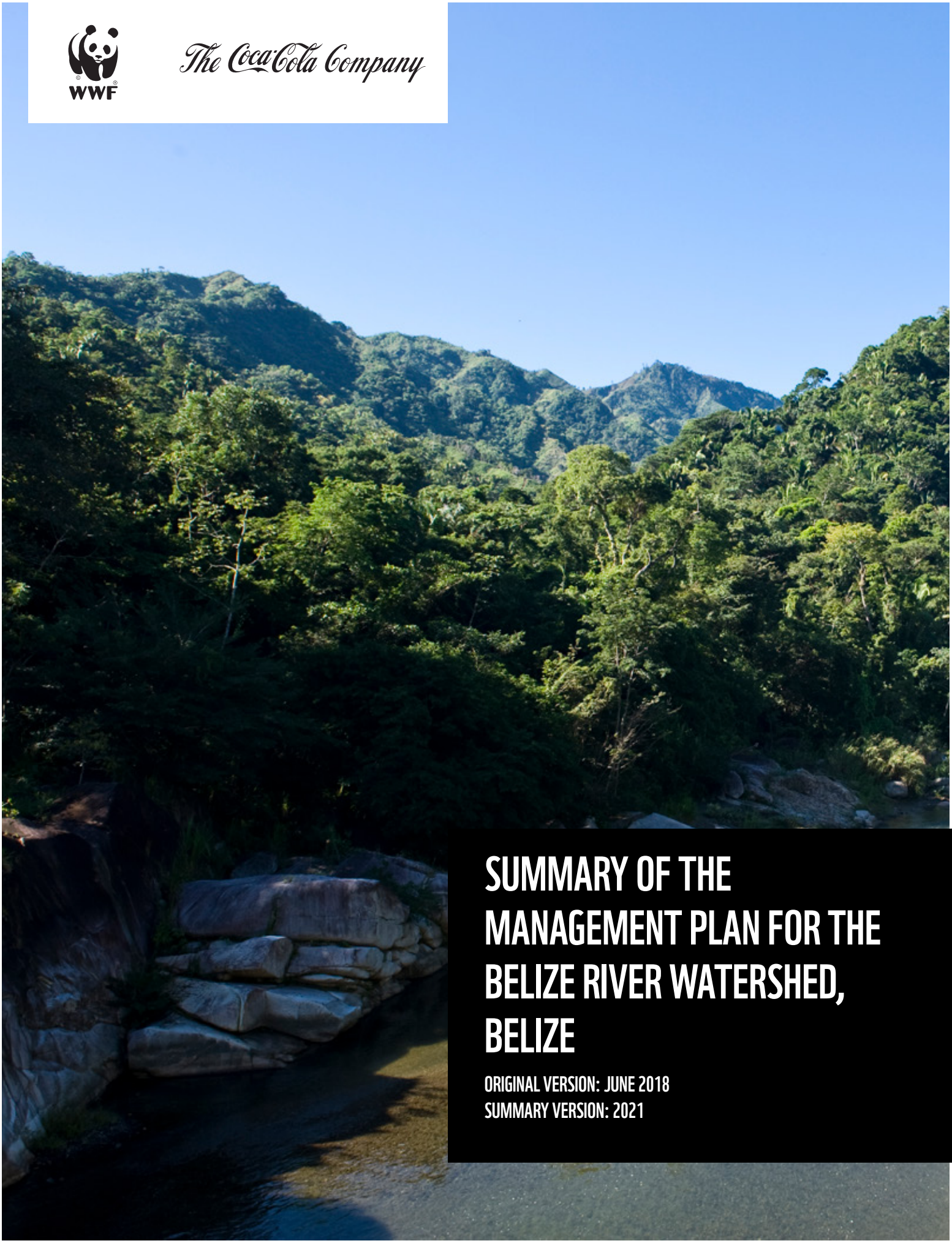
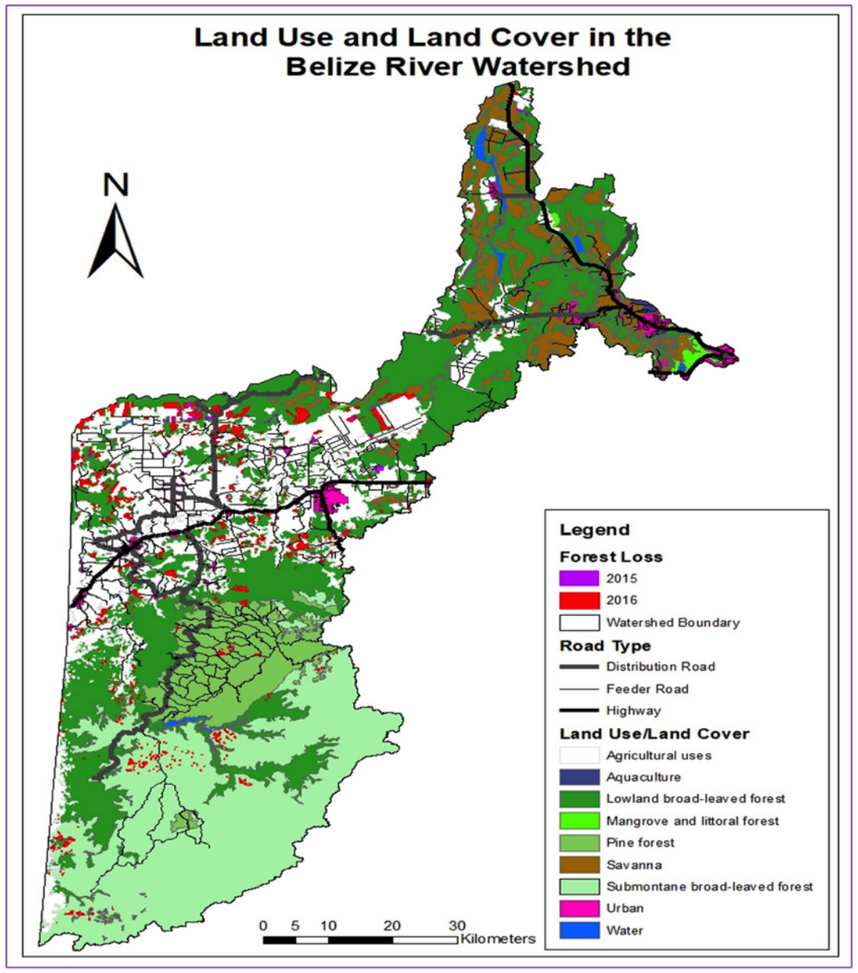


SUMMARY OF THE MANAGEMENT PLAN FOR THE BELIZE RIVER WATERSHED, BELIZE

ORIGINAL VERSION: JUNE 2018
SUMMARY VERSION: 2021



CONTENIDO

ACRONYMS AND ABBREVIATIONS

BAS	Belize Audubon Society
BRV	Belize River Valley
BRW	Belize River Watershed
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agronomy Research and Teaching Center)
CCCCC	Caribbean Community Climate Change Center
CBD	Convention on Biological Diversity
CBO	Community based organization
CBS	Community Baboon Sanctuary
DoE	Department of the Environment
ECP	Environmental compliance plan
FAO	Food and Agriculture Organization
FCD	Friends of Conservation and Development
FST (UB)	Faculty of Science and Technology, University of Belize
GIS	Geographical information system
GoB	Government of Belize
GPS	Global positioning system
GU	Galen University
IWRN	Integrated water resource management
MAR	Mesoamerican reef
MAFFESDCC	Ministry of Agriculture, Fisheries, Forestry, the Environment, Sustainable Development, and Climate Change
MBC	Mesoamerican Biological Corridor
NIWRA	National Integrated Water Resources Authority
NGO	Non-government organization
PACT	Protected Areas Conservation Trust
TNC	The Nature Conservancy
UB	University of Belize
UB ERI	University of Belize Environmental Research Institute
UNDP	United Nations Development Program
WWF	World Wildlife Fund

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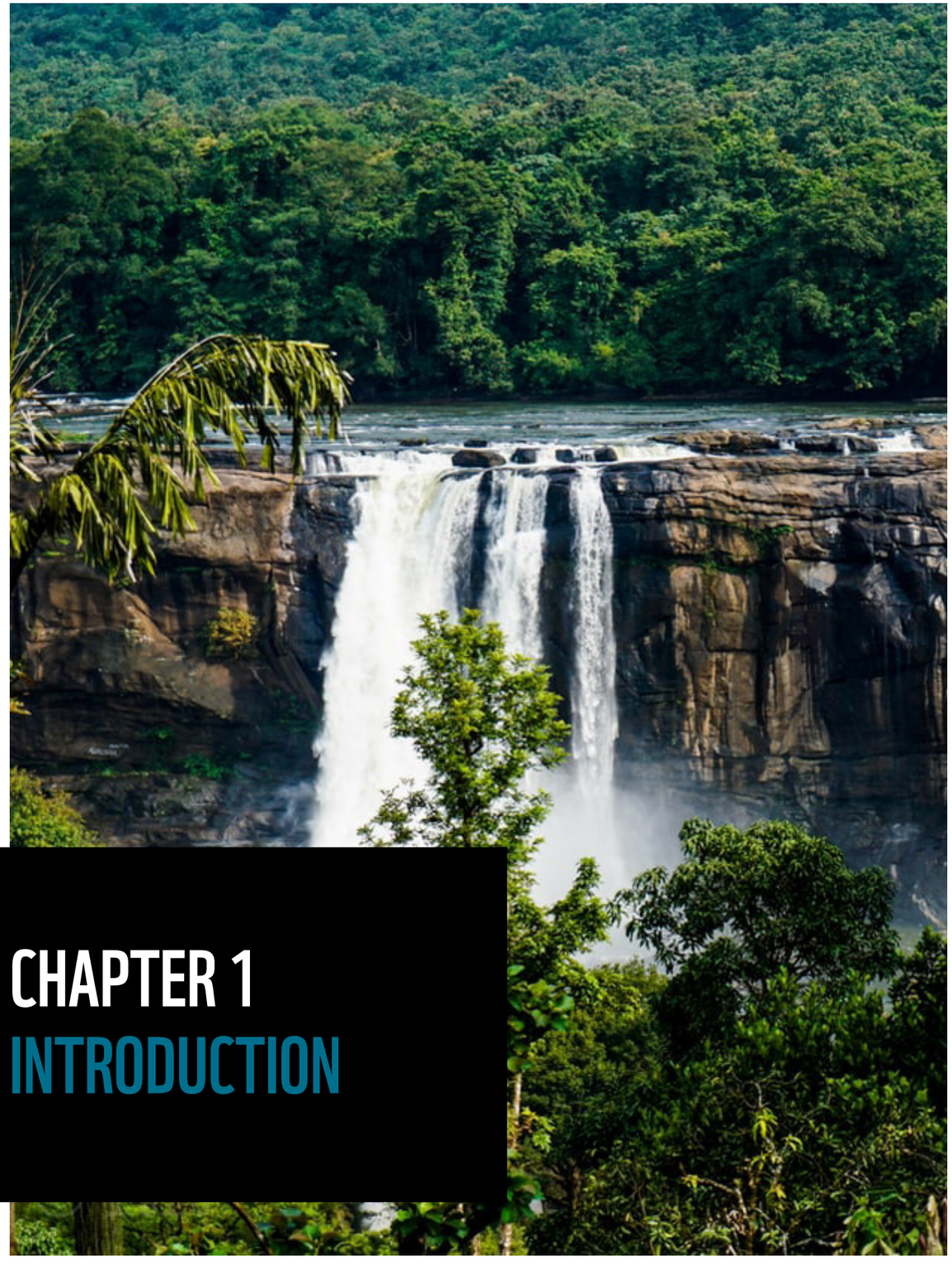


