

**DEVELOPING THE MICROBIAL BIOTECHNOLOGY
INDUSTRY BY HARNESSING MICROORGANISMS IN
KENYA'S SODA LAKES IN LINE WITH THE NAGOYA
PROTOCOL**



**STANDARD OPERATING PROCEDURES AND PROJECT
MANAGEMENT MANUAL**

**Developing the microbial
biotechnology industry from
Kenyan's Soda lakes in line with
the nagoya protocol**

Standard Operating Procedures and
Project Management Manual

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FORWARD

Kenya has been recognized as one of the mega biodiversity countries in the world, with rich biological resources ranging from wild, marine to agricultural diversity. The diverse products ranging from biological resources, genes, traditional knowledge and genetic information are now feedstocks for the global market. For example many species of Kenyan origin are being utilized globally for research and development whose products are now exploited commercially at both gene and bio trade levels; in addition thousands of species are held in foreign ex-situ collection banks.



Communities in Kenya depend on these biodiversity for their livelihoods, however they have not accrued much benefit from previous research undertakings before the Convention on Biological Diversity (CBD) and the Nagoya Protocol. The country is still developing her research and scientific capacity to understand and harness the rich biodiversity for the benefit of the communities and the nation at large.

The Convention on Biological Diversity places obligations on providers and users of biological resources pertaining to accessing of research materials and the sharing of accruing benefits. Kenya is Party to the Convention on Biological Diversity and its two Protocols, the Nagoya Protocol and the Cartagena Protocol. The country is committed to implement the provisions of the CBD and its two Protocols through appropriate legal and institutional frameworks that promote research and development and attract investment in Biodiversity for enhanced conservation and livelihoods.

There are various global initiatives to come up with practical ways on implementation of the CBD and its two Protocols. One of these initiatives is the development and implementation of model projects for informed policy decision making processes. Kenya Government was supported by the GEF through the multi-institutional project 'Developing the Microbial Biotechnology Industry from Kenya's Soda Lakes in line with the Nagoya Protocol' as a model for implementation of the Nagoya Protocol.

The project partners include; resource providers (Kenya Wildlife Service, County governments and local communities within the Soda Lakes areas) and resource users (Jomo Kenyatta University of Agriculture and Technology, Moi University, Kenya Industrial Research and Development Institute, University of Nairobi, Rivatex and industrial partners).

The Project seeks to:

- (a) Provide for legal certainty, clarity and transparent domestic access and benefit sharing legislation or regulatory requirements;

- (b) Provide for fair and non-arbitrary rules and procedures on accessing genetic resources;
- (c) Provide information on how to apply for Prior Informed Consent (PIC);
- (d) Provide for a clear and transparent written decision by a competent national authority in a cost-effective manner and within a reasonable period of time;
- (e) Provide for the issuance at the time of access a permit or its equivalent as evidence of the decision to grant Prior Informed Consent and of the establishment of Mutually Agreed Terms (MAT);
- (f) Set out criteria and/or processes for obtaining PIC or approval and involvement of the County Governments and indigenous and local communities for access to genetic resources;
- (g) Establish clear rules and procedures for requiring and establishing MAT including
 - (i) Dispute settlement clause;
 - (ii) Terms on benefit-sharing, including in relation to intellectual property rights;
 - (iii) Terms on subsequent third-party transfer and use, if any;
 - (iv) Terms on changes of intent, where applicable.

The project also proposes to undertake a bio-discovery program from Kenyan Soda Lake microorganisms for industrial enzyme development, agro-processing and crop protection products. The project will also set up a pilot culture collection at JKUAT in line with the requirements by the CBD to establish ex-situ facilities for conservation of biodiversity preferably in provider countries.

The project is responding to challenges arising from unclear institutional coordination at various levels in respect to roles and responsibilities on access and utilization of biological resources, which complicates compliance, enforcement and monitoring, denying Kenyans from enjoying their biodiversity benefits. The need to streamline permitting processes and scientific collections under the process of PIC and MAT is urgent. The Soda Lakes project provides a road map for practical ways on implementation of Nagoya protocol for informed policy decisions that lead to enhanced research and development and therefore attract investment in biodiversity for conservation and livelihoods.

Therefore these Standard Operating Procedures and Project Management Manual for developing the biotechnology industry by harnessing microorganisms from Kenyan Soda Lakes in line with the Nagoya Protocol will guide the project partners and act as a model for access and benefit sharing research and development partnerships.



BRIG. (RTD) J.M. WAWERU
DIRECTOR GENERAL
KENYA WILDLIFE SERVICE

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For being resilient to the end, indeed notable recognition is accorded to the drafting team spear headed by Prof. Hamadi Boga formerly, Principal, Taita Taveta University College, a constituent College of JKUAT, now PS Ministry of Agriculture Research, Prof Francis Mulaa (UoN), now IP Manager UON, Kavaka Watai Mukonyi OGW and Priscillar Mumo Mutungi (KWS), Martha Induli (KIRDI) and Antony Mbayaki (MU) and Dr. Vitalis Wekesa, who sacrificed their time to research, develop and compile this document. The appreciation is extended to also recognise the role played by Prof. Francis Mulaa, Dr. Martha Induli and Priscillar Mutungi in editing.



ACRONYMS

ABS	Access and Benefit Sharing
BASF	Baden Aniline and Soda Factory
CBD	Convention on Biological Diversity
GEF	Global Environment Facility
IBR	Institute for Biotechnology Research
ICT	Information Communication Technology
IP	Intellectual Property
IPR	Intellectual Property Rights
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KIPI	Kenya Industrial Property Institute
KIRDI	Kenya Industrial Research and Development Institute
KWS	Kenya Wildlife Service
M&E	Monitoring and Evaluation
MAT	Mutually Agreed Terms
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding
MTA	Material Transfer Agreement
MU	Moi University
NACOSTI	National Commission of Science Technology and Innovation
NEMA	National Environment Management Authority
OUV	Outstanding Universal Value
PIC	Prior Informed Consent
PMO	Project Management Office
PSC	Project Steering Committee
RAMSAR	International Convention on Wetlands
SOP	Standard Operating Procedures
UNCITRAL	United Nations Commission on International Trade Law
UNEP	United Nations Environment Programme
UoN	University of Nairobi
WCMC	World Conservation Monitoring Centre

EXECUTIVE SUMMARY

The Standard Operating Procedures (SOPs) presented here are intended to guide the efficient and ethical implementation of Soda Lakes Microbial Bioprospecting Project in line with the Access and Benefit Sharing principles of the Nagoya protocol.

The Standard Operating Procedures give us the background on challenges experienced in promoting research on biodiversity in Kenya and other biodiversity rich countries in line with International Laws. It lays a case for a structured engagement in research and international collaboration in biodiversity research using soda lakes of Kenya as an example.

The SOPs provide a clear demonstration of how such multi-partner project are to be undertaken and how roles are shared between the different project partners and the management structure of the project.

It provides a mechanism for recruitment of staff and students and for ensuring that they comply with legal and ethical requirements of a project of this nature which has a potential for generation of intellectual property and commercialization of products.

The SOPs lay out various instruments that will guide collaboration and engagement between local and international project partners and persons involved in the project.

The SOPs also guides researchers and students on sampling protocols, laboratory best practice, entry and exit procedures from projects and confidentiality arrangements to protect the rights of project partners.

The project places much emphasis on compliance with the Nagoya Protocol on Access and Benefit Sharing and hence this manual will serve as a guide for future projects on how to partner locally and internationally while complying with provisions of the Nagoya Protocol.

The guidelines apply to all researchers, students and collaborators individually and collectively in this project.

All are required to read carefully to enable structured execution of the project and compliance with all relevant laws and best research practices.

1.0 BACKGROUND OF THE PROJECT

Kenya is endowed with diverse habitats that are home to unique and diverse flora and fauna. These diverse habitats are represented within the protected area system that comprise of approximately 12% of the Kenyan territory, classified as national parks, national reserves, marine reserves and forest reserves.

These areas have varied ecosystems and habitats ranging from marine, inland wetlands, fresh and salty water lakes, rivers, volcanoes, hot springs, savannahs, forests, mountains, caves and deserts.

These are rich in biodiversity, and they serve as the country's biodiversity treasure trove that contribute to both National and global economy, an invaluable and extensive potential for innovative products and processes that are still widely untapped.

The soda lakes and associated wildlife continue to attract various types of researchers for both academic and commercial purposes. Consequently, Kenya has been among the 15 mega diverse countries in the world (UNEP-WCMC; Cancun declaration 2002, Caldecott, J.O., et al 1994).

The Soda lakes (Elmenteita, Bogoria, Sonachi, and associated hot springs and vents - Olkaria hot vents and Bogoria geysers) of the rift valley are unique habitats of extremophile fauna and flora. The Soda lakes have been recognized as unique, and of Outstanding Universal Value (OUV) among other comparable lakes globally.



- They were nominated under the World Heritage Criteria vii, ix, and x based on:
- (1) exceptional natural beauty un-matched anywhere else
 - (2) Outstanding examples representing ongoing ecological and biological processes in the evolution and development of saline lake ecosystems
 - (3) Significant natural habitats for in-situ conservation of biological diversity and
 - (4) Presence of globally and regionally threatened species of outstanding universal value. In addition, some of these have been designated as Biosphere reserves and RAMSAR sites.

1.1 THE PROJECT PROBLEM STATEMENT

Previous access to genetic material from Kenyan Soda Lakes has not resulted into, intellectual property protection and commercialization for Kenya, this is because bioprospecting has not been carried out based on the Access and Benefit Sharing (ABS) arrangements between the providers of resources and users as envisioned in Convention on Biological Diversity (CBD) and Nagoya Protocol. This has been due to biopiracy, lack of capacity in local institutions to sustainably exploit genetic resources.

There has been inadequate policy and legislative instruments laying down the partnerships which define ABS. Currently, there are a number of organisms collected and stored in ex-situ germplasm outside the country without proper documentation.

These ex-situ germplasms' are acting as bioprospecting platform for industrial enzymes, agrochemicals and drug discovery without a clear link to the provider and the user as defined by the Nagoya Protocol. As a result of these, the benefits of bioprospecting are not realised by Kenya, both in terms of business; financial income; training and employment.

These have limited Kenya's ability to invest in Intellectual Property infrastructure and also to realize its vision 2030 objective on industrialization on knowledge-based economy.

already existing partnership as a way of enhancing governance through policies and legislative arrangements for better biodiversity conservation and livelihoods.

1.2 LONG TERM SOLUTION

One of the long term solutions is to build the capacity of local researchers to sustainably exploit soda lakes genetic resources through the full cycle of research, product development to commercialization while protecting intellectual property for the economic benefit of the country.

