REPUBLIC OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT
WATER MANAGEMENT AND DEVELOPMENT PROJECT

Updating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namukupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) and Updating the Management Plan for Mabira Central Forest Reserve

COMPLETION OF PROJECT REPORT

PROJECT ID NO. P123204
PROC. REF.: MWE/SRVCS/13-14/00285

Submitted to:
Procurement and Disposal Unit – Room 128
Ministry of Water and Environment
Plot 22/28 Port Bell Road, Luzira
Kampala, Uganda.

Project Data

Project location	Mabira Forest Ecosystem
Project start date:	August, 2015

Consultant

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AUGUST 2017

COMPLETION OF PROJECT REPORT SUBMISSION FORM

16th August 2017

To: Permanent Secretary
Ministry of Water and Environment
Plot 22/28, Port Bell Road, Luzira
Kampala, Uganda

Dear Sir,

M/S Joseph Bahati and Associates has provided consultancy services for the following tasks:

i) Up-dating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga);
ii) Updating the Management Plan for Mabira Central Forest Reserve

This is in accordance with the Request for Proposals dated November 14, 2014. ***"We hereby submit the Completion of Project Report, which includes the activities accomplished to date as well as the findings to date. Please find the deliverables attached to this report."***

M/S Joseph Bahati and Associates hereby declare that:

(a) All the information and statements made in this Completion of Project Report as well as the attached deliverables are true and we take full responsibility for any misinterpretation or misrepresentation contained.
(b) Our Report is valid and remains binding upon us for the period of time specified in the contract.
(c) We have no conflict of interest in accordance with ITC 3.
(d) We have met the eligibility requirements as stated in ITC 6, and we confirm our understanding of our obligation to abide by the World Bank's policy in regard to corrupt and fraudulent practices as per ITC 5.
(e) We observed the laws against fraud and corruption, including bribery, in force in the country of the Client.
(f) We affirm that the tasks have been carried out using the Key Experts as earlier indicated in our Inception Report. We accept that the substitution of Key Experts for reasons other than those stated in ITC Clause 12 and ITC Clause 28.4 may lead to the termination of the Contract.
(g) Our Completion of Project Report is binding upon us and subject to any modifications resulting from comments and suggestions given by the Client.

We affirm that we carried out the work in line with stipulated dates in Clause 30.2 of the Data Sheet or as proposed in the Inception report and agreed with the client.

Yours sincerely,

Authorized Signature: _____

Name and Title of Signatory: _____
Name of Consultant (:
In the capacity of: _____
Address: _____
Contact information (phone and e-mail): _____

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LIST OF ACRONYMS

CFR	Central Forest Reserve
CMG	Consultancy Management Group
CSC	Consultancy Steering Committee
KE	Key Expert
NEMA	National Environment Management Authority
NFA	National Forestry Authority
PSP	Permanent Sampling Plots
QAAT	Quality Assurance and Advisory Team
TORs	Terms of Reference
UNCST	Uganda National Council of Science and Technology
UWA	Uganda Wildlife Authority
WIS	Water Information System
WMDP	Water Resources Management and Development Project

EXECUTIVE SUMMARY

PART A: GENERAL OVERVIEW

This report summarizes the achievements of this work titled ***'Updating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) and Updating the Management Plan for Mabira Central Forest Reserve'***. The work was undertaken by M/S Joseph Bahati and Associates, among others to review and update the management plan for Mabira CFRs, develop monitoring mechanisms for the ecosystem health and ultimately ensure that there are mechanisms in place for guaranteeing sustainability of the Mabira ecosystem. It was carried out between August 2015 and June 2017).

The objectives of the work as derived from the Terms of Reference of the consultancy are, to:

i. Establish the current ecological status of the six central forest reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) that constitute the Mabira ecosystem and establish the socio-economic status of communities in and around the six CFRs.
ii. Establish and operationalize a digital database based on Microsoft Windows, consolidating all the data and information collected for the six central reserves;
iii. Review and update the management plan for Mabira CFRs highlighting the lessons learnt from its implementation;
iv. Develop mechanisms for monitoring of Mabira ecosystem as well as the community-ecosystem interactions.

Scope of Work Accomplished

The ecological studies covered the six forest reserves of the Mabira ecosystem (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) while the socio-economic studies covered the human communities around the forest as well as the influence of the neighboring urban centres such as Kampala, Jinja, Lugazi and Mukono. The sites are located in the districts of Mukono, Buikwe, and Kayunga, which were visited several times by the field teams. Large-scale sugarcane and tea plantations as well as communities practicing subsistence farming surround the Mabira Forest ecosystem. These have been interviewed and additional discussions carried out particularly during management planning.

Deliverables/Outputs

The following 10 deliverables of the work have been achieved:

D1. Deliverable #1: Inception Workshop & Report
D2. Deliverable #2: Ecological baseline Report
D3. Deliverable #3: socio-economic/livelihood survey Report
D4. Deliverable #4: Report on Mabira CFR Management Plan
D5. Deliverable #5: Operational Database
D6. Deliverable #6: Guidelines for monitoring ecological health of Mabira ecosystem
D7. Deliverable #7: Completion Project Report (CPR)

Other deliverables that were achieved during the process of meeting the key deliverables include the following:

- Draft report of ecological baseline study
- Draft reports of socio-economic/livelihood survey
- Draft report of updated Mabira CFR Management Plan
- Validation Workshop held for the outputs of the work and comments have been addressed in the reports now submitted

PART B. ECOLOGICAL BASELINE

Plants

The total number of plant species now known from the Mabira Forest Reserve is 636. The trees, shrubs and climbers (woody plants) contribute 450 species (312 were recorded in the previous Forest Department Biodiversity inventory in the 1990s while 138 are new additions from this work). The herbs contribute 186 species. The rest of the reserves have fewer species: 87 (Namakupa), 92 (Namawanyi), 139 (Nandagi) and 68 (Kalagala), and 68 (Namananga). In the case of Mabira Forest Reserve, the climbers and herbaceous species were previously not included, and also data for the smaller forest reserves are here newly presented in this report. Inclusion of data from the five smaller reserves (Namakupa, Namawanyi, Nandagi, Kalagala and Namananga) gives a total of 732 species recorded from the Mabira ecosystem (this includes 252 species of herbs and 480 woody species). Data on Epiphytes, Mistletoes and Stranglers and other non-vascular taxa such as Bryophytes, Licherns and Fungi are required to enhance the knowledge.

Birds

A total of 154 species was recorded across the whole survey, 97 in Mabira Central Forest Reserve and 100 in the five small reserves. The results show that there were more bird species in the main forest than the five small reserves combined. There was little overlap between the surveyed forest sites, with 54 species unique to the Mabira CFR, 58 species unique to the five small CFRs and 42 species occurring in both forests. Most of the bird species recorded during the surveys are classified as “Least Concern” according to the IUCN redlist criteria. Seven of the species recorded are classified as threatened either at global or regional level. These include the Nahan's Francolin, Grey Parrot, Cinnamon-chested Bee-eater, White headed saw-wing, Toro Olive-Greenbul, White-browed Crombec and Green tailed Bristlebill. There were more forest visitors and other non-forest bird species recorded in the small CFRs than in the main forest block. Forest related bird species (FF & F) were much more in the main forest than in the small CFRs.

Small Mammals

The small mammals constitute 22 species (5 shrews and 17 rodents). An additional 9 species are added to these, from records, to make 31 known species. Three closed forest dependent species *Deomys ferrugineus, Malacomys longipes* and *Scutisorex somereni* were recorded albeit in small numbers. A forest dependent species, *Deomys ferugineus* was captured in Namananga and Namakupa forests that have previously been encroached and opened up. In total 12 species of bats were captured with more species captured in Namananga, although historical records available show Mabira CFR to have a higher number of species.

Other mammals: A total of 12 species of medium and larger sized mammals was recorded (the previous record is 19 species). In total, 22 species were recorded for the 6 forests all together. The Mabira CFR has the richest number of species compared to the rest of the forests, which are much more degraded.

Amphibians and Reptiles

Up to 42 species of amphibiansi n 13 genera and 9 families were recorded. They belong to the Order Anura. The family Hyperoliidae had the highest number of genera (3) and species (11). The water-confined families of Dicroglossidae, Hemisotidae, Pyxicephalidae and Pipidae were represented by single species. A total of 32 reptile species belonging to 4 orders, 13 families and 23 genera was recorded.

Butterflies

All together 207 species of butterflies were recorded -114 species in Mabira, 64 in Namukupa, 63 in Namananga, 82 Nandagi, 45 in Namawanyi, and 54 in Kalagala. A reasonably high proportion of forest dependent species was found in all the forests although Mabira CFR had the largest number of such species. Kalagala and Namananga had the highest proportion of more open environment species, which would symbolize the heavy level of impact by humans opening up these forests.