CHAPTER 1
INTRODUCTION

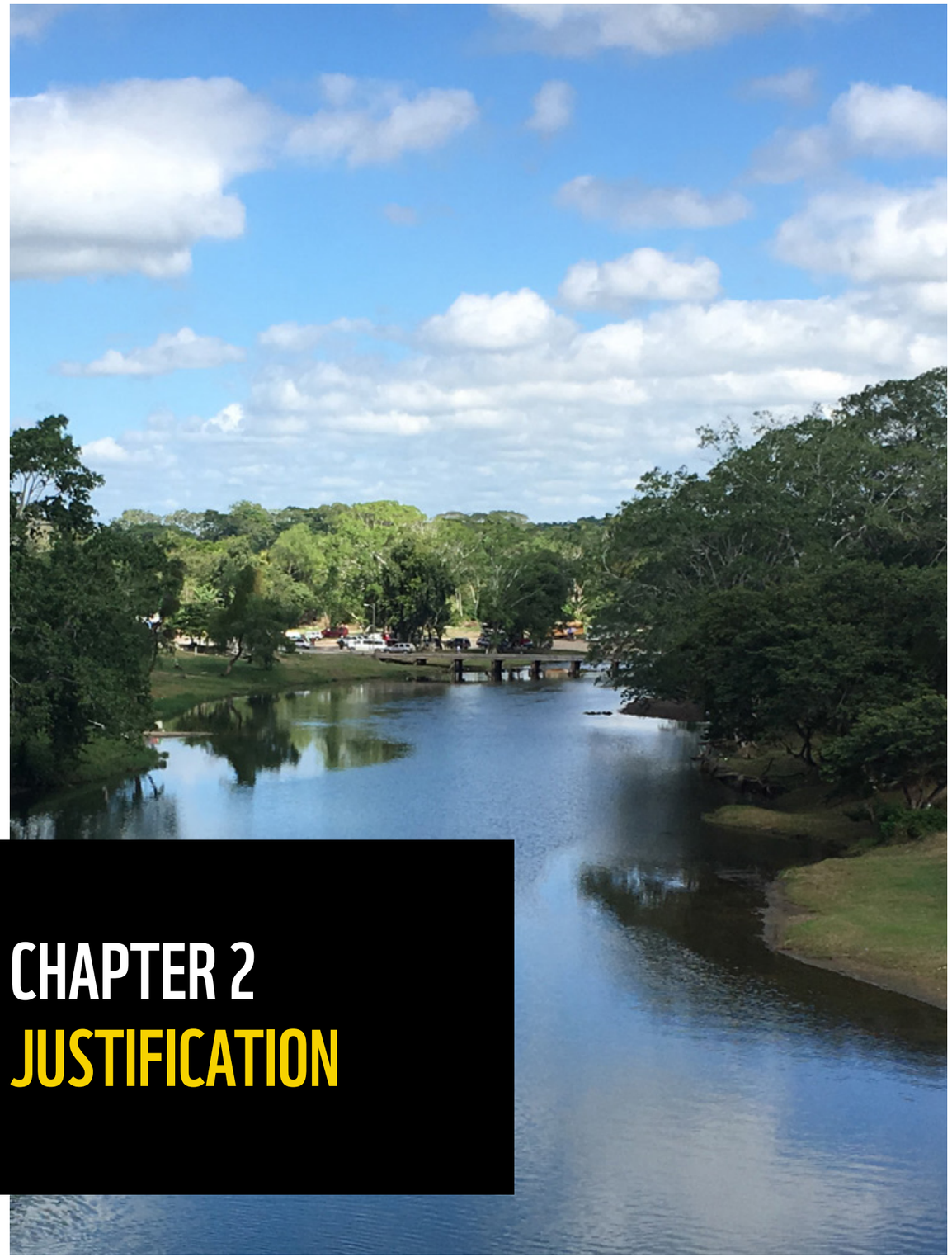
The deterioration of the Mesoamerican reef and associated coastal marine ecosystems is alarming. The current deterioration is caused by several factors. Some originate from anthropogenic activities happening beyond the coastal zone, such as inappropriate agricultural practices, poor management of land resources, and lack of effective land use planning.

These activities occurring within watersheds can have irreparable effects on the coral reef system, leading to increased sediment discharge, fertilizers, pesticides, and other pollutants to the mouth of the rivers draining into the Caribbean Sea and toward the Mesoamerican reef. These issues are highly linked to hydrological dynamics, and that is the reason they need to be analyzed at the watershed scale.

To this end, WWF, and The Coca-Cola Company (TCCC) have joined efforts to protect and preserve water resources around the world. In Central America, the global WWF-TCCC alliance focuses on the Mesoamerican Barrier Reef ecosystem that includes the Caribbean watersheds of four countries: Mexico (Yucatan Peninsula), Belize, Guatemala (the Caribbean region), and Honduras (northern coast).

The effluents generated in the Belize River Watershed (BRW), due to agricultural and small industrial activities, as well as urban growth, significantly affect the health of the Mesoamerican reef. In response to this, WWF Guatemala/Mesoamerica has implemented the “basin to reef,” strategy which includes several innovative watershed conservation and management initiatives.

In this regard, the University of Belize, through the Natural Resource Management Program from the Faculty of Science and Technology, entered into an agreement with the World Wildlife Fund to develop a Management Plan for the Belize River Watershed (BRW). The management plan is the first of its kind in Belize and is considered as a model. Through scientific research, stakeholder consultations, and community engagement, a sustainable management plan was prepared identifying long-term monitoring programs and projects for bolstering conservation actions and policies for the protection of the Belize River watershed, its resources and, by extension, the coral reef system.

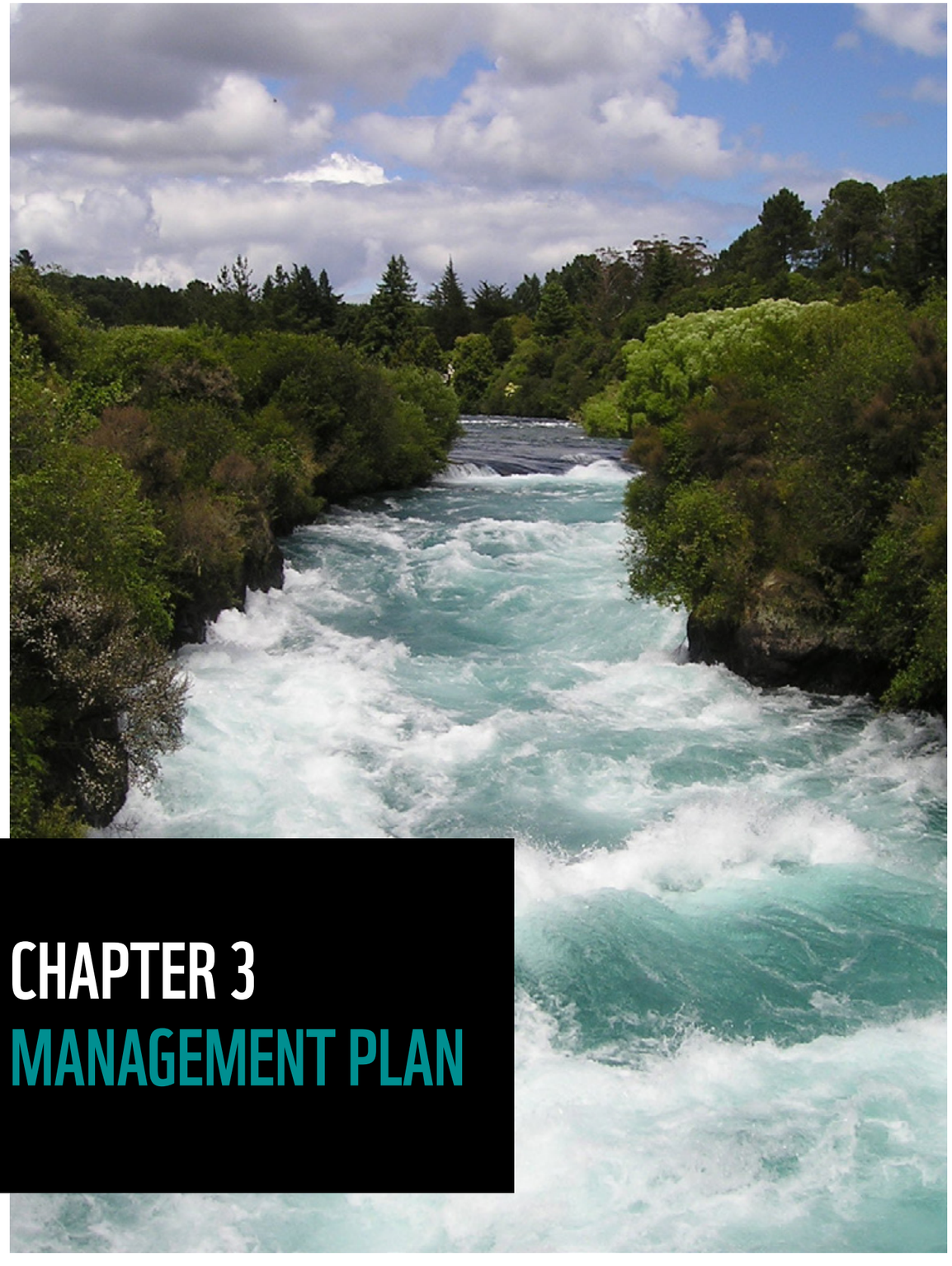


CHAPTER 2
JUSTIFICATION

The Belize River and its watershed supply water and other resources to an estimated population of 135,655 inhabitants in both rural and urban communities.

The Belize River watershed is home to a biologically diverse ecosystem. Natural and anthropogenic activities occurring in the Belize River watershed are adding tremendous pressures to the river itself, promoting the increase of sediments, nutrients influx, and pollutants that are mobilized by surface runoff into the river and eventually discharged into the sea. The increased amount of fertilizers, pesticides, sediment, and other pollutants become potential threats to the river, including the coral reef system.

An integrated management plan for the BRW is an indispensable tool for assessing the current situation, setting objectives and targets for future work, and for measuring progress and development as it relates to the management of the river and its watershed. Therefore, watershed management for the Belize River warrants the collective attention of vital stakeholders and managers to ensure protection of the health of human users, watershed biodiversity, coastal ecosystems, and support for freshwater and coastal management and conservation efforts. For that, management programs, projects, norms, technical and financial instruments will be executed for the integral management of the Belize River basin and area of influence, through systematical management, supported by sound ecological and sociological data, local knowledge, and in partnership with relevant stakeholders.



CHAPTER 3
MANAGEMENT PLAN

3.1 General Objective

The general objective of the Plan is to foster appropriate and equitable stakeholder linkages to the watershed considering the best use practices for all resources and that consensus-based decision-making and actions are achieved for the planning, execution, and evaluation of actions of conservation and sustainability of water, soil, and biodiversity resources.

Vision Statement

To ensure clean water and other watershed resources in perpetuity for people of Belize.

Mission Statement

Through systematical management, supported by sound ecological and sociological data, local knowledge and in partnership of relevant stakeholders, management programs, projects, norms, technical and financial instruments will be executed for the integral management of the Belize River basin and area of influence.

Horizon

The horizon for the execution of the management plan and the programs and projects proposed for implementation is proposed for a period of 10 years, taking into consideration the current status of the watershed, especially those related to the organization and incipient capacities of the local actors. It is estimated that during this period, conflicts over the use of water resources and associated natural resources, such as land use, will have been significantly impacted positively.

3.2 Methodology

A synthesis of the problems linked to the use of renewable natural resources within the BRW was carried out using a combination of stakeholder consultation meetings, a human impact mapping assessment, and a diagnosis study of the BRW.

