

**Mobilizing vital taxonomic information  
to support human well being  
and ecosystem health in Eastern Africa**

*With the ultimate goal to contribute to  
improved livelihoods, food security and ecosystem resilience in Eastern Africa*

**BioNET**  
application to  
**SwedBio**  
May 2008

**ACRONYMS and GLOSSARY**

ANAFE	African Network for Agriculture, Agroforestry and Natural Resources Education
API	African Pollinator Initiative
APPO	African Plant Protection Organisation
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASEANET	BioNET's South East Asia Network for Taxonomy
BGCI	Botanic Gardens Conservation International
BioNET	The Global Network for Taxonomy
BOZONET	GEF Project on Botanical and Zoological Taxonomy Networks for Eastern Africa (unfunded after PDFB)
CAADP	Comprehensive Africa's Agricultural Development Programme
CABI	Commonwealth Association for Biosciences International
CAMP	Conservation Assessment and Management Planning
CAPPS	Common African Plant Protection Strategy
CBD	Convention on Biological Diversity
CORAF/WECARD	Western and Central African Council for Agricultural Research and Development
CTA	Centre for Tropical Agriculture
EAFRINET	BioNET's Eastern African Network
FAO	United Nations Food and Agriculture Organisation
FARA	Forum for Agricultural Research in Africa
GBIF	Global Biodiversity Information Facility
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GISD	Global Invasive Species Database
GISP	Global Invasive Species Programme
GSPC	Global Strategy for Plant Conservation
GTI	Global Taxonomy Initiative
IAALD	International Association for Agricultural Information Specialists
IABIN	Inter American Biodiversity Information Facility
IAPSC	Inter African Phyto Sanitary Council
IAS	Invasive Alien Species
ICIPE	International Centre for Insect Physiology and Ecology
IFAD	International Fund for Agriculture
IISD	International Institute for Sustainable Development
IPPC	International Plant Protection Convention
ISSG	Invasive Species Specialist Group
IUCN	The International Union for the Conservation of Nature
JRS	Biodiversity Foundation (USA)
KARI	Kenya Agricultural Research Organisation
MDG	Millennium Development Goal
MUIENR	Makerere University Institute of Environment and Natural Resources
NAFRINET	BioNET's North African Network for Taxonomy
NARO	National Agricultural Research Organisation
NEPAD	New Partnership for African Development
NMK	National Museums of Kenya
OAU	Organisation for African Unity, now African Union (AU)
PDF B	Project Development Phase B
PESTNET	Network for Pests of ASEANET
RAIN	Regional Agricultural Information Network
SAFRINET	BioNET's South African Network for Taxonomy
TPRI	Tropical Pesticide Research Institute
UDSM	University of Dar es Salaam
UNEP	United Nations Environment Programme
WAFRINET	BioNET's West African Network for Taxonomy
WHO	World Health Organisation
WIOMSA	Western Indian Ocean Marine Science Association
WTO - SPS	World Trade Organisation Sanitary and PhytoSanitary Agreement

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## 2. ABSTRACT

This regional project for Eastern Africa focuses on two key objectives:

1. to consolidate and mobilise crucial **taxonomic information** that is fundamental to support decision making, policy development and action as well back-stop research, agricultural extension work and biodiversity conservation in three countries in Eastern Africa: Kenya, Tanzania and Uganda.
2. to develop models and sample outputs, which demonstrate the potential of locally organised taxonomic partnerships to provide timely, relevant, and **locally optimised products** and services in response to emerging challenges in biodiversity conservation, poverty alleviation and sustainable development in Africa.

While the project will be implemented mainly in Eastern Africa within the target countries Kenya, Tanzania and Uganda, the ultimate goal is to deliver outcomes of pan-African importance and provide a platform for up-scaling and sharing experiences at this higher level. Making taxonomic information from African institutions available freely via online databases and linking this using “interoperable data standards” with freely available data from international sources is high on the agenda of agriculture and biodiversity institutions across Africa. This project will serve as a practical and replicable example of how to mobilise taxonomic data to develop a knowledge base for generating taxonomic tools and products with immediate relevance to poverty reduction and ecosystem management.

### **The problem:**

Africa has a wealth of natural resources, including a storehouse of biological diversity, which offers significant potential for human, social and economic development. However, also common are widespread land degradation and desertification, loss of biodiversity, loss of arable and grazing land and related challenges, together impacting negatively on food security, sustainable resource management, human health and efforts towards poverty eradication.