Water Quality and Quantity: The quality of water within Mabira Forest reserve was tested in order to develop a water quality, monitoring framework for the Mabira ecosystem. Physico-chemical parameters that were determined included total nitrogen, total phosphorous, phosphate, nitrate, and nitrite, pH, dissolved oxygen, turbidity, temperature, electrical conductivity, total dissolved sediment and total suspended solids). These parameters were measured weekly from May to December 2016. A total of 170 water samples were collected along the River Sezibwa that drains the Mabira ecosystem and analysed at Makerere University using *adhoc* procedures. About 83% of the samples were collected from different land-uses/cover including forest, sugarcane, wetlands and cultivated land. The remaining samples were collected from, boreholes within Sezibwa catchment, Sezibwa tributaries entering Mabira ecosystems and at the main outlet on Kayunga road. Protocols and tools for data collection were developed. In addition a database was developed for data entry. The pH values of water collected from the different land use types were near neutral except that from rice gardens. The pH, TP, PO_4, TN and NO_3 tended to be relatively high during the dry season compared to the wet season. TSS and water temperature tended to be relatively higher during the wet seasons. Water collected from sugarcane tended to have relatively higher temperature compared to other sampled points. EC and TDS were relatively higher in water collected from Forest compared to the wetlands. TP and phosphate were relatively low in the wetland compared to other land-use. For boreholes, all the other analysed water parameters were within the WHO limit for drinking water, except pH, which was relatively lower.

PART C: SOCIO-ECONOMIC/LIVELIHOOD BASELINE

The main objective of this study was to collect and summarize baseline socio-economic information for the six Central Forest Reserves of the Mabira ecosystem. Specifically, the study assessed: (i) the current socio-economic status of the households and factors exerting pressure on the forest reserves; (ii) community interactions with the forest resource in terms of access, use, conflicts and regulatory policy and institutional frameworks; (iii) the demand and supply dynamics for value addition and marketing of key forest resources; and (iv) the socio-economic and livelihood strategies of households and local communities adjacent to the Mabira forest ecosystem.

The study applied a combination of quantitative and qualitative survey methods. A reconnaissance survey was conducted to identify communities to participate in the study. The study covered communities within and adjacent to the forest at three distance locations i.e. <1 km (including enclaves within the forest), 1-2 km and 3-5 km. Desk based review of documents, household and key informant interviews, focus group discussions as well as market surveys were conducted. Document review generated secondary information on the management and conservation of Mabira ecosystem, livelihood strategies and forest resource use. A pre-coded semi-structured household questionnaire was used to collect quantitative data from a representative sample of 302 households during face-to face interviews. Key informant interviews and focus group discussion guides were used during interactive sessions with forest resource users, such as firewood collectors, charcoal burners, hunters, herbal medicine practitioners, brick makers, fisher folk, and craft makers, among others. Market survey was conducted to explore market chains of key forest products (e.g. fuel wood, poles, fruits, timber and crafts).

The findings from the study show that household size around Mabira forest ecosystem was 4.8 persons, close to the national average of 4.7 persons. The number of households living adjacent to

the CFRs increased by 31.3% since the 2002 national population and housing census. Over 88% of household members had attained formal education. About 49% had completed primary level education, while 32.8% had attained secondary level education. Taking primary level education as a minimum for literacy, then the literacy rate of 88.8% in the study communities is high compared to the national average that stands at 72%.

Most of the Households (70.6%) reported crop production as main source of income followed by livestock (27.1%). On average, crop production generated UGX 2,628,456 (approx. USD 821) annually representing 57.8% of the overall household income.

The overall annual average income from harvesting and sale of forest products was UGX2,312,972. Specifically, harvesting and sale of forest products generated UGX 5,566,667 (USD. 1,740) annually representing 79% of overall household income for households which considered it as primary source. It also generated UGX 1,104,750 for HHs that considered it as a secondary source and UGX 267,500 for HHs that considered it as a tertiary source. Overall average annual income from the harvesting and sale of forest products decreased as distance from the edge increases implying that households located with 0km earned more income form forest products as compared to those located 3-5 km.

As far as peoples' wellbeing is concerned, a survey of their household endowments based on items used for housing, agricultural production, conservation and household health status revealed that:

i) Over 72% of households have constructed iron roofed houses, implying reduced use of timber for construction;
ii) Over 77% of households use hand hoes for agriculture while only 1.7% own a post-harvest storage facility, implying that there is likelihood of food insecurity in such households that do not store for the future;
iii) Only 15% of households own woodlots, implying that the majority of households obtain their wood products from off farm sources, and therefore probably depend highly on forest sources;
iv) Approximately 76% of households owned radios, while over 50% had mobile phones, implying that there is a high level of connectivity, which may, in some, instances be useful as vehicles for transfer of conservation messages, although the phones may also be used to enable illegal extraction of forest products.

Using 2015 as a reference year, most households experienced three months of food insecurity that year. Households' food security status was noted to improve as the year progresses with very few households facing food shortages during the month of December. Also during January, the most pronounced hunger month, more of the households that indicated experiencing food shortage. Larger households faced food shortages compared to smaller households and this difference were statistically significant ($t = 8.62, df = 272, p < 0.05$) further suggesting that; larger household are more food insecure than smaller ones. Larger households therefore need to incorporate more strategies for agricultural intensification to address food insecurity.

With respect to livelihood strategies; 53% of the households reported crop farming as their major source of livelihood, while 25% said that they keep livestock for livelihood. A range of alternative sources of livelihood was recommended for the communities. These include: (i) Use of improved agricultural practices such as mulching, crop diversification and use of improved crop varieties; (ii) use of crop residues for energy; (iii) community ecotourism; (iv) use of agroforestry practices such as integrated crop-livestock systems and shaded coffee agroforestry; (v) smallholder diary; (vi) zero grazing; (vii) production pharmaceutical farming i.e. cultivation and processing of medicinal plants; (viii) fruit processing; (ix) tree planting; and (x) avoid deforestation.

Findings on land ownership indicate that the average land ownership by households in and around Mabira forest ecosystem is only 2.4 acres. The main land tenure systems in this area are registered freehold, leasehold and kibanja (tenants). However, within the enclaves and some areas adjacent to Mabira CFR, mailo land comprises the main form of land tenure system. Only a few households have leasehold status on land in the study area. The majority of the farmers in the area has no land titles and therefore do not enjoy security of land tenure. Land resource and tenure rights are sometimes overlapping promoting conflict and impeding development. Insecure land tenure poses a threat to conservation of neighboring forests given the uncertain rights of occupants. Tenants on 'kibanja' land do not even have security of tree planting as this may be prohibited by the bonafide land owners. Therefore, there is need for communities to negotiate with land owners for implementation of the alternative livelihood strategies. Although some households are able to purchase their own land, they have not thought about this and therefore require encouragement so as to secure their tenure rights.

With regards to access, only 47% of households reported having direct access to forest products. More households located within the 0 Km (69%) and 1-3 Km (55%) distances from the forest reserves reported access to the forest. About 21.6% of households located 3-5 km from the forest reported having direct access to forest resources. This implies that households located up to 3 km from the forest have more access to (or have higher dependence on) forest products compared to those further away. In terms of gender, a larger proportion (51%) of male-headed households reported having access to forest resources as compared to 35% of female headed households. The forest products accessed from the forests include firewood, timber, poles, rattan canes, charcoal, water, climbers (for basket), medicinal herbs, fruits and wild yams. However, the most important forest products in order of mention by respondents include firewood, water, poles, timber and fruits.

Access to water in the CFR: Overall (Yes=69.64%, No=30.36%). When dis-aggregated by distance as key domain of analysis; 0km (*Yes=100%, No=0%*), 1-2km (*Yes=55%, No=45%*), and 3-5km (*Yes=40.74%, No=59.26%*). Access to water increased with a decrease in distance from the edge of the CFR and the relationship between was significant at 5% level. All HHS in enclaves accessed water in the CFRs.

Marketing of forest products was very low with only 14% of the households selling the forest products. These findings suggest that a majority of the households apparently access forest products for their subsistence use. Moreover, there was very little value addition to these products. This subsequently affects the prices, which were reported to be low, especially in the areas close to the CFRs. Markets further away from the forests tended to be more lucrative. However, there was very little access to such regional markets by the households sampled.
From the foregoing, this study recommends the following actions to be taken in ensuring sustainable coexistence of the forest resources and community livelihoods:

1) Community interactions with the forest resource in terms of entitlement, access, use, conflicts and regulatory policy and institutional frameworks
   i). Strengthen enforcement of laws, policies and regulations governing the six CFRs. Monitoring of illegal activities is not undertaken with due diligence partly due to lack strong structures on ground which in turn is attributed to inadequate funding. NFA and district officials should be facilitated adequately to monitor the CFRs and enforce the laws. For example, conduct periodic, preferably, annual re-opening of forest boundaries and evict encroachers. This will also help discourage potential encroachers.

ii). Strengthen sensitization of the local communities on the existing laws governing the CFRs, and the importance of conserving the CFRs through community dialogues especially with lesser receptive communities e.g. in Sii Sub County. In addition, strengthen engagement with communities around CFRs to participate in the monitoring and prevention of threats to forest health. Volunteers to serve as focal points to help in simple actions for monitoring health- and pest-related developments in the forest can be designated.