Consultations to stakeholders provided information from their perspective using the Problem Tree Analysis to identify problems affecting the watershed, and stakeholder mapping to determine stakeholder interest, influence, financial stake, emotional stake, those on the periphery and those willing to share their related data. The human impact mapping assessment primarily focused on land use and morphology of the watershed. Stress sources identified were ranked by level of magnitude of contribution to each stress as very high, high, medium, low, and not detected. The diagnostics study identified stressors and their impacts for sections of the BRW and prioritized areas for management based on the human impact mapping assessment. The diagnosis study focused on the characterization of the hydrological cycle, the quantification of erosion, and the identification of the origin of water pollution, as well as a socio-economic and institutional characterization.

A SWOT analysis of the watershed conservation and socioeconomic development was carried out to determine strengths, weaknesses, opportunities, and threats associated with the management of the BRW. The SWOT analysis was also used to help identify future goals, and initiatives for further analysis that are optimal for addressing the problems identified and prioritized for action.

3.3 Results

3.3.1 Characterization of the watershed and synthesis of the problem

The BRW watershed includes the department of Peten in Guatemala and the central part of Belize, over an area of 8,389 square kilometers. According to the analysis of the land surfaces characteristics with the watershed, the most important areas in terms of management are the districts of Cayo and Belize, in Belize, and the municipalities of Dolores and Melchor de Mencos, in Guatemala.

The cross-border situation in the watershed has important implications for the implementation of an integrated watershed management approach (Table 1). However, the current situation of the territorial dispute of Guatemala over parts of Belize complicates efforts. Therefore, this assessment and subsequently the management plan developed for the BRW focus almost in its entirety on the Belizean side of the watershed, although one of the programs proposed for implementation in the plan includes a collaborative effort to manage the watershed through grassroots efforts from both countries. Thus, it will be necessary to socialize the plan in Guatemala, beginning with the government sector so that Guatemalan stakeholders will eventually become involved.

To facilitate the presentation of the information gathered, the BRW was divided into three sections, the upper reaches (cuenca alta), the middle reaches (cuenca media) and the lower reaches (cuenca baja) as shown in Figure 1. Furthermore, each of the three reaches was further divided into sub-watersheds to assess and understand the different dynamics within each sub-watershed.

Country	Name	Area within the watershed (km^2)	% Watershed
Belize	Orange Walt	353	4.2
	Belize	1,125	13.4
	Cayo	4,497	53.6
Total Belize		**5,975**	**71.2**
Guatemala	Dolores	1,102	13.1
	Santa Ana	285	3.4
	Flores	27	0.3
	Melchor de Mencos	999	11.9
Total Guatemala		**2,414**	**28.8**
TOTAL		**8,389**	**100.0**

Source: Rosito, 2014

Table 1: Political and Administrative Territories thar are Shared by The Belize River Watershed

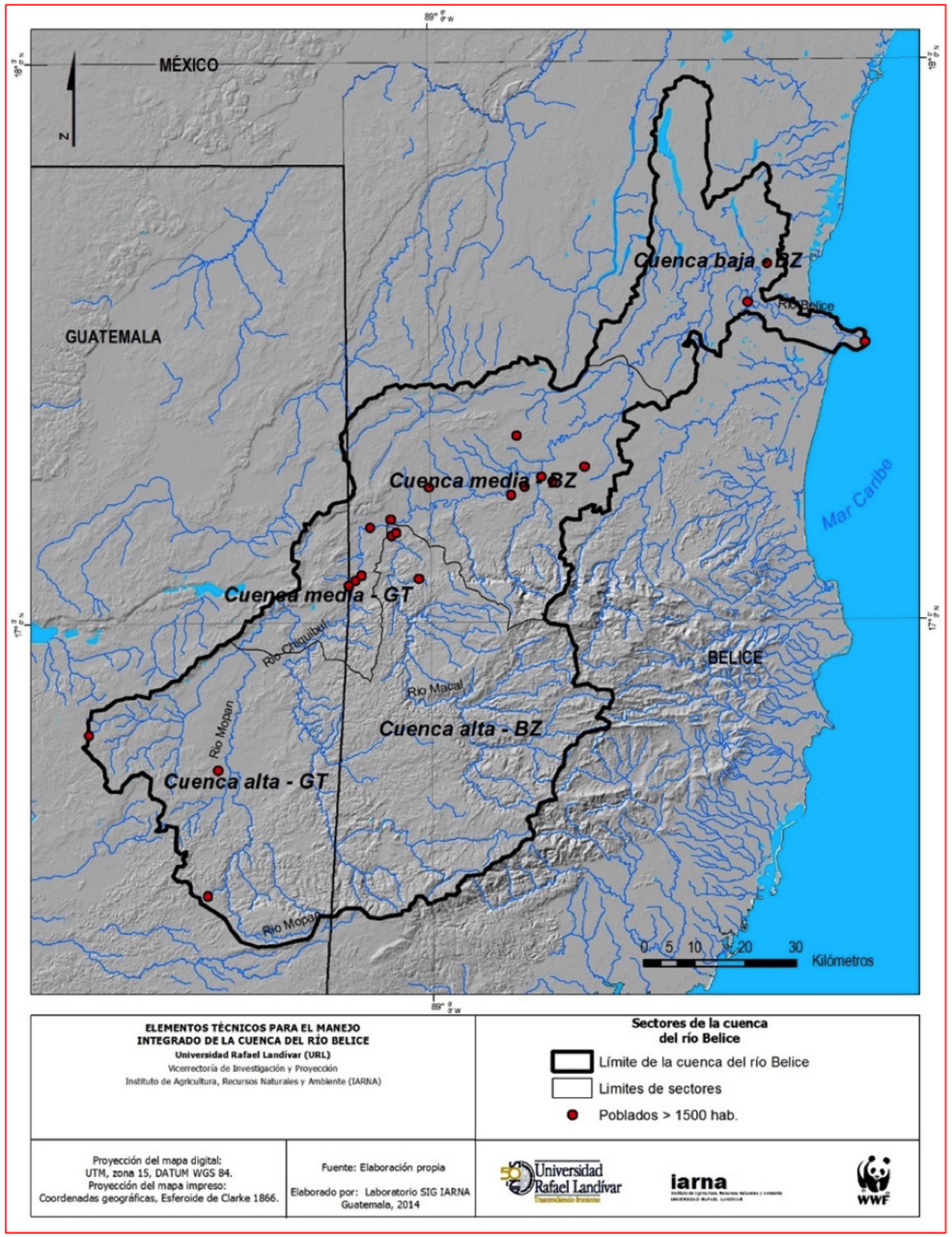


Figure 1: Location map showing the upper, middle, and lower reaches of the Belize River watershed

Livelihoods and impacts on water resources

Traditional small-scale and mechanized large-scale agriculture is considered a major source of livelihood; however, with significant threat to the watershed. As of 2016, the agriculture sector comprised an estimated 325,094.3 surface acres of the watershed, equivalent to 1,315.6 square kilometers. This represents an estimated 22% of the total 5,975 square kilometers of the watershed surface area in the Belizean side. The agriculture sector, and by extension the large-scale expansion of the agriculture frontier, is concentrated in the middle reaches and to a lesser extent in the lower reaches of the watershed. The major concentration of agriculture activities is located within and around Spanish Lookout and the Banana Bank and More Tomorrow communities.

No.	Land use / Land cover	Hectares 2015	%	Hectares 2016	%
1	Submontane broad-leaved forest	145,614	24.00	145,069	23.89
2	Lowland broad-leaved forest	222,813	36.73	218,769	36.03
3	Pine forest	45,856	7.56	45,764	7.54
4	Mangrove and littoral forest	2,959	0.49	2,956	0.49
5	Water	126,399	20.83	130,443	21.48
6	Agricultural Uses	126,399	20.83	130,443	21.48
7	Urban	13,209	2.18	14,327	2.36
8	Savanna	42,545	7.01	42,530	7.00
9	Aquaculture	613	0.10	613	0.10
	TOTAL	**606,683**	**100.00**	**607,146**	**100.00**

Table 2: Land-Use Data for the Belize River Watershed for the Years 2015 and 2016

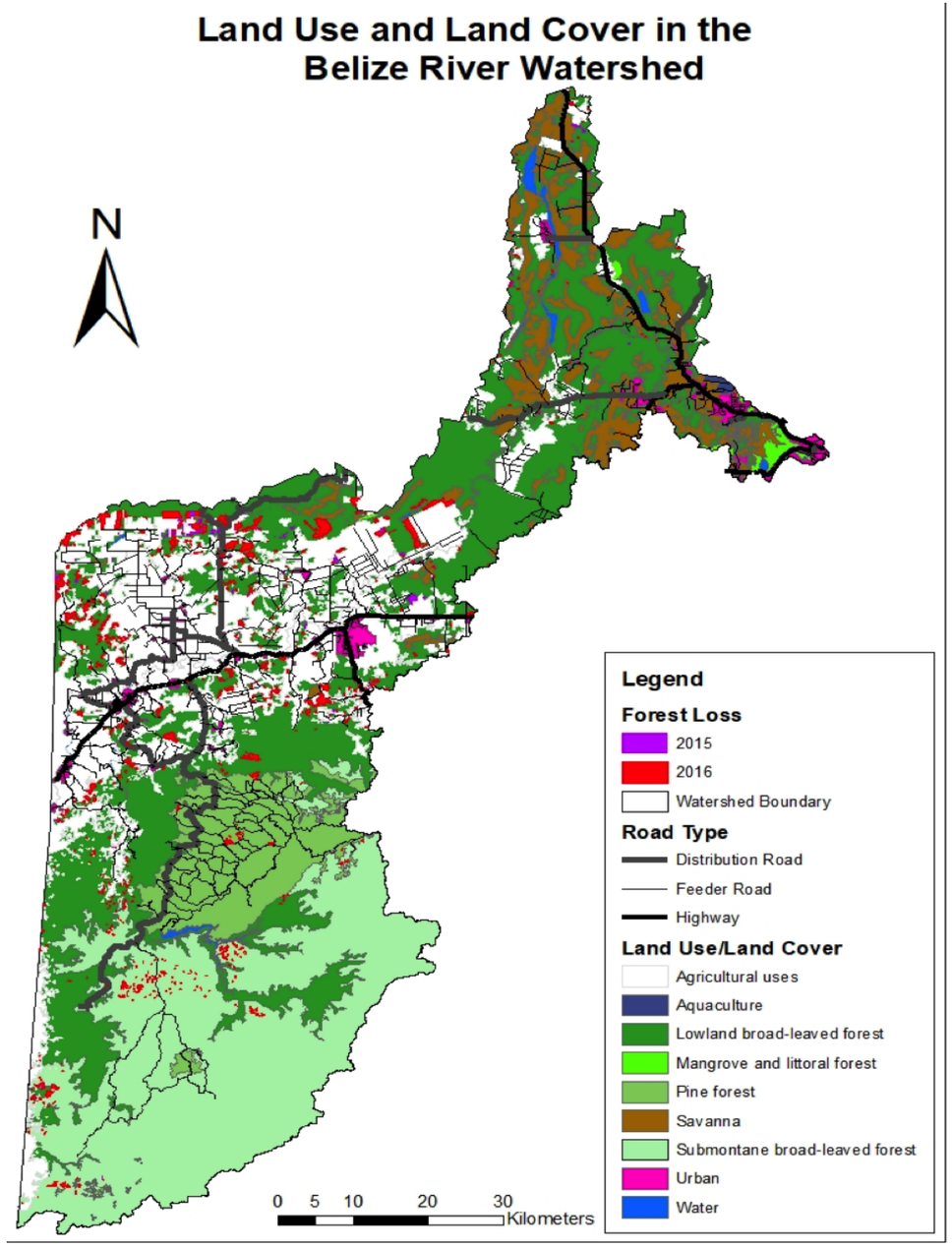


Figure 2: Land Use and Land Cover Map of the BRW.