The Project is focused on linkages between ex-situ conservation, through the improvement of the country's microbial culture collections in a well established platform of Prior Informed Consent (PIC), Material Transfer Agreement (MTA) and Mutually Agreed Terms (MAT), Private-Public Partnership and enabling policy for realization of the benefits of bio-based economy.

The Soda lakes project provide a road map for understanding and improving on The Project seeks to enhance the capacity of providers and the users towards bioprospecting and commercial exploitation of microbial diversity in the Kenyan soda lakes for improved biodiversity conservation, livelihood and environmental protection in a Nagoya access and benefit sharing Protocol compliant manner.

It is expected that by the end of the Project, there will be equitable and fair benefit flows between all partners and stakeholders.

Nagoya objectives will be realized and Kenya will have an appropriate microbial bio-discovery facility and a designated microbial depository centre that will be critical in matters of patent and therefore a technology transfer platform. A per

centage of the proceeds accruing from the benefits will be utilized for sustainable conservation around the soda lake.

The project is consistent with the eligibility criteria and priorities of the fund as it will support the government of Kenya to implement a national ABS project to promote bioprospecting, industrial product discovery and technology transfer on mutually agreed terms.

In addition the project will facilitate private sector engagement and projects targeting investments in the conservation and sustainable use of genetic resources in-situ.

Lessons from this project will be used to update ABS laws and regulations and to improve the capacities in Kenya to facilitate ABS agreements and handling issues under the Nagoya Protocol.

1.3 MAIN OBJECTIVE OF THE PROJECT

To contribute to the country's Vision 2030 development goals through utilization of Microbial genetic resources within the protected Kenyan Soda lakes for research, development and commercialization for improved resource management and livelihoods in compliance with the Nagoya Protocol on Access and Benefit Sharing.

1.4 SPECIFIC OBJECTIVES OF THE PROJECT

To enhance the legal and regulatory framework on ABS; - Systematic discovery and development of novel natural products for the agro-industry and environmental remediation; - Technology transfer between resource provider and user.

1.5 JUSTIFICATION FOR THE SOPS

The project team realized the need to:

- a) Harmonize procedures that would be used in implementing the project to ensure quality and predictability of operations;
- b) Minimize conflict between project partners, staff and lead scientists;
- c) Ensure protection of intellectual property and confidentiality by all persons participating in this project;
- d) Ensure efficient and proper utilization of resource



1.6 OBJECTIVES OF THE SOPS

Have a framework of engagement between partner institutions in line with Nagoya Protocol and;

I. Provide all necessary guidelines for management of staff and students involved in the project;

II. Provide guidelines for management, sharing and transfer of resources including space, money, materials, information, data and intellectual property under the Project;

III. Provide guidelines for sampling and good laboratory practice.

1.7 DEVELOPMENT OF THE SOPS

This document was developed through a consultative process including workshops that involved all partner institutions and other stakeholders (See list of participants under appendix 6).

1.8 PHILOSOPHY AND OBLIGATION

To implement the project in compliance with National Legislation, the Nagoya protocol on ABS and the Convention on Biological Diversity.

2.0 FORMATION OF PROJECT TEAMS

This project was put together and will be implemented by the following organizations:

I. Kenya Wildlife Service (KWS)

Was the lead institution in writing of the proposal and coordinating with UNEP and GEF as well as coordinating participation of the other partners. It is the resource provider and will be involved in research and development. In addition, it will host the project management office and the proposed bioinformatics centre.

II. The National Environment Management Authority (NEMA)

The National Environment Management Authority manages the ABS legislation and is charged with granting of Access permits for the Kenyan genetic resources. It will grant an access permit to the project before the onset of sampling for discovery. NEMA will play a critical role for the success of this project during and after its lifespan through grants of access permits and benchmarking achievements against the ABS legislations and policies.

This project will support NEMA and partners in contributing towards ongoing ABS legislative review and implementation of Nagoya protocol through high impact sensitization workshops and meetings.

III. The National Council for Science, Technology and Innovation (NACOSTI)

NACOSTI is charged with research clearance, gives grants and advices government on all aspects of science and Technology.

The National Commission for Science, Technology and Innovation will work with NEMA to promote and facilitate aspects of research and development within the Project.

Together with NEMA and KWS, NACOSTI will be involved in the ABS regulatory framework review and also as part of the projects exit strategy where they will be requested to fund some of the identified activities.

Already NACOSTI has supported various students undertaking Microbial research in the soda lakes through various grants.

NACOSTI is also putting in place policies on establishment of designated depositories and will support the establishment of the JKUAT pilot microbial culture centre that will act as national depository.

IV. Kenya Industrial Property Institute (KIPI)

The Kenya Industrial Property Institute will facilitate the aspect of technology transfer under the Kenya Industrial Property Act.

V. County Governments

Under the Kenyan constitution, resources are managed at both National and county governments levels. It is critical that for sustainable management of genetic resources and equitable sharing of benefit resulting from their utilization all relevant stakeholders be involved. Some of the designated Soda lakes are co-managed between KWS and the county government.

Aspects of utilization of genetic resources for research and development are being controlled by the National government with involvement of county government and local communities.

Therefore there is a need to establish clear structures for PIC, MAT and MTA linking national government, county government and local communities.

A stakeholder workshop has been held which brought together representatives of local communities and county government within the Soda lakes that discussed issues of utilization of genetic resources for research and development in terms of Nagoya Protocol.

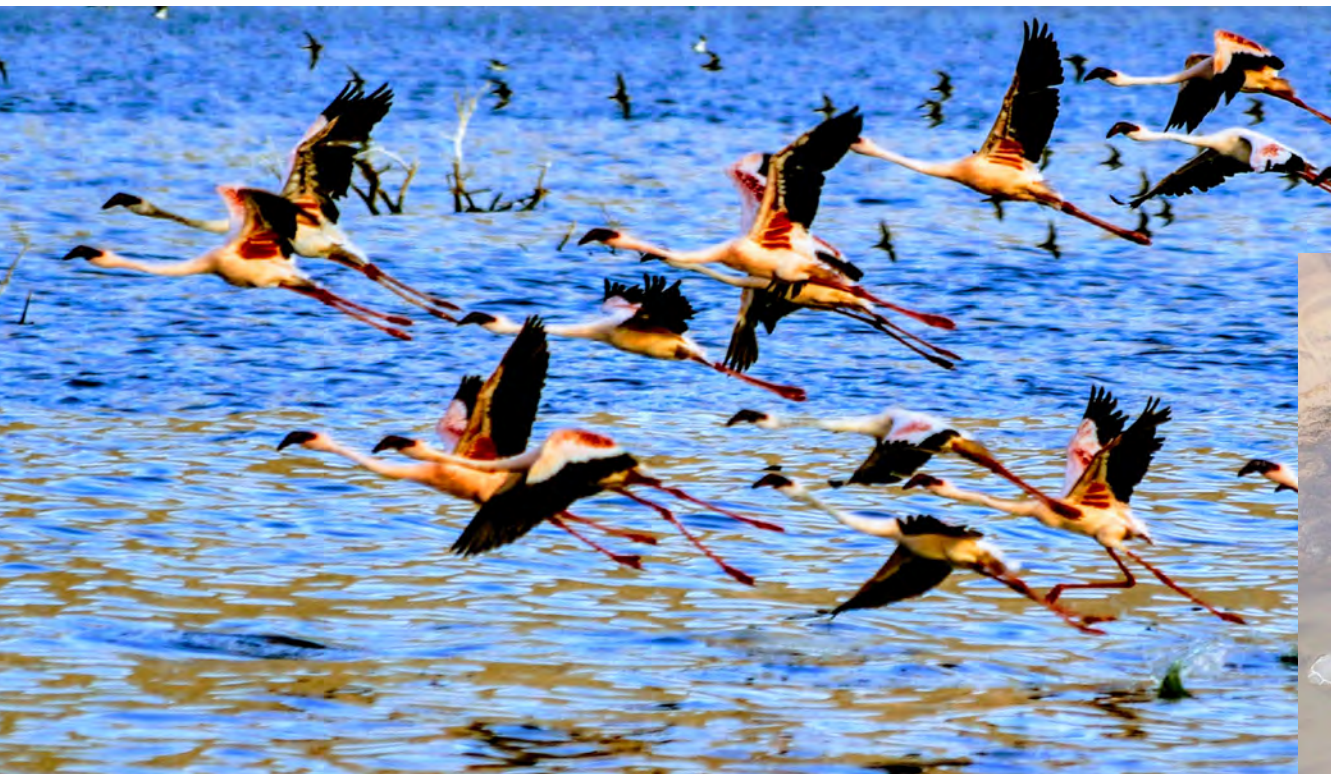
Formation of Soda lakes platform has been suggested. County government will play critical role during and after the project period.

They will be part of the National Bioprospecting steering committee, Soda lakes platform and also in implementation of the joint management plans and will be involved in monitoring the projects implementation.

VI. The Local communities

Communities around the soda lakes will provide Prior Informed Consent and also participate in Conservation aspects.

Community structures within the soda lakes will be established and will be part of the process in granting PIC on utilization of the underlying genetic resources.



Local communities are part of the Soda lakes platform and will actively participate in the development of joint management plans that will review their roles and benefits among others.

Lack of recognition of the local communities in decision making on utilization of the Soda lakes genetic resources and unclear structures of benefit sharing and management at local level has been a major challenge in the share of benefits from research and development.

Efforts will be put in place through the development of joint management plans which recognizes the role of local communities and also structures of benefits sharing, for example the Lake Bogoria National reserve and Lake Magadi.

Benefits generated from this project will be shared as per the agreed Agreement up to community level through the established structures.

VII. Jomo Kenyatta University of Agriculture and Technology (JKUAT)

The JKUAT will be responsible research and development including training of MSc. and PhD students under the project and will play a leading role in sample collection from soda lakes for the isolation of microorganisms.

The University will also be involved in screening of isolated microorganisms and product development in the line of seed and seedling coating and biopesticides for the agriculture sector.



VIII. JKUAT Enterprises Limited

The JKUAT Enterprises Ltd will be the lead institution in up-scaling of the technologies developed for the seed and seedling industry and biopesticides using the soda lakes microbial isolates under the project.

It will also oversee the registration and commercial utilization of the developed biopesticides together with the commercial partner, BASF.

IX. JKUAT Microbial Culture Collection Centre

The pilot microbial culture collection centre at IBR, JKUAT will act as the main depository center for the collected microorganisms from the project.

With funds from this project and other sources, it will be upgraded to a National depository of microorganisms in the country.

The JKUAT culture will establish Code of best practice based on Prior Informed Consent and mutually agreed terms in line to Nagoya Protocol and the CBD.

X. The University of Nairobi (UoN)

The University of Nairobi will be responsible for training of PhD, MSc and undergraduate students and also undertake product discovery and development in line with the project document.