2) Demand and supply dynamics for value addition and marketing of key forest resources

i). Conduct a detailed value chain analysis of all main forest products from the CFRs. Investigating the sequence of forest production and marketing in all their facets – including research and development, the regulatory framework, raw material supplies – is a key to any systematic improvement. It enables policy makers to create favorable framework conditions which promote competitive enterprises, sustainable jobs and income for local people. Furthermore, it allows impact-oriented monitoring of initiated policy actions.

ii). Promote establishment of nurseries and woodlots among the communities within and around the 6 CFRs to provide alternative fuel sources and construction poles thereby relieving pressure from the forest reserves.

iii). Promote establishment of alternative water sources (such as boreholes, springs) in the adjacent so as to reduce reliance on the forest reserves.

3) Livelihood strategies of households and local communities adjacent to the Mabira forest ecosystem

i). Strengthen the functionality of CFMs through increased access to funding, skills development and adoption of appropriate production and value additional technologies to CFM products.

ii). Strengthen adoption of effective modern farming practices including introduction of better crop production technologies. MWE in partnership with key stakeholders (NFA and NaFORRI) should liaise with appropriate research institutions to introduce high yielding; drought resistant; and early maturing crop varieties to increase food production by households adjacent to the CFRs.

iii). Strengthen agriculture production on-farm by increasing adoption of modern farming methods, including agroforestry, agronomic practices, soil conservation practices in order to enhance agriculture production, food security and incomes to relieve pressure from the CFRs. Support households to diversify to other sustainable IGAs, e.g. planting of Cocoa as buffer around CFRs.

iv). Strengthen adoption of appropriate technologies for post-harvest handling and values addition to agriculture produce at household level. This will attract high prices at farm-gate level and marketed produce. Promote planting of indigenous and conservation of indigenous tree species on-farm, e.g. *Maesopsis eminii, Prunus africana*, *Warbugia ugandensis*, *Cordia milenni*, among others.

PART D. REVIEW AND UPDATE OF MANAGEMENT PLAN FOR MABIRA GROUP OF FORESTS

The Planning Process

The process of updating this Forest Management Plan began in 2016 in order to incorporate issues emerging from ecological and socio economic baseline studies carried out in Mabira ecosystem and communities surrounding Mabira ecosystem CFRs in Mabira MPA in line the recommendations in the Kalagala Offset Sustainable Management Plan (KOSMP). The update process was participatory entailing comprehensive stakeholder consultations from community (village) through Sub County and district to national level. A technical planning team was constituted and consisted of 21 members drawn from NFA, DLGs and consultants from Joseph Bahati & Associates. The technical

planning team went through an induction process to orient them to the Forest Management Planning framework.

Location and area

Namukupa, Nandagi and part of Mabira are situated in Mukono District while Namawanyi, Namananga and Kalagala falls are located in Kayunga District. The biggest part of Mabira is situated in Buikwe district. These central forest reserves (CFRs) have a total area of 31,293ha and this Forest Management Plan (FMP) is for the entire MPA.

Summary of Updated Information

Chapter 1: Physical description of the MPA

- For ease of linkages, partnerships and collaboration with district and lower local governments, all the administrative counties and sub counties in which the CFRs in the MPA are situated have been included
- A map of all the CFRs in the MPA has been included
- A drainage map for Mabira ecosystem has been included

Chapter 2: Socio-economic environment

- Information on the total economic value (TEV) of the CFRs in the MPA, estimated at UGX 18,606,348,073,334 (USD 4,774,132,615), has been added.
- Illegal production of charcoal especially in the CFRs of Namananga, Namawanyi and Namakupa primarily from paper mulberry has been highlighted
- The increasing use of sticks for roasted meat (barbeque) in Namawojolo and Najjembe has been pointed out
- The upcoming and emerging markets for charcoal and other forest produce in the mushrooming urban centers such as Bukoloto, Kangulumira, Najjembe, Nakifuma in addition to the major towns surrounding the MPA has been included.
- Seeds and wildlings have been added to the list of major forest products derived from the CFRs
- The population data has been updated using the recent national population and housing census data (UBOS, 2014)
- Under growth statics and yield of forest products, an annual allowable cut of 9,800m3/year of round wood for timber production considering a 30 year harvesting cycle has been recommended
- The list of stakeholders, their specific roles and responsibilities as well as their rights and benefits has been updated. The additional stakeholders include: Buganda Kingdom, Industrialists (SCOUL, Uganda Tea Corporation, BEL), law enforcement agencies (Police, UPDF), UWA, Parliamentarians and other political leaders, line ministries (Ministry of Water and Environment, Ministry of Energy and Mineral Development Ministry of Finance, Planning and Economic Development, Ministry of Tourism, Wildlife and antiquities)
- The need for NFA to develop a comprehensive conflict and grievance redress mechanism which addresses the issues of legitimacy, equity, transparency, accessibility, engagement and dialogue has been recommended.
- Two additional forest stations in the MPA have been proposed

- A manpower gap of two forest supervisors and five patrol men has been identified
- A recommendation to revise the remuneration for patrol men from the current UGX 80,000 to UGX 200,000 per month has been included
- In the award of contracts and employment, it is been proposed that special consideration be given to forest adjacent communities taking into consideration gender and equity issues
- The number of threats identified in the FMP has increased from 6 to 17
- Conflict and grievance analysis has been more extensively undertaken and the number of conflicts identified has increased from one to four broad conflict/grievance areas.

Chapter 3: Environmental Considerations

- The Ecological Baseline information is presented in Part B (above)
- The carbon stored in the CFRs in the MPA is estimated to be 17,211,150 tons which is valued at approximately UGX 940,761,459,000
- Other ecological services such as maintenance of soil quality and provision of organic materials through leaf and branch fall, nutrient cycling and soil formation, control of erosion and protection of soil from the direct impact of rainfall, modulating climate and provision of habitat for many plants and animals have been added to the FMP
- A section on wetlands, rivers and streams as well as vulnerable/ecologically fragile areas has been added
- A detailed list and map of socio-cultural sites and their specific uses has been included
- Emerging issues such as the effects of climate change on the forests and the livelihoods of the forest edge communities have been well articulated in the FMP. Vulnerability, adaptation and mitigation options for climate change have been highlighted. Issues of gender and equity in regard to access, use, control and governance constraints have been highlighted as well.
- REDD+ as a tool for conserving the CFRs in the MPA while promoting sustainable development has been incorporated in the FMP

Chapter 5: Basis of the Plan and Management Objectives

- The vision of the MPA has been improved to reflect the current national and global planning and development frameworks such as vision 2040 and SDGs. The vision for the MPA is: *A well-managed, economically viable, ecologically and environmentally stable forest estate that provides sustainable products and services to the local and global community.* This is different from the previous one which was; to conserve the ecosystem for nature-based tourism investment and supply high quality products for improved livelihoods of the people of Uganda.
- The mission of the MPA has also been revised to read as; To improve management of Mabira CFRs by harnessing their multiple uses and partnerships to produce high quality products and services for the improved livelihoods of the people of Uganda instead of; sustainable management of embracing multipurpose uses to realise its full utilisation through partnership forest management and applied research for prosperity for all the people of Uganda.

- The budget for implementation of the planned activities in the FMP is miserably too low and it is recommended that more funds should be sourced for effective implementation of the FMP and ultimately the management and conservation of the forests in the MPA
- A well-coordinated implementation mechanism including all major players or actors has been recommended.

Chapters 6, 7, 8 & 9: Planned Management Activities, Potential Impacts and Mitigation measures, Management and Logistics and Financial matters

- A total of 151 prescriptions (of which 55 are new) have been proposed for the implementation of the FMP. Refer to Annex 2 below.
- Restoration planting has been recommended for degraded areas
- Regular maintenance and assessment of the 21 PSPs has been prescribed
- Scaling up of collaborative forest management (CFM) to include all the compartments adjacent to the communities has been prescribed with the aim of improving the livelihoods of communities as key stakeholders. This is expected to increased community participation in forest management activities.
- Improved protection against illegal activities has been prescribed in order to conserve the biodiversity in the CFRs in the MPA
- Activities aimed at improving the quality of services at NFA managed eco-tourism at Najjembe have been identified and prescribed
- Activities aimed at improving ecotourism in the MPA such as marketing have been identified and prescribed
- Research into alternative uses and management of paper mulberry in Eastern blocks of Mabira among other things has been identified as key.
- Mitigation measures to address potential technical, environmental and socio-economic impacts that may arise in the course of implementing activities under this FMP have been suggested
- Urgent repair and maintenance of old and construction of new staff houses has been recommended
- Procurement of new motorcycles and provision of adequate funds to run and maintain the vehicles in the MPA has been prescribed
- Sourcing of additional funds to effectively implement the planned activities in this MPA has been emphasized

PART E: OPERATIONAL DATABASE

Under this project, Objective 2 was to "Establish and operationalize a digital database based on Microsoft Windows, consolidating all the data and information collected for the six central reserves". The six Central Forest Reserves in the Mabira Forest Ecosystem include Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga. Accordingly, the database was developed through a series of logical phases which included (i) Requirements Gathering + Stakeholder mapping, (ii) System Modelling and Design, (iii) System Development and Testing, (iv) User Acceptance training and (v) Maintenance, an operatioonal database system which is compatible and integratable with the Water Information System (WIS) has been Implemented in MYSQL.

