forest Reserve. When asked if there was a protected area near their community, the majority of respondents (63%) said yes, 18% said no, and 19% stated that they did not know and (Figure 12).

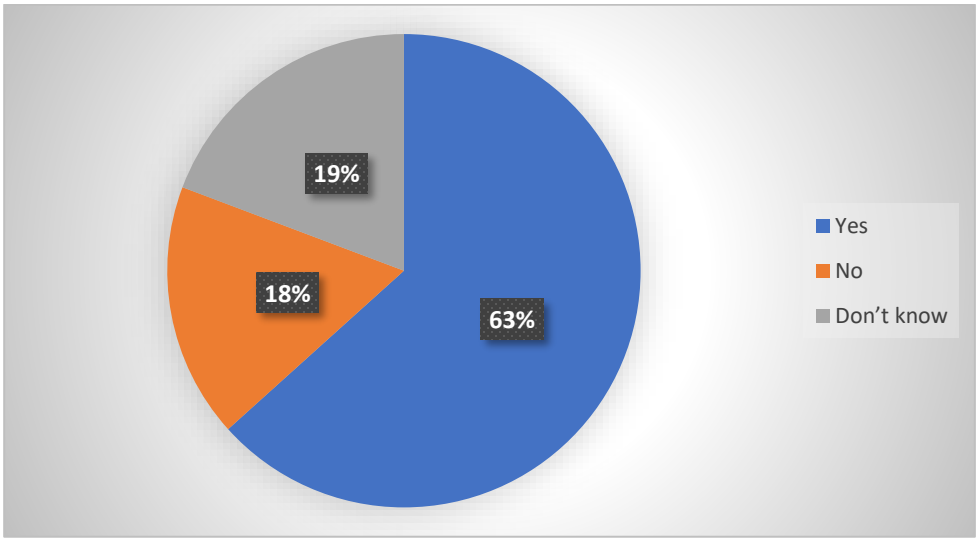


Figure 13: Knowledge of proximity of protected area to the community (%) (n= 379).

When asked if they knew the name of the protected areas near their community, 48% identified Columbia River Forest Reserve, 44% stated they did not know, while 8 % gave the names of other protected areas or private lands (Figure 13).

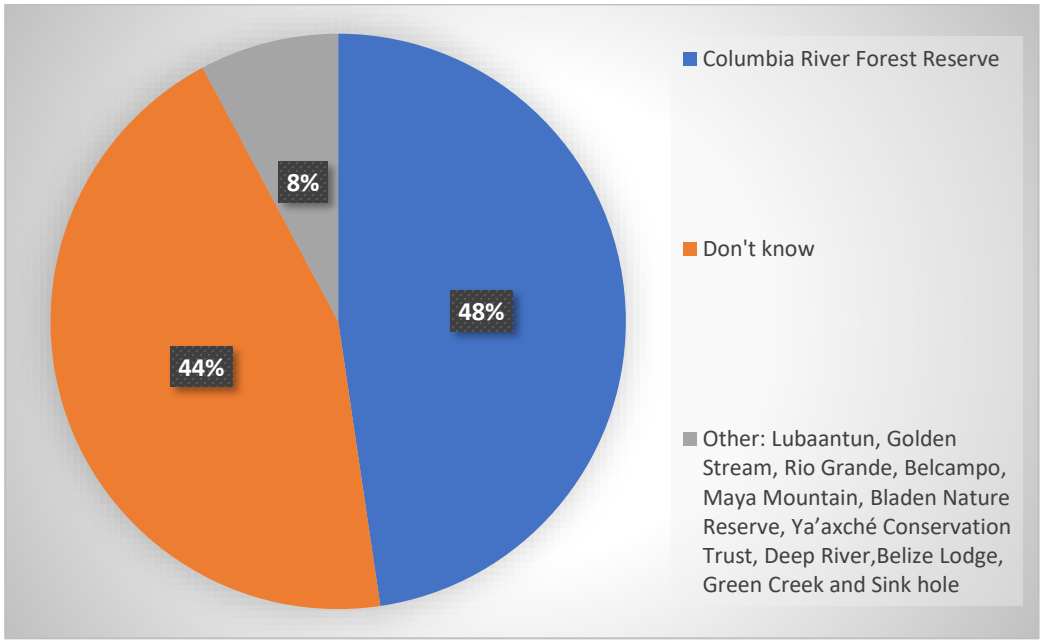


Figure 14: Name of the protected area near their community (%) (n=379).

Respondents were asked how often they visit CRFR 58% of respondents stated they have never visited CRFR, 30% have visited occasionally, 9% approximately once a year, and 3% stated they visit monthly, (Figure 14). When the respondents claimed to have never visited the reserve, they stated that it was too far from their community and have no knowledge of where the protected area boundary starts. Some of the respondents perceive that the reserve is the hills' part only and some of the participants stated that they had never entered the reserve because of its protected status. However, it is felt that the response is not 100% accurate since based on the patrols and investigations by the Forest Department, many individuals do enter the Reserve to harvest produce or to underbrush for farming purposes.

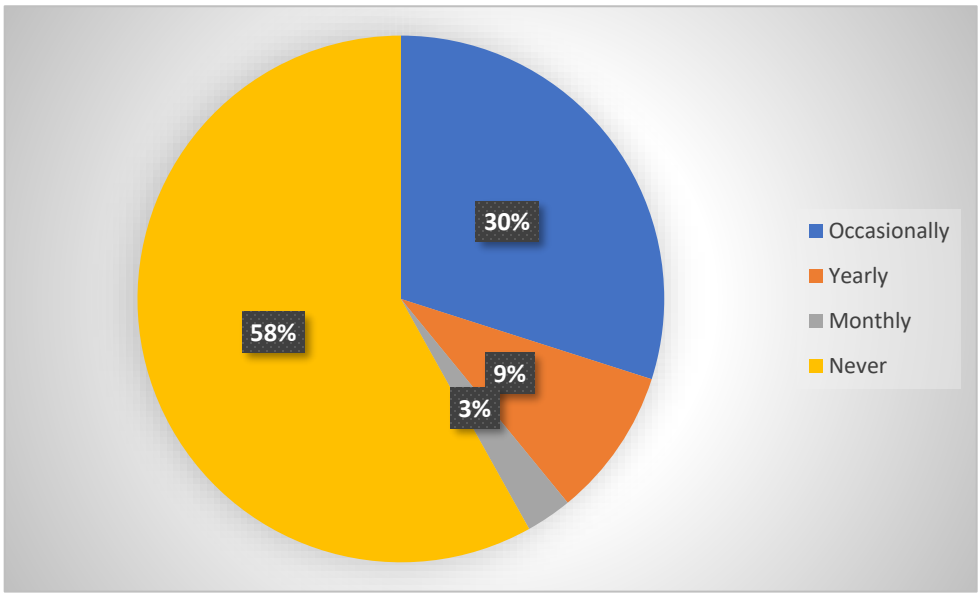


Figure 15: How often respondents visit CRFR (%) (n= 284).

There was mixed feedback on whether respondents could differentiate between forests within the CRFR and forests on village lands, The majority (51%) of respondents said no, with 49% saying yes (Figure 15).

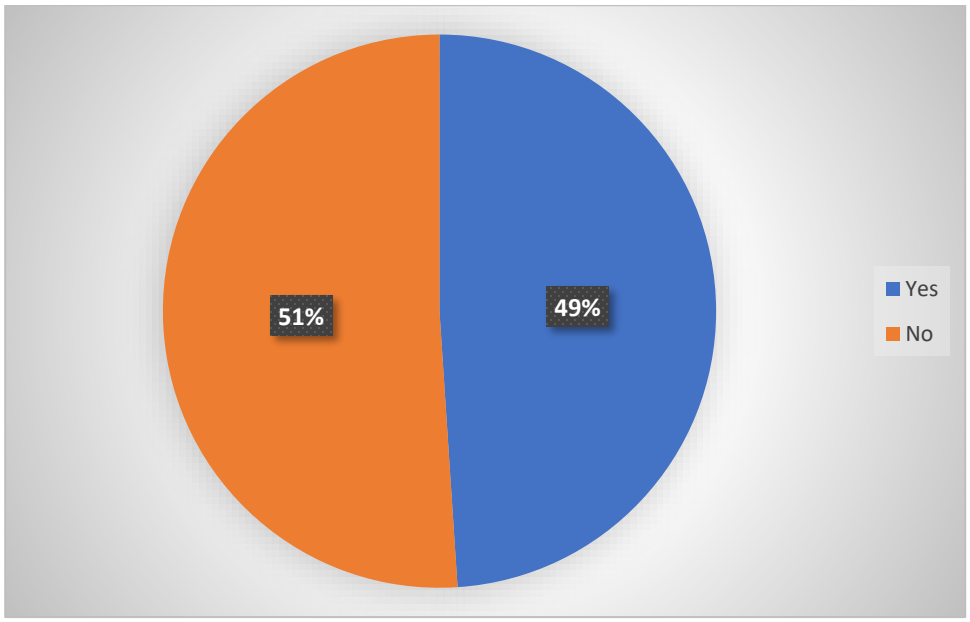


Figure 16: Can respondents differentiate between CRFR and forested village lands (%) (n= 366)

When asked for two principal benefits obtained from the CFRF, 17% of the respondents stated food, followed by water and wildlife (14% respectively), with 12% recognizing fresh air as a benefit (Figure 16).

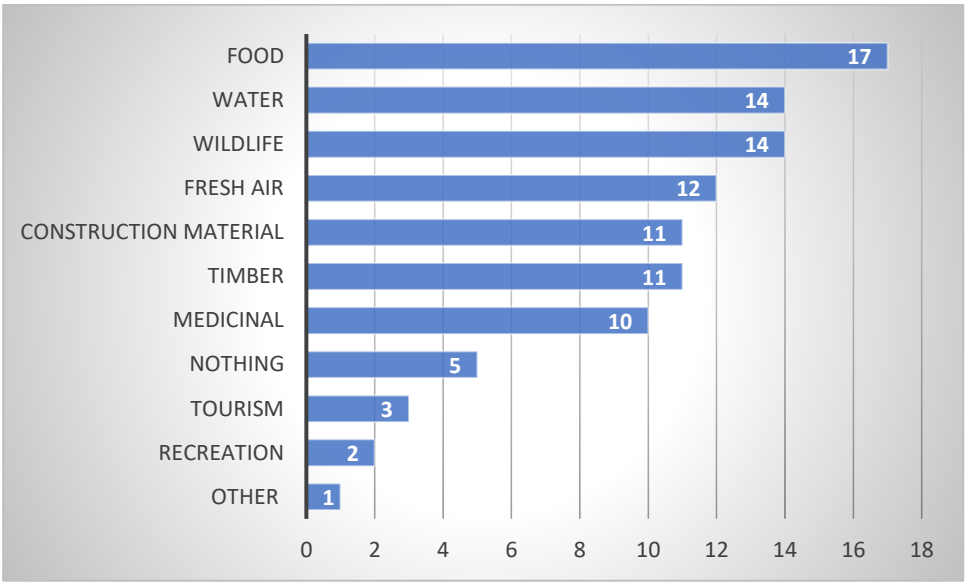


Figure 17: Principal benefits identified by respondents as being obtained from the CRFR (%) (n= 377)

When asked about the health condition of CRFR, only 25% of respondents considered that the protected area is in Very Good condition, with 40% of respondents stating that the reserve is in good condition 19% considered the condition to be Average, whilst 4% considered it to be Poor (Figure 17).

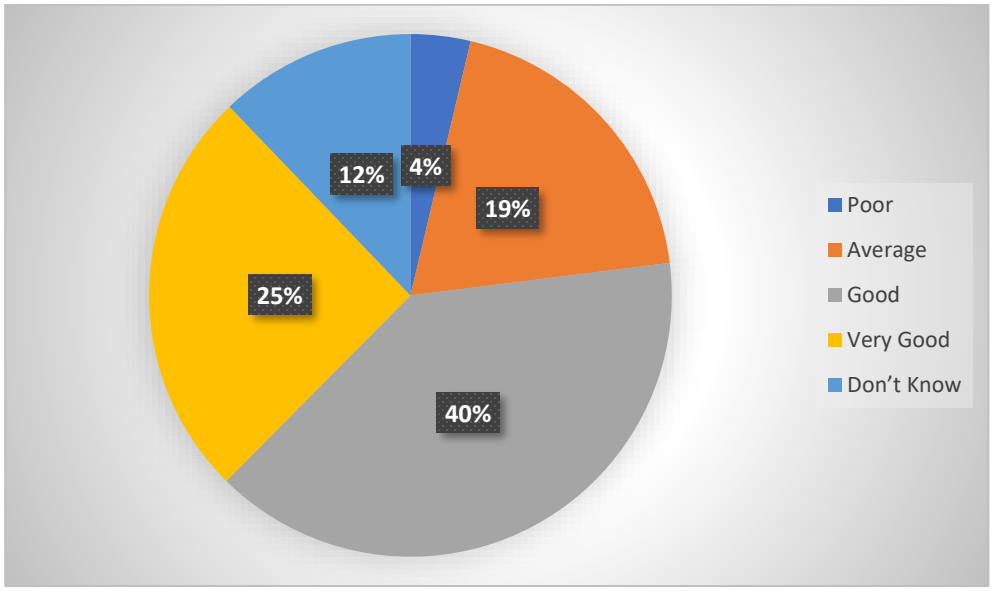


Figure 18: Perceived Condition of CRFR (%) (n= 378).