The University has in-house competence and facilities in the area of enzyme production, purification and downstream processing. Various equipments available for these activities include: bioreactors, pilot bio-fuel plant, preparative centrifuges, preparative high performance equipment and other analytical instruments.

They will be involved in screening and optimizing talented candidate microbes and products.

XI. The University of Nairobi Science and Technology Park Ltd

The University of Nairobi Science and Technology Park undertakes incubation, process development and commercialization of research from the University scientists.

They have over the time built the capacity to evaluate and scale-up enzyme biotechnology processes for commercialization.

They will be involved in incubation of identified priority products.

XII. Moi University/Rivatex

Rivatex is one of the major textile companies in East Africa and is fully owned by Moi University.

The University uses the facility for teaching, research, extension, fabric development and commercialization.

This facility manufactures textile products made from fiber (cotton) from which yarn is made and processed into cloths.

Rivatex through Moi University will undertake the industrial pilot scale testing and development of products for use in the cotton industry including but not limited to cotton dewaxing, yarn strengthening and other textile applications using the soda lakes microorganisms.

XIII. Kenya Industrial Research and Development Institute (KIRDI)

KIRDI is the country's industrial research and development institute which advises the government on various aspects of technology development and application.

They are actively involved in development of a wide range of industrial technologies among them industrial enzymes and bio-pesticides.

Together with UoN and Verenium (BASF), they will be involved in pilot production, testing and quality control of candidate technologies generated from the project.

KIRDI has a highly trained and professionally multi-disciplinary research team competent in designing, fabrication, setting up and optimization of the pilot plant for the production of products on national and international standards in terms of quality, functionality and packaging.

Currently, KIRDI has a company in the name of KIRDI Enterprise Services which will represent KIRDI in implementation of this project.

XIV. Verenium Corporation/BASF

BASF will work with local university spin off companies will commercialize the developed technologies from research and Development and also transfer relevant technologies to enhance Conservation.

It will also advise on the development of products for the global market and commercialization of the same.

3.0 PROJECT MANAGEMENT AND COORDINATION

The following organs have been established to ensure successful implementation of the project.

1. Project Steering Committee

The Steering Committee is the highest decision making organ of the project.

It is composed of key people from the Kenyan institutions which are not part of the project partners.

Committee members are selected and appointed by the Principal Secretary, State Department of Environment.

The main role of the Project Steering Committee is to oversee the successful implementation of the project through an oversight role. The terms of reference are:

- a) Ensure that project goals and appropriate GEF procedures for reporting are met;
- b) Evaluate on a periodic basis whether project expectations are being met, and recommend ways of improving project delivery and quality;



- c) Provide global insights and report on events, initiatives or obstacles that could affect either ABS issues or project performance;
- d) Assist in procuring additional co-financing as needed during the life of the project;
- e) Assist in reaching out to non-governmental sectors and other stakeholders to expand their role in ABS issues;
- f) Receive periodic reports on progress and make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan.

2. Project Executing Committee

The project executing committee will be composed of the Principal Investigators from the respective partner institutions.

The key role of the committee will be to oversee the day to day running of project activities.

They will be meeting occasionally to review the progress of project activities and provide guidance on its implementation.

3. Project management office

The Kenya Wildlife Service shall second two of their staff as project administrator and assistant project administrator who shall oversee the successful implementation of the project. Their terms of reference are:

1. Report to steering committee;
2. Together with KWS finance /project prepare account documents for the project expenditures/returns and requests accordingly;
3. Prepare for the project steering committee/executive committee work plan and meetings;
4. Prepare and submit workshop / project/technical reports to UNEP and steering committee;

5. Plan and organize for workshops/meetings within the projects approved activities;
6. Ensure that Projects funds are utilized as per the approved work plan/budget activity;
7. Keep records of the project expenditures, meetings and activities;
8. Develop the projects procurement plan and ensure that items are procured with the approved guidelines.

3.1 POLICY AND RESEARCH TEAMS

In line with the research objectives, the tasks and activities are outlined in the GEF soda lakes project and have been shared out to three teams given below:

3.1.1 THE POLICY TEAM

The team leader will be Mr. Kavaka Mukonyi.

This team will be tasked with streamlining the legal framework and proposing new or improvements of legislation to align with the Nagoya protocol.

The specific tasks include:

- I. Review of existing legislation that govern conservation and sustainable use of genetic resources in light of the implementation of the case study of this project;
- II. Present reviewed ABS legislation in light of this project to county and National governments to facilitate ratification and implementation of the Nagoya Protocol;
- III. Review of existing agreements, PIC, and access permits in light of the new ABS law;
- IV. Establish a National bioprospecting steering committee under the National strategy for bioprospecting within and outside protected areas in Kenya established to promote bioprospecting activities in the soda lakes;

IV. Establish a National bioprospecting steering committee under the National strategy for bioprospecting within and outside protected areas in Kenya established to promote bioprospecting activities in the soda lakes;

V. Facilitate the ABS regulatory agencies under NEMA for effective management and administration, monitoring and enforcement of access permits to the genetic resources of the Soda Lakes;

VI. Improve the protected area system to conserve and manage the soda lakes genetic resources, including new infrastructure for enhanced research and tourism by KWS and local communities (i.e. trails around lake Bogoria, lake Elementaita, and Simbi Nyaima);

VII. Set up a well equipped bioinformatics centre at KWS to streamline biodiversity data handling;

VIII. Establish a data handling system on collection and transfer of biological specimen within and outside Kenya;



IX. Develop a standard model agreement for ABS contracts based on the reviewed ABS laws;

X. Develop at least 1 ABS agreement between users (UoN and JKUAT spin off companies and BASF) and providers (KWS and Soda lakes - county government), resulting from research and development of microbial samples taken from the Soda lakes;

XI. Develop cooperation and financial contracts between partner institutions of the project.

3.1.2 THE MICROBIOLOGY/CULTURE COLLECTION TEAM

The team leader will be Prof. Hamadi Iddi Boga.

This team will be concerned with systematic discovery of Microorganisms and the setting up of a pilot culture collection centre at JKUAT.

The specific tasks include:

- (i) Carry out sampling from soda lakes at different seasons;
- (ii) Isolate, characterize, identify and curate microorganisms;
- (iii) Develop a catalogue of all microorganisms in the collection;
- (iv) Screen new and existing isolates for bioactivity and potential use in seed and seedling industry;
- (v) Train staff and students on handling of microorganisms;
- (vi) Develop training manuals and laboratory protocols on culture collection;
- (vii) Upgrading of existing facilities in JKUAT for the pilot culture collection;
- (viii) Provide culture collection services for all users.

3.1.3 ENZYME DISCOVERY TEAM

The team leader will be Prof. Francis Mulaa. This team will be concerned with systematic discovery of enzymes and their industrial applications.

This team will be responsible for:

- I. Screening for industrial enzymes from microorganisms;
- II. Characterization and identification of microbial secondary metabolites;
- III. Develop and optimize both solid and submerged fermentation studies for enzymes and secondary metabolites ;
- IV. Pilot production of selected enzymes and secondary metabolites;
- V. Formulation and evaluation of developed products in collaboration with industrial partners;

3.1.4 PRODUCT DEVELOPMENT TEAM

The team leaders will be:

KIRDI	Dr. Moses Makayoto
JKUATES	Dr. Winfred Karugu
UoN Science and Technology Park	Prof. Lucy Irungu
Moi University	Prof. David Tuingong
Rivatex	Director, Rivatex
BASF	TBC

This team will be concerned with industrial up-scaling and commercialization of the developed products and processes. This team will be tasked to:

- I. Pilot scale and validate the developed products and processes by the research teams;
- II. Protection of the developed commercial technologies;
- III. Large scale production and commercialization of the products and processes;

3.2 ORGANIZATIONAL FRAMEWORK FOR THE PROJECT

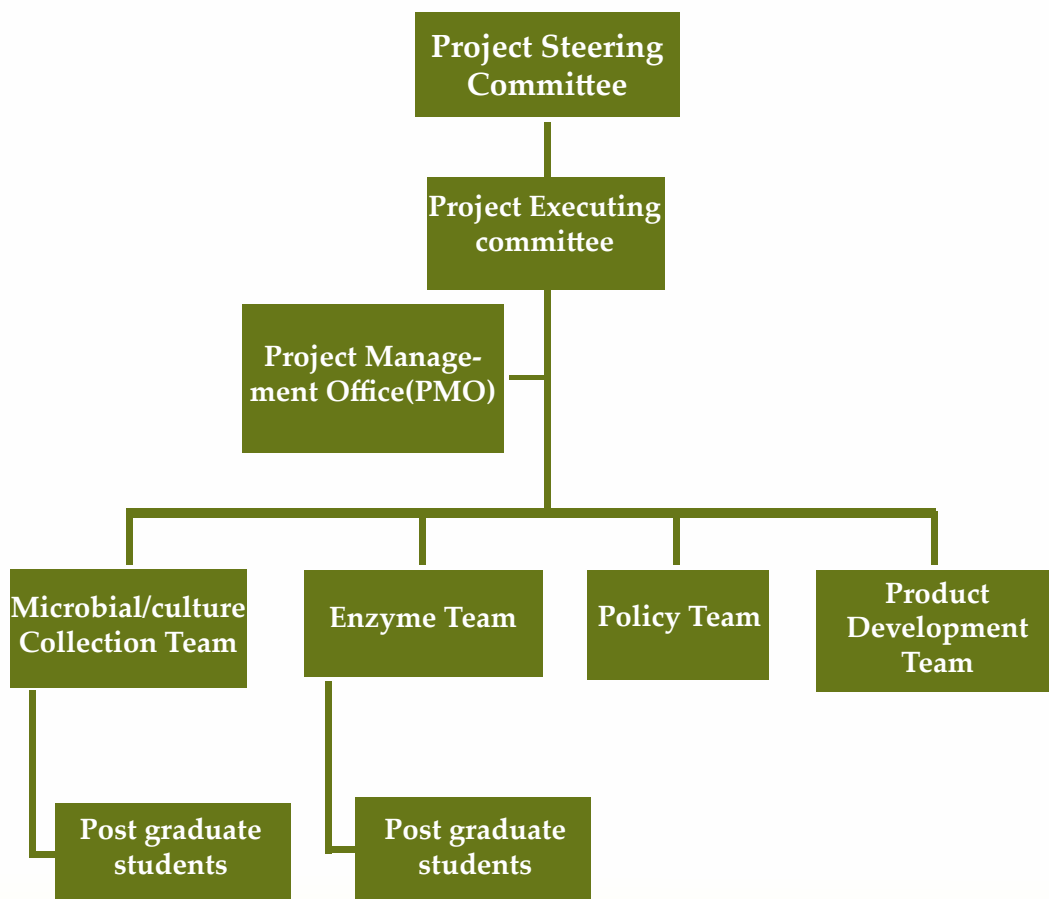


Fig. 1 An Organogram showing the various teams for implementation of the research project as described above.