The key features of the system include:

(i) The system administration can from time to time create users and assign the different roles on the system
(ii) The system provides for reports.
(iii) Users can create their own reports based on a desired decision from time to time.
(iv) System allows the user to carry out surveys in the same site in case there is need to analyze the change in the various parameters.
(v) System can interface other systems through pre-defined interfaces and excel uploads
(vi) The system is fully integrated with the Water Information Management System

The key benefits of the system include:

(i) Centralised storage of data captured
(ii) Ease of analysis of captured data
(iii) Reports and Dashboards to guide the decision makers based on data collected.
(iv) Single view of a site visited across the different studies undertaken at the same site.
(v) Security of the data captured.

PART F: PLAN FOR MONITORING ECOLOGICAL HEALTH OF MABIRA ECOSYSTEM

The Mabira Forest ecosystem is globally recognised for its importance in the conservation of biodiversity and watershed management in the fragile Lake Victoria basin ecosystem ecosystem. Human and wildlife populations within this area derive their livelihood from the Mabira ecosystem. It is necessary for the Mabiral Central Forest Reserve management to ensure that the conservation integrity of the forest is upheld. Given the natural and anthropogenic problems within the reserves, developing a plan for monitoring the Ecology and community-ecosystem interactions is inevitably a priority. With support from the World Bank, the Ministry of Water and Environment tasked a team of Consultants to work with stakeholders and develop a monitoring plan for the Mabira ecoststem. This is the outcome of the process carried out alongside the development of the management plan.

This plan provides an overview of the global importance of forest reserves within the Mabira ecosystem and highlights management challenges. These include forest degradation, external pressures for degazettment, illegal human activities in the forest reserve, and conflicts over use of forest reserve resources among others. Effects of climate change and Invasive Alien Species are also addressed. In addition, observations regarding the current monitoring needs for the reserves are discussed based on literature and additional research. This monitoring plan provides the goals and objectives of monitoring specific aspects of the reserves such as vegetation change, fauna and flora, water quality and quantity, climatic parameters, human activities and their impacts. The following aspects will, specifically, be monitored: vertebrates; human impacts; water quality and quantity;

climate, gravity flow schemes and glaciers; resource use; as well as vegetation and land cover. Aspects of data handling and general recommendations for the EMP are presented.

To guide the forest reserve management in monitoring the ecological and socio-economic aspects, this plan sets out approaches for conducting the monitoring. Aspects highlighted include key considerations in identifying and using indicators, baselines against which changes can be detected and the importance of involving the local communities in monitoring such changes. Detailed sampling designs, techniques and tools for gathering data (monitoring protocols and formats to be used by people of different levels of skills and at various times) are presented in this plan. These are aimed at ensuring quality, credibility and consistency in monitoring. The plan also discusses the procedures for recording, managing and analysing the data, interpretation as well as reporting. Management of Mabira Central Forest Reserves will however, prioritize the proposals and decide on what aspects to monitor, depending on available resources.

In order to implement this Ecological Monitoring Plan for Mabira, it is important for NFA and other stakeholders to decide on 'what data are needed, and for what purpose'. This plan provides detailed methods that can be used to address monitoring needs for various purposes: from the management oriented to the academic. During preparation of this monitoring plan, the need to have various baselines was emphasized by various stakeholders. It would be ideal and desirable to include such baselines, but this has not been achieved in this plan because of two reasons: i) many of the data that exist, require verification and preliminary analyses to extract the baselines; and ii) various data are held by other stakeholders. Obtaining such data requires that proper mechanisms for the sharing of the data are put in place. Partners must, therefore, be invited to contribute to the monitoring programme. Moreover, there is a need to ascertain what data are available and what plans there are for utilizing such data. The NFA should take a lead in ensuring that this plan is implemented.

PART G: CONCLUDING REMARKS, CHALLENGES AND LESSONS LEARNED

- The ecological surveys have added to the list of species known from the Mabira Ecosystem
- The data suggest that small forests do support reasonable numbers of forest species
- The relatively high turnover of species across sites implies that a series of such forests could, collectively, hold a significant number of forest species
- This can not be said to be conclusive, hence additional efforts are still required
- However, the findings can already be used to guide management decisions

Overall, the findings show that measures are needed to strengthen protection of the forest to ensure its ecological integrity. However, it is necessary to work towards improving the condition of adjacent communities. A range of potential alternative livelihood strategies are proposed by the communities could be analysed and prioritized. They include: 1) Use of improved agricultural practices such as mulching,; crop diversification and use of improved crop varieties; 2) use of crop residues for energy; 3) community ecotourism; 4) use of agroforestry practices such as integrated crop-livestock systems and shaded coffee agroforestry; 5) smallholder dairy farming; 6) zero grazing; 7) production pharmaceutical products i.e. cultivation and processing of medicinal plants; 8) fruit processing; 9) tree planting; and 10) avoiding deforestation to benefiting from carbon credits. The suggested alternatives indicate that the majority of them involve the use of land.

The management plan, the monitoring guidelines and the database that have been developed should be used to strengthen management and improve livelihoods. Ultimately, the integrity of the Mabira Forest Reserves will be sustained. The smaller reserves also require attention since they contain some species of conservation concern.

In general, the work was carried out largely as planned. There were some delays during the beginning mainly related to the February National Elections in Uganda and flow of funds. These have to be taken into account during the planning of projects. The scheduling of release of funds required improvement to ensure progress. It appears that the scheduled completion of the Ecological baseline Survey as well as the Socio-economic/livelihood baselines was too early in the work plan and gave very limited time for the tasks to be accomplished prior to activities following them. Moreover, the communities, officials always require to be facilitated or motivated to participate in project activities.

1.0. INTRODUCTION

The work commenced with an Inception Workshop where an ***Inception Report*** was presented as the first deliverable. The report gave a detailed account of the methods that were to be used to implement the work. At the workshop, the proposed methods and procedure were presented to the key stakeholders and agreed with them. Modifications were suggested, and once these were addressed, the team was authorized to proceed with fieldwork following the objectives as explained in the following text:

Objective 1 (*Establishing the current ecological status of the six central forest reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) that constitute the Mabira ecosystem and establishing the socio-economic status of the communities in and around the 6 CFRs*. Within Objective 1a (the ecological baseline) and objective 1b (the socioeconomic baseline), the fieldwork was completed within the limited time allocated. It would have been desirable to carry out more sampling to capture the seasonal variability (especially of fauna). Hence the deliverables ii and iii have respectively been achieved i.e. ii) *Revised report of ecological baseline study*; and iii) *Revised report of the socio-economic/livelihood survey*. The clients and other stakeholders provided comments which have been addressed and revised versions submitted.

Within the ecological baseline report, in addition, data collected during the present surveys were compared with data compiled from the Forest Department biodiversity inventories carried out in 1996 as well as other inventories carried out thereafter. Progress with these activities is summarized in the detailed draft reports report.

The ecological data, includes: species data on plants (trees, shrubs, climbers and herbs), birds, small mammals, large and medium sized mammals, butterflies, herpetiles (Amphibians and Reptiles), and Benthic macro-invertebrates. Data have also been collected on water quality and soil characteristics.

Socio-economic data were collected on various aspects of forest utilization and management. Data on resource use have been collected to document the livelihood issues and economic benefits.

Objective 2 (*Establishing and operationalizing a digital database based on Microsoft Windows, consolidating all the data and information collected for the six central reserves*). The data base has been developed based on information derived from the data record forms used by the ecological and socioeconomic baseline teams. Discussions have been held with various technical staff at NFA, the main users of this database.

Objective 3 (*Reviewing and updating the management plan for Mabira CFR highlighting the lessons learnt from its implementation*). Various meetings were held with stakeholders to discuss challenges related to forest utilization and access. The findings were analysed as part of the write up process.

Objective 4 (*Developing mechanisms for monitoring the Mabira ecosystem as well as the community-ecosystem interactions).* The drafting of this report was done based on the outputs of the Ecological and Scocio-economic baselines. A participatory process was used to validate the proposals carried out alongside the management planning task.

2.0. ADMINISTRATIVE MATTERS

The management and administrative activities continued as planned. The team of Key Experts and Non Key Experts kept together all through the work. Regular meetings were held and progress is evaluated on a regular basis. The appointed key experts (KE), namely Dr Joseph Bahati (Chair and KE – Forest Ecologist), Dr. Gerald Eilu (KE – Taxonomist), Dr. Mary Namaganda (KE – Botanist), Dr. Robert Kityo (KE – Zoologist), Dr. Daniel Waiswa (KE – Data/Information Specialist) and Mr. Jude Sekatuba (Socio-economist) coordinated the field activities and liaised with the project officers at the Ministry as well as the NFA. A number of meetings were held with the client (MWE) as well as the main beneficiary (NFA) to ensure that implementation is agreeable to all parties and the correct procedures were followed.

Following the signing of the contract, the Management Structure of this consultancy under M/S Joseph Bahati and Associates was operationalized to ensure efficiency and to ensure timely achievement of the desired deliverables. The two major management teams i.e. the Consultancy Management Group (CMG) and the Consultancy Steering Committee (CSC) held several meetings to steer the work forward. The CMG (comprised of Dr Joseph Bahati, Dr. Samson Gwali, Mr. Kepher Kateu Kuchana and Mr. Moses Odeke) took up the responsibility for the overall coordination of the consultancy.