When the respondents were asked whether the condition of forest near their communities has improved or declined over the last 5 years, 23% stated that the forests had improved, 32% that the forest condition had remained the same and 30% considered the forest condition had declined (Figure 18).

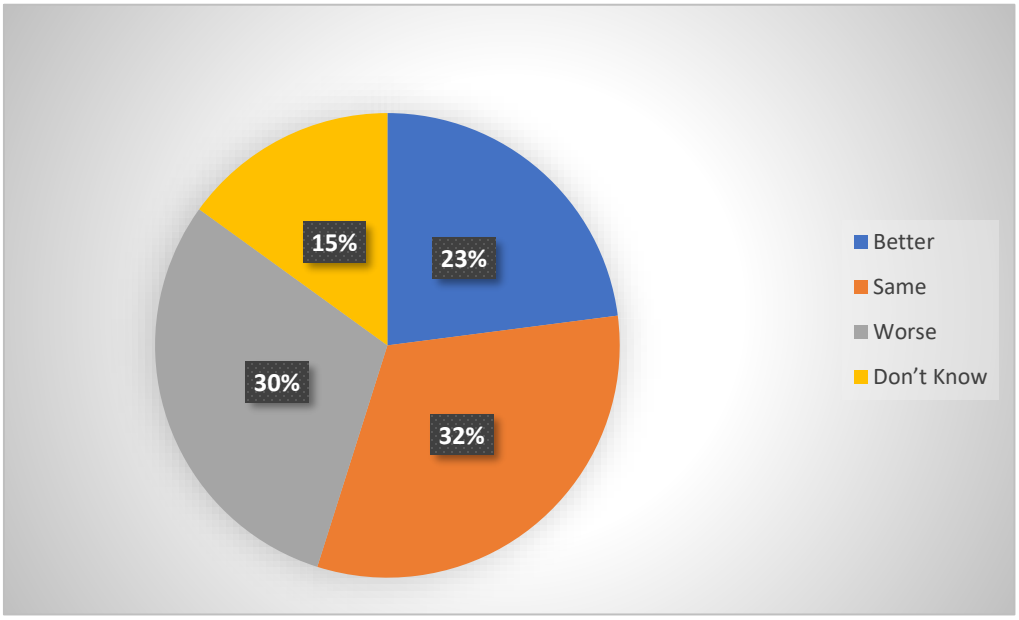


Figure 19: Perceived Condition of Forest near respondent's community (%) (n=379)

The highest perceived threats identified as affecting the forest within the CRFR were forest fires (27%), illegal incursion (19%,) village farming, and natural disasters (12 % respectively) (Figure 19).

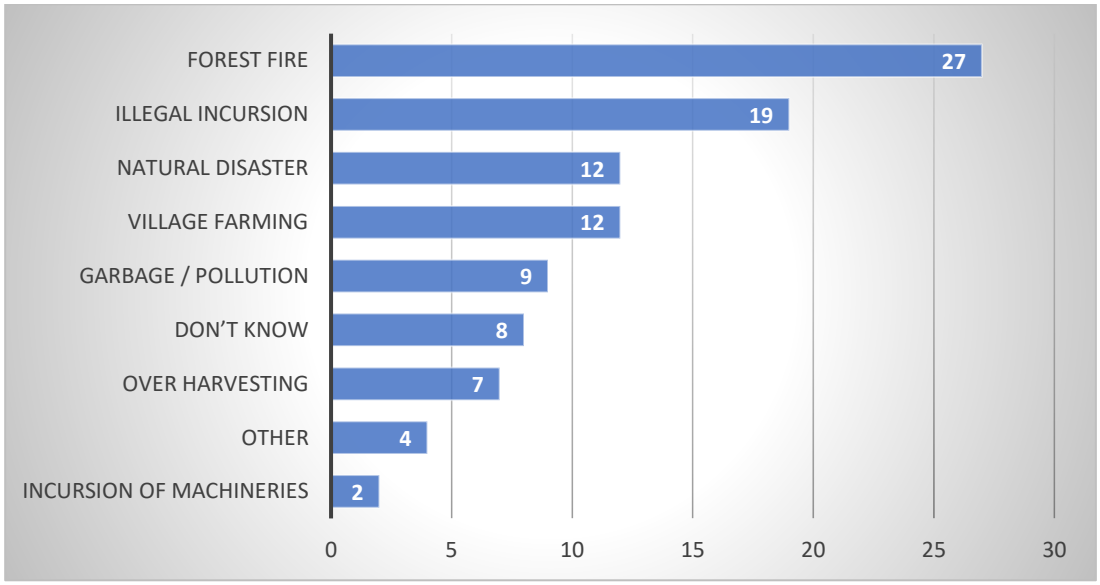


Figure 20: Main Threats Perceived in the CFRF (%) (n= *377*)

The main threats identified as affecting the forest within community village lands were Forest Fire (30%), village farming (22%) and solid waste pollution (13%) (Figure 20).

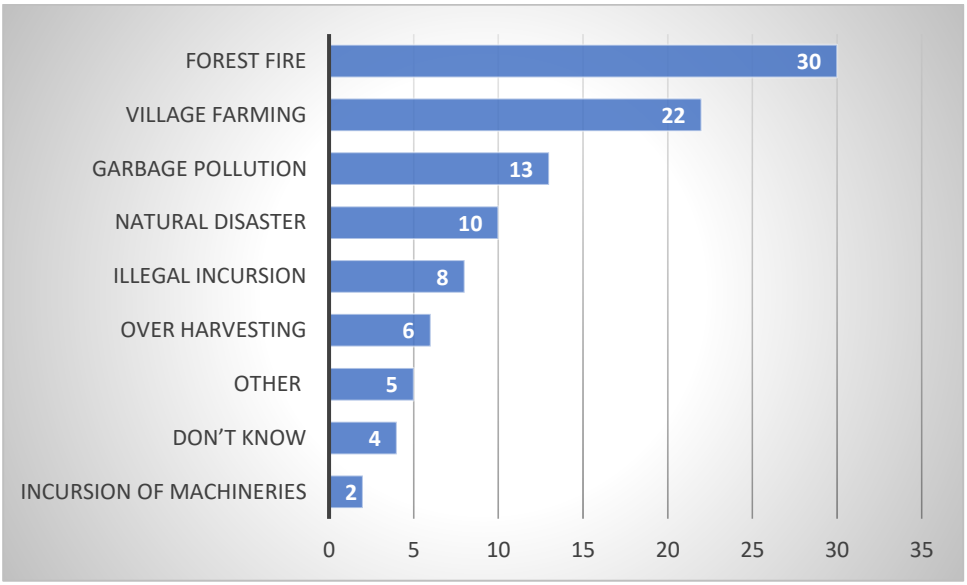


Figure 21: Main Threats to forests in the respondent's community lands (%) (n= 378).

When asked to identify two (2) activities they think are needed to better protect the CRFR, the most frequent response was 'More Patrols' (25% of respondents), with the need for government support and stronger laws ranking second each proposed by 13% of respondents, and stronger community laws proposed by 11% of the respondents (Figure 21).

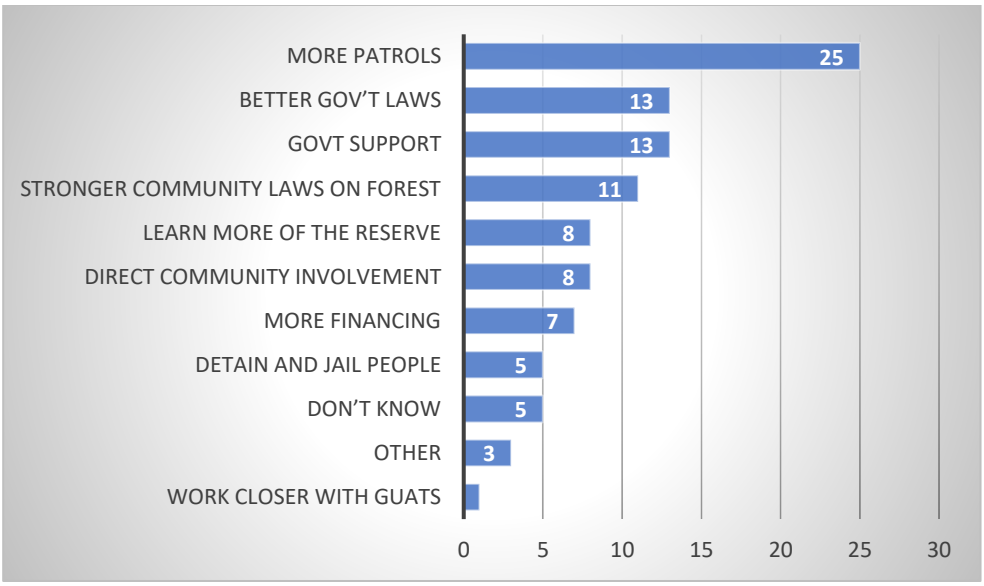


Figure 22: Activities identified to better protect CRFR (%) (n= 378).

When asked what the community can do to protect the Columbia River Forest Reserve the most frequent responses were: organize themselves to protect (23% of respondents), report to authorities (19%), strengthening community stewardship (17%) and direct community management of the area (10%) (Figure 22).

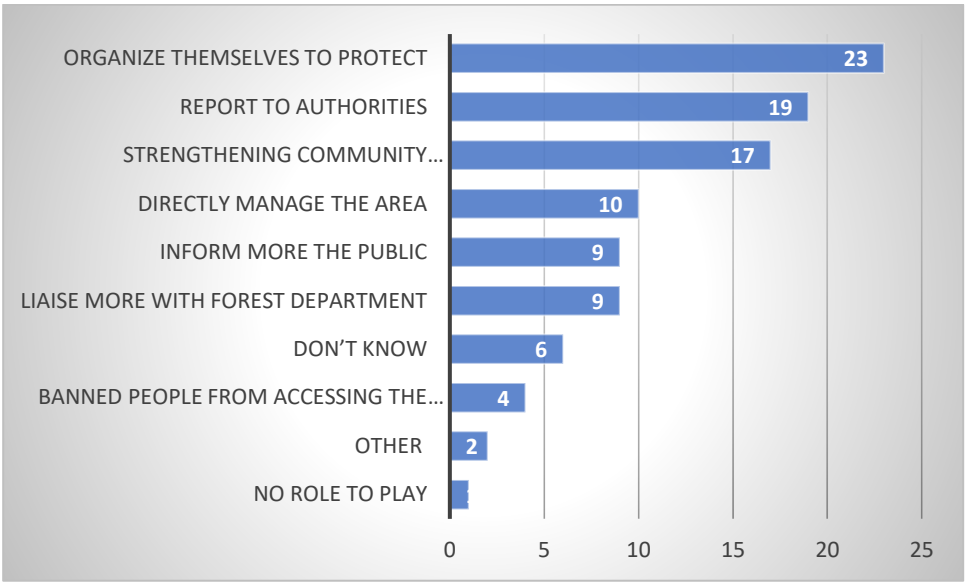


Figure 23: Activities the community can do to protect CRFR (%) (n= 378).

When asked what the community needs to better protect the forest, watershed and wild animals, the most frequent response (33% of respondents) was the need for communities to learn more about protection. 23% considered it was important for communities to become more organized, and 12% identified the need for the necessary funding to enable community-based management. 9% identified the need for a formal agreement with Government (Figure 23).

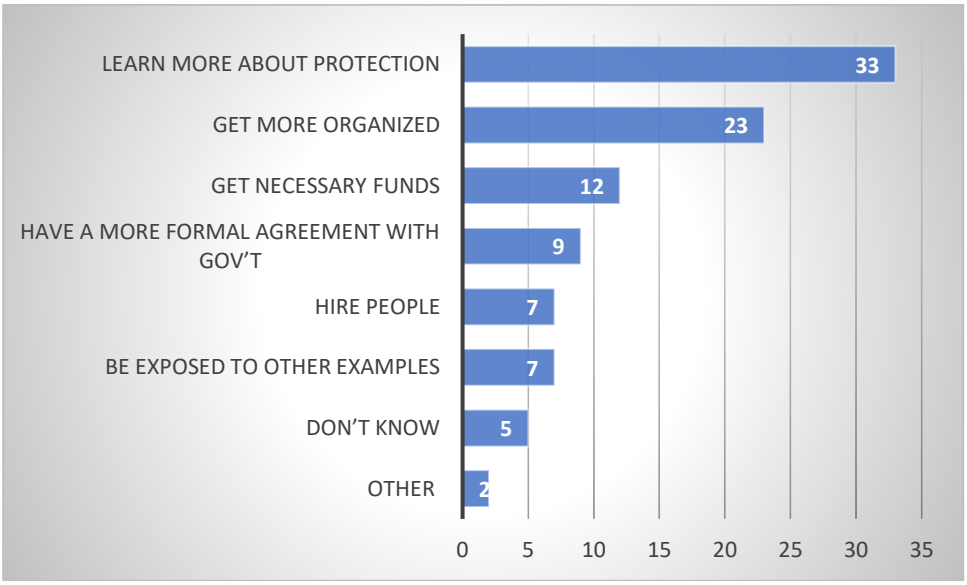


Figure 24: Activities the community need to better protect CRFR *(%) (n=374)*.