Each team leader will be responsible for recruiting members and reports to the Steering Committee.

The members of each team must demonstrate competence in areas relevant to the implementation of the project and must be able to contribute to a specific target in the project.

Each member shall sign a confidentiality agreement binding him/her to intellectual property agreements as guided by the general MoU and other legal instruments (Appendix 1B).

4.0 RECRUITMENT AND EXIT OF STAFF

All applicants will be given equal consideration for selection.

The team will comprise of:

- a) Co-researchers
- b) Post graduate students
- c) Technical staff

4.1 CO-RESEARCHERS

Will be recruited competitively by the team leaders and shall be bound by the rules and regulations of the project.

4.2 POST GRADUATE STUDENTS

The recruitment of postgraduate students in the project is subject to a number of terms and conditions that are listed below:

1. Subject to the Project document and Partnership Agreements.
2. Recruitment approval by the Project Implementation committee
3. Signing of the Project IP agreements
4. The student agrees to be bound by the Academic Regulations and Procedures of the host University/or the university where he/she is registered;

5. For Masters Students, one must have successfully completed his/her course work in the respective discipline while for PhD students one must be in possession of a Masters degree.

6. The research project for a Masters student is 1 year (2 semesters) while for a PhD student is 3 years (6 semesters); 6. Students will be expected to give a full-time commitment to their designated research project and to be fully involved in the various elements that comprise the research programme;

7. Students will be allowed to exit from the programme after successful completion of their course. In case of non-completion of the course, a student must give a detailed report of all the work covered under the project and you may be required to refund the money spent;

8. Partners are encouraged to source for funds to support scholarships for students involved in this project.

4.2.1 SUPERVISION OF POSTGRADUATE STUDENTS

1. The research programme will be under the general advice and supervision of project team leaders and nominated supervisor(s) who will specify the operational requirements;

2. Upon commencement of the research, students should agree with their supervisors, in writing, the title, the description and terms of reference of their research project.

These may be subject to review during the project and where there is a change it is important that the student agrees with the changes in accordance with Academic Regulations and Procedures;

3. Publications and dissemination of information are an important part of University research. To protect the University, the student and their supervisors, it is required that prior to publication or dissemination of information relating to the research, the student must obtain written approval from the project steering committee.

Where appropriate, such publications should include supervisor(s) name(s) as co-author(s). These conditions apply during your period of study at the University and continue to apply to research conducted from this project;

4. Every question or dispute that may arise in relation to this project will be determined by the project team leaders in accordance with academic regulations and with MoA and agreements governing this project.

4.3 TECHNICAL TEAM

Each Research Team will have at least 2 technicians who may be recruited or seconded to the project and who must demonstrate competence in the area of work. The Technicians will support researchers and students in their work and will ensure a good working environment in the laboratories. They will be answerable to the team leader.

4.4 EXIT PROCEDURE

All project staff must give a notice of at least 1 month before exiting the project. The project management team may give an exit interview to get to know the reason why the employee wishes to leave.

5.0 FIELD SAMPLING, LABORATORY PROCEDURES AND RESEARCH NOTEBOOKS

5.1 FIELD SAMPLING

Research authorizations and permitting will precede any field sampling processes. Field sampling will be done in selected soda lakes and from the months of February-March and August-September in 2015 and 2016. These are the dry season when the soda lakes are not flooded and diluted.

The Microbiology/Culture Collection Team will be responsible for designing the sampling to address specific research questions.

Metadata for each sampling site will be collected as per approved standard practice for Microbial Ecology studies.

Each team will develop a work package detailing how they intend to implement their part of the project.

Utmost care should ensure quality of experimental design, sampling and in the actual execution of the research as per international best practice.

Researchers, students and other workers will be expected to adhere to the highest ethical standards, comply with Kenyan law and the Institutional policies. More information can be obtained from the project document and the partners Memorandum of Agreement.

5.2 LABORATORY PRACTICES AND PROCEDURES

5.2.1 DATA GENERATION

Each participating laboratory shall be required to develop and operationalize SOPs for good laboratory practice. Prior to commencement of the experiment, the following shall be required to be undertaken:

1. Good laboratory practice must be adhered to all the time;
2. The researcher will undertake proper experimental designing and execution with appropriate controls including the title, date, time and place;
3. The researcher will clearly define the experimental objectives and give an elaborate methodology.

5.2.2 DATA DOCUMENTATION, STORAGE AND RETRIEVAL

Research staff will be issued with official field and laboratory notebooks. Field notebooks will specifically be used to record field data. All the results must be documented in ink, in an official notebook and signed daily by the researcher.



The notebook should then be counter signed periodically not exceeding one month by the supervisor. Any comments or discussions by / with the supervisor should be recorded on the same pages.

Notebooks should be accessible during use. Those containing confidential information should be locked up in safe cabinet outside of working hours. After completion, notebooks should be returned to the project management office for archiving and signing.

When the notebook is filled up, the researcher should hand it over to the project management office and sign for a new notebook. Research staff shall have an electronic record of data in a folder.

Regular back-up of data in a separate computer or external disk will be expected to guard against loss of information.

Passwords for project data shall at all times be shared between the team leader and the project management office. Any changes in passwords will be communicated promptly to the same.

5.3 RESEARCH NOTEBOOKS (ATTACH SAMPLE NOTE BOOKS)

5.3.1 FIELD NOTEBOOK

Field notebooks will be used to record and catalogue all field observations. They will maintain a pagination scheme that stretches over many notebooks for the duration of their entire project.



The cover page should contain the partner institution logos, title and book number and serialized page numbers.

The first page shall have the collaborating institutions logos, project title, instructions for use and the book serial number.

Each subsequent page shall have the collaborating institutions logos, Project title and the serial number.

There will be provision for table of contents on the second page.

Each of the remaining pages will have the project title at the top and provision for the researchers' and supervisors' (witness) name, signature, and date at the bottom of the page.

They will be designed to have content, context, rendering, structure and behavior.

Context – this should bring out the temporal division most frequently recorded, and how e.g Time of the day/month/year method of sample collection and environmental factors.

Content – How are external sources of data included or cited (e.g. sketched, photographs, pasted in, cited)? Are external databases referenced? What events are recorded?

Structure – Should provide for cataloguing and pagination scheme.

Rendering – the kind of data to be collected and how it is represented (colour, measurements and sound)

Behavior - What and how is qualitative/quantitative data collected?

5.3.2 LABOLATORY NOTEBOOK

Laboratory notebooks will be used to record and catalogue all laboratory experimental procedures and outcomes/results.

They will also maintain a pagination scheme that stretches over many notebooks for the duration of their entire project.

The cover page should contain the project partner institution logos, project title, and serial number.

Each page will have the project partner institution logos, project title, and serial number.

Each page will have the project partner institution logos, project title and instructions for use on the first page.

There will be provision for table of contents on the second page.

Each of the remaining pages will have the project title and the project partner institution logos at the top of the page and provision for the researchers' and supervisors' (witness) name, signatures and date at the bottom of the page.

The key notebook entries will include: date & title of experiment, statement of objective, and detailed description of experiment, researchers' / supervisors' name, date and signature.

Experiments should be recorded in chronological order and errors shall be crossed through with a single line and initialed.

If the error is more than a few words, an explanation of the error should be noted in the margin where the error is corrected.

All essential facts such as equipment used, conditions, time, materials including source and quality, yields and characterizing data should be recorded.

Abbreviations and codes should be chosen and used in an unambiguous and consistent way and non-standard abbreviations and codes should be defined in the Laboratory Notebook before using the same.

Date and time of each experiment should be recorded.

If work carries over more than one day, each succeeding day's entries shall reflect the time and date of same.

If experiment requires more than one page, reference should be made to previous and following pages so that the experiment can be followed.

Unnecessary derogatory comments should not be made in the research Notebook.

An unused portion of a page should be struck out to forestall any challenge that the record has been augmented at a later date.

All results, both good and bad should be entered.



6.0 CONFIDENTIALITY

All staff working on the project will be required to sign a binding individual confidentiality agreement as per appendix 1B and 1C.

7.0 INTELLECTUAL PROPERTY MANAGEMENT

7.1 MANAGEMENT OF KNOWLEDGE AND INTELLECTUAL PROPERTY

Knowledge management is a key issue in the project.

Knowledge management will be ensured by interactive and efficient meetings and storage of all project documents in a jointly accessible but restricted and secure portal of the project website.

The web-site will be hosted by KWS and will also contain a public domain, in which results are disseminated to the public.

Items for intellectual property issues will be audited and analyzed on a routine basis by the Project Executing Committee.

The project administrator will be in charge of over-viewing and managing the IPR issues. All rights to IPR are defined in the Partner Agreement which will be signed prior to project execution.

The Partner Agreement draft will be circulated to all partners before signing. This is to give an opportunity for each partner to comment on IPR rules stated in the agreement.

The object of creating IPR rules in the Project Agreement is to find a balanced situation between the different types of partners i.e. research institution(s) and Industry(ies), especially taking care that the industry partners of the project can benefit from the results created within the project.

The Project Agreement will also contain rules and format of publications acceptable to the project. Concerning the publications and IPRs, the following steps will be adhered to:

a) a summary of the manuscript or patent application will be forwarded to the executing co

b) If a partner is interested to file an IP protection on this topic (in collaboration) it should inform the other partners within 30 days of issuance of the intent;

c) A confidentiality period of up to 6 months before publication of the results enabling IP protection will be allowed from the time of communication of intent. The following principles, obeying the agreement spirit of the Project, in regard to knowledge and intellectual property issues will be adhered to.

7.1.1 OWNERSHIP AND PROTECTION OF KNOWLEDGE

a) Knowledge shall be the property of the partner institution carrying out the work leading to that new knowledge (Foreground).

b) Where several partners have jointly carried out work generating the new knowledge and where their respective share of the work cannot be ascertained, they shall have joint ownership of such knowledge. The partners concerned shall agree amongst themselves the allocation, terms of exercising ownership and protection of that knowledge.

c) If personnel working for a partner are entitled to claim rights to knowledge, the partner shall take steps or reach appropriate agreements to ensure that these rights can be exercised in a manner compatible with its obligations. The rights and share of benefits will be guided as per the Project MOA.

d) Where a partner transfers ownership of knowledge, it shall take steps or conclude agreements to pass on to the assignee its obligations, in particular regarding the granting of access rights and dissemination as stated in the Memorandum of Agreement by the partners.

e) Where knowledge is capable of industrial or commercial application, its owner shall provide for its adequate and effective protection, in conformity with relevant legal provisions, and having due regard to the legitimate interests of all partners concerned.