Thus, Africa is characterized by two interrelated challenges: – rising poverty levels and deepening environmental degradation. While over 40% of the population live below the poverty line, Africa is the only continent whose poverty levels are projected to rise during this century if adequate measures are not urgently taken. Land is the main resource on which African economies are based, with agriculture contributing 40% to regional GDP and providing livelihoods to about 60% of the population. Yet, there has been continued deterioration in most ecosystems resulting in a threatened agricultural base and depauperate biological resources. As a result, while reconciling development needs with sustainable management of biodiversity is crucial for Africa, the overriding goal and priority for their development policies is poverty alleviation.

Ideally, adequate and timely investments aimed at supporting and enhancing sustainable agricultural practices, conserving biodiversity and promoting management of ecosystem services reduce vulnerabilities to human well being and provide opportunities for sustained economic development. However, **invasive alien species** have been identified as key drivers of change in ecosystems, often severely compromising

the delivery of ecosystem services; the constant challenge of **pests** has compromised agricultural production and trade while the emerging challenge of declining **pollinator** diversity and abundance is likely to be next crisis in agriculture in Africa.

To address these threats and provide the tools necessary to manage them in a timely manner we depend on the availability of taxonomic information, resources and expertise. Yet, these factors have been identified as key constraints in advancing the poverty reduction and environmental conservation agenda. Indeed, the NEPAD Action Plan for the Environment notes that the capacity to generate, manage and effectively use information and data on various aspects of the environment is in short supply in Africa.

### **The solution:**

BioNET-INTERNATIONAL (BioNET) – the global network for taxonomy, seeks to strengthen its Eastern Africa regional taxonomic partnership, BioNET-EAFRINET, to mobilise vital taxonomic information that will help to underpin research and develop and disseminate selected relevant products and tools to remove taxonomic barriers related to the management of invasive species, pests and pollinators. The project will involve partner institutions including the following: Kenya (National Museums of Kenya); Uganda (Makerere University); and Tanzania (Tropical Pesticide Research Institute), each of which have been appointed by their governments as National Coordinating Institutions for EAFRINET.

Building on the outcomes of the PDF B process of the GEF Botanical and Zoological Network (BOZONET) project, which unfortunately was not funded, and working closely with the JRS Foundation East African Regional Project on the CBD Global Strategy for Plant Conservation (GSPC), and other existing initiatives in Eastern Africa, the project will aim to accomplish the following:

- Develop taxonomic knowledge bases of selected invasive species, pests and pollinators in accessible formats as a basis for tool and product development and as a reference for national planning, prioritisation, conservation action and investment for trade, food security, health agriculture and development.
- Develop user friendly tools and products to mobilize the available technical information, packaged in appropriate formats for end users such as local communities, farmers, entrepreneurs, policy makers, conservation practitioners and regulatory agencies concerned with trade, pests and other controlled organisms.
- Disseminate through appropriate workshops for end-users, forums and media the taxonomic tools and products related to invasive species, pests and pollinators to strengthen action at local, institutional, national, regional and international level and to influence policy making.
- Strengthen the capacity of institutions in the region to use EAFRINET to deliver timely and locally optimised taxonomic tools and products in an effective, efficient, timely and sustainable manner.

### 3. APPLICANT ORGANISATION - BIONET

BioNET comprises a UK-based Secretariat (hosted by CABI) linking regional, government-endorsed networks – the “Locally Owned and Operated Partnerships” (LOOPs) – with international technology, informatics and capacity building partners. Ten LOOPs have been established to date bringing together institutions from over 100 countries in Africa, Asia and Oceania, the Caribbean and Latin America.

BioNET is the only international not-for-profit organisation dedicated to enhancing human well being and biodiversity conservation by building capacity to discover, name and classify the world’s living organisms. In line with its Business Plan 2007-2010, BioNET is seeking to strengthen its partnerships in Africa and be part of the solution to Africa’s crisis. In a world of unprecedented inter-dependence between the challenges of development and environment, knowing what is living where has never been more important to our security. BioNET's **driving force** is the timely and accurate provision of identifications where they are most needed - helping people everywhere have the capacity to name the elements of their living world. In its work, BioNET is guided by **five core values**:

**End-user Focus** – Knowledge of what taxonomic support non-taxonomists want is the essential basis for a demand-driven response from the taxonomic sector.

**Awareness and Action** – Increasing engagement of the taxonomic sector in addressing policy priorities serves to focus effort and increase the responsiveness and immediate impact of taxonomic work.