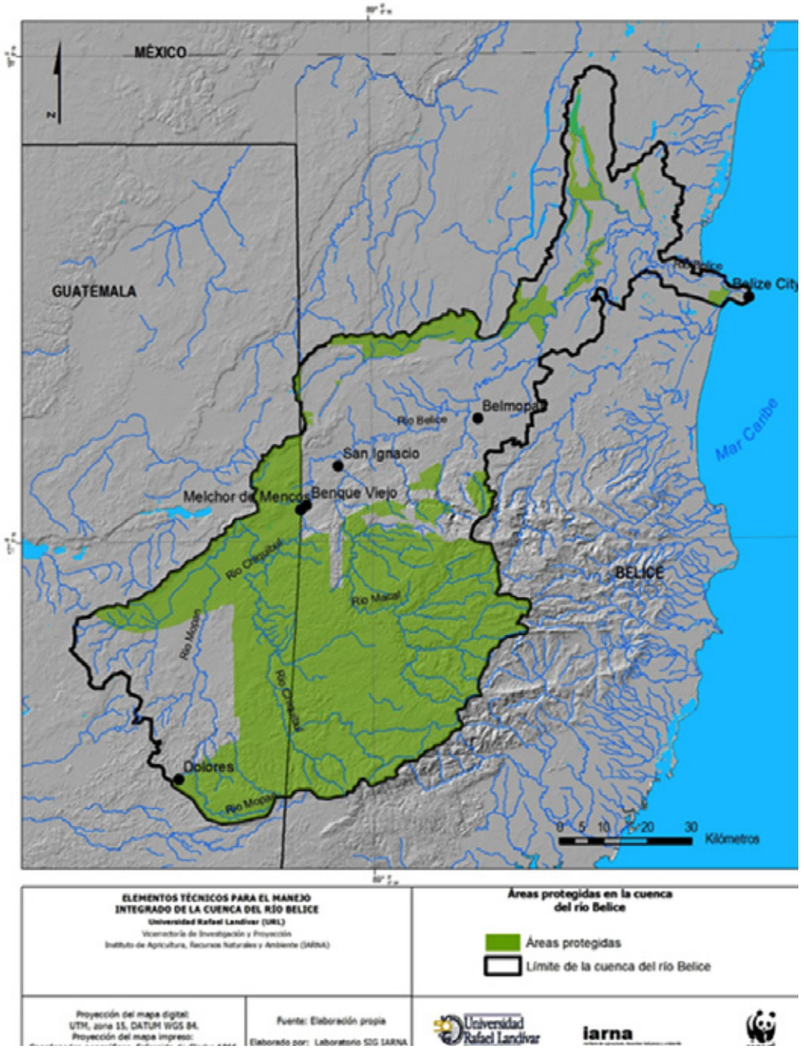


Figure 3: Map of Protected Areas of the Belize River Watershed

Current conditions in the upper reaches of the watershed

Belize: Macal River sub-watershed and Chiquibul River sub-watershed

The upper watershed (Belize) is characterized by low population density and predominance of protected areas with adequate management. Most of the headwater drainage of the Belize River Watershed lies within the Maya Mountains. Most of this area is under a relatively successful protection as part of the Chiquibul National Park, Chiquibul Forest Reserve, Mountain Pine Ridge Forest Reserve, Caracol Archaeological Reserve, and others. Protection efforts in this part of the watershed have been relatively successful, resulting in maintenance of forest cover in 89% of this territory (Figure 3). This area is relatively undisturbed, accredited mostly to the protected areas system strategies and management system.

The primary environmental issues within the headwaters include illegal intrusion by Guatemalan farmers, gold prospectors, hunters, wildlife poachers, and loggers.

There is also a legal gold mining operation that has contributed to the degradation of a local stream system and sedimentation of downstream areas. In addition, a few private areas of the Maya Mountains are legally logged, but with legitimate forests management strategies in Belize.

The karstic western side of the Macal River Watershed and the Chiquibul River Watershed support several tourism developments which pollute the watershed. Additionally, road networks give access to hunters, loggers, foresters, tourists, and tourism facilitators alike. In addition to the roads, there are scattered quarries that represent a sediment source during surface flow events.

The Macal River and subsequently the Belize River are regulated rivers due to the installation of the three-dam hydroelectric system. Also, local fish species along the Macal River have been found with above-accepted mercury levels for human consumption.

Furthermore, it has been reported that the Chalillo Dam was built downstream of a fault line. If the fault should be triggered by a tremor, the consequence may be a large deluge of water rolling downslope, causing damage to riparian forests , riverside and floodplain development, as well as the lower areas of San Ignacio, Sana Elena, and riverside communities.

Guatemala: Upper Mopan River and Macal sub-watersheds

The upper reaches of the watershed on the Guatemalan side are characterized by predominance of rural and urban population, agriculture, and high rate of deforestation. The Mopan River Watershed within Guatemala is heavily populated by small villages and a few urban settings that act as potential sources of pollution. There are some towns without adequate sewage systems in place, with discharge emptying directly into the river with minimal treatment. Many of the water soluble components generated by urbanized areas are further mobilized into rivers via storm water drainage systems. The soil is generally not fertile, which requires the use of fertilizers and chemicals. In addition, pasture areas provide direct access to streams and rivers for livestock use, representing a significant source of fecal material and pathogens. Riparian forests throughout the urban and rural areas have been damaged severely, with very few patches of forest remaining.

Current conditions in the middle reaches in Belize

The middle reaches of the BRW are characterized by predominance of urban population with a traditional and intensive mechanized agriculture and livestock. Spanish Lookout community, located in this sector, is one of the most important zones of mechanized farming in Belize. Under this division of the BRW, the middle section begins at the border on the Mopan sub-watershed, which covers two urban centers, San Ignacio and Santa Elena in the lower Macal sub-watershed, extending to Belmopan city. This section of the watershed includes several sub-watersheds including Barton Creek and Labouring Creek. The main source of water for many of the rural communities comes from the Belize River system. Income generated from tourism focusing on the natural environment and archaeological sites is also economically important.

Other threats to this area come from the widespread use of pesticides, often applied by aerial spraying, increasing irrigation leading to a massive extraction of water, cattle destroying riparian forests, wastewater from San Ignacio, Santa Elena, and Belmopan City polluting the Belize River. Also, oil extraction is actively occurring in this section of the watershed.

Lower Mopan and Macal sub-watersheds

The lower end of the Mopan River from the Belize/Guatemala border is immediately downstream from Melchor, with several villages contributing the usual pollutants. The Mopan River is notably heavily littered with solid waste, particularly plastic.

The river banks of the lower Macal River upstream of San Ignacio and Santa Elena are much less deforested than the Mopan River, but where the river flows past San Ignacio and Santa Elena, the river banks are largely deforested. A municipal water extraction site is located on the left bank of the Macal River just upstream of the urbanized area. Several large sand mines are also in operation just upstream of the new bridge and the junction of the Macal and Mopan Rivers.

Labouring Creek sub-watershed

Labouring Creek watershed headwaters flow out of karstic areas in western Belize and the northern Peten area of Guatemala. Most of these areas are karst hills and are in a protected area on the Guatemalan side. Within Belize, the Labouring Creek watershed is a patchwork of forests and small farms. There are several large farms, including sugar cane plantations such as Santander Farms, as well as large Mennonite holdings growing corn and beans. There are many wetland areas within this sub-basin threatened by agriculture.

Upper Belize River Valley

This is the most degraded area of the watershed. Therefore, the upper Belize River Valley of the BRW is high priority area for watershed conservation and management. The upper Belize River Valley is dominated by the Spanish Lookout farming community and several small villages, many lying adjacent to the river, extending down to Big Falls. The large, tilled holdings are clustered along the banks of the river, resulting in degradation of riparian vegetation. Large amounts of pesticides and fertilizers are utilized by large- and small-scale farmers. Cattle are often given access to riparian forests and to the river, increasing the amount of riparian vegetation destruction, soil compaction, and fecal material entering the water.

Water abstraction is occurring for irrigation of fields and to supply water to river side communities. Santander Farms diverts water from the Belize River into a canal system that supplies water to the cane crops, and then discharged back into the river through the illegally dug canal cutting through the Jaguar corridor. Discharged water is passed through settling ponds before being released back into the river. Belmopan extracts water from the river upstream of the Roaring River confluence. The river also receives wastewater discharge from many communities. Belmopan has a sewage treatment system that supplies a portion of the city, with treatment lagoons discharging into the river. Several sites along this reach are also mined for sand and gravel.

Current conditions in the lower reaches in Belize

The lower reaches of the watershed are characterized by the predominance of urban, coastal wetlands and savannas; however, significant riparian buffer degradation also exists. The lower section of the BRW runs from Belmopan towards the Caribbean Sea, passing near Belize City. The alluvial plain located between Belmopan and the wetland of Crooked Tree is characterized by small farms producing basic grains and artisanal livestock. Crooked Tree wetland, declared as a Ramsar site in 1998, is also located in the lower watershed. This wetland plays a fundamental role in the regulation of floods, and possibly in the water quality of the river, acting as a filter. The main livelihood activities practiced in this area include tourism, small-scale livestock, fisheries, and cashews and charcoal production.

Single farms with cattle accessing the river contribute to the erosion of river banks in the lower reach. Natural erosion sites were also evident along the outside banks of meanders downstream in the lower reach.

The Central Belize Corridor (CBC) is located within the lower reaches of the BR watershed. The CBC is considered an important corridor because it provides biological connectivity to the Belize National Protected Areas System (NPAS). The conservation action plan for the CBC notes that clear cutting of forested areas is considered by far the most important threat, followed by unsustainable hunting practices.

The wetland zone of the lower watershed comprises coastal savannas, wetlands, and mangroves. The coastal area includes Belize City, Ladyville, and the International Airport. Belize City is a port city and the economic capital of the country. Part of the Belize River is diverted toward the center of Belize City through Haulover Creek. It is a man-made channel that acts as a “second river mouth” of the Belize River, and it is an important source of pollution for the Inner Channel and the reef, as it is loaded with organic waste. Another big threat in the urban areas is degradation of wetlands and mangroves caused by urban expansion. Adding to this, pollution increases with storm water runoff from urban canals.

3.3.1.1 Priority sub-watersheds

Based on a prioritization scheme, the Chiquibul River and Macal River sub-watersheds in the Belizean side are higher priority for conservation. These two sub-watersheds still have extensive areas of forest that are less intervened. Therefore, these two zones must be conserved to ensure that they continue to serve an important role to produce goods and services and the regulation of the hydrological cycle. On the other hand, the middle Belize sub-watershed has a higher priority for restoration. This sub-watershed shows a high level of human intervention, mainly related to agricultural activities that have promoted environmental degradation, and thus the reduction of services, including the regulation of the hydrological cycle.

3.3.1.2 Problems associated with the BRW, their causes, and effects from the stakeholder perspective

A list of prioritized problems was collectively identified by stakeholders representing government entities, NGOs, academia, the private sector, farmers (both small-scale and large-scale), cooperatives, water boards, and community leadership:

- Degradation of forest coverage/Increasing deforestation
- Contamination and pollution of soil and water through runoff and discharge
- Loss of biodiversity/Biodiversity degradation
- Unsustainable human practices (agriculture and logging expansion)
- Human health and animal health problems
- Lack of enforcement of conservation laws particularly those associated with environmental clearance and compliance, maintenance of riparian buffers and forest connectivity, and land use
- Degradation of riparian forests/buffer
- Garbage disposal
- Rapid expansion of agriculture

3.3.2. Synthesis of the potentialities of the watershed and opportunities for the management of the watershed

The SWOT also provided general insights on potentialities and opportunities in the BRW, which are divided into two areas: socio-economic and environmental.