The Consultancy Steering Committee (CSC) made up of nine members (composed of the CMG members and key experts, namely Dr Joseph Bahati (Chair and KE – Forest Ecologist), Dr. Gerald Eilu (KE – Taxonomist), Dr. Mary Namaganda (KE – Botanist), Dr. Robert Kityo (KE – Zoologist), Dr. Daniel Waiswa (KE – Data/Information Specialist) and Mr. Jude Sekatuba (Socio-economist) met several times to review progress, develop. The Key Experts had the responsibility for ensuring that consultancy activities within their teams proceed as planned.

The External Advisory Structure (Quality Assurance and Advisory Team - QAAT) was operationalized at the inception stage of the consultancy prior to launching the consultancy. It comprised of scientists and practitioners with high level knowledge of the issues the consultancy is addressing. The QAAT members provided an external check on consultancy implementation as well as capacity building and community rapport.

3.0. METHODS

The field teams largely used the methods presented in the Inception Report (and the initial proposal). No major changes were introduced. The analyses (mainly of ecological data) followed the major aspects presented in the Biodiversity Reports on the Forest Department Biodiversity Inventories carried out between 1994 and 1996. No major changes were introduced. Appropriate analytical methods were used for the taxa not previously included in the biodiversity reports i.e. herbs, climbers, primates, and Benthic Macro-Invertebrates. Similarly, the socioeconomic surveys were carried out using household questionnaires, Key Informant Interviews and Focus Group Discussions.

The database development component involved consultation with potential users of the database to ensure that user needs were captured. The design was partly based on the data sheets development and on existing databases that were to be integrated. Similarly, the monitoring plan was mainly based on user needs.

In the case of the Management Plan, the planning process started in 2005 with formation of a planning team consisting of staff of the National Forestry Authority (NFA) and officers from institutions whose work is closely related to forestry. Members of the team consulted the communities adjacent to the forest reserves and other relevant stakeholders. The information collected during these meetings coupled with secondary technical data collected from various sources was compiled, analyzed and used for the preparation of this forest management plan (FMP). Updating the management plan was undertaken in 2016 in order to incorporate emerging issues from ecological and socio economic baseline findings. The update process was participatory in nature.

4.0. WORK ACCOMPLISHED

4.1. OVERVIEW OF ACTIVITIES

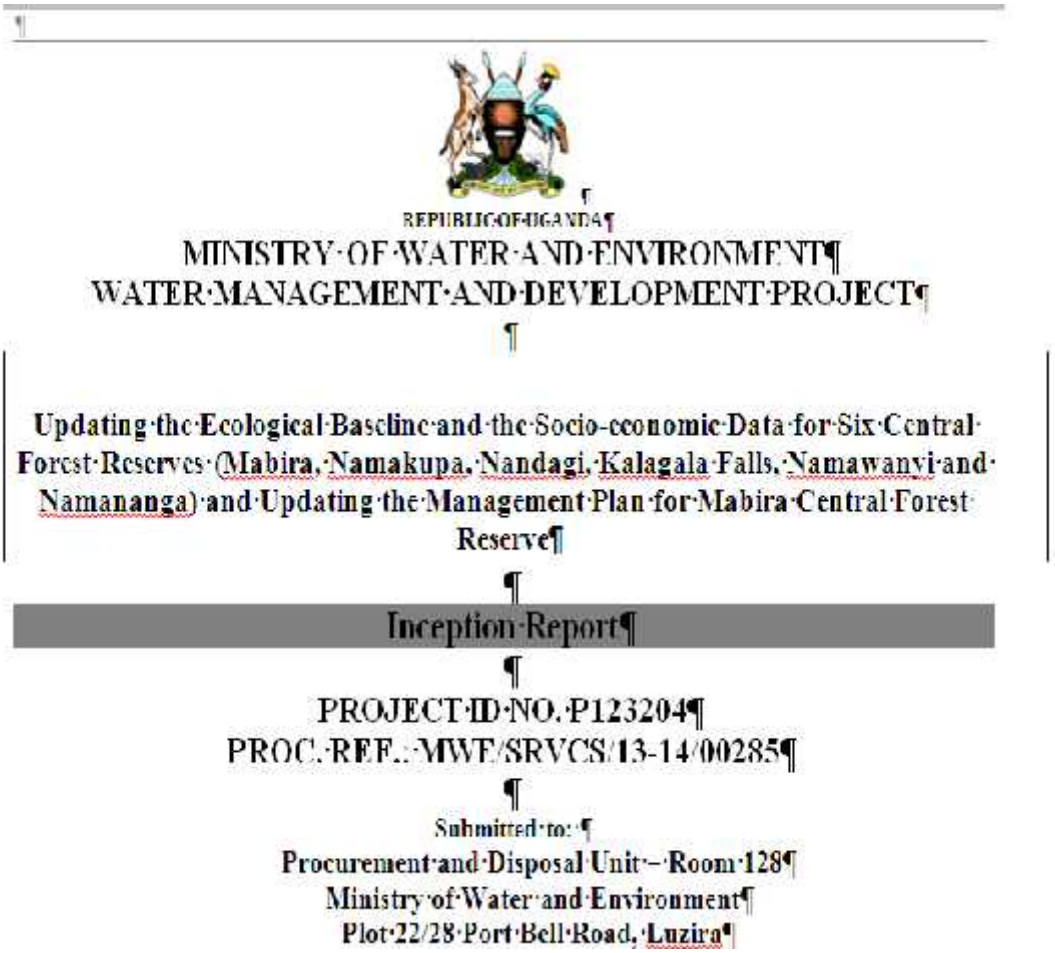
The following activities stipulated in the TOR were carried out:

1. Collecting, analysing and documenting relevant data and information required to establish the ecological baseline for Mabira ecosystem;
2. Collecting, analysing and documenting relevant data and information related to socio-economics and livelihood of communities and institutions adjacent to the Mabira forest ecosystem;
3. Collecting and assembling environmental, ecological, socio-economic and associated data to establish at the minimum on vegetation types, extent and intensity of use, human and natural disturbance, list of indicator plants, and mammals;
4. Documenting environmental and ecological information in order to support the management planning process;
5. Assessing information and where necessary collecting additional data in order to determine the presence, current status and trends of High Conservation Value Forests (HCVF) and associated conservation attributes;
6. Undertaking a threat analysis including assessment of drivers and their associated agents with rare, threatened and endangered species and their habitats; the existence of safeguards, size and representativeness of the key habitats, quality and quantity of key ecosystem services, pest disease management
7. Based on information collected and assembled above, describing the actual and potential impacts on the environment; and an assessment of risks to the environment, soil conservation, habitat and invasive species to guide management.
8. Assessing the effectiveness of the current measures employed to maintain or enhance the applicable conservation attributes. The team proposed additional measures from best practices for conservation;
9. Assessing the current socio-economic status of the communities living around Mabira forest ecosystem and the contribution of the forest goods, services and attributes to their livelihoods.
10. Identifying and assembling information and data for promoting the conservation of natural forests especially the High Conservation Value forests;
11. Establishing a Windows Access database on Mabira forest ecosystem based on data and information collected;
    a) Designing, developing and supporting the operationalization of the database
    b) Linking the database to the Water Information System (WIS) and other databases (not done due to absence of WIS)
    c) Building the capacity of the client in the operation, maintenance and updating of the database
12. Reviewing and updating the management plan for Mabira ecosystem covering Namakupa, Nadagi, Kalagala Falls, Namawanyi and Namananga Central Forest Reserves
13. Assessing the effectiveness of the Mabira Management plan as part of the Kalagala Offset Sustainable Management Plan, highlighting lessons learnt from its implementation so far;
14. Preparing a monitoring plan that will, at the minimum address the frequency, intensity and procedures as well as parameters or variables for assessing the health of the ecosystem taking into consideration the community interactions;
15. Undertaking a full and effective participatory consultation on the baseline findings and their implications for Mabira ecosystem plan as well as KSMP; and
16. Undertaking a full and effective participatory consultation on the proposed monitoring and assessment plan.

The outputs related to these activities are summarized in sections 4.2 -

4.2. DELIVERABLE #1 (. D1): INCEPTION WORKSHOP AND REPORT

The work commenced with an Inception workshop in January 2016 where an ***Inception Report*** was presented as the first deliverable. The report gave a detailed account of the methods that were to be used to implement the work. At the workshop, the proposed methods and procedure were presented to the key stakeholders and agreed with them. Modifications were suggested, and once these were addressed, the team was authorized to proceed with fieldwork in line with stated objectives. The cover page of the report is shown in Figure 1, Appendix I.