7.1.2 ACCESS RIGHTS

1. The general principles relating to access rights

a) Access rights shall be granted to any of the other partners upon written request. The granting of access rights may be made conditional on the conclusion of specific agreements aimed at ensuring that they are used only for the intended purpose, and of appropriate undertakings as to confidentiality.

b) It is the basis of the project that the granted access rights shall also confer entitlement to grant sub-licenses within the project and the terms and conditions shall be stipulated in the MTA.

2. Access rights for execution of the project

a) Partners shall enjoy access rights to the results (Foreground) and to the pre-existing know-how (Background), if those are needed to carry out their own work in the project. Access rights to both Foreground and Background shall be granted.

b) Subject to its legitimate interests, the termination of the participation of a partner shall in no way affect its obligation to grant access rights to the other partners pursuant to the previous paragraph until the end of the project, and in accordance with the articles under the partner MoA.



3. Access rights for use of knowledge

- a) Partners shall enjoy access rights to knowledge and to the pre-existing know-how, if that knowledge or pre-existing know-how is needed to use their own knowledge. Access rights to Foreground and Background shall be granted on fair and reasonable conditions with the exception of internal research activities.
- b) Access rights may be requested under the conditions laid down in the previous paragraph until five years after the end of the project.

This is also applicable to a partner who terminates participation before end of the project.

In practice, this means that e.g. if a partner creates innovation and protects it with a patent, the other project partners, including the industrial partners, are entitled to get access rights to these results, if they need them in order to be able to utilize their own results.

The party granting access rights to its Foreground is entitled to get fair and reasonable compensation for granting the access rights. Additionally, the parties can freely use any results that are not protected by any intellectual property rights within the project.

As the project is targeted to promote industrial production, the benefits will be secured during planning and execution of the project. In the planning phase, every partner has an equal possibility to participate in the formulation of the Partner \ Agreement by creating the IPR and other rules for the project work.

During the annual project partner meeting, there shall be dissemination of research results. When implementing the actual project work, the industrial partners may be involved in the directing of the project.

By attending the annual meetings of the Project Steering Committee, the industrial partners are able to participate in the supervision and management of the work and will be updated with the information on the gained results.

This will give the industrial partners a good chance to plan for exploitation of results of interest.

7.2 EXCHANGE OF BIOLOGICAL MATERIALS

The Partners shall, whenever exchanging biological materials collected under this project, and genetic information or know how conclude a Material Transfer Agreement (MTA), Information Transfer Agreement, setting out the terms and conditions upon which the biological material, from either institution, described in the project document will be transferred, held, or applied by the recipient party.

The MTA shall originate from the provider and shall be signed by the provider and parties' authorized signatories at the collaborating institutions and the recipient. The MTA shall be provided by the Provider and shall contain, among others the attached terms and conditions attached in Appendix 2. A copy of the concluded MTA shall be kept by the provider and each of the involved institution in the transfer of the said genetic material.

8.1 GENDER ASPECTS

Team leaders and other partners have been chosen to the project on the basis on their expertise(s).

Gender equality will be strongly supported by Soda Lakes project in agreement with Constitution of Kenya 2010 which advocates for at least 30% participation of women at all levels in implementing and managing research projects.

Project responsible persons shall ensure that no gender falls below 30% of the overall implementing team. The project will include the following gender aspects:

Recruitment and equal opportunities

a). Recruitment procedures will conform to national and Institutional standards of equal opportunities.

New posts to be recruited during the course of the project will aim for a 1:2 inter-gender ratio however based on excellence; Advertisements shall be checked by the Project Executing Committee to ensure absence of gender bias and aim to appoint equal gender numbers of new staff to the project;

b). The Project shall avoid gender bias and there shall be no gender discrimination in the allocation of its funds;

c). The Partners and Management will seek to promote the participation of women throughout the project.

Management of Research Meetings

a). Selected use of video conferencing to enable full participation in research meetings will help to address life pattern issues including family commitments both for men and women; All project review meetings will be held in venues with comfortable working environment and modern communication facilities including ICT.

Promoting careers in science (men and women):

a). As part of the dissemination activities, the younger members of the project will be expected to advertise their involvement and activities via the project website. However care shall be taken not to compromise IPR;

b). Several partners have competent female and young scientists participating in the project. Their Participation in project meetings will be encouraged.

9.0 SUSPENSION AND TERMINATION OF A PARTNER

The following conditions may lead to suspension and/or termination of a partner:

- a) Non compliance with these procedures;
- b) Non conformity to this project's SOPs;
- c) Non submission of financial and scientific (narrative) reports;
- d) Mismanagement of project funds from GEF;
- e) Upon recommendation by the Projects' Steering Committee.

The suspended partner shall be required to show compliance within three months.

9.1 PROJECT PARTNER SUSPENSION

A partner shall be suspended where violations of the project agreement becomes apparent, or where it appears that the conditions surrounding the project have changed to such an extent that, in the opinion of the Soda lakes Microbial Project Management, the successful completion of the specific project is unlikely or jeopardized.

Microbial Project. This shall be in a written notice and all further disbursements of funds shall be suspended pending a review.

9.1.1 PROCEDURES FOR SUSPENSION

The Soda lakes Microbial Project Management Office shall inform the Executing committee of the partners' non compliance to the conditions set out in 9.0 above and the guidelines stated under the Memorandum of Agreement signed by all partners shall be applied.

9.1.2 EFFECTS OF THE SUSPENSION

Upon project partner suspension the following shall apply;

- a) The suspended institution shall be barred from continuing with the same research without prior permission from the Projects' Steering Committee;
- b). The Soda lakes Microbial Project shall not incur any further expenditures on the project planned activities by the partner until the suspension is lifted;
- c). The suspended institution shall provide safe custody of all assets procured for the project implementation during the suspension period. The suspension shall be in consultation with the other collaborating partners in the Soda lakes

9.2 PROJECT PARTNER TERMINATION

A project partner shall be terminated under the following circumstances;

- a). Mismanagement of financial resources provided for the project to an extent of compromising and/or jeopardizing the fulfillment of the project objectives;



- b). The mismanagement of personnel implementing and failure to forward project reports to an extent of interfering with the successful operational completion of the project or accomplishment of its purpose;
- c) Its continued funding no longer serve the objectives of the project;
- d) Sharing of researching findings with other non-partner institutions without prior approval by the Project's Steering Committee.

9.2.1 PROCEDURE FOR PROJECT PARTNER TERMINATION

A project partner shall be terminated from further participation in the project in accordance with the provisions stipulated in signed Memorandum of agreement by all partners.

9.2.3 EFFECTS OF PROJECT PARTNER TERMINATION

Upon termination of a project partner, the following shall apply;

- a). The funding to the partner institution shall stop forthwith upon receipt of the termination letter from the Project's Steering Committee;
- b). The unused part of the resources by the terminated partner from the project shall be returned to the PMO together with a final audited statement within three months after the date of termination;
- c). All project research records and inventory of all equipment bought with project funds shall be returned to the PMO together with the final audited accounts;
- d). The partner institution shall be barred from continuing with same research without the prior approval of the Soda lakes Microbial Project Steering Committee and as stipulated in the Memorandum of Agreement signed by all partners.

10.0 CO-FINANCING/CO-FUNDING

All project partners are expected to submit a report of co-financing used with the projects annual report submitted at the end of June of every year in the format attached in Appendix 5. Project partners are encouraged to apply for external funding to support project activities.

Such funding shall be cleared by the Project Executing Committee before submission of the request to the donor in order to avoid contradiction of IPR issues within the project.

11.0 MONITORING AND EVALUATION

The projects monitoring and evaluation shall follow the procedures and formats as provided by UNEP in the project document. Monitoring and Evaluation (M&E) process will include a mid-term review and an end of project assessment undertaken by independent review teams.

The mid-term and final reports from each partner institution will be submitted to the PMO for forwarding to UNEP as well as other stakeholders and/ or donors involved in the implementation of this project.

A report on the status of implementation of the project will be submitted to the regular meetings of the Project Steering Committee (PSC). The project will be evaluated on the basis of: execution, performance, output, delivery and project impact.

Evaluation of the project's success in achieving its outcomes will be monitored continuously throughout the project through the bi-annual progress reports, annual summary progress reports and the final evaluation.

11.1 KEY EVALUATION PRINCIPLES

In attempting to evaluate any outcomes and impacts that the project may have achieved, evaluators should remember that the project's performance should be assessed by considering the difference between the answers to two simple questions "what happened?" and "what would have happened anyway?".

These questions imply that there should be a consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts.

In addition it implies that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project.

Details of M&E activities are provided in the Table below.

Table 1: Project reports and timelines

Type of M&E activity	Responsible Parties	Time-frame	Indicative cost to GEF US\$	Indicative cost supported by co-financing
Inception workshop	Project Coordinator	Within 2 months of project approval		
Project inception report	Project Coordinator, KWS and UNEP Task Manager	Within first 3 months		
Project Implementation Review, PIR	Project Coordinator with input from project partners	Yearly		
Project Progress / Operational Reports to UNEP	Project Coordinator and KWS	Half-yearly (as at 30 June & 31 December)		
Half-yearly progress reports to GEF	Project Coordinator with input from partners to UNEP Task Manager	Half-yearly (as at 30 June & 31 December)		
Meetings of Project Steering Committee (PSC)	Project Coordinator, KWS Collaborating Partners UNEP Task Manager	At start of each year and at end of project.		
Reports of PSC meetings	Project Coordinator with inputs from partners	Annually		
Independent final Evaluation	UNEP/DGEF Task Manager	3 months prior to the “terminal” review meeting		
Project terminal report	Project Coordinator, Eco-Agriculture Partners, final clearance and processing by UNEP Task Manager	Within 60 days of project completion		
Total indicative cost				

12.0 PROJECT COMPLETION/CLOSURE

Upon completion of the project, the following shall apply;

- a). Each partner institution shall make an early assessment of its outcomes and accomplishments and submit to the PMO a completion report and a final inventory report of all equipment bought with project funds within two months of completion. The report shall give a summary of the project objectives, all planned activities, actual implementation, expenditures, main outcomes (e.g. patent, publications, products) and the expected sustainability of the project in the post-project period. The report shall be written in accordance with a model template given in Appendix 4;
- b). All resources procured during the project implementation by the partner institution using project funds shall be reallocated in accordance with the agreement presented in Appendix 4;
- c). All intellectual properties rights issues of the project shall be guided by the partners Memorandum of Agreement;
- d). The management of the project spinoffs from the partner institution shall be in accordance with the agreement given in Appendix 7;



APPENDIXES

Appendix 1A: Institutional Confidential Agreement

Effective Date _____, 20_____

A. Narration

1. The parties to this Agreement, their addresses, and phone and fax numbers are:

Company/institution/organisation	University of Nairobi
Phone ()	Fax ()
	[address]
	Phone: Fax:
"Company"	

2. The Confidential Information disclosed under the terms of this Agreement is limited to: research and development in the GEF Soda Lakes Microbial project.