Socio-económic
Potentialities
1. Watershed supports livelihoods and provides water for an estimated population of 135,655 in Belize
2. Ecosystem services and aquatic resources for recreation and tourism attractions
3. Soils with agriculture potential/Prime agricultural land
4. Watershed as a nexus point
5. Waterfront development
6. Presence of groups of high economic power: Bowen and Bowen (Coca-Cola and Brewery), Mennonites, Santander, Valley of Peace Farms, etc.
Oportunities
1. Foster entrepreneurship in existing organized entities to bloster ecotourism and strenghten capacities in management and conservation of natural resources and community tourism
2. Foster alternative livelihoods that are environmentally friendly and sustainable
3. Demonstrate green development is cost-effective through education and outreach
4. Carbon sequestration of watershed, especially wetlands, an opportunity for carbon credits/trade
5. Restoration opportunities/reforest degraded forest areas with logwood plantation using valuable species such as teak and mahogany
6. Contribute to SDG 6 (Ensure access to water and sanitation for all Belizeans)
7. Increased value of land may motivate existing non-conforming to sell or change its use
8. Agriculture diversification and upgrading production systems

Table 3: Potentialities and Opportunities

Environmental
Potentialities
1. Watershed supports variety of terrestrial and aquatic habitats including wetland, riparian, estuarine, and forest habitats
2. Large amount of hydrological resources as high availability of surface water, high recharge value, and quality surface water
3. Existence of organized groups involved in conservation of water and other resources in the BRW
4. Presence of government intitutions and regulatory framework to support the environment and conservation
5. Low urban development
6. High value land is less constrained
Oportunities
1. Implement the measures defined in the legislative framework for proper water resource management (NIWRA) and monitor and enforce compliance with existing envirnmental laws
2. Organize, incentivize, and foster active participation of diverse stakeholders
3. Foster government and non-government initiatives to build capacity of community leadership
4. Develop an agriculture strategy and action plan for the BRW, favoring biodiversity and natural resources
5. Promote the use of best management practices and standards for compatible development and identify priority zones
6. Restoration opportunities
7. Foster ownership by sharing common vision
8. New sewer systems can reduce impacts of existing septic systems
9. Sound biological and ecological research opportunities
10. Technical assistance and training programs on environmental education and management
11. Development of business plans and business diversification and strategic investment plan

3.3.3. Stakeholders

The stakeholders that are essential to achieve the goals of the BRW were prioritized according to their interest and their influence over the watershed in the categories described in Table 4.

Primary Stakeholders	Those affected directly, either positively or negatively, by developments or operations.	Large-scale farmers and associations, small-scale farmers and cooperatives, Bowen and Bowen Bottling Co., private, community leadership
Secondary Stakeholders	Those who are indirectly affected	National Meteorological Services, Pesticides Control Board, Statutory Board, Belize, Red Cross Society, Community Baboon Sanctuary (CBS), NGOs, Belize Institute for Environmental Law and Policy
Key Stakeholders	Those who have significant influence upon or importance within or to the watershed (may also belong to the first two groups).	Several departments of the Government of Belize, Pesticides Control Board, Statutory Board, National Integrated Water Resources Authority (NIWRA), Coastal Zone Management Authority and Institute (CZMAI), autonomous public statutory body, NGOs, GIZ, farmers, community leadership, bottling companies, academia
Non-Key Stakeholders	Those who are directly or indirectly affected and without significant influence or importance to the watershed development or operation (may also belong to the first two groups).	NGOs, academia, Belize Agriculture Health Authority (BAHA), Statutory Board

Table 4: Stakeholders categories

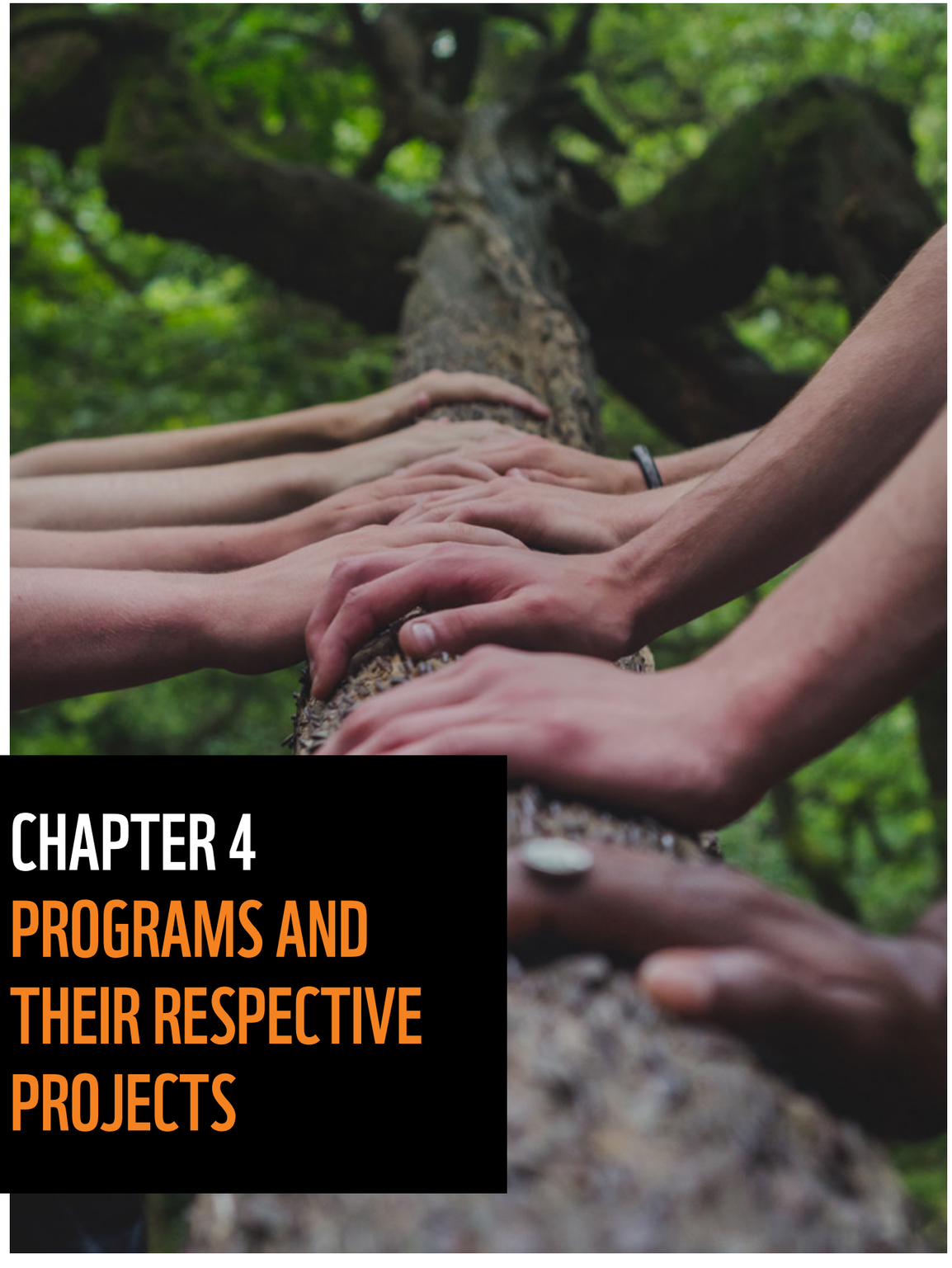
3.4. Legal Framework

There is no legislation in Belize specifically governing watershed management per se; however, there are several pieces of legislation that govern different aspects of watershed management.

The major piece of legislation applicable to watershed management is the National Integrated Water Resources Act. The National Integrated Water Resources Act enacted in 2010 empowers the Government of Belize to ensure the rights of Belizeans to have access to water, and provides guidance on the management of water resources, including the assessment, governance, framework, and valuation of water resources. Through the National Integrated Water Resources Act, the National Integrated Water Resources Authority (NIRWA) was established and is housed under the Hydrology Unit within the Ministry of Agriculture, Fisheries, Forestry, the Environment, Sustainable Development, and Climate Change and Immigration. The main functions of this authority are to conduct water data management, planning, water allocation, water quality (protection), technical assistance, water conservation, and public awareness.

Municipalities and villages also have some legal standing that gives them limited authority over the management of local water resources. In 2000, legal recognition was given to village water boards for management of community rudimentary water systems, but decision-making and enforcement power lies with the central government.

The pieces of legislations that contribute to the holistic framework of watershed management in Belize are presented in Annex 1.



CHAPTER 4
PROGRAMS AND THEIR RESPECTIVE PROJECTS

4. Programs and Their Respective Projects

Five programs and their associated projects are proposed for implementation under the management plan.

These programs and projects are planned and organized by common objectives, administrative aspects, goals, monitoring, control, and evaluation. It is imperative that all programs and projects are interconnected. At this stage, each of the programs and their respective projects, including their most important aspects, is presented in a simple and broad context. Each program, from which projects were derived, responds to specific problems. The horizon for the execution of the management plan and the programs and projects is proposed for a period of 10 years, including short-term (1-2 yrs.), mid-term (2-5 yrs.) and long-term (5-10 yrs.) projects.

4.1. Programs focusing on conservation of protected areas/ maintaining forest coverage – upper reaches of the BRW

Sub-Program 1. Fostering community stewardship: Creating interest and building a culture of ownership through public awareness, education, and the establishment of community watershed associations for the integral management of the upper reaches of the Belize River Watershed.

In order to address the issues identified in the upper reaches of the watershed, it is necessary to empower the community through knowledge and tools. Fostering community stewardship through awareness, education, and dialogue at grassroots level has proven to be a strong tool for promoting conservation of ecologically and economically important areas. Additionally, it is recognized that it is critical to build local capacity and to establish community associations to manage their own local resources.

Objective of the program

To achieve increased awareness of the importance and value of the BR watershed, create consciousness, and change perception and attitudes that will ensure interest and local ownership for the long term conservation of the upper reaches of the BR watershed, inclusive of forest coverage.

Brief description of the projects included in the sub-program

Project 1. Strengthening Institutional Capacity of Project Implementing Organizations

The objective of the project is to support and develop organizational capacity of various institutions, local authorities, and community organizations to conduct educational awareness by providing funding, material, and knowledge. This will be achieved by identifying community-based organizations and strengthening their capacities in watershed management through workshops, courses, and knowledge transfer, in addition to funding. The project will be implemented in buffer communities along the Belize, Macal, and Mopan Rivers, for 1.5 years, with an estimated total cost of US$100,000.

Project 2. Grass-Roots Education, Awareness, and Fostering Dialogue

The objective of the project is to systematically disseminate information, educate, foster dialogue, and increase participation and community involvement for addressing core issues affecting the upper BR watershed. This will be achieved by designing an education and awareness campaign with effective strategies. The project will be implemented in buffer communities along the Belize, Macal, and Mopan Rivers. This includes buffering communities in the Guatemalan and all communities in the Belizean side. The project will have a duration of 5 years, with an estimated cost of US$250,000.

Project 3. Establishing and Empowering Community Watershed Associations

The objective of the project is to establish and empower community watershed associations to lead community involvement and efforts for addressing core issues affecting the upper BR watershed. This will be achieved through capacity-building and establishing community watershed associations in strategic communities within the upper reaches of the BRW. The project will be implemented in buffer communities along the Belize, Macal, and Mopan Rivers. This includes buffering communities in the Guatemalan side and all communities in the Belizean side. The project will have a duration of 5 years, with an estimated cost of US$800,000.