When asked what the respondents are willing to do to protect the forest within the Columbia River Forest Reserve, the top four responses were as follows: continue to respect and promote traditional rules and values (26% of respondents), respect community rules on forests (21%), participate in community projects (20%) and inform other people (14%) (Figure 24).

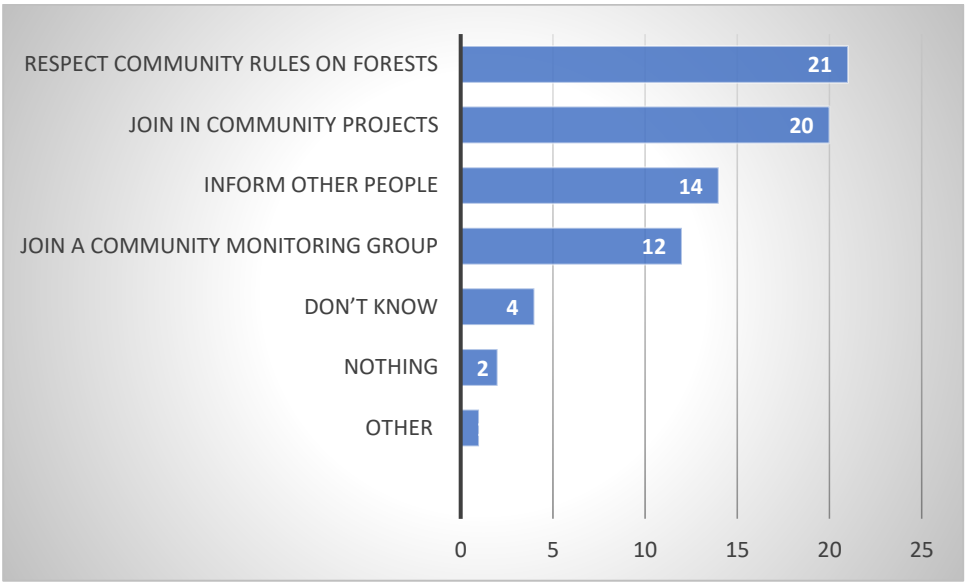


Figure 25: Activities community are willing to do to protect CRFR (%) (n= 377)

There was strong support for the development of a Community Monitoring Group for protection of the CRFR forest, with 89 % responding yes while 4% said no (Figure 25).

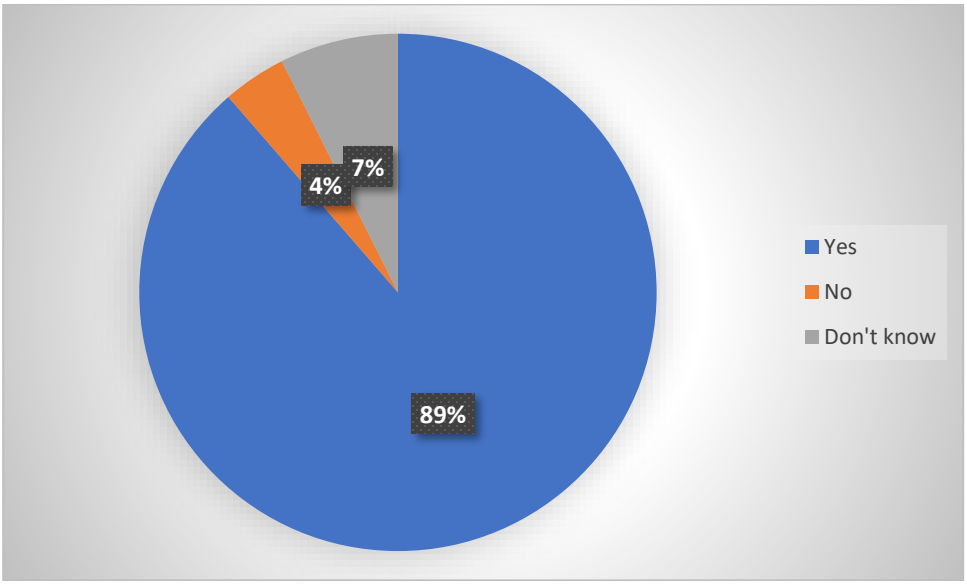


Figure 25: Development of Community Monitoring Group (%) (n= 378).

5.1.9 FOREST REGULATIONS

When asked if they think there are rules and laws on how to use the forest, the majority (90%) of respondents stated yes with 90%. 4 % said no and 6% stated they did not know (Figure 26). The respondents knew that they must obtain a permit from either the Forest Department or the village leaders before cutting a tree for lumber. They also knew that they could call the Forest Department to report others cutting trees without permission.

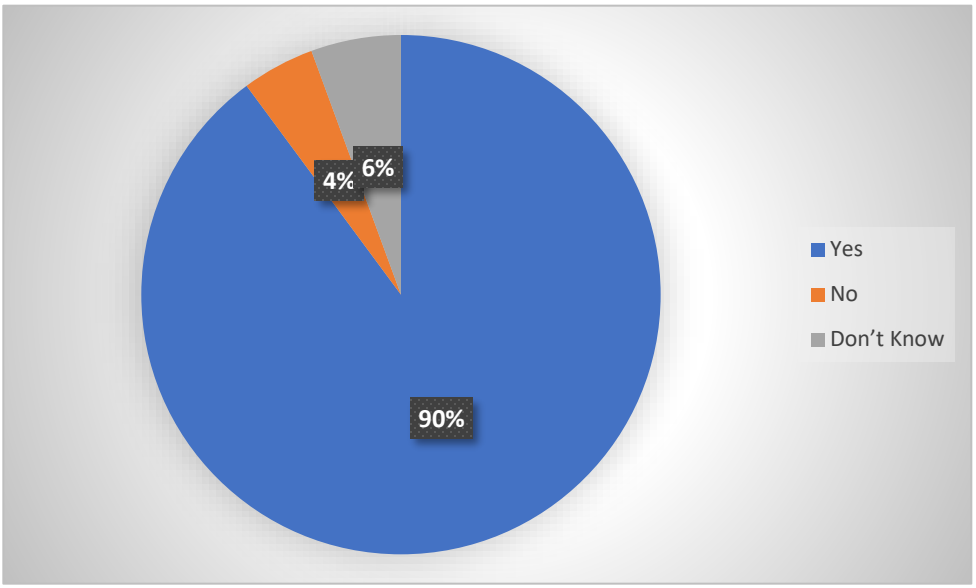


Figure 26: Knowledge of rules and laws that govern forest use (%) (n= 375).

When respondents were asked what level of respect is given by the community for these laws, only 3% responded that the level of respect was Very High and 11% that it was High (Figure 27) 35% considered that respect was low (Figure 23). Supporting data suggest that the communities respect the customary laws set in place by the village more than the laws governed by the Forest Department, based on the low number of reports received by the Forest Department since the implementation of the Forest Customary (FCUP). Before the FCUP the Forest Department would receive a lot of calls reference illegal activities within the communities.

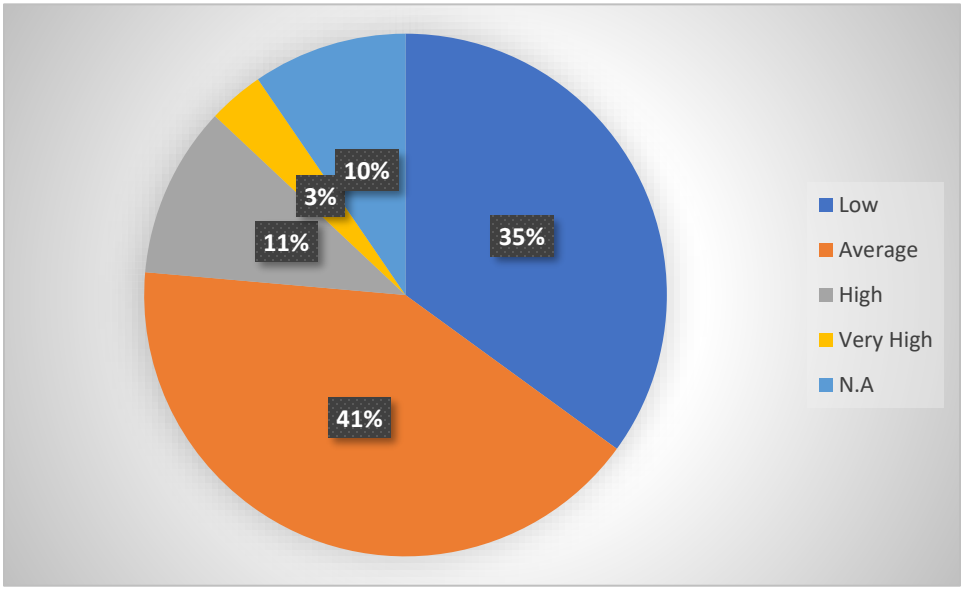


Figure 27: Community respect for the Forest Regulations (%) (n= 377).

When respondents were asked if they believe that the forest rules are enforced by authorities, 68% of respondent said yes, with 24% saying no. 8% stated they do not know (Figure 28).

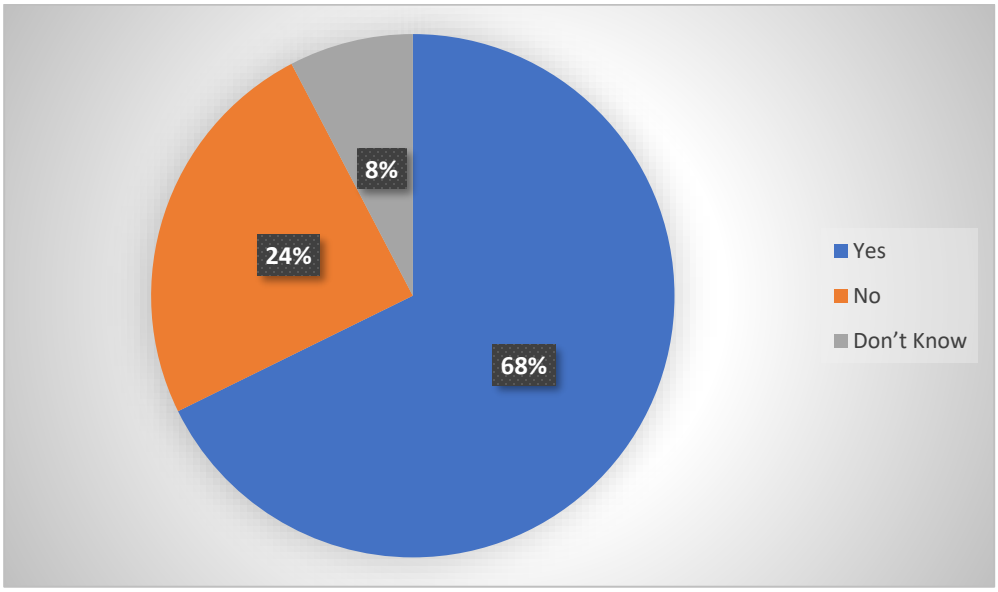


Figure 28: Perception as to whether Forest rules are enforced by authorities (%) (n= 378).

When respondents were asked to what extend the forest rules are enforced by authorities, only 5% perceived that enforcement was Very High. 35% responded that they perceived enforcement to be Low, with 33% considering it to be Average, and 18 % to be High (Figure 29). Those who perceived enforcement to be Low based this response on their experiences, stating that the Forest Department never investigates when they report, that they do not see perpetrators being dealt with, and that the material confiscated is sold by the Forest Department back to the same perpetrators, causing a loss of trust in the Forest Department.