REPUBLIC OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

WATER MANAGEMENT AND DEVELOPMENT PROJECT

Updating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) and Updating the Management Plan for Mabira Central Forest Reserve

Inception Report

PROJECT ID NO. P123204

PROC. REF.: MWE/SRVCS/13-14/00285

Submitted to:

Procurement and Disposal Unit – Room 128

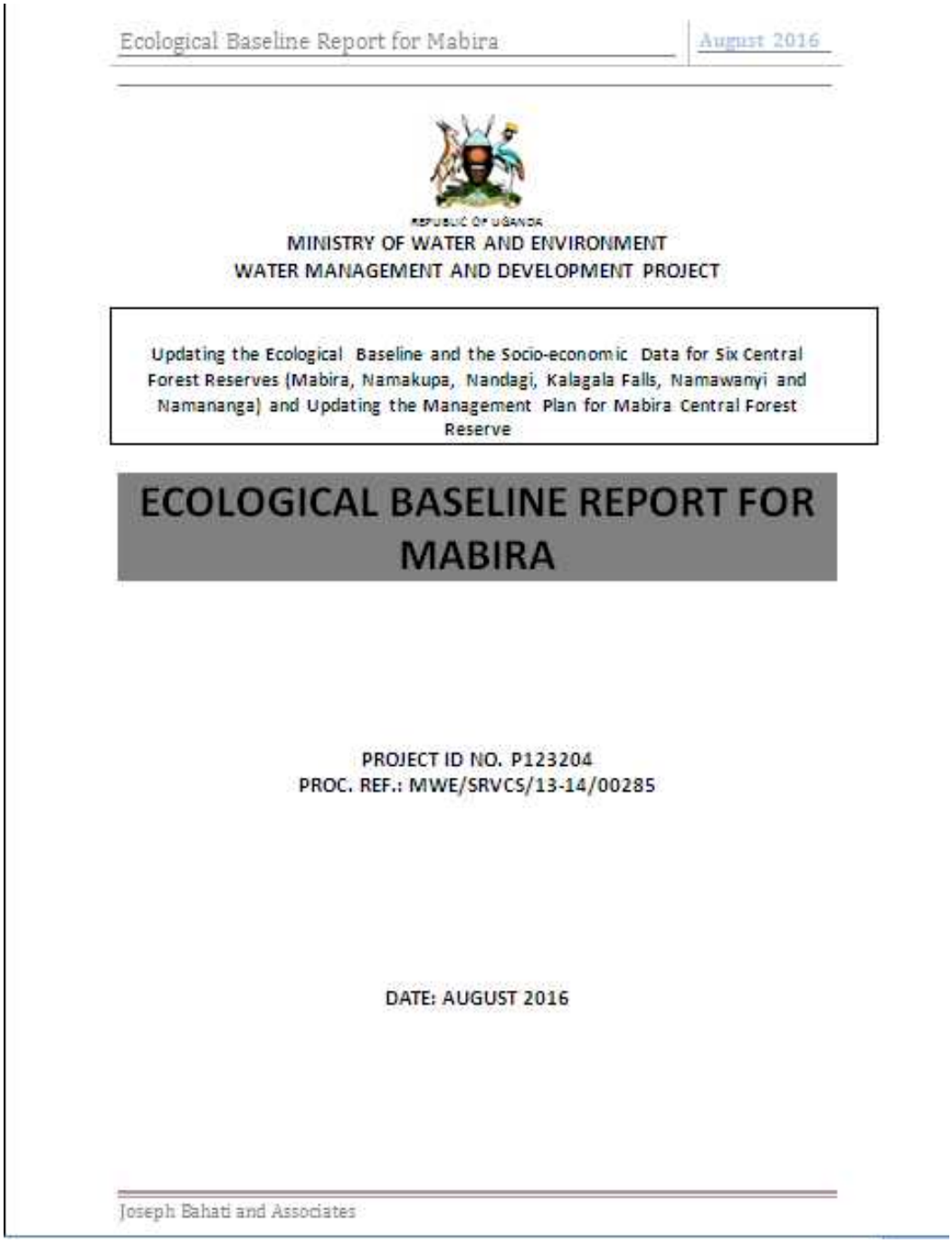
Ministry of Water and Environment

Plot 22/28 Port Bell Road, Luzira

Figure 1. Cover page of the inception report

4.3. DELIVERABLE #2 (D2): ECOLOGICAL BASELINE REPORT

Following presentation of the Inception Report, the data collection tools were finalized and tested in the field. These were used to collect data. Concurrently, there were ongoing reviews of literature and other data sources, to generate an update of the current state of knowledge. The outcome of these reviews and additional data collected during this assignment (on some of the taxa) are presented in the report. This deliverable aimed at establishing the ecological baseline data for the Mabira ecosystem: action 1 (objective 1a). The draft report was submitted and subsequently the final Ecological Baseline Report was finalised and submitted (Figure 2, Appendix 2).


Ecological Baseline Report for Mabira | August 2016

REPUBLIC OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

WATER MANAGEMENT AND DEVELOPMENT PROJECT

Updating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) and Updating the Management Plan for Mabira Central Forest Reserve

ECOLOGICAL BASELINE REPORT FOR MABIRA

PROJECT ID NO. P123204

PROC. REF.: MWE/SRVCS/13-14/00285

DATE: AUGUST 2016

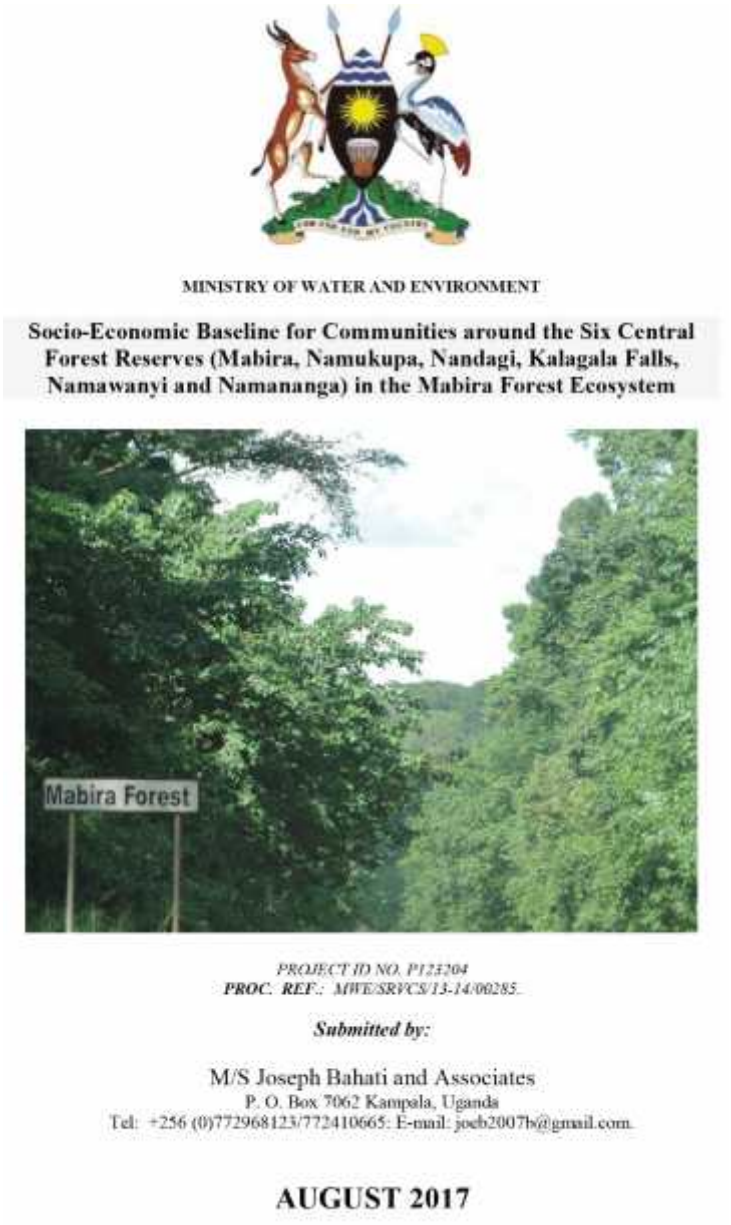
Joseph Bahati and Associates

Figure 2. Cover page of the Ecological Baseline Report for Mabira

4.4. DELIVERABLE #3 (D3): SOCIO-ECONOMIC/LIVELIHOOD SURVEY REPORT

The main objective of this component was to collect and summarize baseline socio-economic information for communities within and around the six Central Forest Reserves of the Mabira ecosystem (action 1, objective 1b). The specific objectives were to: 1) Assess the current socio-economic status of the households and factors exerting pressure on the forest reserves; 2) Understand community interactions with the forest resource in terms of access, use, conflicts and regulatory policies and institutional frameworks; 3) Understand the demand and supply dynamics for value addition and marketing of key forest resources; and 4) Analyse the socio-economic and livelihood strategies of households and local communities adjacent to the Mabira forest ecosystem.

This task was completed, the draft report submitted and the final report submitted (Figure 3, Appendix 3).


MINISTRY OF WATER AND ENVIRONMENT

Socio-Economic Baseline for Communities around the Six Central Forest Reserves (Mabira, Namukupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) in the Mabira Forest Ecosystem

PROJECT ID NO. P123204
PROC. REF.: MWE/SRVCS/13-14/00285.

Submitted by:

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AUGUST 2017

Figure 3. Cover page of the Socio-economic baseline report for the Mabira Ecosystem

The findings show that household size around Mabira forest was 4.8 persons, close to the national average of 4.7 persons. The number of households adjacent to the CFRs increased by 31.3% since the 2002 National Population Housing and Census. Over 88% of household members had attained formal education. About 49% had completed primary level education, while 32.8% had attained secondary level education. Taking primary level education as a minimum for literacy, then the literacy rate of 88.8% in the study communities is high compared to the national average that stands at 72%. Using 2015 as a reference year, most households experienced three months of food insecurity that year.