4.2. Programs focusing on restoration of agriculture impacted areas: middle and lower reaches of the BRW

Sub-Program 1. Fostering community stewardship: Creating interest and building a culture of ownership through public awareness, education, and the establishment of community watershed associations for the integral management of the middle and lower reaches of the Belize River watershed.

The main threats to the middle and lower reaches of the watershed can be grouped into agriculture, urbanization, and infrastructure development. The primary problem is that stakeholders in these sectors are largely unaware of the ecological importance of watersheds. Most of resource users will agree on more practical, effective, and affordable alternatives that are more sustainable. It is critical to build local capacity and to establish and empower community watershed associations to manage their own local resources.

Objective of the program

To achieve increased awareness of the importance and value of the BR watershed, create consciousness, and change perception and attitudes that will drive restoration and ensure long term conservation of the middle and lower reaches of the BR watershed.

Brief description of the projects included in the sub-program

Project 1. Watershed Management Workshops for Small-Scale Farmers and Rural Communities

The objective of the project is to provide introduction to watershed functions and customized, site-focused workshops that identify local challenges, issues, and impacts relevant to the small-scale farmers and their villages, and propose consultatively developed, practical, and effective actions and solutions. This will be achieved by designing and implementing workshops to address the pre-conceived needs and interests of small-scale farmers and their communities, and developing and managing an online platform where small-scale farmers and community members can seek assistance. The project will be implemented in three to five central communities that interact with neighboring communities, along the Belize River Valley. The workshops will be carried out every year for 5 years, with an estimated cost of US$150,000.

Project 2. Watershed Management Workshops for Large-scale Farmers and Agro-businesses

The objective of the project is to provide introduction to watershed functions and customized, site-focused workshops that identify challenges, issues, and impacts relevant to the large-scale farmers, and propose consultatively developed, practical, and effective actions and solutions. This will be achieved by designing and implementing workshops to addresses the needs and interests of large-scale farmers, and developing and managing an on-line platform where farmers and managers can seek assistance. Workshops will be carried out every year for 5 years, with an estimated cost of US$150,000.

Project 3. Watershed Management Workshops for Engineers, Urban Planners, and Municipal Government Officials and Technicians

The objective of the project is to provide introduction to watershed functions and customized, site-focused workshops that identify challenges, issues, and impacts relevant to the engineers, urban planners, and municipal managers and propose consultatively developed, practical, and effective actions and solutions. The workshops will be addressed to the needs and interests of engineers, urban planners, and municipal managers working in the watershed. Workshops will be spread out over a two to three period, with a total amount of US$80,000.

Project 4. Watershed Management Workshops for Educators

The objective of the project is to provide capacity building to educators using a "train the trainer" model particularly focusing on developing knowledge and skills required to effectively educate and impart knowledge for watershed restoration and conservation. This will be achieved by designing and implementing a workshop to addresses the needs and interests of educator focusing on developing knowledge and skills. The workshop may be held in Belmopan, possibly at the University of Belize. Workshops will be spread out over a two to three-year period, with an estimated total cost of US$150,000.

Project 5. Watershed Management Workshops for Select Youth from Throughout the Watershed Interested in Watershed Ecology and Conservation as a Profession

The objective of the project is to provide introduction to watershed ecology and conservation to a select group of junior high school and senior high school and university students from around the watershed, who have expressed interest in water management, aquatic ecology, environmental and public health, community leadership, and related areas, and who are interested in learning more about watershed conservation and water resource management to benefit their neighborhoods, villages, towns, and cities. This will be carried out through workshops, which will be hosted at Monkey Bay Wildlife Sanctuary and take place on the Sibun River. A total amount of US$75,000 is required for 5 workshops over a 5-year period.

Project 6. Establishing and Empowering Community Watershed Associations

The objective of the project is to achieve increased awareness of the importance and value of the BR watershed, create consciousness, and change perception and attitudes that will ensure interest and local ownership for the long-term conservation of the middle and lower reaches of the BRW, including forest coverage by establishing community watershed associations in strategic communities within the upper reaches of the BRW. The project will be implemented in buffer communities along the Belize River. The duration of the project will be 5 years, with an estimated total cost of US$500,000.

Sub-Program 2. Promote adoption of climate-smart agriculture (CSA) to ensure food security and of cost-effective green agriculture technology using good/best agricultural practices for the restoration and maintenance of landscape, biodiversity, soil protection, and water resources.

The consequences of climate change present a serious threat to the agriculture sector within the watershed. This may provide an opportunity for farmers to adopting a climate-smart agriculture technology and a more efficient and green farming technology. Agriculture activities within the Belize River Watershed are characterized by three main sub-sectors: a) a small-scale farm sector, b) a large-scale commercial sector (i.e. Mennonites), and c) a well-organized sugar sector recently established. Some of the key climate-smart agriculture (CSA) technologies and practices are already being adopted across several production systems in Belize.

Objective of the program

To achieve adoption of farming climate-smart agriculture and green technologies that will ensure food security and will contribute to the restoration and maintenance of biodiversity, landscape, soil protection and water resources in the next ten years.

Brief description of the projects included in the sub-program

Project 1. Agriculture Strategy and Action Plan

The objective of the project is to achieve adoption of climate-smart agriculture and green farming technologies that will ensure food security and will contribute to the restoration and maintenance of biodiversity, landscape, soil protection and water resources within the BRW in the next ten years. This will be achieved by hiring a project coordinator and a consultant, who will develop an agriculture strategy and action plan for small- and large-scale farmers through a consultative process. Activities will take place in the conference center or other facilities in farming communities and in Spanish Lookout. Consultations and development of strategies and action plan must be completed within 6 months. Workshops will be repeated every year for 5 years, with an estimated total cost of US$125,000.

Project 2. Promoting Adoption of Climate-Smart Agriculture

The objective of the project is to achieve adoption of climate-smart agriculture and green farming technologies that will ensure food security and will contribute to the restoration and maintenance of biodiversity, landscape, soil protection and water resources within the BRW in the next five years. This will be achieved by hiring a project coordinator who will work along with Water Management and Climate Change Officer of the Ministry of Agriculture, Fisheries, Forestry, the Environment, Sustainable Development and Immigration to understand, adopt and modify their Climate-Smart Agriculture (CSA) Strategy for Belize. The project will be implemented in major small- and large-scale farming communities of strategic importance, with an estimated total cost is US$250,000.

Sub-Program 3. Riparian Forest/Wetland Conservation and Restoration by Resource User Groups

Riparian zone deforestation and wetland destruction are key issues that are greatly contributing to ecosystem degradation. These two very important watershed components are heavily integrated into the primary ecological services rendered by the watershed, with the loss of riparian forests and wetlands resulting in impacts that ultimately reduce the quality of riverine and marine habitats, and the livelihoods of people dependent on those resources. That is why successful conservation and restoration require the involvement of farmers, communities, youth, non-governmental organizations (NGOs), and Belizean governmental agencies.

Objective of the Program

The objective of the program is to put into effect any feasible restoration actions proposed by the workshop attendees, schools, community groups, farmers and others, or that have been identified as essential by assessment protocols, produce seedlings of suitable riparian and wetland trees needed in restoration projects, monitor general river environmental status and status of restoration efforts, keep government technicians and management informed of the status of the watershed, and to engage farmers, riverside residents, urban managers, and youth in positive initiatives to improve the quality of the mid-reaches of the Belize River watershed.

Brief description of the projects included in the sub-program

Project 1. Restoration Nursery Network

The objective of the project is to develop a functioning nursery network among select interested schools in the watershed to produce and supply appropriate tree seedlings for local degraded riparian and/or wetland sites, with advice, training, nursery setup, and seed stock. The central nursery will be located on the University of Belize School of Agriculture campus at Central Farm and two to five school nurseries will be located on the grounds of those select participating schools within the Belize River watershed. This project can extend over multiple years, at least 5 years but preferably ranging from 8 to 10 years depending on the budget. The estimated total cost is US$400,000.

Project 2. Riparian and Wetland Restoration

The objective of the project is to assemble a small team riparian/wetland restoration technicians who can review project proposals for restoration sites, conduct site visits to determine appropriate strategies to use, seek consultation for sites that require some measure of soft engineering, assist in coordination of the restoration plan, help implement the restoration effort with the assistance of school groups, community groups, tertiary institutional volunteers, farmers, and others, and conduct follow-up visits after several months to evaluate success or to prescribe adjustments. The working office of the Riparian and Wetland Restoration Project team should be located at the University of Belize (UB) Central Farm campus in close association with the Central Nursery. This project can extend over multiple years, at least 5 years but preferably ranging from 8 to 10 years depending on the budget. The estimated total cost is US$450,000.

Project 3. Conservation of the River Commons

The objective of the project is to conduct routine evaluations of the mid- and lower-reaches section of the BRW to determine general conditions of the system, detect changes in conditions over time, identify any new infractions to the ecosystem early so that appropriate and timely intervention can occur, develop and file field reports with the Forest Department, Department of the Environment, the Lands Department, the Agriculture Department, and other groups as necessary, and coordinate with other research and assessment projects that may be conducted in this area. The working project office should be located at the main campus at the University of Belize, where there is a support lab available to students experienced in conducting field work who may volunteer to assist in these field efforts. This project can extend over multiple years, at least 5 years but preferably ranging from 8 to 10 years depending on the budget. The estimated total cost is US$150,000.

4.3 Program focusing on securing biodiversity, climate change resilience, and other ecosystems services provided by Belize's national protected areas system through long-term connectivity of its main forest blocks-lower reaches of the BRW

There are several threats to defined areas of the watershed specific to the lower reaches of the watershed. These are mainly wetland degradation, and degradation of forest connectivity.

The Central Belize Corridor (CBC) is the most critical and important of Belize's three primary corridors that provide biological connectivity to the National Protected Areas System (NPAS), where wide-ranging animals travel safely between the RBCMA and the MMM in Belize. The CBC sustains buffer communities with forests. The broad-leaved forests help maintain soil integrity, pollinator services, and climate change impact resilience, as well as flood control zones. However, the looming threat of the CBC is the conversion to large scale mono-cropping mechanized agriculture. However, to date there is still no protection of the most critical private forested lands that comprise the CBC.

Objective of the program

To maintain and manage a functioning CBC through actions that balance our cultural, social, and economic well-being.

Brief description of the projects included in the program

Project 1. Securing Conservation and Corridor-Compatible Management of Private Lands in the CBC

The objective of the project is to implement a plan to retain critical private lands forested and with corridor function for the long-term. This will be achieved by directly engaging companies and land owners, buffering communities in the CBC, putting into effect regulatory mechanisms and non-regulatory mechanisms for protection of private lands, applying incentives, and purchasing a portion of critical private lands within the CBC. The duration of the project will be 3 years, with an estimated total cost of US$500,000.

Project 2. Establishing Co-management in the Labouring Creek Jaguar Corridor Wildlife Sanctuary (LCJCWS)

The objective of the project is to establish a management structure and presence in the LCJCWS to secure its integrity within the CBC. This will be achieved by directly engaging stakeholder communities, private companies, and land owners, preparing a management plan for the LCJCWS, hiring and equipping at least four rangers, and developing a monitoring plan to assess progress in the management effectiveness of the LCJCWS. The duration of the project will be 3 years, with an estimated total cost of US$250,000.

4.4 Programs focusing on empowering communities to police themselves and for achieving harmonization of existing legislation relevant to watershed management-entire BRW

There is no legislation in Belize specifically governing watershed management per se; however, there are several pieces of legislation that govern different aspects of watershed management.

A major piece of legislation applicable to watershed management is the National Integrated Water Resources Act, enacted in 2010. Unfortunately, the implementation of the National Integrated Water Resources Act is still not realized to date. The lack of enforcement of applicable laws hinder effective management of the BRW, yet the enforcement of pertinent legislation can reduce the threats to the watershed.