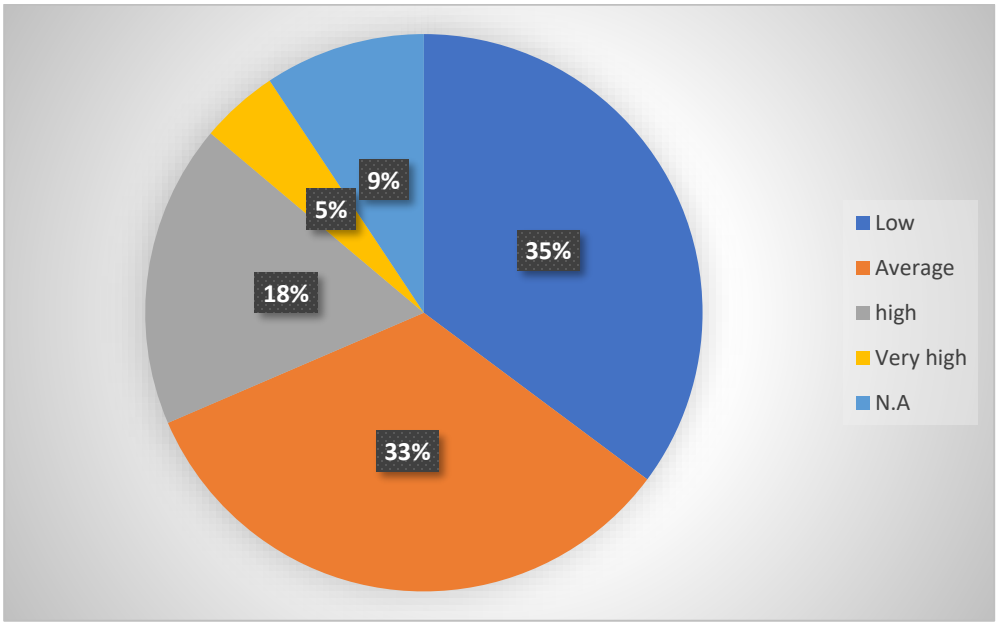


Figure 29: Perceived enforcement by Authorities (%) (n= 375).

5.1.10 TRADITIONAL PRACTICES

When asked what traditional practices can help conserve the traditional game species from being over hunted, the most frequent suggestion by 41% of the respondents was that hunters should only hunt to provide for their families. 14% of respondents suggested that hunting should only be for mature game, while 10% identified restricting hunting in community lands to only community members (Figure 30).

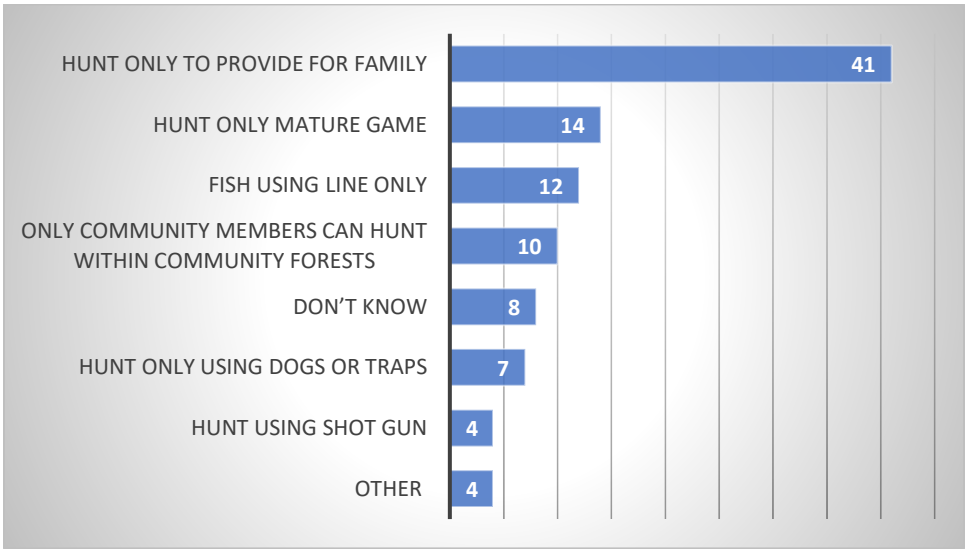


Figure 30: Traditional practice that can help conserve game species (%) (n= 379).

When asked what traditional practices are more effective in conserving the forest on community lands, 29% suggested the use of the proper traditional rotational farming, with 23% identifying the need for harvesting of forest produce to be restricted to family use. Other key comments included following community rules on reduced farming in high forest (20% of respondents) and the need for issuance of community permits before harvesting forest produce (11% of respondents) (Figure31).

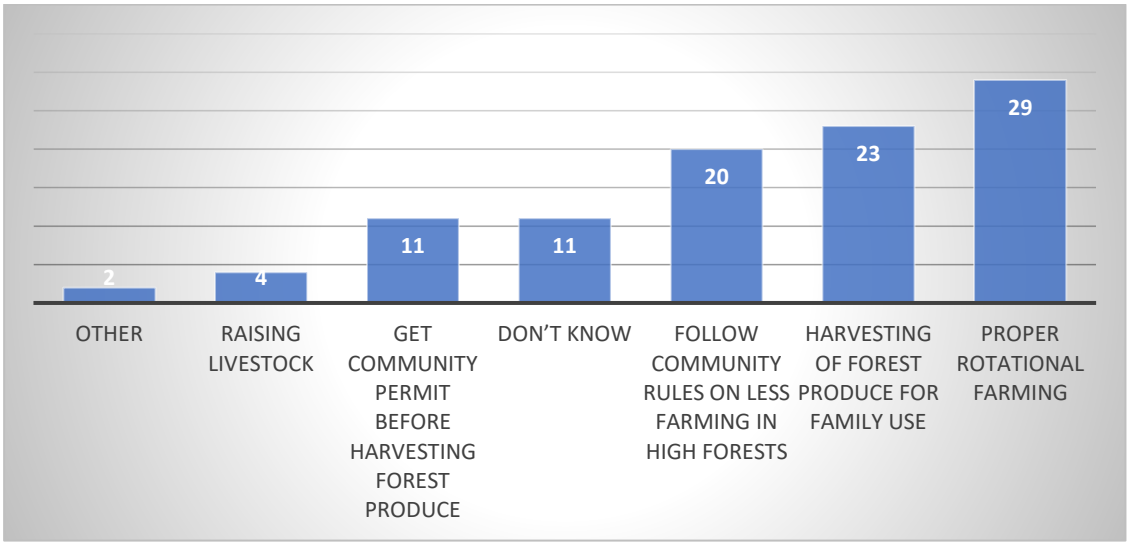


Figure 31: Traditional practices in conserving the forest on village lands (%) (n= 377)

5.2 FOCUS GROUP DISCUSSION

Table 5: Community values of CRFR

Community	Population Estimate (SIB, 2010 census)	Primary Occupations	Activities that impact CRFR	Recognized Va Forest Reserve
San Vicente Established: 1987 Q'eqchi	441 (73 Households)	farmer	Construction material, food (pacaya etc., game species), timber, water (washing) and medicinal	• CRFR is imp and as sourc community underground year round. collect the pumps that storage tank with water. • San Vicente system. • Helps protec • Provides cle by supplying • Important (hardwood). • Important fo
San Jose Established: 1940's Mopan	849 (175 Households)	farmer, Government jobs (Police and BDF)	Construction material, food (pacaya, jute etc., palm seeds for export, game species), timber, tourism, water (washing) and medicinal	
Na Lum Cah Established: 1987 Mopan	69 (12 Households)	farmer, ranger and housewife	Construction material, food (pacaya, jute etc., game species), timber, water (washing) and medicinal	
Crique Jute Mopan	223 (50 Households)	farmer, housewife, student and teacher	Construction material, extraction of ornamentals (xate), water (washing) and hunting game species	
San Pedro Columbia Established: 1930 Q'eqchi, Mopan + Hispanic	1703 (317 Households)	farmer, housewife, student, teacher, carpenter and business Owner	Construction, food (jippi jappa, pacaya, bay leaf, game meat), medicinal purposes (bark, leaves and roots), craft making from salvage rosewood, cedar and mahogany, and water (washing and bathing)	• Important w and washing • Important fo bay leaf, pac • Medicinal roots). • For constr homes). • Material for source of in salvage rose

5.2 FOCUS GROUP DISCUSSION (continued)

Community	Population Estimate (SIB, 2010 census)	Primary Occupations	Activities that impact CRFR	Recognized Va Forest Reserve
San Miguel Established 1950's Q'eqchi + Mopan	537 (96 Households)	farmer, housewife, student, teacher, shop keeper, NGO and business owner	Construction, food (jippi jappa, pacaya, bay leaf, game meat), medicinal purposes (bark, leaves and roots) crafts making (jippi jappa), and water (washing)	• For constru homes). • Material for source of inc salvage Rosew
Silver Creek Established 1969 Q'eqchi	473 (83 Households)	farmer, housewife, student, teacher, shop keeper,	Construction, food (jippi jappa, pacaya, bayleaf, game meat), medicinal purposes (bark, leaves	

		accountant, and office assistance	and roots) crafts making ('bile basket'), and water (washing)	
Indian Creek Established 1969	721 (134 Households)	farmer, housewife, student, environmental consultant and office assistance, waitress	Construction, food (pacaya, warrie palm, cohune cabbage, game meat), medicinal purposes (allspice, vervain and wild yam) and water (drinking and irrigation)	• Important wa the communi and farming (• Pristine jungl fauna). • Serves as a system and M • Medicinal pla • Provides clea leaves, sabal sticks, vine, r for the comm
Golden Stream Established 1970 Q'eqchi	349 (52 Households)	farmer, housewife, cook, security guard	Construction, food (pacaya, warrie palm, cohune cabbage, game meat), medicinal purposes (vine, roots, gumbo limbo, minvine/tea and wild yam) and water (drinking, washing and irrigation)	
Medina Bank Established 1920 Q'eqchi, Mopan + Hispanic	237 (34 Households)	farmer, housewife, forester (wood stop), maintenance, security guard and cook	Construction, food (pacaya, warrie palm, cohune cabbage, game meat), medicinal purposes (allspice, vine, roots, gumbo limbo, minvine/tea and wild yam) and water (drinking, washing and irrigation)	

Table 6: Community Perceptions and Opinions

Community Group	Community Concern
San Vicente, San Jose, Na Lum Ca, Crique Jute	• The forest resources need better protection from Guate hunters and xateros. • Xateros steal parrots from the reserve. • There is no village land available for expansion of farmlands, so villagers want to ente their farmland. • No one is benefiting from the living spring; it should be converted into a park with perm • Villagers are not benefitting - only Guatemalans.
San Pedro Columbia, San Miguel and Silver Creek	• The watershed system needs cleaning - fallen branches cause river blockages. The form to do some cleaning about 4 miles, (2 miles downstream and 2 miles upstream from San with the change in Government, it is not sure if the cleaning will continue. • Government needs to establish a working relationship with community leaders, and they the decision-making of the reserve. • The communities should be involved in the decision making for logging licenses given the Forest Reserve • Deforestation is occurring within the Forest Reserve. • There should be proper usage of the reserve. • Political Interference. • Squatting with the Forest Reserve. • Escaped fires from the Guatemalans cleaning land for slash and burn farming. • Illegal incursion. • Illegal Logging from both Guatemalans and Belizeans. • Hunting of young wildlife, parrots and over hunting of game species for commercial pu

Community Group	Community Concern
Medina Bank, Golden Stream and Indian Creek	• Illegal incursions: • Guatemalans destroying the Forest Reserve, causing Belizeans to suffer. • Guatemalans cutting mahogany and cedar. • Xateros entering the Forest Reserve. • Looting and taking of wildlife. • Poisoning of the River. • Giving logging concessions to people without the consent of the communities. • Illegal logging in the Reserve. • Logging companies destroy the watershed and damage farm roads. • Limited support from the Government to the community. • Corruption within the system. • Communication is failing between Government and Community. • Logging concessions are affecting the community (Wood stop). • Private lands issued within the village without the community knowledge or consent. • Villagers try to protect the Forest Reserve, but others enter the community and destroy it. • Outsiders come in the community and creating conflict with the community member. • Political interference.

5.3 DIRECT OBSERVATION

Most respondents stated that they enjoy some principal ecosystem service from the Columbia River Forest Reserve such as water and fresh air; they also derive forest products such as food, medical, timber and construction material for the nearby forest as was clearly observed when visiting the communities (Figure 33). During our site visits to the communities, it became obvious that these communities use the forest on a daily basis. The uses and users involve everyone in the household (Figure 34), the women use the river for washing and bathing, and have specific areas designated for these activities. The men use the forest to harvest forest produce to build or repair their homes. The elderly, women and children use the forest to harvest firewood. The usage of the forest is not limited to males only since females too assist their husband in the harvest of leaves. The teenagers use the forest as a means of arts and craft for school projects especially during this time of the pandemic.

Figure 30: Some of the activities seen throughout the villages through direct observation.

Figure 31: Different users and uses of the forest.