A range of potential alternative livelihood strategies are proposed by the communities. These include: 1) Use of improved agricultural practices such as mulching,; crop diversification and use of improved crop varieties; 2) use of crop residues for energy; 3) community ecotourism; 4) use of agroforestry practices such as integrated crop-livestock systems and shaded coffee agroforestry; 5) smallholder dairy farming; 6) zero grazing; 7) production pharmaceutical products i.e. cultivation and processing of medicinal plants; 8) fruit processing; 9) tree planting; and 10) avoiding deforestation to benefiting from carbon credits. The suggested alternatives indicate that the majority of them involve the use of land.

4.5. DELIVERABLE #4 (D4): REPORT ON MABIRA CFR MANAGEMENT PLAN

This focused on reviewing and updating the management plan for Mabira Central Forest Reserves (action 4, objective 3). This objective involved two major activities: i) reviewing and updating the management plan for Mabira ecosystem covering Namakupa, Nadagi, Kalagala Falls, Namawanyi and Namananga Central Forest Reserves, and surrounding landscapes; and ii) Assessing the effectiveness of the Mabira Management plan as part of the Kalagala Offset Sustainable Management Plan, highlighting lessons learnt from its implementation so far. The key activities were finalized and two main deliverables/outputs realized: 6) Draft report of updated Mabira CFR Management Plan; and 7) Final report of Mabira CFR Management Plan. The cover page of the final deliverable (7) is shown in Figure 4, Appendix 4.

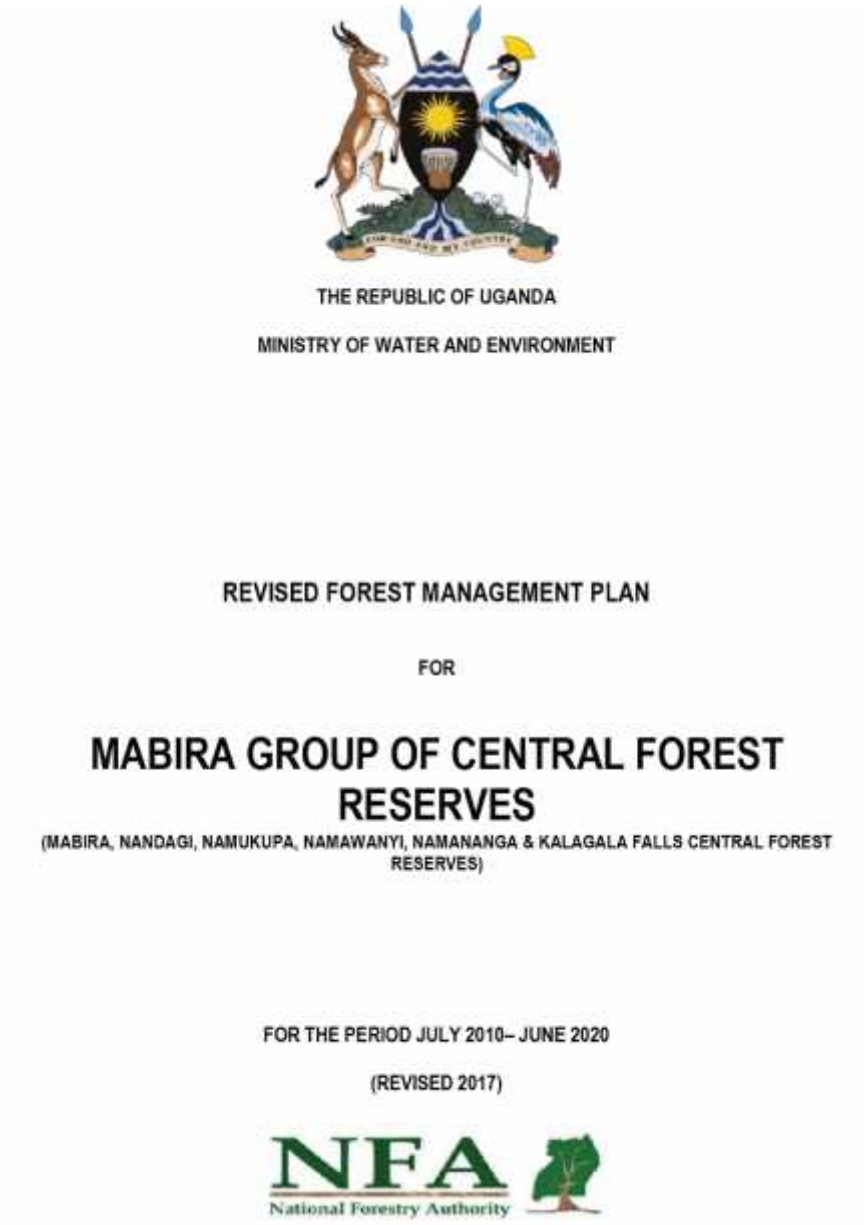

Figure 4. Cover page of the updated Forest Management Plan of the Mabira Central Forest Reserves

4.6. DELIVERABLE #5 (D5): OPERATIONAL DATABASE

The aim was to develop and operationalize a digital database (objective 2). The main output from the activities under this objective is an operational Database for the Mabira Forest Ecosystem. The database was finalized and a copy of the access information is shown in Figure 5.

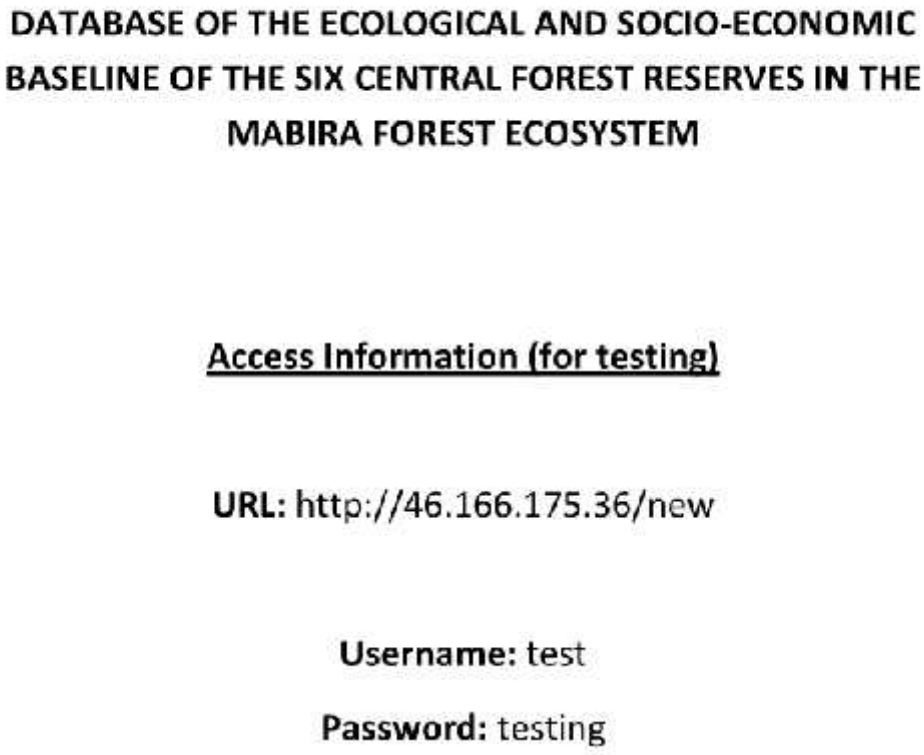

Figure 5. Access information for the database on the ecological and socioeconomic baseline of the Mabira Ecosystem

A user manual has also been developed for the database. The cover page of the user manual is shown in Figure 6, Appendix 5.

ecoSurvey

Management Information system

A DATABASE OF THE ECOLOGICAL AND SOCIO-ECONOMIC BASELINE OF THE SIX CENTRAL FOREST RESERVES IN THE MABIRA FOREST ECOSYSTEM:

Database Technical Report

By

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Submitted to:

Ministry of Water and Environment, Plot 22/28 Port Bell Road, Luzira, Kampala, Uganda Under the Project titled: Updating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) and Updating the Management Plan for Mabira Central Forest Reserve (Project ID NO. P123204).

AUGUST 2017

Figure 6. Cover page of the user manual to accompany the database on the Ecological and Socioeconomic baseline for the Mabira Ecosystem.

4.7. DELIVERABLE #6 (D6): GUIDELINES FOR MONITORING ECOLOGICAL HEALTH OF MABIRA ECOSYSTEM

This deliverable involved developing a framework and plan for monitoring the health of the Mabira Ecosystem, and community-ecosystem interactions (action 5, objective 4), Figure 7, Appendix 6. Key aspects included in the monitoring plan were identified from the ecological and socio-economic baseline surveys, and the Management Plan (objective 3). An overview of the plan is given here:

FRAMEWORK AND PLAN FOR MONITORING THE HEALTH OF THE MABIRA ECOSYSTEM, AND COMMUNITY-ECOSYSTEM INTERACTIONS

A) Goal

To provide information needed for the management of the six CFRs within the Mabira Ecosystem to enable NFA and their collaborators to assure the effective conservation of the values that the CFRs were created for.