**Timeliness** – Emerging, technology assisted and more efficient approaches to delivering taxonomic services and research outputs need to be widely adopted.

**Partnerships** – Increased world-wide access to taxonomy demands partnerships on several levels: among taxonomic institutions, between taxonomic institutions and political structures and between taxonomic institutions and international technology and training leaders.

**Scientific Integrity** – The practice of taxonomy requires the application of scientific rigour and method.

BioNET's principal goal is to enhance the availability and application of taxonomy to support delivery of the Millennium Development Goals (MDG), the CBD 2010 biodiversity target and, through the Global Taxonomy Initiative (GTI) and other programmes of work of the CBD. This is in line with the Convention on Biological Diversity’s 2010 target; *to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth*. An important step towards the achievement of this ambitious goal will be made when the taxonomic sector in developing countries can better identify and respond to market opportunities, technologies are deployed widely in delivering taxonomy, taxonomists world-wide are mobilised to deliver locally optimised products to address policy priorities and policy makers are sensitised to the socio-economic benefits of taxonomy. These elements summarise the "**Global Programme 2007-2011**" of BioNET.

#### **BioNET's Vision:**

*The capacity to name all living organisms is accessible to serve the needs of people everywhere.*

#### **BioNET's Mission:**

*Enhance human well-being and biodiversity conservation by building capacity to discover, name, and classify the world's living organisms.*



## 4. PROPOSAL NARRATIVE

### 4.1 Rationale and importance of the work

Africa has a wealth of natural resources, including a storehouse of biological diversity, which offers significant potential for human, social and economic development. However, also common are widespread land degradation and desertification, loss of biodiversity, loss of arable and grazing land and related challenges, resulting in wider implications for food security, sustainable resource management, human health and efforts towards poverty eradication.

Over 70 per cent of Africa's population is rural and depends directly on the land and the natural environment for its livelihoods and well-being (IFAD 2001)<sup>1</sup>. For example, it is widely recognized in Africa that biodiversity is the key capital resource for development and poverty alleviation. No where else in the world is the provisioning role of biodiversity clearly exemplified as it is in Africa. Indeed some rural populations rely entirely on biodiversity resources to meet all the basic needs including food, fibre, fuel, medicines and so on.

African biodiversity is closely linked to **nutrition and achieving food security**<sup>2</sup>. Nearly three-quarters of the recorded protein consumption in Africa is derived from plant sources. In rural areas, essential micronutrients are derived from eating a large variety of plant foods. Foods from the wild are particularly important in times of stress – drought, ill health and economic change. Natural ecosystems provide a wide variety of plants and animals that are important for traditional medicines and modern pharmaceutical products. Up to 80 per cent of people make some use of traditional medicine (WHO 2003)<sup>3</sup>, which draws on a wide variety of indigenous plants and animals, and especially on rare or unusual organisms.

Biodiversity in itself forms a component of **commodity trade** in some countries. For example, the Namibian devil's claw (*Harpagophytum procumbens*) is used locally for digestive problems, arthritis and low back pain, and supports lucrative trade. The bark of the afro-montane tree *Prunus Africana* is the source of a commercial prostrate remedy. Pharmaceutical bioprospecting is likely to increase in coming years, especially as new methods that utilize evolutionary and ecological knowledge enhance productivity. Rural communities have a great opportunity to effectively use their local knowledge to become serious players in the global herbal medicine market.

Similarly, healthy ecosystems are central to the **survival of communities and their livelihoods**. Indeed many communities depend entirely on ecosystems for regulating supporting services such as pollination. Biodiversity-based agriculture and 'pro-biodiversity' agricultural practices still form the backbone of economic activity in many rural communities due to lack of resources for agricultural intensification and

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<sup>1</sup> IFAD (2001). *Rural Poverty Report 2001: The Challenge of Ending Rural Poverty*. International Fund for Agricultural Development. Oxford, University Press, New York. <http://www.ifad.org/poverty/index.htm>

<sup>2</sup> UNEP, 2002. African Environmental Outlook. [http://www.unep.org/dewa/africa/docs/en/aeo-2/chapters/aeo-2\\_ch07\\_BIODIVERSITY.pdf](http://www.unep.org/dewa/africa/docs/en/aeo-2/chapters/aeo-2_ch07_BIODIVERSITY.pdf)

<sup>3</sup> WHO (2003). Traditional Medicine. World Health Organization Fact Sheet No. 134. World Health Organization. <http://www.who.int/mediacentre/factsheets/fs134/en/index.html>



mechanization. Strengthening these systems provides multiple benefits not only for improved productivity and income generation but also for enhancing ecosystem functioning and resilience.