Objective of the program

To improve enforcement and to achieve harmonization of existing legislation that is relevant to watershed management.

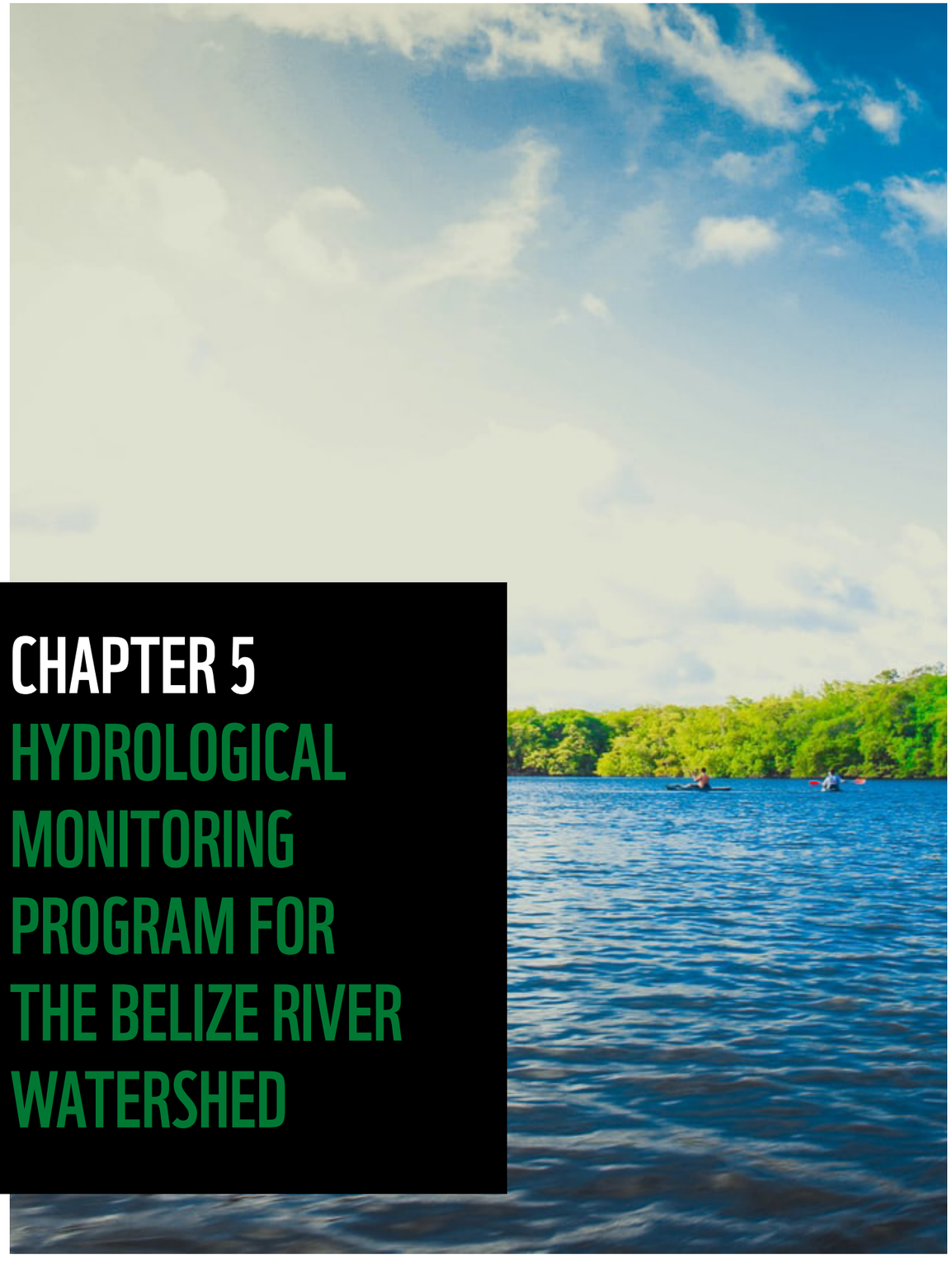
Brief description of the projects included in the program

Project 1. Assessment of Legislative Framework and Strategies for Enforcement

The objective of the project is to assess the existing legal framework relevant to watershed management and to develop recommendations for harmonization of laws for a more effective management of the watershed. This will be achieved by hiring a consultant, carrying out an assessment of the legal framework and of the environment, and develop strategies for enforcement of relevant laws. The project will be implemented in Belmopan for one year, with an estimated total cost of US$40,000.

Project 2. Empowering Communities to Police Their Community through the Establishment and Support of Environmental Neighborhood Watch Groups

The objective of the project is to bring together community members, local, and national government authorities with environmental justice advocates establishing and supporting environmental neighborhood watch groups. This will be achieved by hiring and installing watershed management technician, establishing environmental neighborhood watch groups, and establishing a platform for reporting people that break environmental laws. The project will be implemented in Belmopan, will have a duration of 5 years under project funding and an additional 5 years through government support, with an estimated total cost will be US$600,000.



CHAPTER 5
HYDROLOGICAL MONITORING PROGRAM FOR THE BELIZE RIVER WATERSHED

5.1 Introduction

Hydrological monitoring involves measuring different parameters and variables, including flow, water quality (sediments, nutrients, temperature, etc.), and climate (precipitation, temperature, etc.).

The proposed hydrological monitoring program for the BRW does not include water quality monitoring of groundwater resources. Furthermore, it does not include climatological measurements as this aspect is monitored effectively by the National Meteorological Service of Belize. The program instead concentrates medium-term resources into better quantifying the ambient conditions of surface waters of the BRW, seeking to establish baseline information of the state of water, to identify the hotspots of environmental impacts, and to monitor to comply with international and national water quality standards amongst the users/stakeholders.

5.2 Justification

In the upper reaches of the BR watershed the presence of several dams located along the Macal River represent a threat because, when the dams are open for maintenance purposes, these are unloading large quantities of sediment, having a negative impact on the coastal-marine ecosystems, including the Mesoamerican Reef.

Furthermore, the Macal River has been changed to a black water river, possibly from draining heavy detritus, resulting in characteristic tea-colored water that is often relatively clear unless filled with sediments. The coloration is largely due to tannins released into the water from the slow leaching of these compounds as leaves and wood decompose.

Throughout the entire watershed, but particularly in the middle reaches, and to a certain extent the lower reaches of the watershed, intensive agricultural activity has caused heavy deforestation inclusive of riparian forest deforestation leading to erosion and sedimentation of the Belize River. Adding to this, high amounts of fertilizer and pesticides are used. Given the potential sources of pollutants to the Belize River, monitoring the BRW water resources is important for maintaining a healthy aquatic ecosystem, preventing water-borne diseases and improving the quality of life for populations whose daily lives is dependent on it.

5.3 Methodology for Monitoring Program Design

A desktop review of existing literature and stakeholder consultations were used to design the proposed hydrological monitoring program for the BRW. The meeting with stakeholders had the goal to determine existing water quality data in Belize, share ideas and formulate a framework for the establishment of a hydrological monitoring program for the BRW.

The monitoring parameters include chemical, physical, microbial, biological, and stream flow aspects. The methodology and standards to be used are based on US Environmental Protection Agency (USEPA), National Department of Energy (DOE), World Health Organization (WHO), US Rapid Biological Protocol (RBP).

5.4 Objective of the Monitoring Program

It was agreed by stakeholders present in the meeting that the objective of the monitoring program is to protect the water resource in the watershed and safeguard the water quality for human consumption and the environment.

5.5. Monitoring Component No. 1: Hydrological Monitoring Network of Laboratories

Given the existing laboratory and human capacity and the ongoing hydrological monitoring activities by several entities in Belize, it was determined that the most practical approach to a holistic monitoring of the BRW is through the formation of a monitoring network.

The Belize River Watershed Hydrological Monitoring Network (BRWHMN) will include two monitoring types: Baseline Monitoring for the upper reaches and Compliance Monitoring for the middle and lower reaches. These two types of monitoring will comply with international and national water quality and quantity standards to meet the general objective of the Monitoring Program.

The baseline monitoring in the upper reaches involves site selection within the catchment area that represents the condition of the entire area to produce quality data. The list of parameters of water quality and quantity will be established and maintained as standard of good quality of water.

The compliance monitoring in the middle and lower reaches involves hotspot pollution monitoring, which is intricately linked to compliance of effluent releases and prioritizes the sources of industrial effluent discharges or point-source (hotspots) pollutants in a watershed. However, principle threats to the middle reaches of the watershed can be grouped into impacts related to agriculture, urbanization, and infrastructure development (roads, dams, bridges, canals, pipelines, transmission lines).

5.6 Project Profiles

Project 1. Formalization of a Hydrological Monitoring Network of Laboratories for the BRW

The objective of the project is to define scope, monitoring details, and roles and responsibilities of each participating member of the hydrological monitoring networking for the BRW. This will be achieved by carrying out in-depth evaluation of current human and laboratory capacities of each network member, carrying out stakeholder consultations to identify scope, monitoring details and roles and responsibilities of network participants, signing a memorandum of understanding (MOU) to agree to participate in the monitoring network, and identifying monitoring sites. The project will be implemented in the entire watershed. It will have a duration of four months, with an estimated total cost of US$80,000.

Project 2. Strengthening Institutional Capacity of Network Members

The objective of the project is to build capacity of network members for optimization of techniques and methodologies, particularly focusing on internal quality control. This will be achieved by reviewing parameters currently monitored, performing training sessions, selecting parameters and methodologies, standardizing data collection, handling and analysis methods, and developing a monitoring program guide. The project will be implemented in the entire watershed. It will have a duration of six months, with an estimated total cost of US$20,000.

Project 3. Belize River Water Hydrological Network (BRWHN): Data Sharing and Storage Platform

The objective of the project is to establish and operationalize a data sharing platform for the BRWHN. This will be achieved by performing stakeholder consultations, signing an MOU for data sharing, procuring network hardware for data storage, establishing a data management committee, and maintaining and managing a data sharing platform for ten years. The project will be implemented in the entire watershed, with an estimated total cost of US$100,000.

Project 4. Operationalization of the Belize River Hydrological Monitoring Network

The objective of the project is to equip and fund the monitoring network and to monitor hydrological parameters within the BRW for 10 years, through the establishment of a project management team with representation from each network member, drafting guidelines for access and distribution of equipment, reagents, and funds, procuring minor equipment and reagents, and allocating financial resources according to roles and responsibilities of network members. The project will be implemented in the entire watershed, with an estimated total cost of US$600,000.

5.7 Monitoring Component No. 2: Community-Based Monitoring Network

5.7.1 Monitoring Approach

The proposed water quality monitoring network is part of a watershed management approach that focuses on community-based watershed stewardship (CBWS), a participatory process that links community groups to low-cost and reliable appropriate technologies for understanding, protecting, and managing their watershed. The community-based monitoring (CMB) program proposes following the model of the Global Water Watch (GWW). Its model promotes long-term water monitoring through community participation. GWW recommends a process through which organizations can establish a partnership with GWW to foster a community-based watershed stewardship and a community-based monitoring program in their local communities, which is formalized with a signed memorandum of understanding. GWW also recommends conducting water testing at least once a month but project partners have the final decision regarding their monitoring schedule.

5.7.2 Objective of the Monitoring Program

The overall objective of the hydrological monitoring program for the BRW as determined by stakeholders is to protect the water resource in the watershed and safeguard the water quality for human consumption and the environment. However, the specific objective of the Community-Based Monitoring program is to promote awareness and the importance of community involvement in the management of the water resources of the BRW. The proposed stakeholders to be involved in the program are Communities along the BRW, University of Belize, Ministry of Education, Government Agencies, Conservation Organizations.