B) Specific aspects to be monitored

i). Fauna and flora (Animals and plants)

- *Populations and species diversity*
- *Ecological Baseline Data*
- *Key indicator taxa for ecosystem health*
- *Key species for monitoring e.g. species of conservation concern and invasive species*

ii). Vegetation changes

- *Extent of current vegetation types*

iii). Water quality and quantity

- *Baseline data are being collected and sampling points referenced for future monitoring*
- *Benthic Macro-invertebrates*
- *Water quality and quantity*

iv) Human activities and impacts

- *Threats to the Mabira FRs*
- *Human population changes (especially within the village enclaves)*
- *Impacts of resource use and human activities inside the reserves on vegetation*
- *Cultural activities in the reserves*
- *Illegal activities and their impacts on the ecosystem e.g. poaching, logging, Forest fires, Tourism*
- *Human-Wildlife Conflicts*

v). Climate

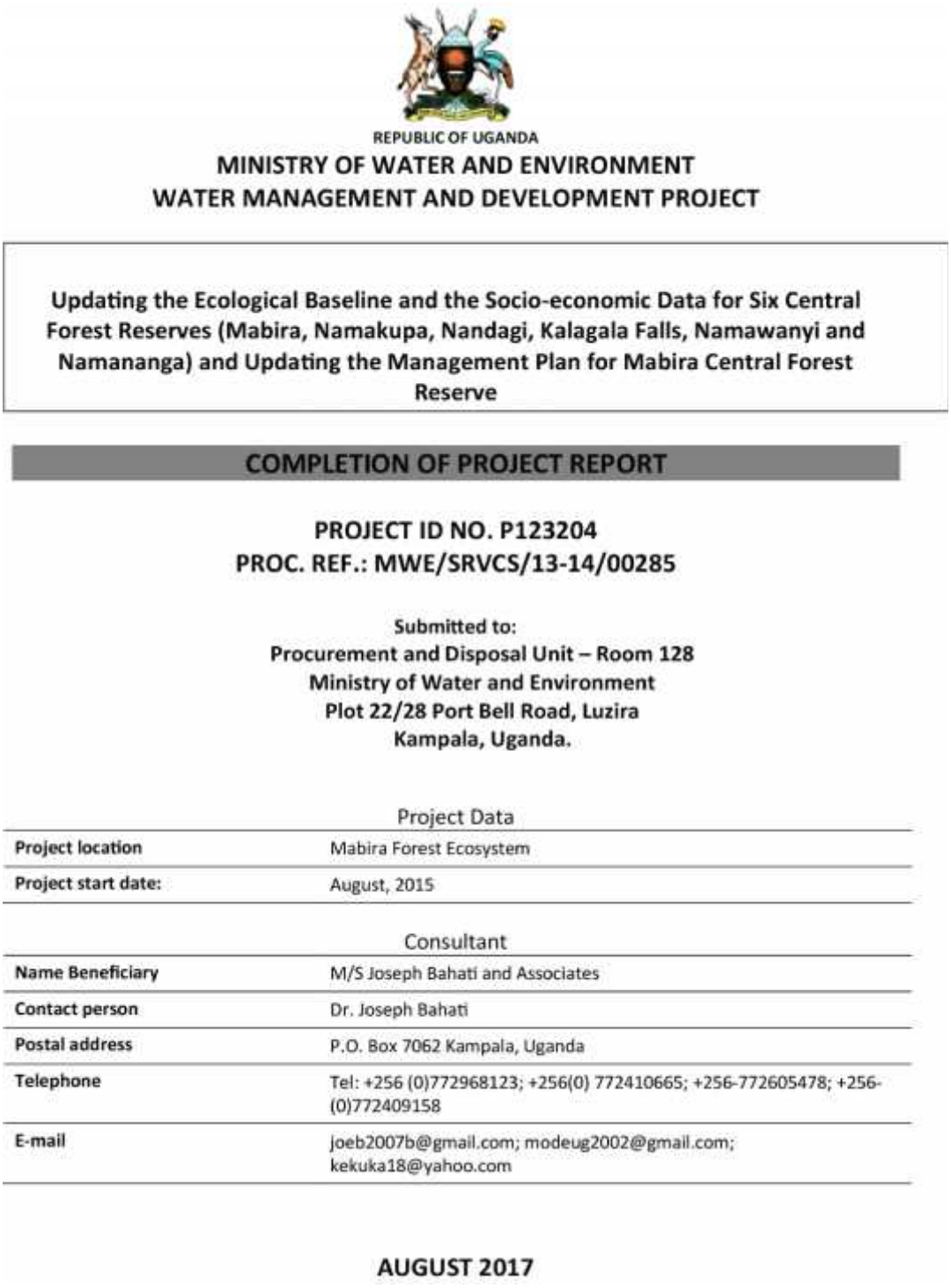
- *Weather related parameters (temperature, rainfall, Relative Humidity and sunshine).*

C. Monitoring Protocols, Tools and Formats

a. Monitoring objectives
b. Monitoring methods
c. Monitoring Requirements
d. Reporting procedures
e. Indicators
f. Analyzing the threats to the Mabira forest ecosystem health

4.8. DELIVERABLE #7 (D7): COMPLETION OF PROJECT REPORT

This is the final deliverable of the project (this report). A copy of the cover page is shown in Figure 8 (Appendix 7). This report gives an overview of the key deliverables accomplished within this work.



REPUBLIC OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

WATER MANAGEMENT AND DEVELOPMENT PROJECT

Updating the Ecological Baseline and the Socio-economic Data for Six Central Forest Reserves (Mabira, Namakupa, Nandagi, Kalagala Falls, Namawanyi and Namananga) and Updating the Management Plan for Mabira Central Forest Reserve

COMPLETION OF PROJECT REPORT

PROJECT ID NO. P123204

PROC. REF.: MWE/SRVCS/13-14/00285

Submitted to:

Procurement and Disposal Unit – Room 128
Ministry of Water and Environment
Plot 22/28 Port Bell Road, Luzira
Kampala, Uganda.

Project Data

Project location	Mabira Forest Ecosystem
Project start date:	August, 2015

Consultant

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AUGUST 2017

Figure 8. Cover page of the completion of project report

5.0. CONCLUSION

5.1. CROSS-CUTTING ISSUES

Knowledge Exchange and Capacity Building Plan

These aspects have progressed as planned. Several technical field staff from the NFA were involved in the field activities. Specifically assigned staffs were involved in different components of the work. Hence, there is a realization of the knowledge exchange and capacity building plan aimed at ensuring that the knowledge generated and skills utilized in the accomplishment of this assignment are passed over to relevant stakeholders.

Gender Issues

Following the cue from the socio-economic and livelihood survey as well as other components of the work, gender issues have been taken care of. The involvement of females and other marginalized groups was ensured in the Management Planning, Monitoring and Database development activities.

5.2. OVERALL APPRAISAL OF THE WORK

Overall, progress of the work has been good. Tremendous effort was made to make up for the slow start early in implementation. All the following deliverables have been achieved.

D1. Deliverable #1: Inception Workshop & Report
D2. Deliverable #2: Ecological baseline Report
D3. Deliverable #3: Socio-economic Report
D4. Deliverable #4: Report on Mabira CFR Management Plan
D5. Deliverable #5: Operational Database
D6. Deliverable #6: Guidelines for monitoring ecological health of Mabira ecosystem
D7. Deliverable #7: Completion Project Report

However, the team requested a no cost extension to avoid a hurried completion of the work. This was granted and enabled a logical conclusion of this work.

5.3. LESSONS LEARNED

The national elections in Uganda (carried out in 2016), involved an intense period of campaigns leading up to the elections. This affected some of the activities negatively: as follows

- The campaign and election schedules interfered with some of the project activities, particularly those involving the local communities. The team made efforts to mitigate this problem by harmonizing its schedules with the campaign schedules of Electoral Commission where possible.
- There were attempts by politicians at different levels to make political capital out of the project activities. Where possible, the implementation team worked with the local politicians especially in mobilizing the local stakeholders at grass root and seeking for their support, and ownership of the project activities.

The lesson is that political events cannot and should not be overlooked during implementation. Moreover, the politicians cannot be avoided during implementation. Efforts should be made to work with them.

Security of personnel and equipment in the field were sometimes of concern in cases where there were illegal activities or encroachment taking place in the study sites.

Success of the work was mostly ensured by actively involving the various staff at the central and local governments. These were for example, critical in validating the information collected and presented.

A lot of information is available as grey literature. It is important to always make thorough reviews prior to collection of new data. Otherwise efforts would be wasted.

APPENDICES

APPENDIX 1: D1. Deliverable #1: Inception Workshop & Report
APPENDIX 2: D2. Deliverable #2: Ecological baseline Report
APPENDIX 3: D3. Deliverable #3: Socio-economic Report
APPENDIX 4: D4. Deliverable #4: Report on Mabira CFR Management Plan
APPENDIX 5: Operational Database and User manual
APPENDIX 6: D5. Deliverable #5: Mechenisms for monitoring the ecology and community-ecosystem interactions in the Mabira Central Forest reserves
APPENDIX 7: D6. Deliverable #6: Completion Project Report