3. The parties appoint the following representatives to disclose and receive Confidential Information.

For Company:

For University of

1. Designated GEF project research staff

4. Subject to exceptions stated below, a recipient of Confidential Information may not disclose such information or use the same except for the purpose of this Agreement, which is: *For research and development in the GEF Soda Lakes Microbial project.*

5. Discloser of Confidential Information represents that the disclosure of information is not in violation of any commitment or obligation to any former employer, present employer, or any other party and that discloser has the right to make such a disclosure and to make the promises and agreements expressed herein.

6. Recipient of Confidential Information shall be: Company [] University []

7. All disclosures hereunder shall be completed not later than [] months following the Effective Date.
8. All obligations created by this Agreement expire [Month] 31, 20__.
9. Confidential Information may include, by way of example but without limitation, data, know how, formulae, processes, designs, sketches, photographs, plans, drawings, specifications, samples, reports, customer lists, pricing information, studies, findings, inventions, and ideas.
10. To the extent practical, Confidential Information shall be disclosed in documentary or tangible form marked "Proprietary" or "Confidential."
11. In the case of disclosures in non-documentary form made orally or by visual inspection, the discloser shall have the right or, if requested by the recipient, the obligation to confirm in writing the fact and general nature of each disclosure in advance.
12. Each representative designated by the parties for receiving and disclosing Confidential Information shall make all arrangements for his/her party and be informed of all communications relating to this Agreement.
13. Any change of representative shall be made only upon written notice to the other party to this Agreement.
14. The amount of Confidential Information to be disclosed is completely within the discretion of the discloser.

The recipient of Confidential Information shall exercise reasonable care to prevent its disclosure to any third party and shall limit internal dissemination of Confidential Information within its own organization to individuals whose duties justify the need to know such information, and then only provided that there is a clear understanding by such individuals of their obligation to maintain the trade secret status of such information and to restrict its use solely to the purpose specified herein. No other right or license to use Confidential Information is granted hereby.

15. Confidential Information provided hereunder shall be returned to the party providing said Confidential Information, and all copies of Confidential Information shall be destroyed if a license agreement has not been executed between the parties, or a licensee of the parties, prior to the termination of this agreement or as otherwise requested by disclosing party.

B. Exceptions

16. The recipient of Confidential Information shall be under no obligation with respect to any information a. which is, at the time of disclosure, available to the general public or b. which becomes, at a later date, available to the general public through no fault of the recipient and then only after said later date or c. which recipient can demonstrate was in its possession before receipt or d. which is disclosed to recipient without restriction on disclosure by a third party who has the lawful right to disclose such information.

17. Confidential Information shall not be deemed within the foregoing exceptions if it is; a. specific and merely embraced by more general information in the public domain or recipient's possession or b. a combination which can be pieced together to reconstruct the Confidential Information from multiple sources, none of which shows the whole combination, its principle of operation, and method of use.

C. Disputes:

18. This Agreement shall be governed by the laws of Kenya. a. Any dispute, controversy, or claim arising under, out of, or in connection with this agreement, including, without limitation, its formation, validity, binding effect, interpretation, performance, breach, or termination, as well as non-contractual claims, shall be referred to and finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules then obtaining. b. The language to be used in the arbitral proceedings shall be English. c. The place of arbitration shall be Kenya.

19. Either party to this agreement may request any judicial authority to order any interim measures of protection for the preservation of its rights and interests to the extent permitted by law, including, without limitation, injunctions and measures for the conservation of such property and information that form part of the subject matter in dispute. Such requests shall not be deemed incompatible with, or as a waiver of, this agreement to arbitrate.

20. In respect of any requests for interim measures of protection, and without limitation to proceeding in any other forum, the parties hereby consent to the exercise of jurisdiction by the judicial authorities of Kenya.

21. In the event a party fails to proceed with arbitration, unsuccessfully challenges the arbitrator's award, fails to comply with the arbitrator's award, or fails to comply with any interim measure of protection issued by any competent authority, the other party shall be entitled to costs of suit, including reasonable attorney's fees, for having to compel arbitration or defend or enforce the award or interim measure.

D. Special Conditions

22. The following special conditions shall be observed

- a. _____
- b. _____
- c. _____

23. Attachments:

- a. _____
- b. _____
- c. _____

By the signatures below of representatives authorized to commit the parties to this Agreement, parties agree to all conditions expressed herein, including the printed terms on both pages hereof. This Agreement is executed in duplicate, and an original shall be given to each of the parties.

For Company.....:

For University of :

Signature

Signature

By: _____

By: _____

Date: _____

Date: _____

**APPENDIX 1 B: GEF MICROBIAL SODA LAKES PROJECT
INDIVIDUAL LEVEL CONFIDENTIALITY AGREEMENT**

Fill five copies

The parties here to are:

1. _____ representing the institution(s)
 2. _____ representing the researcher/supervisor/student/technician/other specified
- In the presence of the institutional legal counsel.

(Insert Names and full addresses as appropriate-researcher/supervisor/student/technician/other specified)

I, _____ of P.O Box _____, the undersigned, do hereby agree that;

E. Authorization

1. any confidential scientific, technical, marketing or business information received by myself from any member of, or party associated with, the GEF MICROBIAL SODA LAKES PROJECT referred herein as “the Project”, will not, unless subject to further written agreement, be disclosed or used by myself or the institution I represent, but is provided solely so that I may perform my duties as.....
.....[Insert the role in the project].

2. I agree that with respect to any confidential information disclosed to myself, providing that the said information is disclosed in writing marked “Confidential” or is of such a nature (or has been disclosed in such a way) that it is obvious to the other party that it is claimed as confidential (“Confidential Information”), I shall:

(a) Use said confidential information only for the purpose of furthering the activities of the this project

(b) Disclose the confidential information only to those others who shall have similarly committed in writing to the terms of this agreement as per the list provided to me by the supervisor. The supervisor shall notify me of any changes to this list as soon as they happen.

(c) Undertake to verify persons eligible to access this information before disclosing to them.

(d) Agree to protect the confidentiality of the information according the laid rules and procedures.

(e) Agree that confidential information disclosed under this agreement shall at all times remain the property of the disclosing party. No license or other rights in or to the material disclosed, or any disclosure of confidential information under this agreement except as provided herein is granted by this agreement. All confidential information and material made available under this agreement, including copies there of, shall be returned to the disclosing party (or, upon such party’s request or consent, destroyed) upon the first to occur of:

- i. completion of the purpose(s) set forth in this Agreement; or
- ii. the reasonable request of the disclosing party; or
- iii. cancellation of this Agreement or

- iv. termination of this agreement
- v. termination of project

(f) Have no obligation of confidentiality with respect to information that:
i. is in the public domain by use and/or publication at the time of its receipt or enters the public domain thereafter through no fault of myself; or
ii. was already in my possession prior to receipt as shown by written documentation written, and where applicable accompanied by material, evidence of which to be delivered to the disclosing party within thirty (30) days; or iii. was properly obtained from a third party not under a confidentiality obligation to the disclosing party; or
iv. was previously developed, independently, by myself or my institution, as shown by written documentation written, and where applicable accompanied by material, evidence of which to be delivered to the disclosing party within thirty (30) days.

3. The obligations of confidentiality under this Agreement shall be limited to a period of five (5) years after termination of the project.

4. Clause 3 above notwithstanding matters protected under trade secret shall not be disclosed ever unless a written consent is granted by the parties owning the trade secret.

This agreement shall be subject to the Kenyan law.
This Agreement contains my entire understanding with respect to the matters herein contained, and supersedes any previous agreements and undertakings with respect thereto.

IN WITNESS WHEREOF, this agreement is hereby executed by:
NAME: _____

SIGNED: _____ DATE: _____

ID /Passport Number _____

For and on behalf of _____ (institution) and duly authorized in his/her personal capacity:

NAME: _____ POSITION _____

SIGNED: _____ DATE: _____

1 Copy remains with the signee, 1 copy remains with the supervisor, one copy with project administrator, one copy with the legal/IP office and one copy to the PMO.

APPENDIX 1 C: STUDENT RESEARCH PROJECT AGREEMENT

The purpose of this document is to formalize the terms of research collaborations between students and their mentors for the project described below. The Student Research Project Agreement addresses some of the specific tasks, responsibilities, and other relevant issues associated with the conduct of scientific research (e.g., research ethics, data ownership, authorship, etc.). Please read and complete this form.

Title of Proposed Study _____

Name of Student Investigator _____

Name of Project Supervisor(s) _____

Agreement Statement

I, _____ recognize that scientific research is important and requires high level of personal commitment. By signing this document, I promise to dedicate the necessary time and effort to complete this project in accordance to the schedule provided to me. I will also uphold the principles of scientific integrity and ethical principles.



I recognize that any form of data falsification, data fabrication, or plagiarism in the conduct of research is not only an academically dishonest act, but also a most severe form of scientific misconduct.

I shall also abide by the stipulation that all research data (e.g., questionnaires, data files, records, observations) from this project become the property of the institution and will be retained by the Supervisor who will determine who and under what circumstances may have access to such data.

I understand that presentations of works in public fora, where am involved in authorship, shall be subject to approval by my supervisor.

I am also aware that authorship of any resulting conference presentation or journal article will depend on the extent of my contributions to this project.

Student's signature_____

date_____

Supervisor's signature_____

date_____

Team leader Name_____Sign_____

Date_____

APPENDIX 2: TERMS AND CONDITIONS FOR BIOLOGICAL MATERIAL TRANSFER

A material or CONFIDENTIAL INFORMATION transfer agreement shall be concluded at the time of transfer of such material or confidential information. The following shall be included in Material or CONFIDENTIAL INFORMATION transfer agreement (the word "MATERIAL" shall be used both for material and CONFIDENTIAL INFORMATION)

1. The MATERIAL is the property of the PROVIDER and is to be used by the RECIPIENT solely for research purposes at RECIPIENT's institution and only under the direction of the Recipient's Scientist.

2. The RECIPIENT Scientist shall not transfer the MATERIAL to anyone who does not work under the project at the RECIPIENT's institution or any other third party without the prior written consent of the PROVIDER. Recipient Scientist shall refer any request for the MATERIAL to PROVIDER.

3. (a) RECIPIENT shall have the right, without restriction to distribute to the Soda Lakes Microbial bioprospecting partners substances created by RECIPIENT through the use of the MATERIAL including Progeny, Unmodified Derivatives, or Modifications and products through an MTA concluded with the provider solely for the purpose of the soda lakes microbial project activities.