The proximity of the CRFR is clearly visible and is used to their advantage since several of the communities have access to the resources offered by the Forest Reserve. From eight (8) of the twelve villages (San Vicente, San Jose, Na Lum Cah, Crique Jute, San Pedro Columbia, San Miguel and Golden

Stream/Tambran), the CRFR is within daily travel distance - equivalent to the distance to their farmlands. For some villagers, their farms are located within the CRFR (Figure 34), with farmers starting to underbrush the forest floor by removing the shrubs and small trees forming the undergrowth, before completely clearing it for farming purposes, with the hopes of obtaining the land as their own from the Government in the future. Villagers also claim to not know where the boundaries of the Forest Reserve are located and therefore claim to not be in the CRFR or not visit the protected area when indeed they are within the Forest Reserve.

Figure 32: Under brushing occurring in the CRFR by community members of Golden Stream Village.

5.4 SECONDARY INFORMATION

Based on review of the previous management plan (Wildtracks, 2010) we can note that not much has changed in the community perception of threats. The main threats identified and highlighted during the study are very similar and have persisted over the intervening years (Table 7).

Table 7: Community threats identified affecting the CFRF

Main Threats	Threats in 2010	Present Threat
Garbage pollution		X
Village farming (expansion)	X	X
Forest fire (Slash and Burn)	X	X
Natural disaster	X	X
Over harvesting	X	X
Illegal incursion/ Trespassing	X	X
Incursion of machineries		X
Poaching	X	X
Logging without a permit		X
Deforestation		X
Illegal activities (hunting, Xate harvesting and logging)	X	X
Land change (expansion of pasture)	X	

The most critical threats identified in 2010 were:

- Escaped fire from poorly managed agricultural associated burning in the San Antonio area was considered the highest threat. It was considered that San Antonio farmers no longer practiced good fire management, with little communication with other farmers when areas were to be burnt. These fires have spread across the boundary into the Forest Reserve.
- Guatemalan incursions into the Forest Reserve – illegal hunting, xate and timber harvesting and farming (e.g., as previously in the Santa Rosa area).
- Land crises in communities adjacent to the Forest Reserve (including San Vicente)
- Pasture Expansion – changing land use patterns around San Vicente, with purchase of larger tracts of land for clearance for cattle farming.
- The community lands are not delineated – there are still lands available for expansion, and a buffer of forest exists between the farmlands and the Forest Reserve. A Maya Atlas exist that provides the measurement of the total land use are for the Maya communities in the Toledo District. But the Atlas also identities the extend of overlap between communities. Therefore, many conflicts exist between communities over village boundary lines.
- The majority of households are supported through farming – a combination of slash and burn and matahambre, with some expansion into cattle farming.
- Hunting is focusing on white-lipped peccary (warrie) and paca (gibnut) but hunting pressure from San Jose has resulted in a decline of these species and they are only found far inside the boundaries of the Forest Reserve. Hunting pressure, both locally and from Guatemalan xateros.
- Hurricane Iris caused a subsequent reduction in availability of fruiting trees affecting the game birds such as great curassow and crested guan, which are now reported to be scarce.
- Erosion caused by use of heavy logging equipment on steep slopes, despite Forest Department regulations to the contrary.
- Guatemalan incursions into the Forest Reserve – illegal hunting, xate and timber harvesting (though this activity has not been reported close to the community as yet).

The Management Plan (Wildtracks, 2010) identified management strategies which, whilst never followed, should be implemented to curb the threats being faced then and now. These priority management strategies were the following:

- Maintain the environmental services of CRFR in the long term, for the benefit of all stakeholders.
- Preserve the cultural resources of CRFR for future generations.
- Sustainable harvesting of commercial forest products, providing socio-economic benefits to buffer communities.
- Maintain viable traditional resources through effective sustainable harvesting.
- Prevent unplanned agriculture within the Forest Reserve and reduce the negative impacts of past agricultural incursions.
- Effective fire management within Columbia River Forest Reserve and adjacent areas
- Ensure watershed functionality and continued water flow and quality to the coastal plain and stakeholder communities.
- Assist Belizean communities within the watersheds of Columbia River Forest Reserve to better manage their lands towards future water security.
- Prevent transboundary incursions from Guatemala and associated removal of natural resources from CRFR.
- Reduce agrochemical pollution within the CRFR watershed.

The recommended Management Actions were:

- Establish a Columbia River Forest Reserve Management Committee (CRFRMC)
- Ensure administrative and operational support of the CRFR Management Committee through the Forest Department
- Hire a CRFRMC Coordinator for an initial two-year period to establish the CRFRMC and start implementation of the management plan.
- Identify and contract a person/organization (Community Management Committee Coordinator) to guide and facilitate the establishment of the community co-management process and sustainable land use plans for a minimum of a two-year period.
- Seek agreement with Ya'axché Conservation Trust (or similar NGO) for facilitation of establishment of management structure and Management Committee, and implementation of management activities.
- Seek agreement with Ya'axché Conservation Trust (or similar NGO) for facilitating establishment of community management groups, development of sustainable land use plans and mechanisms for representation on CRFR Management Committee
- Increase stakeholder participation in management decisions, management and monitoring activities through representation on the CRFR Management Committee.
- Ensure visible results from recommendations arising from community consultations, and feedback on areas of concern.
- Develop an effective Communication Plan for keeping communities and other stakeholders informed of management activities.
- Continue and increase collaboration with Belize Defense Force for addressing transboundary security issues.
- Continue and increase collaboration with FCD towards effective systematic addressing of transboundary security issues.
- Develop, approve and implemented sustainable resource use plans per community for identified CRFR community resource use areas, with effective monitoring and enforcement by communities, in collaboration with Forest Department.
- Increase communication and collaboration with communities for participation in surveillance and enforcement activities.
- Investigate potential for integrating community surveillance and enforcement activities in community natural resource use areas under the fajina system.
- Develop interpretive materials for CRFR focusing on its role in maintaining the water cycle and water security.
- Work with other partners (Ya'axché Conservation Trust, FCD, TIDE, SATIIM) to reach stakeholders with educational and outreach activities.

These management actions were spread across a five-year time frame but were never accomplished, as no one took up management or interest in the CRFR, even after priority status was given to the protected area.

5.4.1 LOCAL COMMUNITIES' PARTICIPATION

The protection and management of any protected area cannot be achieved without the active participation of the farmers and landless people who have a daily dependence on forests and forest resources for their existence. It has been progressively recognized that effective local participation is an

important component for sustainable management of forest resources. Participation has been acknowledged as an indispensable component of sustainable development in general and in protection of protected areas in particular. Local communities may only support conservation action within the Forest Reserve if they are able to benefit from the resources and are involved in the management of those resources. Local communities therefore have a communal duty to facilitate the protection of forest reserves. Based on this, every community is expected to:

- Establish community conservation norms in line with national policy.
- Undertake community education to create awareness of the importance of the Forest Reserve.
- Maintain a clean, safe and pleasant physical environment within their settlements.
- Undertake participatory monitoring and evaluation role to protect the Forest Reserve located within the community whether it be through co-management or community forest management.
- Sanction villagers who undertake activities that undermine the objective for establishing the forest reserve or who omit or commit acts contrary to the regulations of maintaining the forest reserve functioning.
- Promote measures that will protect the conservation of soil, water and wildlife resources in forest reserve.

5.4.2 THE CONCEPT OF SUSTAINABILITY IN FOREST RESOURCE MANAGEMENT

The concept of sustainability is critical to long term forest resource management. As forest resources can diminish over time, there is the need to ensure all communities around the forest understand the concept of resource sustainability, particularly with the growing role of communities in management of the resources. It is only through this that sustainable development in resource management can be achieved. For a community to participate effectively in the management of natural resources, the government needs to provide appropriate policies and frameworks, which offer a favorable and legitimate platform that a community can use in the management of natural resources that lie within their jurisdiction.

6 ANALYSIS AND INTERPRETATION OF DATA

It is proposed that management of CRFR be based on the concepts of maintenance of watershed functionality for current and future water security in the face of climate change; increased community participation through community control and management of current natural resource areas, and agroforestry initiatives in the agricultural incursion and fire-damaged areas, to promote forest restoration and management. Collaborative conservation of forest resources requires that stakeholders trust one another and commit themselves to sustainable forest use. Legal or administrative procedures need to be reformed and power redistributed to build relations of trust. Mutual trust needs to be developed, especially since the stakeholders have no previous experience of sharing decision-making or management responsibilities. In Belize, there has been a shift in the decentralization of the management of these resources, with a strong focus on co-management partnerships, community-based participation and equitable benefit from conservation efforts. Results from the data shows that the communities believe that in order to better protect the CRFR, they must organize themselves, report to their authorities (primarily the Chairman and Alcalde), strengthen community stewardship and directly mange the area themselves. This is what the concept of Ostrom recommends that communities co-operate to share resource use by building their responsibilities.

The Government of Belize has pledged to promote the sustainable use of Belize's protected areas by educating and encouraging resource users and the general public to properly conserve the biological diversity contained in these areas, in order to maintain and enhance the quality of life for all. This can be achieved by facilitating the participation of local communities and other stakeholders in decision making and the equitable distribution of benefits derived from them, through adequate institutional and human capacity building and collaborative research and development (NPAPSP, 2005). The communities are conscious that they require the support from the Government, they cannot do it on their own. Therefore, the communities are cognizant to the idea that in order to better protect the forest, watershed and wildlife they need to learn more about protection become more organized, acquire the necessary funds and establish formal agreements with the government.

The communities surrounding the Columbia River Forest Reserve require a structured, legitimate involvement in the management of the forest, with a platform for sharing their input concerning the use of the forest and how their ideas can help boost management activities. Even though they generally have low education levels, they have indigenous knowledge which can be equally useful in managing the forest successfully. After their systematic involvement, they can then be given the authority to manage their own activities with guidance from the government.

Communities have been engaged in the past at a level considered as "tokenism" where they can participate only to the extent of expressing their views but have no real say that matters. Community members noted during the data collection and discussions that the CRFR is near their community, it is an area where animals and plants are protected, that a permit is required in order to access the resources therefore restricting the community in the use of the resources but is also seen as an opportunity for community development. A Forest Reserve is the most unrestrictive category of protected area in that an array of activities allowable by law such as research, education, tourism, sustainable extraction with, of course, permission from the Forest Department. Moving their level of participation from tokenism to real participation, in collaboration with the Government of Belize would provide an opportunity for access to the resources, if this is conducted in a way that is guided by sustainable use plans and still maintains the core values of the Forest Reserve of watershed protection.

Even though there are few people who actively participate in natural resource management practices, it shows however that the communities are not completely left out in the management of the community forest resource. This also explains that since community participation in the management of forest resources is a known tool for resource preservation, the buffering communities have started involving themselves in some aspects of forest resource management, although the results show that it is not enough. The study also revealed that both primary precious hardwood species (such as rosewood) along with the other hardwoods are disappearing. These wood species used for their house posts, posts for farm fencing, covering the house, roofing and furniture keeping their traditional use of these resources alive. When asked the pivotal question as to how the community can help manage rosewood and other hardwood species, they immediately stated by managing the extraction by the community, by not extracting live trees in the case of rosewood, by creating a rosewood and other species planation and reforest, by having an effective permit system, by community monitoring and the development of a management plan.

These responses highlight that the communities have the willingness to be stewards of their own resources. The development of the Forest Customary Use Permit (FCUP), which serves as a guide for Village Leaders as they use the permit at the village level, will help benefit both the community and

environment. The updated FCUP makes provision that for every tree cut one must be replanted. It also limits the number of trees an individual can harvest and the tree species that are harvestable. It will help curb illegal extraction, contribute to climate change mitigation, strengthen village level governance over communal forest resources and encourage good faith collaboration between the government and the Maya people. This process is one step towards achieving sustainable development and combating marginalization and poverty in the vulnerable/Indigenous communities. The study also revealed that in order to implement community management at community level, support from the community members, community participation in management of those resources, and the necessary training and financing through government support is required, which are all within obtainable limits.

The management of the Colombia Forest Reserve will only be successful if the government integrates customary resource use and indigenous land tenure, as well as indigenous and Government control systems, towards enhancing biodiversity conservation. Increasing community participation in management decisions and promoting adequate access to the benefits associated with forest reserve will be tied into sustainable management of the resources. Since 2015 (the court decision about Maya land tenure and use right) the relation between the Forest department and Maya organizations (and Julian Cho society) have improved and the former accepts and backs applying the Maya customary law, practices and community stewardship strategies through the Forest Customary Use Permit and other mechanisms, which has been approved and supported by the Maya organizations.

It was also an objective of this research to find whether there is any relationship between community participation and alleviation of poverty. Community participation in protected area and natural resource management is thought to be linked to the alleviation of poverty because when community members are able to use the forest sustainably, e.g., through agroforestry, they have the potential to increase their income. In these Maya communities it is based on customary rights and not necessarily based on income generation but mainly to support the household. When community members are able to benefit from resource use or income from the forest, the reliability of these forest resources for their survival should ensure their willingness to manage these resources sustainably. Currently the Maya have the highest poverty rate at 77% amongst all other ethnic groups in Belize, this ethic group is the only ethnic group with a poverty rate above national average (SIB, 2019).