Thus, how environmental goods-and-services are used will have practical consequences for alleviating poverty, improving human well-being, and ensuring sustained economic development<sup>4</sup>. Environmental and economic changes can introduce vulnerabilities to human well-being and undercut opportunities for development. Improved human well-being is critical to increasing the range of options, choices and responses people are able to make to mitigate and adapt to such changes.

There is an urgent need to break the so called 'cyclical and downward spiral' of the poverty-environment nexus. Indeed throughout Africa, poverty remains the main cause and consequence of environmental degradation an resource depletion and so without significant improvement in the living condition and livelihoods of the poor, environmental programmes will achieve little success.

Thus, Africa is characterized by two interrelated challenges: – rising poverty levels and deepening environmental degradation. While over 40% of the population live below the poverty line, Africa is the only continent whose poverty levels are projected to rise during this century if adequate measures are not urgently taken. As a result, for African countries, alleviating poverty is the overriding goal and priority for their development policies.

**Ensuring food security** - the basic right of people to the food they need - is one of the greatest challenges facing the world community. The challenge is most critical in low-income, food-deficit countries. Of the 86 countries that are defined as low-income and food-deficient, 43 are in Africa<sup>5</sup>.

Scholars and policy-makers agree that food and nutrition insecurity remain fundamental threats to the sustainable development of Africa, where per-capita food production has declined in recent decades despite a 25% increase in absolute food production in the last two decades. The number of undernourished people in Africa has increased by 15% in less than a decade, to a current total of around 200 million. This figure represents a doubling since the late 1960s. In 1996, the World Food Summit set the goal of halving the number of undernourished people by 2015. The urgency of this goal was reinforced in 2000 at the UN Millennium Summit, where world leaders resolved to halve the proportion of people who suffer from hunger by 2015.<sup>6</sup>

The major challenge to food security in Africa is its underdeveloped agricultural sector that is characterized by over-reliance on primary agriculture, low fertility soils, minimal use of external farm inputs, environmental degradation, significant food crop loss both pre- and post- harvest, minimal value addition and product differentiation, and inadequate food storage an preservation that result in significant commodity price fluctuation. A significant amount of the food is lost through pre- and

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<sup>4</sup> UNEP 2002. The African Environmental Outlook. [http://www.unep.org/dewa/africa/docs/en/aeo-2/chapters/aeo-2\\_ch01\\_THE\\_HUMAN\\_DIMENSION.pdf](http://www.unep.org/dewa/africa/docs/en/aeo-2/chapters/aeo-2_ch01_THE_HUMAN_DIMENSION.pdf)

<sup>5</sup> FAO. 1998. Knowledge and information for food security in Africa: From traditional media to the Internet. <http://www.fao.org/sd/CDdirect/CDan0017.htm>

<sup>6</sup> IISD 2004. Brief history of the 2020 Vision Initiative for Food Security in Africa. <http://www.iisd.ca/sd/IFPRI/sdvol58num6e.html>

post-harvest losses. The tropical climate makes foods produced in these regions prone to pests and diseases. Poor handling and storage further increase the post-harvest losses<sup>7</sup>.

Because over 70 percent of the poor live in rural areas, where also the largest proportion of the food insecure live, it is evident that we cannot significantly and sustainably reduce food insecurity without transforming the living conditions in these areas. The key lies in increasing the agricultural profitability of smallholder farmers and creating rural off-farm employment opportunities. Hence the challenge is not just poverty alleviation but wealth creation.

To date, land is the main resource on which African economies are based, with agriculture contributing 40% to regional GDP and providing livelihoods to about 60% of the population. African countries, cognizant of the fact that that agriculture is the backbone of most of their economies, have put in place comprehensive policies for the advancement of agricultural research, education and development. For example, there is an effort to strengthen and refocus the capacity of Africa's agriculture research and extension systems and address issues of upgrading the physical and institutional infrastructure that supports the agricultural systems.<sup>8</sup>

The Action Plan of the Environment Initiative for the New Partnership for Africa's Development (NEPAD)<sup>9</sup> recognises that one of the most important environmental challenges for Africa is to reconcile its development need with the sustainable management of its resources. Therefore the main objective of the NEPAD Environment action Plan is to assist African Countries to integrate environmental considerations into poverty reduction policies and strategies whose ultimate twin goals are to reduce poverty and environmental degradation.