(b) Upon written notice to PROVIDER through an MTA, RECIPIENT may distribute Modifications to non-profit or governmental organizations for research purposes only, after the end of the project period and as guided by the clauses in the Soda Lakes Microbial Bioprospecting Project Partners Memorandum of agreement.

(c) Upon written permission from PROVIDER under an MTA, the RECIPIENT may distribute Modifications for commercial use. This will however be guided by clauses in the Soda Lakes Microbial Bioprospecting Project Partners Memorandum of Agreement.

4. The provision of the MATERIAL to RECIPIENT shall not alter any pre-existing right to the MATERIAL. If PROVIDER has granted any rights to a third party which would affect RECIPIENT, the PROVIDER shall notify the RECIPIENT in the MTA or in writing within 30days.

5. Any MATERIAL delivered pursuant to the Agreement is understood to be experimental in nature and may have hazardous properties. THE RECIPIENT INDEMNIFIES THE PROVIDER OF ANY MAKES NO REPRESENTATIONS AND EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED.

6. Except to the extent prohibited by law, RECIPIENT assumes all liability for damages which may arise from its use, storage or disposal of the MATERIAL. PROVIDER shall not be liable to RECIPIENT for any loss, claim or demand made by RECIPIENT, or made against RECIPIENT by any other party, due to or arising from the use of the MATERIAL by RECIPIENT, except to the extent permitted by law when caused by gross negligence or willful misconduct of PROVIDER.

7. The agreement shall not be interpreted to prevent or delay publication of research findings resulting from the use of the MATERIAL or Modifications. Recipient's Scientist shall provide appropriate acknowledgement of the source of the MATERIAL in all publications.

8. The Agreement will terminate on the earliest of the following dates:

(a) On completion of RECIPIENT's current research with the MATERIAL, or (b) On thirty (30) days written notice by RECIPIENT or on ninety (90) days written notice by PROVIDER, or (c) on the date specified in an implementing letter.

However, clauses on ownership of the material, its progeny, derivatives, extracts, compounds, modifications etc shall survive the termination of the agreement as long as the material is in use.



SAMPLE MATERIAL TRANSFER AGREEMENT

Dated: _____

THE PARTIES

This Material Transfer Agreement (MTA) will facilitate and govern the terms of the transfer of materials between:

A. Kenya Wildlife Service (‘ Provider ’) AND

B.

B.[INSERT NAME & ADDRESS] (‘Recipient’)

PREAMBLE

The Parties are jointly undertaking the GEF funded Soda Lakes Microbial Bio-prospecting Project entitled “Developing the Microbial Biotechnology Industry from Kenya’s Soda lakes in line with the Nagoya Protocol”. The project is funded through the United Nations Environment Programme (UNEP) who are the implementing agencies and KWS, KIRDI, Moi University, University of Nairobi and Jomo Kenyatta University of Agriculture and Technology as the executing agencies.

The Parties have executed a Cooperation Agreement to facilitate collaboration in undertaking the Project activities.

THE PARTIES THEREFORE AGREE AS FOLLOWS:

1. DEFINITIONS

1.1 ‘Parties’ shall mean the institutions named here above.

1.2 Add others

2. AUTHORISED REPRESENTATIVES

2.1. Each Party will designate persons as the duly authorized representative (‘Authorized Representative’) for the purposes of implementing this MTA. The Authorized Representative shall be responsible for ensuring that all institutional, national and international laws and procedures in force relating to the exchange of Biological Material are respected by the respective Parties.

3. OWNERSHIP

3.1. Material exchanged in accordance with this MTA including any Material contained or incorporated in modifications, wherever located, shall at all times be the property of the Provider and shall not be used by, or transferred to third parties without the knowledge, consent and written authorization of the Provider.

3.2. The ownership of any new intellectual property derived from Material transferred under this MTA shall be governed by the terms of the Cooperation Agreement.

All modifications of Material developed jointly by the Parties shall be owned as provided for in the Cooperation Agreement.

3.3. The Recipient shall inform the Provider on any modification of the original material which shall only be for the optimization of the intended use only. For avoidance of doubt, the use granted under this sub-clause is for the achievement of the project activities only.

4 CONDITIONS FOR USE OF MATERIAL

4.1. Unless otherwise agreed between the Parties, any Material transferred under this MTA is to be used solely for the soda lakes microbial bioprospecting Project.

4.2. If the Recipient wishes to use the Material in any other way, other than described in the soda lakes microbial bioprospecting Project, the Recipient must seek written authorization from the Provider.

4.3. Each Party shall comply with the terms of this MTA and shall ensure that its staff including but not limited to scientists, technical staff as well as students are aware of, and comply with the provisions of this MTA.

5. CONFIDENTIAL INFORMATION

5.1. 'Confidential Information' means all confidential or proprietary information or materials directly relating to the Soda lakes microbial bioprospecting Project howsoever disclosed by any Party, whether disclosed in writing, orally, or visually, including, without limitation, inventions, methods, plans, processes, specifications, know-how, compounds, business plans, financial statements, cost information, or technical information relating to the data generated in the Soda lakes microbial bioprospecting Project.

5.2. The Parties shall hold in confidence, and shall not disclose to any third party Proprietary and/or Confidential Information of the other Party. The Parties shall only disclose Proprietary and/or Confidential Information received or generated under this MTA to the projects executing/steering committee who have a need to know such Proprietary and/or Confidential Information in the course of the performance of project implementation.

5.3. The obligations specified in Clause 5.1 above shall not apply, and the Parties shall have no further obligations hereunder with respect to any Proprietary and/or Confidential Information, to the extent that such Confidential Information is:

5.3.1. possessed by a Party, other than through prior disclosure by the disclosing other Party, prior to the commencement of dealings between the Parties as evidenced by the Parties' written records and which was not acquired directly or indirectly from the other Party

5.3.1. possessed by a Party, other than through prior disclosure by the disclosing other Party, prior to the commencement of dealings between the Parties as evidenced by the Parties' written records and which was not acquired directly or indirectly from the other Party

5.3.2 in the public domain at the time of disclosure

5.3.3 already published or available to the general public after disclosure, otherwise than through a breach of this Agreement

5.3.4 obtained by a Party from a third party with a valid right to disclose such Information, provided that the said third party is not under a confidentiality obligation to any of the Parties or any other third party

5.3.5 independently developed by employees of a Party which had no knowledge of the other Party's information as shown by relevant documentary evidence

5.4 The Parties shall protect, store and handle the Proprietary and/or Confidential Information in such a way as to prevent unauthorized disclosure and unwarranted access, acting always in accordance with prudent commercial practice and having utmost regard for the sensitivity of the Proprietary and/or Confidential Information.

5.5 The above obligations of confidentiality shall survive the expiry or termination of this MTA and continue for a period of five years after the date of termination.

6. DURATION OF THE AGREEMENT

This Agreement shall be valid until the end of the Soda lakes Microbial Bioprospecting Project. The following Paragraphs shall survive the termination of the Agreement: Paragraphs 3, 4, and 5.

7. TERMINATION

7.1 Unless otherwise agreed, this MTA shall terminate at the expiry of the Soda Lakes Microbial Bioprospecting Project provided that the following shall apply to any Material exchanged under each specific MTA.

7.1.1 The Parties shall remain bound to each other by the terms applicable to the Material obtained in the pursuance of the purposes of this MTA and any modifications thereof.

7.1.2 The Parties shall discontinue their use of the Material and return any remaining Material to the Provider; where such return is not practical the Parties shall destroy such Material.

7.1.3 If for any reason, any of the Parties wishes to terminate this Agreement before the completion of the Soda Lakes Microbial Bioprospecting Project each of the Parties agree that they shall give written notice of six months (6) to the other Parties so as to enable the completion of ongoing research. Such written notice shall be provided to the execution/steering committee that are signatories to his agreement.

8. SETTLEMENT OF DISPUTES

Any disputes which arise between Parties during the performance of MTA shall be settled as provided for in the Cooperation Agreement.

9. MISCELLANEOUS

9.1. The Parties acknowledge that the Material provided in pursuance of the purpose of this Agreement may have characteristics that are unknown or difficult to determine and which may be potentially hazardous.

NONE OF THE PARTIES MAKES WARRANTIES, EXPRESS OR IMPLIED, AS TO THE SAFETY, QUALITY, VIABILITY OR PURITY OF THE BIOLOGICAL MATERIAL, OR ITS MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

9.2. No variation or amendment to this MTA shall be effective unless in writing and signed by the executing/steering committee.

AGREED TO AND ACCEPTED BY:

Name of Provider Institution _____

Full Address _____ Head of Team _____ Title _____

Signature _____ Date _____

Name of Recipient Institution _____

Full Address _____

Receiving Officer _____ Title _____

Signature _____ Date _____

Head of Team

Title

Signature _____ Date _____

1 1 Copy remains with the signee, 1 copy remains with the supervisor, one copy with project administrator, one copy with the legal/IP office and one copy to the PMO.



APPENDIX 3: TOOLS FOR MICROBIAL ECOLOGY AND MICROBIOLOGY RESEARCH TEAM

Data about data

Critical component of 'omic' data study

16s gene surveys (microbiome data)

MIMARKS

Tutorial: <http://www.microbio.me/qiime/docs/tutorials/tutorial.html>

Examples available at: <http://www.microbio.me/qiime/>

Register (free, 2 minute process) then retrieve hundreds of examples

'Omics' data requires bioinformatic pipelines

QIIME, Mothur, LEfSe, MetaPhlAn, USEARCH, UPARSE, PandaSeq, etc.