The relationship between environment and poverty and environment and employment are connected to each other and each of them has some effect on the other. Safeguarding the environment can be directly connected to the process of economic development which in the end creates employment and reduces poverty in the communities. Members from the twelve communities would have access to benefits such as sustainable forest resource extraction and opportunities for agroforestry and tourism development, with the potential for improving their financial condition Collaboration and increased community participation through community control and management of current natural resource areas can be enhanced through the promotion of agroforestry initiatives and forest restoration and management.

The community believes that CRFR is solely protected for its water while the village land is mainly for farming, that the CRFR is rich in biodiversity while the village lands have been over hunted, that CFRF is governed by the Government while the village land is governed by the village leaders. Through the focus group discussion, the leaders were able to express their frustration and the concerns of their villagers (Table 6). The village leaders main concern was the issue of issuance of license to people who do not reside within the community and poor consultation with the communities. Their major concern is the extraction of resources which has little to none benefit to the community. These concerns

have been lingering and hovering over the communities for years. It is only now through the court ruling in 2015 when the Caribbean Court of Justice affirmed the Maya Land Rights that some of these concerns are now being investigated and addressed by the Maya Land Commission. One of the communities' major concerns is the issuance of Forest Licenses within their community and CFRF, an action that the consent order declared that the government should abstain from:

- issuing or renewing any authorizations for resource exploitation, including concessions, permits or contracts authorizing logging, prospecting or exploration, mining or similar activity under the Forests Act, the Mines and Minerals Act, the Petroleum Act, or any other Act.

This however has not been fully addressed nor has the government abstained from issuing these licenses. Recently, at least eight or nine complaints regarding Maya Land Rights were received by the Forest Department from the villages of San Pedro Columbia, Indian Creek, Golden Stream and Medina Bank. The licenses, primarily for the recovery of sunken logs in the Rio Grande River, have subsequently been cancelled by the Forest Department. The cancelling of the licenses is not considered enough by the communities, which stated that there were impacts on watershed and water resources, deforestation and loss of valuable resources in trees, as well as heavy impacts on roads, soil, and farming. The communities stated that they use this river for fishing, washing, collection of water for home use, and other essential activities. The river is especially important for the women and children of the village, as highlighted in the household survey, focus groups and direct observation. Upon investigation of these complaints, it was highlighted that the community is not saying no to these licenses, but they want to be included in the discussion and they want the community to be consulted prior to any decision being made as they are the ones being directly affected by the decision of the government. They want to be part of the process and have their voices be heard - not just considered - but actually heard and their requests acted on. The communities are adamant that the government has a duty to proactively protect this natural resource from the issuance of licenses and authorizations without the consultation and consent of the Maya peoples.

The results from each data method reinforces that the communities need guidance in the management of their resources. They are not shying away from the responsibilities of managing their resources and they know the importance of the CFRF. They are very much in tune with what needs to be done in order to maintain and protect the CRFR for future generations and support the development of a community monitoring group to put this into action.

7 INPUTS FOR AND PROCESS OF MAKING THE ROAD MAP

Management Recommendations by the twelve Communities:

- Develop a Co-Management Agreement between the Maya Communities and the Government.
- Develop a Memorandum of Agreement between Forest Department, CRFRMC and community management committees to increased collaborative effort in addressing issues affecting CRFR.
- Involve communities in the decision making affecting the CRFR.
- Creation of a community-based monitoring group with the support of the Belize Defense Force and Police to assist with surveillance and enforcement in the Forest Reserve.
- Monitoring/ protection of the watershed from pollution and other environmental damage such as dumping of boulders on the riverbanks. And removal of riparian vegetation

- Establishment of a manned Observation Post in San Jose (It is recognized that his will not be enough as it will be impossible to stop transboundary incursions unless Belize's border dispute is resolved, but it will be a start.
- Village leaders should be consulted reference activities affecting the reserve in order to minimize political interference. This would include the issuance of Forest Licenses in the CRFR (e.g., the Salvage License for the recovery of sunken logs).
- Reports of illegal activities should be taken seriously, and subsequent action should be free of political interference on behalf of the perpetrators to ensure adequate penalties and fines are placed.
- Development of an updated management plan for the CRFR.
- Protection of the buffer area of the riverbanks and resources.
- Provide/ acquire financial support for the establishment of the management structure and implementation of the updated CRFR management plan.
- Establish an effective communication mechanism between Maya Communities and the Government.
- The Government must provide community support in capacity building and community development projects.

7.1 MANAGEMENT GOALS

The primary goal of the management of the CRFR since its establishment has been and will always be to ensure the maintenance of the health of the forest ecosystem and its productive capacity (Bird, 1994), giving protection to the watersheds originating in the CRFR and the high biodiversity while allowing for the sustainable extraction of economically important hardwood species.

Therefore, the development of a future management plan needs to be based on the concepts of maintenance of watershed functionality for current and future water security in the face of climate change; increased community participation through community control and management of current natural resource areas, and agroforestry initiatives in the agricultural incursion and fire-damaged areas, to promote forest restoration and management. These have already been identified in the previous management plan (Wildtracks, 2010)

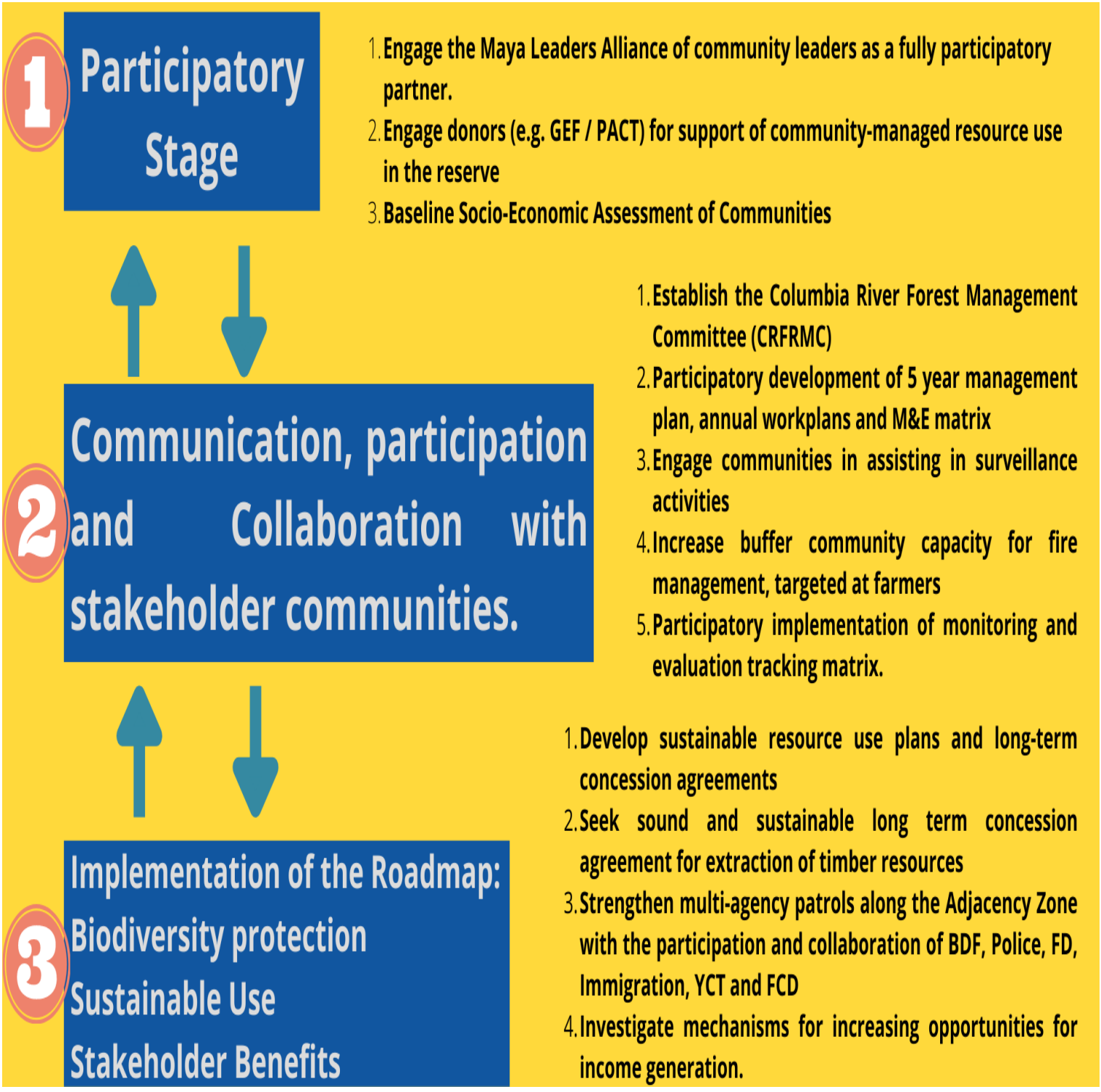
Table 8: Management Goals identified to tackle treats in the development of a Management Plan for the CRFR (Wildtracks, 2010)

Threat	Management Goal
Unsustainable Harvesting of Commercial Forest Products	Sustainable harvesting of commercial forest products, providing socio-economic benefits to buffer communities.
Unsustainable Harvesting of Non-commercial Forest Products	To maintain viable traditional resources through effective sustainable harvesting.
Agricultural Incursions	To prevent unplanned agriculture within the Forest Reserve and reduce the negative impacts of past agricultural incursions.
Transboundary Incursions	To prevent transboundary incursions from Guatemala and associated removal of natural resources from CRFR.

Fire	Effective fire management within Columbia River Forest Reserve and adjacent areas.

7.2 MANAGEMENT ACTIONS

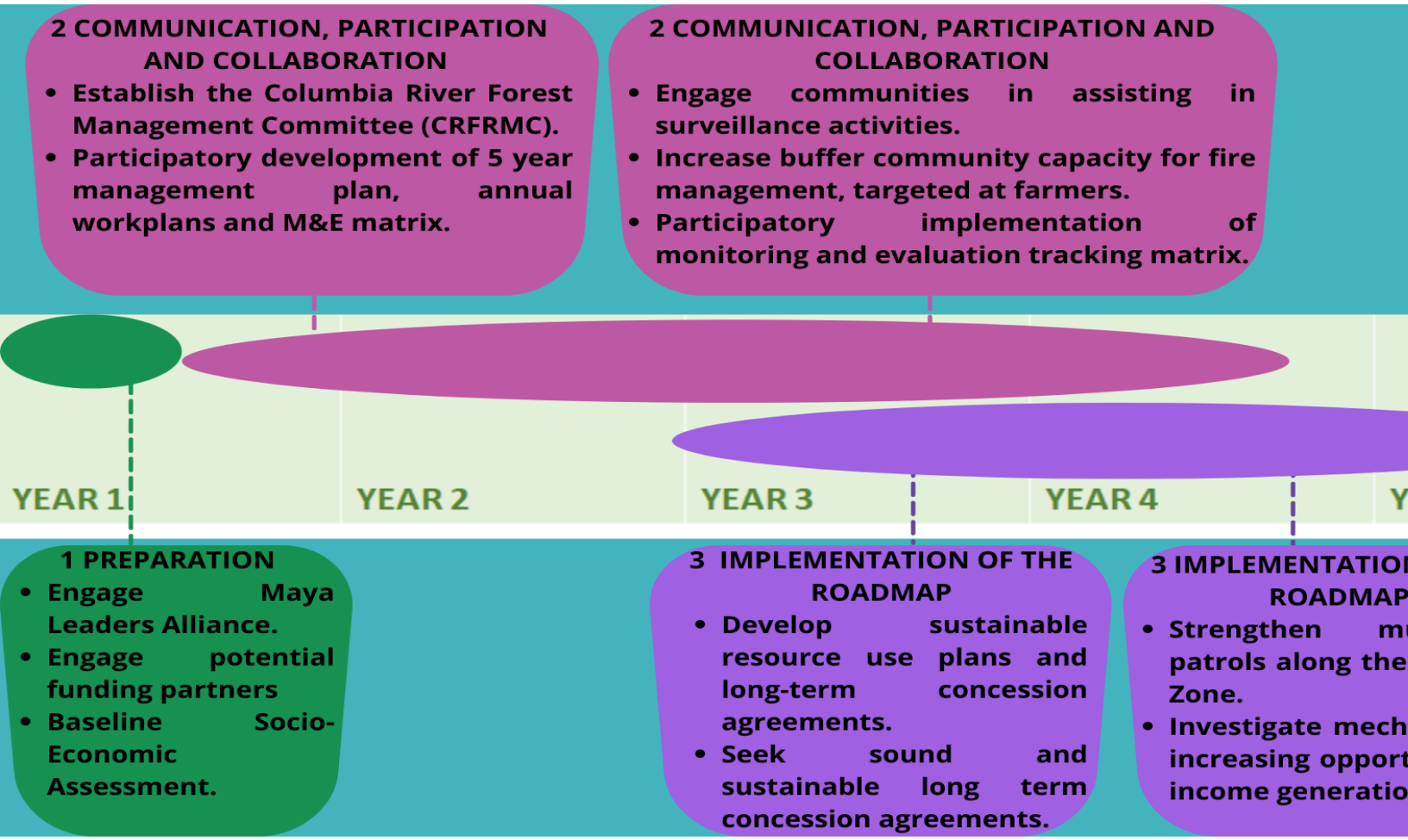
Figure 33: Road Map



7.3 TIMELINE

This timeline is being developed for the management activities need to be carried out for the implementation of the Road Map and Management Plan (Table 9).