The action Plan aims to, among other objectives:

- Enhance the human and institutional capacities of the African countries to address effectively the environmental challenges facing the continent,
- Foster regional and sub regional cooperation to address environmental challenges,
- Build a network of regional centres of excellence in environmental science and management,
- Mobilise and direct African and international scientific and technical communities to solve Africa's pressing environmental problems, and
- Mobilise international resources for the implementation of the African environmental initiative.

In addition, NEPAD has secured endorsement of the Comprehensive Africa Agricultural Development Programme (CAADP) which sets broad goals and strategies. Various initiative to address the agricultural challenges have been developed in Africa including such as the Association for Strengthening Agricultural Research in Eastern

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<sup>7</sup> Angela Mwaniki. Achieving Food Security in Africa - Challenges and Issues.  
<http://www.un.org/africa/osaa/reports/Achieving%20Food%20Security%20in%20Africa-Challenges%20and%20Issues.pdf>

<sup>8</sup> <http://www.anafeafrika.org/downloads/ANAFE%20Strategy121107.pdf>

<sup>9</sup> UNEP 2003. Action Plan of the Environment for NEPAD.  
<http://www.nepad.org/2005/files/documents/113.pdf>

and Central Africa (ASARECA)<sup>10</sup>, Western and Central African Council for Agricultural Research and Development (CORAF/WECARD)<sup>11</sup> and the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE). The Forum for Agricultural Research in Africa (FARA)<sup>12</sup>, provides a strategic platform to foster continental and global networking that reinforces the capacities of Africa's national agricultural research systems and sub-regional organizations.

Yet, there has been continued deterioration in most of the fragile ecosystems resulting in a threatened agricultural base and depauperate biological resources<sup>13</sup>. Further, the African Environmental Outlook indicates that land degradation, natural as well as human induced disasters and alien invasive species continue to be a major problem in Africa. In fact, the threat posed to biodiversity by invasive alien species (IAS) is considered second only to that of habitat loss<sup>14</sup>. Other major challenges of course are the continuing threat of pests and potential loss of pollinators as habitats are lost, damaged, degraded and ecosystem services disrupted. These three challenges are discussed in more detail below.

#### 4.1.1. Invasive Alien Species

Invasive alien species may threaten native species as direct predators or competitors, as vectors of disease, or by modifying the habitat or altering native species dynamics. Entire ecosystems may be placed at risk through knock-on effects and given the critical role biodiversity places in the maintenance of essential ecosystem functions, IAS may compromise the ecosystems' ability to provide environmental services.

Africa is home to hundreds of IAS – both plant and animal – but the magnitude of the problem varies from country to country, and from ecosystem to ecosystem<sup>15</sup>. The second African Environment Outlook notes that the proliferation of IAS affects the potential of countries to meet their development and environmental objectives. This is because resources spent on trying to control IAS could be redirected to other development initiatives, such as the implementation of the Millennium Development Goals (MDGs) given that currently, Africa spends an estimated US\$60 million annually on the control of IAS.

For example, across Africa IAS in the genus *Striga* have a direct impact on local livelihoods: it affects more than 100 million people and as much as 40 per cent of arable land in the savannahs. The cost of eradicating is reportedly between US\$7-13 000 million annually. These invasives stunt maize plant growth by attacking the roots and

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<sup>10</sup> <http://www.asareca.org/>

<sup>11</sup> <http://www.coraf.org/>

<sup>12</sup> <http://www.fara-africa.org/>

<sup>13</sup> UNEP, 2002. African Environmental Outlook.

<sup>14</sup> UNEP, 2002. African Environment Outlook.

[http://www.unep.org/dewa/africa/docs/en/aeo-2/factsheets/aeo-2\\_IAS\\_factsheet](http://www.unep.org/dewa/africa/docs/en/aeo-2/factsheets/aeo-2_IAS_factsheet).

<sup>15</sup> UNEP, 2002. African Environment Outlook. [http://www.unep.org/dewa/africa/docs/en/aeo-2/chapters/aeo-2\\_ch10\\_INVASIVE\\_ALIEN\\_SPECIES.pdf](http://www.unep.org/dewa/africa/docs/en/aeo-2/chapters/aeo-2_ch10_INVASIVE_ALIEN_SPECIES.pdf)

sucking nutrients and water and thus in addition to the direct financial costs have implications for food security<sup>16</sup>.