They are complicated and non-intuitive

QIIME forum: <https://groups.google.com/forum/#!forum/qiime-forum>

Mothur: http://www.mothur.org/wiki/Main_Page

SeqAnswers: <http://seqanswers.com/forums/index.php>

StackExchange: <http://biology.stackexchange.com/>

'Omics' tools require computational power

Local cluster

AWS Educational Grants: <http://aws.amazon.com/education/>

Partner with a bioinformatics lab

A little bit of scripting can go a long way

Project Rosalind: <http://rosalind.info/about/>

Project Euler: <http://projecteuler.net/>

Resources

EMP: <http://www.earthmicrobiome.org/emp-standard-protocols/>

HMP: <http://www.hmpdacc.org/>

Tutorials/workshops

QIIME/Mothur workshops

Distance workshops

STAMPS: http://hermes.mbl.edu/education/courses/special_topics/stamps.html

QIIME tutorials: <https://www.qiime.org/tutorials>

Software Carpentry: <http://software-carpentry.org/>

NGS overviews: <http://informaticstraining.hms.harvard.edu/>

Open Courses

Coursera: <https://www.coursera.org/>

Biostatistics boot camp (started Nov 18th)

Machine learning

Bioinformatics methods

MIT: <http://ocw.mit.edu/index.htm>

APPENDIX 4: INTERIM REGULATIONS

I Of the Department of School of.....ofuniversity;

1. Am aware that research notebooks are the property of the gefnpif microbial soda lakes project
2. Am aware the books will be issued by the technology transfer office and returned to it on completion of the project or complete utilisation of all the pages, whichever is earlier.
3. Shall record all experiments and reasonable technical details of equipments used
4. Shall give detailed methods used or quote author of method used
5. Shall record all results including;
 - a) Raw data
 - b) Analyzed data
 - c) Calculations, formulae or data analysis software used
 - d) Charts
 - e) Photos
 - f) Computer print outs
 - g) Diagrams
 - h) Labeled figures
 - i) Modifications

6. I shall record favourable and unfavorable results
7. I shall give a key to abbreviations used
8. I shall record legibly, neatly in permanent ink (blue or black)
9. I shall make entries in chronological order
10. I shall use pages in consecutive order
11. I shall be the only user of the book for this project entitled gefnpif microbial soda lakes project
12. I shall sign and date every page
13. I shall ensure the note book is reviewed weekly by a witness who:
 - A) Understands the technology
 - B) Is not involved in the present project
 - C) Is a trusted person who shall sign and datethat the written work was done



14. I shall ensure that any joint work is signed by all contributors and text shall indicate which work is applicable to which (co-) inventor
15. I shall permanently stick/affix photos and other support materials on the page in proper chronological location and include the following:-description of the attached item, conclusion, signature and date.
16. I shall maintain large supplementary material in ancillary record maintained for this purpose. Description of this source shall be indicated in the notebook.
17. I shall not leave empty spaces instead shall draw a cross-diagonal line throughout page spaces not used.
18. I shall not remove any pages nor erase or delete writings completely.
19. I am aware that the book may be recalled from me by the technology manager for routine checks or scrutiny.
20. I am aware that i may be denied further access to the book on being recalled for reasons cited by the IP office/technology transfer officer (IPO) which may or may not be told to me in writing. However, where the reasons are not disclosed to me, the TTOs/IPO retention notice will be backed by support notice from the relevant university authority that shall be presumed to have been adequately communicated to the prevailing reasons of retention in a confidential document by the tto/ipo.

Sign date20.....

Report of planned and actual co-finance by budget Report of planned and actual co-finance by budget line									
Name:									
Project title: Developing the Microbial biotechnology Industry from Kenya's soda lakes in line with the Nagoya Protocol									
Project No. GFL-2328-pppp-nnnn									
Project executing partner:									
Project Reporting period: From _____ To: _____									
Budget line	Activity	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
		Prior Year	Cash cofinance		In-kind cofinance		Total for year		Cumulative
		Actual Total	Planned	Actual	Planned	Actual	Planned	Actual	Planned
		A	B	C	D	E	F=B+D		H=A+G
1100	Project personnel								
1200	Consultants								
1300	Administrative support								
1600	Travel on official bussiness								
2100	Sub-contracts (UN entities)								
2200	Sub-contracts(supporting organizations)								
2300	Sub-contracts (commercial purposes)								
3200	Group training (study tours, field trips, workshops, seminars etc)								
3300	Meetings/conferences								
4100	Expendable equipment								
4200	Non-expendable equipment								
4300	Premises (office rent, maintenance of premises etc)								
5100	Operation and maintenance of equipment								
5200	Reporting costs (publications, maps, newsletters, printing)								
5300	Sundry (communications, postage, freight clearance charges etc)								
5400	Hospitality and entertainment								
5500	Evaluation (consultant fees/travel/ DSA/admin support etc)								
TOTAL COSTS									
* The actual expenditures should be reported in accordance with the specific budget lines of the approved budget of the project document									
Name		Title		Name of project manager					
	Duly authorized official of Executing Division	Date		Date					
Signature				Signature					

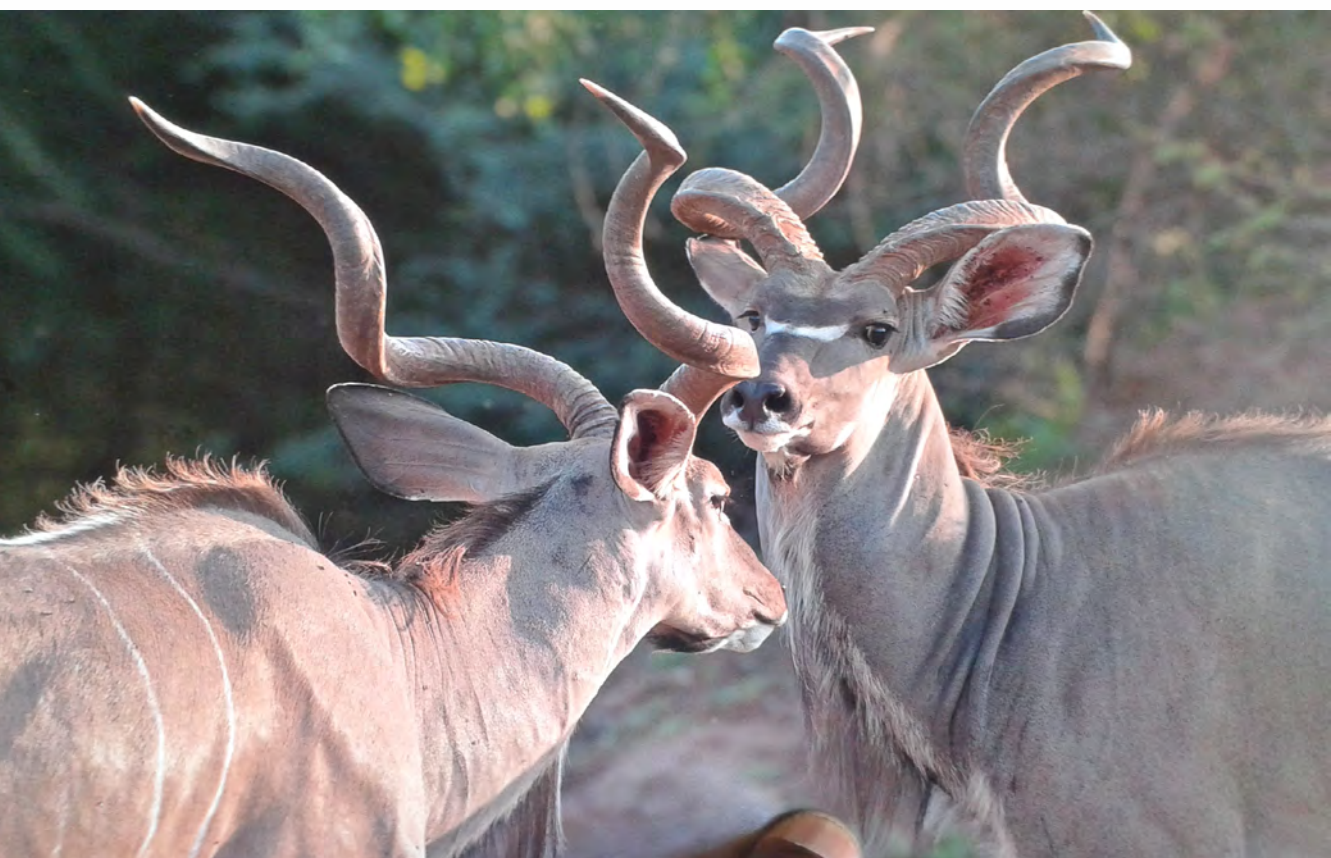
APPENDIX 6: LIST OF PARTICIPANTS FOR DEVELOPMENT OF SOPS

A: List of Participants for the meeting at Voi Safari Lodge

No.	Name	Institution	Email Address
1.	Damaris Thairori	Kenya Wildlife Service	dthairora@kws.go.ke
2.	Beth Ndunda	University of Nairobi	Beth.ndunda@uonbi.ac.ke
3.	Adam Wako	Kenya Industrial Research and Development Institute	Adam.wako.aw@gmail.com
4.	Justus Onguso	Jomo Kenyatta University of Agriculture and Technology	jonguso@jkuat.ac.ke
5.	Prof. Francis Mulaa	University of Nairobi	mulaafj@uonbi.ac.ke
6.	Antony S. mbayaki	Moi university	ambayaki@yahoo.co.uk
7.	Prof. Hamadi Boga	Jomo Kenyatta University of Agriculture and Technology / Taita Taveta University College	hamadiboga@yahoo.com
8.	Carol Kiage	Kenya Wildlife Service	ckiage@kws.go.ke
9.	Ann Kelly Kambura	omo Kenyatta University of Agriculture and Technology	annnderitu@gmail.com
10.	Dr. Charles Nzila	Moi University	cnzila@gmail.com
11.	Kavaka Mukonyi	Kenya Wildlife Service	mwatai@kws.go.ke
12.	Priscillar Mutungi	Kenya Wildlife Service	pmutungi@kws.go.ke
13.	Richard wokabi	Jomo Kenyatta University of Agriculture and Technology	rwkariuki@jkuat.ac.ke
14.	Vitalis Wekesa	Technical University of Kenya	vwwekesa@yahoo.com
15.	Jackson Cherutio	Moi University	cherutoijackson@yahoo.com
16.	Chris Oketch	Moi University	nyaombao@gmail.com
17.	Prof. Julius Mwangi	University of Nairobi	Julius.mwangi@uonbi.ac.ke
18.	Etta Mwango	Kenya Wildlife Service	emuango@kws.go.ke
19.	D.kiboye Yogo	Moi University	kiboyye@gmail.com
20.	Martha Induli	Kenya Industrial Research and Development Institute	Martha_induli@yahoo.com
21.	Kabete Julius	Kenya Wildlife Service	jgitonga@kws.go.ke
22.	Martin Murimi	Kenya Industrial Research and Development Institute	gichugumurimi@gmail.com

B: List of Participants for the second meeting in Nakuru

No.	Name	Institution	Email Address
1.	Prof. Francis Mulaa	University of Nairobi	mulaafj@uonbi.ac.ke
2.	Antony S. mbayaki	Moi university	ambayaki@yahoo.co.uk
3.	Ann Kelly Kambura	Jomo Kenyatta University of Agriculture and Technology	annnderitu@gmail.com
4.	Priscillar Mutungi	Kenya Wildlife Service	pmutungi@kws.go.ke
5.	Vitalis Wekesa	Technical University of Kenya	vwekesa@yahoo.com
6.	Martha Induli	Kenya Industrial Research and Development Institute	Martha_induli@yahoo.com
7.	Royford mbaka	Kenya Wildlife Service	rmbaka@kws.go.ke
8.	Jenipher Olang	Kenya Wildlife service	conventions@kws.go.ke
9.	Leonida Kerubo	University of Nairobi	lkerubo@uonbi.ac.ke





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