Figure 34: Timeline for Implementation of Road Map and Management plan



8 CONCLUSION

CRFR is critical for providing protection to watershed service, biodiversity, connectivity to other protected areas and landscape functions. It is evident that forest resources conservation and management can be improved when communities participate in its management. However, currently, 71% of respondents are active in some way in management of community forests and forest resources while only a few people (27% of respondents from the twelve communities) do not participate in the management of the forest. For those who do not participate, their reasons were that they are not allowed to enter the Forest Reserve, the Forest Department does not involve them, they do not get any benefit from the Forest Reserve, and they are not given the chance to participate in activities related to the management of the CRFR. For those who participate, their reasons were that they need to protect the forest for the future generation.

Community participation in the management of CRFR implies the kind of activities that members of the communities can undertake in order to derive some benefit from the forest while ensuring those resource is still available for the future. These activities should not degrade the forest but rather assist the community members to gain a deeper understanding in forest conservation. The communities have expressed interest in being involved in the management of the CRFR. The CRFR has the potential to be sustainably managed, but a strong management framework must be set in place with clearly define roles and responsibilities. The management system needs to be established with and by the communities that buffer the CRFR, in collaboration with the Forest Department, and with the technical input and support of other organizations with capacity in protected area management, working to a common Vision and goals. Management should build community ownership of the Forest Reserve and capacity for management and is the only feasible way that CRFR will thrive and fulfill its function as a protected area. The CRFR must remain intact for its valuable watershed protection, recognized by the respondents during the study as being one of the principal benefits obtained from this reserve.

Therefore, it is of utmost importance that communities surrounding the CRFR be improve their knowledge about the Forest Reserve, and about protected area and natural resource management. A well-designed educational programme is critical, targeted at educating the communities to ensure they have a deeper understanding of the objectives behind the establishment of the Forest Reserve. Community participation in forest management activities should be the prime focus of those who take up the role of co-management of the Forest Reserve. Programs need to be designed together with the communities and reach out to those who are interested in participating. These programs should be geared towards reducing poverty and increasing community participation, especially for women as they form a greater part of the population, and it is these women who collect non timber forest products from the forest for use in the household.

There needs to be increased and consistent communication between the management committee and communities, and between the participating communities regarding the Forest Reserve and activities to ensure there are no misunderstandings, and so that any potential conflicts can be addressed early on. This will help boost community interest in undertaking some management activities and in being actively involved. There will be a need for the formation of Community Management Committees that would link the communities to the CRFRMC and the management of the forest. This would enhance communication flow between the CRFRMC and the communities. These groups should also be in-charge of all community participating activities, with the necessary training to run the community management activities and ensure sustainability. The communities need to be involved in decision making – especially for those decisions that concern them. This will

not only help to reduce conflicts but also improve collaboration and enhance the communities 'understanding of forest conservation. There should be the development of other attractions in the communities that have tourism potentials. CRFR can also be turned into another attraction site managed by the communities around it. This will help ease the pressure on the CRFR and provide additional revenue for buffer communities in the CRFR area.

During the focus groups, community stakeholders were asked for their opinions as to the values of Columbia River Forest Reserve. There was general agreement on the importance of Columbia River Forest Reserve in its role in protecting the watersheds and providing traditional natural resources such as construction materials (cohune, house posts and sticks, tying vines), game meat, and also of the importance of maintaining the forest for its heritage values.

It is challenging to get a reasonable job with limited education, so many depend on the natural resources, especially those of the forest. As, with increased forest clearance around the communities, they can no longer access the products, there is the need for them to be engaged in other alternative activities, reducing their dependency on the forest resource. Most community members are farmers and most of them make their living by harvesting their crops and going to market to sell them.

Women also play major roles in forest resource management. As homemakers they fetch the firewood and cook the household food and know the amount of Non-Timber Forest Products like Jippi Jappa (*Sabal mexicana*), cohune cabbage (*Attalea cohune*), pacaya (*Chamaedora tepejilote*) and warrie cohune (*Astrocaryum mexicanum*) that they would need to collect from the forest to have available at home. During both the household data and the Focus Group Discussion, both men and women had knowledge about trees that can be used as medicines for different ailments. Involving both of them in management activities and in the decision, making can help improve their living conditions and that of the community in general. The rights of the traditional community members to the traditional use of their lands and resources must be adhered in order to secure equal access to the forest resources.

These communities are considered farming communities and during the household interviews farmers emphasized their interested in getting more land to expand their farming activities and would want a portion of the forest to be cleared so that they can farm in the Forest Reserve as they consider the soils to be fertile. Hence it is important for management of the forest resource to cooperate with them to ensure sustainable use of the resource.

The twelve Maya communities are fully engaged and have improved capacity for taking on a collaborative role with the Maya Leaders Alliance, Toledo Alcaldes Association and Forest Department in the sustainable management of Columbia River Forest Reserve, improving socio-economic benefits in the buffering areas and good stewardship of the natural values and ecosystem services of the protected area. Therefore, community participation in forest management activities will enable the communities to improve their access to traditional forest resources and open up opportunities for increased income, assisting them in improving their living conditions and reduce poverty.

9. NEXT STEPS

- Validation of the workplan with the communities and the leaders.

- Harmonize the Indigenous Community Forest Caring Strategy with this road map to ensure that communities are integrated in the management structure and participate in the good governance of the Forest.
- Involve the Forests Department and Mayan Organizations and other relevant actors to the further development and implementation of the roadmap.

10 REFERENCES

About Latest PostsHafsahWriter. A Caffeine dependent life-form. Original Hopeful Rational Inquisitive Ingenious Photographer Sailor Philosopher Happy. Serial Chips and Salsa Eater. Curious and ambitious. In-between sofa cushions. Latest posts by Hafsah (see a, & Hafsah. (2017, July 2). *Should Governments Manage Common Pool Resources?* The Global Millennial. https://www.globalmillennial.org/files/2017/07/02/government-manage-common-pool-resources/.

Bird, N.M. (1994). Draft Forest Management Plan. Columbia River Forest Management Unit. The Forest Planning and Management Project, Ministry of Natural Resources, Belmopan, Belize.

Bosco, S. (2017, September 25). *What is Direct Observation? Features and Types*. Life Persona. https://www.lifepersona.com/what-is-direct-observation-features-and-types#:~:text=The%20observation%20direct%20is%20a%20method%20of%20data,Otherwise%2C%20the%20data%20obtained%20would%20not%20be%20valid.

Bunce, L. & B. Pomeroy (2003). Socioeconomic monitoring guidelines for coastal managers in the Caribbean: Socmon Caribbean. World Commission on Protected Areas and Australian Institute of Marine Science, Australia.

Bunce, L., Townsley, P., & Pollnac, R. B. (2000). *Socioeconomic manual for coral reef management*. Australian Institute of Marine Science.

C. Sobrevila, The Role of Indigenous Peoples in Biodiversity Conservation: the natural but often forgotten partners, (World Bank, Washington D.C., 2008), at p. 5 and 9

The Caribbean Court of Justice. (2015). Appellate Jurisdiction on Appeal from the Court of Appeal of Belize. CCJ Appeal No BZCV2014/002 BZ Civil Appeal No 27 of 2010. Page 10811 of 10814.

Celorio, R. (2020, June). Concluding Report. Dispute Resolution Framework Authority. Complaint presented by the Medina Bank Village, Golden Stream, Indian Creek and San Pedro Columbia.

Claridge, T. (2004). Designing social capital sensitive participation methodologies. Report, Social Capital Research, Brisbane, Australia.

Conservation International. (2003). Biodiversity Hotspots - Mesoamerica. www.biodiversityhotspots.org. Eshun. F. (2008). Community Participation in the Management of Forest Resource: A Means to Reduce Poverty for Sustainable Development The case of Kakum National Park. Department of Sociology and Human Geography, University of Oslo.

Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action, 32 Nat. Resources J. 415 (1992). Available at: https://digitalrepository.unm.edu/nrj/vol32/iss2/6

Eshun, F. (2008, April 24). *Community participation in the management of forest resource: a means to reduce poverty for sustainable development: the case of Kakum National Park*. DUO. https://www.duo.uio.no/handle/10852/16068.

Forest Department, Hayman, A., & Aitcheson, K., The Monitoring and Evaluation (M&E) Framework and Plan for the Strategic Action of the Belize Forest Department (2019-2023).1–74 (2019). Belmopan, Belize; Forest Department, Ministry of Agriculture, Forestry, the Environment and Sustainable Development and Immigration (MAFFESDI).

Forest Department. (2015). National Forest Policy-Belize. Ministry of Forestry, Fisheries and Sustainable Development.

Hayes, A.& Westfal, P. Update (2021, March). Systematic Sampling Definition (investopedia.com). https://www.investopedia.com/term s/s/systematic-sampling.asp.

Hedayat Nikkhah. (2016, January 26). *(PDF) Participation as a medium of empowerment in community development*. ResearchGate.

https://www.researchgate.net/publication/281604206_Participation_as_a_medium_of_empowerment_in_community_development.

IvyPanda. (2019, August 19). Community Participation in Natural Resource Management: A Case Study of Community Forestry in Nepal. Retrieved from https://ivypanda.com/essays/community-participation-in-natural-resource-management-a-case-study-of-community-forestry-in-nepal/.

Karithi, M. (2014/2015). Community Participation in Forest Management a Case Study of Ntugi Hill Tharaka Nithi County.

Kelly, D. (2001) 'Community participation in rangeland management: a report for the Rural Industries Research and Development Corporation.' (RIRDC: Barton ACT).

Madon, S., Malecela, M. N., Mashoto, K., Donohue, R., Mubyazi, G., & Michael, E. (2018). The role of community participation for sustainable integrated neglected tropical diseases and water, sanitation and hygiene intervention programs: A pilot project in Tanzania. *Social Science & Medicine*, *202*, 28–37. https://doi.org/https://doi.org/10.1016/j.socsimed.2018.02.16

Matola, S. (1991). The Columbia River Forest Reserve Expedition, 9 - 16 December 1990. Unpublished report. 39 pp.

The Maya Leaders Alliance / Toledo Alcaldes Association and Julian Cho Society. (2020). Development of a Community Stewardship Strategy.

McGill University. (n.d.). *2.0 Community Participation*. https://www.mcgill.ca/mchg/files/mchg/chapter2.pdf.

Meerman J. C. & B. Holst. (1999). Review of Natural Vegetation and Associated Habitats in the Southern Region of Belize". Report to ESTA

Meerman J. C. & S. Matola (eds.), (2003). The Columbia River Forest Reserve: Little Quartz Ridge Expedition, A Biological Assessment. Columbia University Printing Services. 93 p.

Meerman, J. C. (1997). Columbia River Forest Reserve, Compartment 33, Sub compartment 2. Rapid Biodiversity Assessment, 2-6 June 1997. Report to the Forest Planning and Management Project. 6 pp + app

Meerman, J. C. (2001). Hurricane Iris. A first assessment to damage to terrestrial ecosystems. http://biological-diversity.info/hurricane_iris.htm

Meerman, J. C. (2004). Rapid Ecological Assessment Columbia River Forest Reserve, Past Hurricane Iris. Report to Ya`axché Conservation Trust. U.S. Fish and Wildlife Service.

Meerman, J. C. (2006). Columbia River Forest Reserve Research Synthesis. Report to Ya`axché Conservation Trust and Toledo Institute for Development and Environment. 12 pp.

Meerman, J. C. (2007). Key Biodiversity Areas (KBA's) in Belize. Study to establish Key Biodiversity areas for Belize based on IUCN Red List Criteria. Study funded by the Critical Ecosystem Partnership Fund. http://biological-diversity.info/KBA.htm

Meerman, J. C. and J. C. Lee. (2003). Amphibians and reptiles of the Columbia River Forest Reserve. pp 66-70

Meerman, J. C. and S. Matola (Eds.). The Columbia River Forest Reserve Little Quartz Ridge Expedition: A Biological Assessment. The Wildlife Trust, Columbia University Printing Services. Meerman, 2006: Columbia River Forest Reserve Research Synthesis Page 14.

Ministry of Forestry, Fisheries and Sustainable Development. (2014). Management and Protection of Key Biodiversity Areas in Belize project. Social Safeguards Operational Policy 4.10. Culturally Appropriate Community Consolations and Indigenous People Planning Framework.