IAS impact on land resources, and agriculture and livestock production systems, in multiple ways, potentially threatening food security. They may affect the productive capacity of the land and increase agricultural labour time, affecting human well-being by threatening the availability of food.

Many IAS grow faster than native plants and reproduce quickly, and thus replace indigenous plants and completely alter the composition of the area they have colonized. *Parthenium hysterophorus* (congress weed), introduced through relief food<sup>17</sup>, invades disturbed land, including overgrazed and recently cleared or ploughed land. Once present, it is easily spread through seed dispersal – its seeds can remain viable for up to two years and buried seeds can stay dormant for up to 20 years – and as a result of its allelopathic character. Because it is unpalatable to livestock its colonization of rangelands results in grazing shortages, placing livestock production at risk<sup>18</sup>.

In order to deal effectively with IAS, the Global Strategy on Alien Invasive Species<sup>19</sup>, in responding to considerations highlighted by the Convention on Biological Diversity, programme of work on alien invasive species, recommends a series of actions at local, national, regional and international level. In defining tools to prevent invasions, the Strategy stresses the need for public information, and more so for a spectrum of lists, noting that listing of species in one effective tool of dealing with IAS issues. Three categories of lists are suggested:

- Black lists – species known to be invasive and their introduction should be prohibited,
- White lists – species known to have such low probability of becoming invasive that their introduction is acceptable
- Grey lists – the great majority of species whose probability of becoming invasive is unknown.

The Global Invasive Species Database<sup>20</sup> (GISD) developed by the IUCN Invasive Species Specialist Group (<http://www.issg.org/database>) is one reference resource with a searchable database that is accessible to ‘low tech’ users. The database already lists 33 taxa recorded as invasive for Uganda, 55 for Kenya, and 45 for Tanzania. Some of the taxa are shared across borders. More data and much greater use of this data is essential for monitoring, predicting and managing IAS at national and regional levels. An element of this Project will therefore focus on contributing data to GISD or other databases as appropriate, both establishing and using distributed information systems of linked global, regional and national databases of IAS. Sources

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<sup>16</sup> [www.icipe.org](http://www.icipe.org)

<sup>17</sup> McNeely, J.A., H.A. Mooney, L.E. Neville, P. Schei, and J.K.Waage (eds.) 2001. *A Global Strategy on Invasive Alien Species*. IUCN Gland, Switzerland, and Cambridge, UK. x + 50 pp. <http://www.gisp.org/publications/brochures/globalstrategy.pdf>

<sup>18</sup> <http://www.issg.org/database>

<sup>19</sup> <http://www.gisp.org/publications/brochures/globalstrategy.pdf>

<sup>20</sup> <http://www.issg.org/database/>

of information and database systems and standards will include the invasives data management tools of the Inter American Biodiversity Information Network (IABIN), the Global Invasive Species Information Network and GBIF. The information system will build on existing data standards and facilitate input and sharing of data.

Issues dealing with IAS in Africa have been discussed at various fora including the regional workshop on 'Invasive Species in Eastern Africa' - Nairobi in 1999 hosted by the International Centre for Insect Physiology and Ecology (ICIPE). In addition, during the preparatory phase of the NEPAD Action Plan on the Environment, a thematic workshop on alien invasive species was held in 2003 in Pretoria, South Africa.

Some regional responses include a GEF funded project, 'Removing Barriers to Invasive Plant Management in Africa' is working in Ethiopia, Ghana, Zambia, Uganda with CABI and IUCN to combat water hyacinth (*Eichornia crassipes*), paper mulberry (*Broussonetia papyrifera*), parthenium weed (*Parthenium hysterophorus*), citronella (*Cymbopogon nardus*), mesquite (*Prosopis juliflora*), *Mimosa pigra*, *Lantana camara*, and *Senna spectabilis*.<sup>21</sup>

#### 4.1.2. Pests

Pests have been a historical challenge to farming systems in Africa because in the tropics, insects are a fact of life to be reckoned with. Insects pose a greater risk to food production, often causing the loss of entire crops and destroying about half of all harvested food in storage. The challenge is heightened given the oscillations in climate, heterogeneity in habitats and continued degradation of the land and ecosystems. Intensification in agriculture has increased yields and contributed much to food security, but tagged to this success is the massive increase in the pest burden.

Africa is faced with major pests such as stem borers in cereals in Eastern and Southern Africa, which account for massive losses in the staple food category, compromising incomes, food security, and in general rural livelihoods<sup>22</sup>. Another group is the fruit flies (Diptera, Tephritidae) which affect horticultural crops, especially commercial and wild fruits and vegetables.