The CBM program proposed for the BRW is a modified version of the GWW program, specifically designed to meet monitoring needs, objectives, and context of the watershed. Below are a brief description of the proposed projects.

Project 1. CMB Design and Training of Trainers

The objective of the project is to design a CMB monitoring program for the BRW and to certify at least 5 trainers to train monitoring participants by the first quarter of 2019. This will be achieved by producing a monitoring program and implementing training workshops. The project will be implemented at the University of Belize, Belmopan Campus, for one week every year for three years, with a total cost of US$30,000.

Project 2. Training of monitoring participants

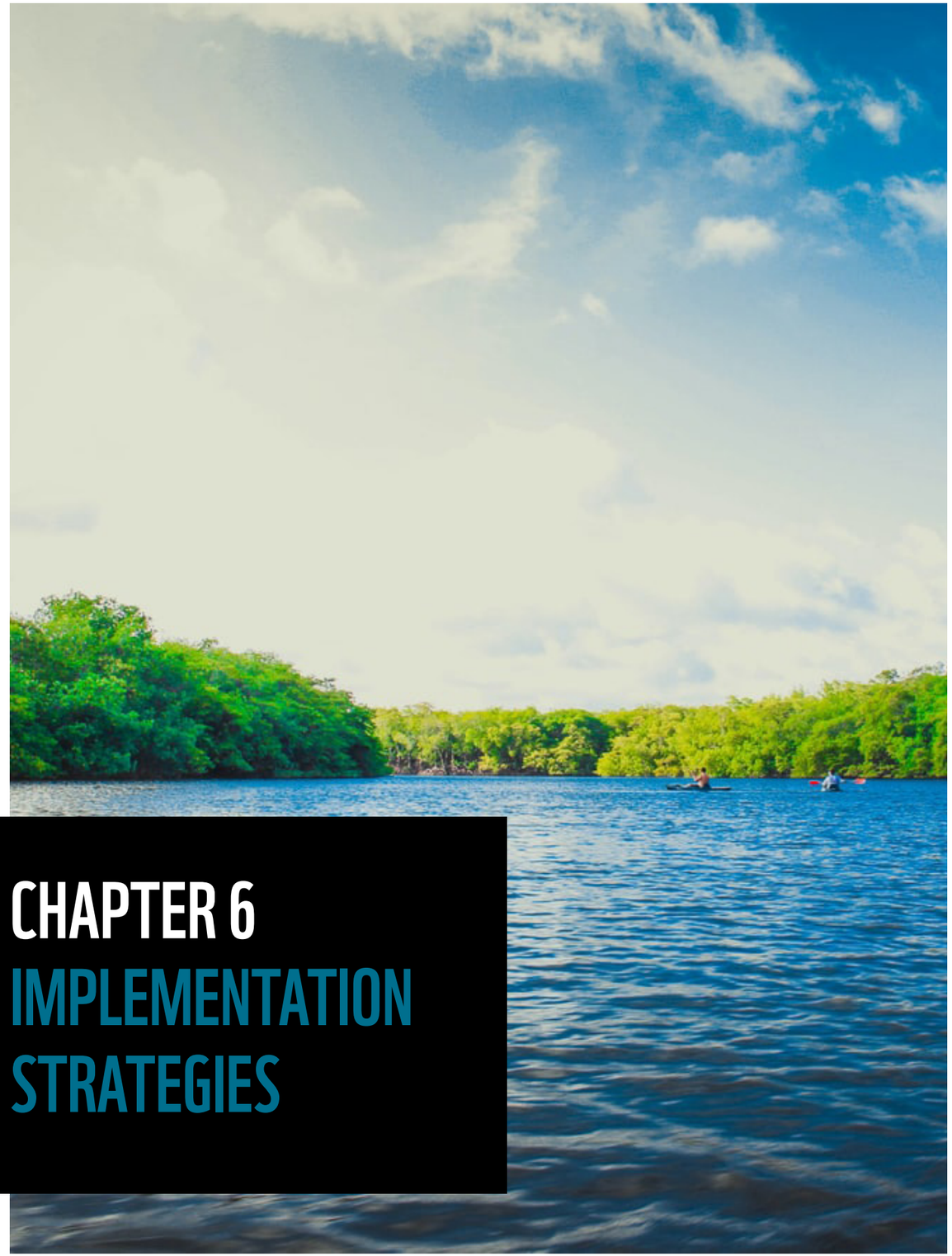
The objective of the project is to equip at least 20 monitoring participants in the first year and as needed biennially thereafter for 10 years, with necessary knowledge and skills required to monitor hydrological parameters using GWW recommended equipment and methodologies. This will be achieved by producing a training manual and implementing training workshops every two years for ten years, with a total cost of US$35,000.

Project 3. Formalization of the CBM network and execution of monitoring activities for ten years

The objective of the project is to formalize the CBM network and to execute monitoring activities for 10 years. This will be achieved by hiring a project coordinator and executing monitoring activities using a phone app for data imputing. The project will be implemented in the entire watershed for ten years, with a total cost of US$500,000.

Project 4. Building Stewardship through Exploring Our Living Streams (EOLS) aquatic science curriculum

The objective of the project is to design and incorporate aquatic science-water conservation education into the curriculum of upper level primary school grades in at least six schools. This will be achieved by designing and incorporating instructional content, materials, resources, and processes into school curriculum. The project will be implemented in schools within the BRW for two years, with a total cost of US$50,000.



CHAPTER 6
IMPLEMENTATION STRATEGIES

A successful implementation requires first to secure the entailed technical and financial assistance. It is also vital that local actors supported by local and central governments and key stakeholders are empowered as the critical workforce for organizing implementation efforts, coordinating, and carrying out the management tasks.

Open communication between organization members and increased involvement of community members are equally important.

The immediate actions proposed below should be led by the existing Belize River Watershed Task Force, based on the horizon of the Plan, according to the achievements of resources. The responsibilities to implement these activities should later be transferred to specific units as agreed by all stakeholders. Evaluation during and after implementation of conservation practices are an indispensable component of watershed management.

No.	Activities	Management Plan Horizon									
		Short Term		Mid Term				Long Term			
		1	2	3	4	5	6	7	8	9	10
1	Institutionalization and government recognition of BRW Task Force	■									
2	Socialization of the management plan and targeted discussions specifically with the UNDP	■									
3	Socialization of transfer of the Management Plan	■	■	■							
4	Development of a mechanism for capturing available resources	■	■								
5	Development and execution of an immediate action plan	■	■	■							
6	Draft an investment plan	■	■	■							
7	Execution of projects	■	■	■	■	■	■	■	■	■	■
8	Preparation of annual operating plans	■	■	■	■	■	■	■	■	■	■
9	Preparation of monitoring and evaluation (M&E) instrument	■	■	■	■	■	■	■	■	■	■
10	Annual reports	■	■	■	■	■	■	■	■	■	■

Table 5: Schedule of Immediate Actions

6.1 Resource Management and Financing

It is envisioned that the socialization of the management plan and targeted discussions with the UNDP for streamlining efforts and for exploring funding potential through UNDP's project will result in success in obtaining some funding.

It is therefore essential that existing resources and any financial resources available through the UNDP are used efficiently and effectively and leveraged to the maximum degree possible. Additional funds can be raised to implement specific projects, as agreed by the stakeholders.

The estimated total cost of the management plan for the BRW amounts to US$6,455,000, for a period of 10 years. As a recommendation, financing mechanisms for the BRW management plan should consider the funds available under the United Nation Development Programme (UNDP) project regarding the Belize River Watershed, the commitment and funding capacity of World Wildlife Fund, funds from the Protected Areas Conservation Trust, and the 5Cs long standing commitment and capacity to source and manage funds for climate related issues.

6.2 Communication Strategy

The general objective of the strategy is to raise awareness and participation of the actors about the BRW management plan, its objectives, and its outputs by engaging with (potential) beneficiaries, relevant stakeholders, and the public, thereby facilitating the achievement of the changes sought by the plan.

For maximum success the communication should be local in nature, adapted to the social, political, and cultural circumstances that arise in its development. Its implementation must seek to influence different stakeholders of the watershed, allowing their participation, their power of decision, and their actions. The potential audiences for communication of the management plan are divided into three groups:

Main Audience:

Are those sought through effective communication, promote new attitudes, behaviors, opinions, in order to achieve an impact on proper implementation of the Plan, such as entities of high political and administrative level, regulatory enforcement and auditing institutions, water user organizations, producer organizations, and population and representative leaders.

Secondary audience:

This audience will support the initiatives and proposals of the main audience, with respect to the effective communication strategy,

6.3 Gender Strategy

The Plan considers that gender equity is a political priority, accompanied by a process of institutionalization.

Gender equality is promoted in work procedures and the organizational or institutional culture sensitive to gender differences, so that it develops a model of respect for gender equity and where women and men who work in it can be identified. All actors regardless of gender are involved in all activities, from planning to the evaluation of the plan. Thus, all programs, projects, and activities implemented under the plan includes spaces for consultation and decision-making and the improvement of women's access to resources while avoiding inequality and discrimination among people.

6.4 Monitoring and Evaluation System

To monitor changes in the watershed, key baseline data and findings are required and need to be translated into indicators for the monitoring system so that conditions can be compared with the prior project situation.

Indicators ideally comprise environmental, social, economic, and institutional indicators. In order to track progress and measure both environmental benefits and socio-economic benefits for local communities, it is important to define performance, impact, and process indicators that can capture the changes resulting from the implementation of programs and projects. Indicators should, wherever possible, be SMART, meaning that they should be specific, measurable, achievable, relevant, and time bound.

The M&E will be overseen initially by the existing Belize River Watershed Task Force, and later it will transition into a specific unit. The M&E will require hardware and software according to how the system is designed. At the beginning of the M&E implementation process, an internal training program will be required for the personnel involved in the activities to be carried out.

Annex 1. The legislation that governs different aspects of watershed management

- Environmental Protection Act, 1992. Department of Environment, Ministry of Agriculture, Fisheries, Forestry, the Environment, Sustainable Development, and Climate Change and Immigration (MAFFESDI).
- Environmental Impact Assessment Regulations, 1995. Department of Environment, MAFFESDI.
- Effluent Limitation Regulations, 1995. Department of Environment, MAFFESDI.
- Pollutions Regulations, 1995. Department of Environment, MAFFESDI.
- Coastal Zone Management ACT. Chapter 329. Revised Edition 2000. Coastal Zone Management Authority and Institute, MAFFESDI.
- Mines and Minerals Act, 2000. Mining unit, Ministry of Natural Resources and Immigration.
- Belize Public Health Act Revised Edition, 2000. Ministry of Health.
- Petroleum Act, 2003. Geology and Petroleum Department, Ministry of Economic Development and Petroleum.
- Forest Act, 2000. Forest Department, MAFFESDI.
- Wildlife Protection Act, 2000. Forest Department, MAFFESDI.
- National Park System Act, 2000. Forest Department, MAFFESDI.
- Land Utilization Act, 1981. Lands Department, Ministry of Natural Resources and Immigration.
- National Lands Act, 1992. Lands Department, Ministry of Natural Resources and Immigration.
- Crown Land Rules (Subsidiary Laws of Belize). Lands Department, Ministry of Natural Resources and Immigration.
- Ancient Monuments and Antiquities Act, 2000.
- Belize Tourism Board Act, 2000. Ministry of Tourism.
- Solid Waste Management Authority Act, 2000. Belize Solid Waste Management Authority, MAFFESDI.
- Fisheries Act (amended by Acts No. 1 of 1983, 10 of 1987 and 22 of 1987). Fisheries Department, MAFFESDI.
- The Pesticides Control Act, 1985. Pesticides Control Board.
- Village Councils Act.