Ostrom, E. (1999). COPING WITH TRAGEDIES OF THE COMMONS. *Annual Review of Political Science*, *2*(1), 493–535. https://doi.org/www.annualreview.org

Ostrom, E., Gardner, R., Walker, J., & Agrawal, A. (2008). *Rules, games, and common-pool resources*. The University of Michigan Press.

PEFC International. (2021, January). ENABLING SUSTAINABILITY IN FOREST MANAGEMENT. Geneva; PEFC International.

Rui, S. (n.d.). *Environmental Justice Organizations, Liabilities and Trade*. Environmental Justice Organizations Liabilities and Trade. http://www.ejolt.org/2013/02/common-pool-resources/.

Samuel, B., Nancy, G. C., & Steven, B. (2007, February). *Common Palms of Belize*. 1 Common PALMS of BELIZE - Field Guides. https://fieldguides.fieldmuseum.org/sites/default/files/rapid-color-guides-pdfs/404_1.pdf.

Shal, V. (2013). Belize REDD+R-PP: Final Reports on Indigenous People Consultations. The Nature Conservancy for Deutsche Gesellschaft fur International Zusammenarbeit (GIZ).

Sheil, D. & Wunder, S. (2002). The Value of Tropical Forest to Local Communities: Complications, Caveats, and Caution. The Resilience Alliance. Conservation Ecology.

The Statistical Institute of Belize (2010). Belize Population and Housing Census: Country Report 2010.

The Statistical Institute of Belize (2018/19). Poverty Study 2018/2019.

Statement of the GOB's commitment to advance the undertakings contained in the judgment in CCJ Appeal No. 2 of 2014 (20 April 2015), Commitment 1 (referring to paragraph 3 of the Consent Order).

Stone, Moren & Nyaupane, Gyan. (2015). Protected areas, tourism and community livelihoods linkages: a comprehensive analysis approach. Journal of Sustainable Tourism. 24. 10.1080/09669582.2015.1072207.

SurveyMonkey. (n.d.). Log in to your account. http://www.surveymonkey.com/analyze/DOD5XxLk8Pm0WuK5Iiat4WPp0vpfYQKqbmOqSmDQpIw_3D?tab_clicked=1.

Tang, S. Y. (1991). Institutional Arrangements and the Management of Common-Pool Resources. *Public Administration Review*, *51*(1), 42. https://doi.org/https://www.jstor.org/stable/976635?seq=1

Taylor-Powel, E., Stele, S., (1996, August). Collecting Evaluation Data Direct Observation. Program Development and Evaluation. University of Wisconsin-Extension.

The National Protected Areas System Plan (2015), p. 14.

See e.g., UNDRIP, Art. 26(1), providing that "Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired." In Kaliña and Lokono Peoples v. Suriname, 2015, para. 139, footnote 178, the IACTHR Court cites UNDRIP, Art. 26, and states that "Similarly, [that article] recognizes the right to lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired, as well as the right to own, use, develop and control these lands; thus, States must give legal recognition and protection to these lands, respecting the customs, traditions and land tenure systems of the indigenous peoples concerned."

The vision of the National Protected Areas System Plan is: "An effectively managed National Protected Areas System that maintains healthy ecosystems and maximizes its social, cultural and economic contribution to local and national development" (p. 42).

Walker P, Walker Z, Awe J, & Catzim, N. (2008). Summary Report. Technical Assessment of the Maya Mountains Massif April, Belize. Wildtracks Report to the Protected Areas Systems Plan Office. Ministry of Natural Resources and the Environment, Belmopan, Belize.

Walljasper, J. (2011, October 2). *Elinor Ostrom's 8 Principles for Managing A Commmons*. Elinor Ostrom's 8 Principles for Managing A Commmons | On the Commons. http://www.onthecommons.org/magazine/elinor-ostroms-8-principles-managing-commmons.

Wasilwa, C. W. (2015, March 26). *Effect of Community Participation on Sustainability of Community Based Devt. Projects in Kenya*. LinkedIn. https://www.linkedin.com/pulse/effect-community-participation-sustainability-based-calebwasilwa.

Wildtracks. (2008). Columbia River Forest Reserve Management Planning Process. A Forest Department Initiative. Ministry of Natural Resources, Belmopan, Belize.

Wildtracks. (2015). Columbia River Forest Reserve Management Plan 2010-2015. Belize Forest Department. Ministry of Forestry, Fisheries and Sustainable Development.

World Bank. (2019). Belize Rural Population 1960-2020. www.macrotrends.net. Retrieved 2020-09-09.

11 ANNEX: MAYA COMMUNITY OUTREACH PRE-QUESTIONNAIRE SURVEY

The purpose of this community survey is to understand community knowledge systems, traditional values and practices related to natural resources surrounding your community that can help in the design of a long-term conservation program and the development of a road map for forest and water management. All information will be kept as strictly confidential and will be used specifically for the development of the program. Thank you for your cooperation.

1) In which community do you live? _____

2) Gender: [A] Male [B] Female

3) Age range**:** [A] 6-10 [B] 11-15 [C] 16-20 [D] 21-25 [E] 26-30 [F] 31-35 [G] 36-40 [H] 41-45 [I] 46-50 [J] 51-55 [K] 56-60 [L] 61 and above

4) Ethnic Group: [A] Mopan Maya [B] Q'eqchi Maya [C] Other_____

5) What is your profession or occupation? [A] Student [B] Government worker [C] Construction worker
[D] Farmer [E] Housewife [F] Teacher [G] Contractor [H] Business owner
[I] Unemployed [J] Other _____

6.) What is your weekly income range? [A] <100 [B] 100- 150 [C] 150-200 [D] >200

7) What is your level of education? [A] Primary school [B] High School [C] Sixth Form [D] University [E] None [F] Other _____

8) What is the best way that you get your information? [A] At school [B] Facebook [C] Radio/TV [D] Family [E] Village Meeting [F] Newspaper [G] Other _____

9) Is there a protected area near to your community? [A] Yes [B] No [c] Don't know

10) If so, what is the name of it? [A] Columbia River Forest Reserve [B] Don't know [C] Other _____

11) How often do you visit the reserve? [A] Never [B] Occasionally [C] Monthly [D] Yearly

12) When you hear the word "Reserve" what does it mean to you**? MULTIPLE ANSWERS. DO NOT GIVE ANSWERS**
[A] Animals and plants are protected [B] You can use resources but with a permit [C] Natural richness for community [D] Community is restricted in use of resources [E] An opportunity for community development [F] A barrier to community development [G] Don't know
[H] Other _____

13) Can you differentiate between forests within the Columbia River FR and forests on village lands? [A] Yes [B] No. **EXPLAIN YOUR ANSWER**:

_____

14) The Columbia River Forest Reserve is found near to you. What 2 principal benefits do you get from this Forest? **DO NOT GIVE OPTIONS.** [A] Wildlife [B] Water [C] Fresh air [D] Medicinal [E] Timber [F] Construction material [G] Recreation [H] Food [I] Tourism [J] Nothing [K] Other _____

15) How healthy do you think the forest within the Columbia River Forest Reserve is? **GIVE OPTIONS.**

[A] Poor [B] Average [C] Good [D] Very Good [E] Don't Know

16) Over the last 5 years, do you think the forest near your community is better or worse? **GIVE OPTIONS**

[A] Better [B] Same [C] Worse [D] Don't Know

17) What do you consider is the main threat affecting the forest within the Columbia River Forest Reserve? **ONE ANSWER. DO NOT GIVE OPTIONS**

[A] garbage pollution [B] Village farming [C] forest fire [D] natural disaster [E] over harvesting [F] illegal incursion [F] incursion of machineries [G] don't Know [H] Other_____

18) What do you consider are the main threats affecting the forest in your village land? **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS**

[A] garbage pollution [B] Village farming [C] forest fire [D] natural disaster [E] over harvesting [F] illegal incursion [F] incursion of machineries [G] don't Know [H] Other_____

19) Do you think there are rules and laws on how to use the forest? [A] Yes [B] No [C] Don't Know

20) If, so, to what extend does your community respects these? **GIVE OPTIONS.** [A] Low [B] Average [C] High [D] Very High [E] Not Applicable

21) Are incursions from Guatemala affecting the forest cover near your community?

[A] Yes [B] No [C] Don't Know

22) If so, how serious are the effects? **GIVE OPTIONS.**

[A] Low [B] Average [C] high [D] Very high [E] N.A

23) Do you believe that forest rules are enforced by authorities? [A] Yes [B] No [C] Don't Know

24) If, so, to what extend do you think these are enforced? **GIVE OPTIONS.** [A] Low [B] Average [C] high [D] Very high [E] N.A

25) What 2 things you think is needed to better protect the Columbia River Forest Reserve? **MULTIPLE ANSWERS DON'T GIVE OPTIONS.** [A] Govt support [B] better Gov't laws [C] more patrols [D] more financing [E] direct community involvement [F] learn more of the reserve [G] detain and jail people [H] work closer with Guats [I] stronger community laws on forest [J] Don't know [K] Other _____

26) What can the community do to protect the Columbia River Forest Reserve? **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS.** [A] Report to authorities [B] Organize themselves to protect [C] Directly manage the area [D] banned people from accessing the forest [E] strengthening community stewardship [F] Liaise more with Forest Department [G] Inform more the public [H] No role to play [I] Don't Know [J] Other_____

27) To do so what will the community need to better protect the forest, watershed and wild animals? **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS.** [A] Learn more about protection [B] Be exposed to other examples [C] have a more formal agreement with Gov't [D] Get more organized [E] Get necessary funds [F] Hire People [G] Don't Know [H] Other_____

28) What do you think is the condition of rosewood in your area? **GIVE OPTIONS. ONE ANSWER.** [A] Disappearing fast [B] decreasing [C] remains the same [D] increasing [E] Don't know

29) What do you think is the condition of hard wood species in your area? **GIVE OPTIONS. ONE ANSWER** [A] Disappearing fast [B] decreasing [C] remains the same [D] increasing [E] Don't know

30) For what do you or your community use rosewood? **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS.** [A] house posts [B] post for farm [C] carving [D] tool handles [E] planting stick [F] Don't know [G] other _____

31) For what do you or your community use hardwood species? **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS.**
[A] building house [B] commercial purposes [C] furniture [D] Don't know [E] other _____

32) How can you and your community help manage rosewood and other hard wood species**?** **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS.** [A] Manage the extraction by Gov't [B] Manage extraction by community [C] create a rose wood and other species planation and reforest [D] do not extract live trees [E] implement mgmt. plan [F] Community Monitoring [G] Effective permit system [H] Don't know [I] other _____

33) To do community management of rosewood and other species what is needed? **MULTIPLE ANSWERS. DO NOT GIVE OPTIONS.** [A] Training [B] Finance [C] Collaboration with other groups [D] collaboration with other communities [E] Gov't Co-operation [F] Community Support [G] Community Participation [H] Don't know [I] other_____

34) As a Maya community**,** what traditional practices can help conserve the traditional game species from being over hunted? **MULTIPLE ANSWERS**. **DO NOT GIVE OPTIONS.**

[A] Hunt only to provide for family [B] hunt only using dogs or traps [C] Hunt using shot gun
[D] Hunt only mature game [E] fish using line only [F] fishing using poison - cha'lam or b'olontyok
[G] only community members can hunt within community forests [H] Don't Know
[I]Other_____

35) What traditional practices is more effective in conserving the forest on village lands? **MULTIPLE ANSWERS**. **DON'T GIVE OPTIONS.** [A] harvesting of forest produce for family use [B] proper rotational farming [C] raising livestock [D] get community permit before harvesting forest produce [E] follow community rules on less farming in high forests [F] Don't know [G] Other: _____

36) Do you have relatives in Guatemala that live close to the borders with the Forest Reserve? [A] Yes [B] No [C] Don't know

37) Should your community leaders reach out to Guatemalans to jointly protect forests on village lands and the Forest Reserve? [A] Yes [B] No [C] Don't know

38) What are you willing to do to protect the forest within the Columbia River Forest Reserve? **GIVE MORE THAN ONE ANSWER. DO NOT GIVE OPTIONS.** [A] Join in community projects [B] inform other people [C] join a community monitoring group [D] continue to respect and promote traditional rules and values [E] respect community rules on forests [F] Nothing [G] Don't know [I] Other _____

39) Would you support the development of a Community Monitoring Group so that your forest is protected? [A] Yes [B] No [C] Don't know

40) What have you done to protect the forest over the last 12 months? **DO NOT GIVE OPTIONS.**
[A] Joined in community projects [B] Informed other people [C] Practiced traditional methods [D] Planted a tree(s) [E] Used less pesticides [F] Practiced less slash and burn [G] Attended educational sessions/trainings [I] Done nothing [I] other _____

40) Over the last 12 months have you seen any action to conserve the Columbia River Forest Reserve? [A] Yes [B] No [C] Don't Know

THANKYOU

Comments:

_____
_____
_____