There are about 950 species and 150 genera of fruit fly (Tephritidae) known in Africa, most of which form a natural component of Africa's rich and varied biodiversity, in many cases attacking wild fruits and flowers. Most species which attack commercially grown fruit crops belong to just two genera, *Ceratitis* (94 species) and *Dacus* (177 species). A few species belong to other genera such as the coffee fruit flies (*Trirhithrum* spp.) which are close relatives of *Ceratitis*, or to the genus *Bactrocera*, which are close relatives of *Dacus*<sup>23</sup>. In Africa there are only 11 native species of *Bactrocera*, one of which is a widespread pest in southern Europe, namely the olive fruit fly (*B. oleae*). However, the genus *Bactrocera* forms a very large group in Asia, Australia and the Pacific with about 500 described species in those regions, including numerous pests. So far, four Asian species belonging to the genus *Bactrocera* have in-

<sup>21</sup> <http://www.cabi.org/datapage.asp?iDocID=859>

<sup>22</sup> [www.icipe.org](http://www.icipe.org)

<sup>23</sup> <http://www.africamuseum.be/fruitfly/AfroAsia.htm>

vaded Africa, two of which were introduced in recent years and hence the risk for other introductions is great<sup>24</sup>.

ICIZE has established various research programmes on Africa's pests including the following<sup>25</sup>:

- Biological Control of Stem Borers in Eastern and South Africa,
- Habitat Management Strategies for control of Stem Borers and Striga Weed in Cereal Based Farming Systems in Africa.
- The African Fruit Fly Programme using Mango as a model crop, and
- Integrated management of Red Spider Mites, among others.

A further impetus for addressing pest related challenges is provided by the the Common African Plant Protection Strategy (CAPPS), developed by the African Plant Protection Organization (APPO) under the Inter African Phytosanitary Council (IAPSC). Noting that plant protection in Africa is visualised as an instrument that can provide substantial input towards the sustainable development of agriculture until 2020<sup>26</sup>, through this Strategy, three basic elements in African agriculture are addressed:

- Sufficient food and feed with satisfying quality is available at any point in time for the entire population of the African continent.
- African agricultural exports increase and meet world market standards at competitive prices, and
- Environmentally acceptable plant protection policies and practices that are safe for human health and which do not impede trade and/or exchange in plants and plant products.

Constituted under the African Union, IAPSC, is an intergovernmental organization with 53 member countries under the umbrella of OAU, coordinates plant protection procedures in Africa. Under the International Plant Protection Convention, IAPSC is the regional organization for Africa. The council has continued to work with national and regional organizations to develop common standards for pest quarantine and control, integrated pest management, capacity building and information sharing in line with the obligations of the Sanitary and Phytosanitary Agreement of the World Trade Organisation.

The council has undertaken various projects, notably, the development of lists of high risk quarantine species for Africa<sup>27</sup> and pests of quarantine importance in Africa<sup>28</sup>. In addition, the challenge of pests is being addressed by the National Research Organisations and other Regional Economic blocks. However, deficient national agricultural information systems have been identified as the major constrain in the ag-

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<sup>24</sup> <http://www.africamuseum.be/fruitfly/AfroAsia.htm>

<sup>25</sup> [www.icipe.org](http://www.icipe.org)

<sup>26</sup> AU. Revised Mandate of the IAPSC. 2002. <http://www.au-appo.org/en/IMG/pdf/mandates.pdf>

<sup>27</sup> <http://www.au-appo.org/en/IMG/pdf/quarantinepests.pdf>

<sup>28</sup> <http://www.au-appo.org/en/IMG/pdf/pestslda.pdf>

ricultural innovation, research implementation and management<sup>29</sup>. Quality taxonomic data, including names and identification aids and distribution data, will be made available by this Project and contribute significantly to improving the quality of agricultural information systems.

### 4.1.3 Pollinators

Pollination is a central service to all ecosystem functions. The variety of pollinators – butterflies, bees, birds and bats – and the variation within flowering plants have stimulated each other's evolution, leading to remarkable variety diversity and adaptations. Conservation of pollinators in an ecosystem therefore means preserving the finely tuned links between plants and animals that make it possible for plants to multiply.

But pollination services are key to agriculture as insect pollinators are essential for many vegetables and fruits and indeed demand for pollinators increases with increase in productivity. Conservation of pollinators is therefore not only fundamental for plant diversity and therefore ecosystem health, but their absence will compromise food security and national economies that are reliant on cash crops.

The Convention on Biological Diversity<sup>30</sup>, in articulating the International Initiative for the Conservation and Sustainable Use of Pollinators in 2001, noted that throughout the world, agricultural production and agro-ecosystem diversity are threatened by declining populations of pollinators. The major contributors to this decline in pollinator populations are, *inter alia*, habitat fragmentation, agricultural and industrial chemicals, parasites and diseases, and the introduction of IAS.

The Convention further notes that in order to secure sustained pollinator services in agricultural ecosystems, far more understanding is needed of the multiple goods and services provided by pollinator diversity and the factors that influence their decline. It is necessary to identify adaptive management practices that minimise negative impacts by humans on pollinators, promote the conservation and diversity of native pollinators, and conserve and restore natural areas necessary to optimize pollinator services in agricultural systems.

The Convention, established the International Initiative for the Conservation and Sustainable Use of Pollinators, with the aim to promote coordinated action worldwide to:

- Monitor pollinator decline, its causes and its impact on pollination services;
- Address the lack of taxonomic information on pollinators;
- Assess the economic value of pollination and the economic impact of the decline of pollination services; and
- Promote the conservation and the restoration and sustainable use of pollinator diversity in agriculture and related ecosystems;

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<sup>29</sup> Hilda Munyua, Dickson Baguma, Byron Mook, Jacqueline Nyagahima and Dorothy Mukhebi, 2004. Regional Agricultural Information Network, Priority Report. ASARECA.  
<http://www.asareca.org/rain/index.php?option=publications&Itemid=8&lang=eng>

<sup>30</sup> [www.cbd.int](http://www.cbd.int)

This Initiative is to be implemented as a cross-cutting initiative within the programme of work on agricultural biodiversity.

Some of the key elements of the Action Plan include the following:

- Assess the state of scientific and indigenous knowledge on pollinator conservation, in order to identify gaps in knowledge and opportunities for application of knowledge; including:
  - Taxonomic knowledge; and
  - The knowledge, innovations and practices of farmers, indigenous and local communities in sustaining pollinator diversity and agro-ecosystem services for and in support of food production and food security.
- Promote the development of identification keys for bee genera.

There is also a need to build taxonomic capacity to carry out inventories of the pollinator diversity and distribution in order to optimize their management, through, *inter alia* the training of taxonomists and para-taxonomists of bees and other pollinators. In addition, the Initiative calls for investment in development of tools and mechanisms for the international and regional exchange of information for the conservation, restoration and sustainable use of pollinators. This may include:

- Establishing an inventory of existing pollination and pollinators experts to serve as a pool for consultations in technology transfer, and establish an international advisory group on pollinator conservation.
- Disseminating information on pollination in agricultural environments through databases, websites, and networks. This may include the establishment of an international information network on pollinator conservation and promotion of networks of farmers and farmers' organizations at regional level for exchange of information and experiences.
- Developing and updating global and national lists of threatened pollinator species, and produce multilingual manuals on pollinator conservation and restoration for farmers.

Finally, it calls on stakeholders to strengthen national institutions to support taxonomy of bees and other pollinators, through, *inter alia*:

- Assessing national taxonomic needs (this would contribute to activity 1.3);
- Maintaining continuity of taxonomic and reference collections of bees;
- Recognition of centres of excellence in bee taxonomy and establishment of centres of excellence as appropriate;
- Repatriation of data through capacity-building and benefit-sharing.

It is therefore clear that understanding the taxonomy of pollinators and the pollinator/plant relationships are essential for conservation and sustainable use of pollinators. Informed by the increasing recognition worldwide that pollinators play a key role in ecosystem health, and noting that remarkably little was known about pollinators in Africa, the African Pollinator Initiative (API) was established on 1999. In February 2002, the API developed an action Plan with four components: public awareness and education, placing pollination in the mainstream; conservation and restora-



tion and capacity building. API has opted not to create new structures but use the BioNET networks in East, West and Southern Africa to achieve its objectives<sup>31</sup>.

Already the Initiative is collating information on pollinators in Africa and one of its priorities is to make known the information on pollination biology and taxonomy of pollinators readily available to researchers and interested public. In addition, developing tools for pollinator identification, developing databases and dissemination are strategic interventions.

Through FAO, a GEF Funded project on Pollinators – Conservation and Management of Pollinators for Sustainable Agriculture, through and Ecosystem Approach-involving eight countries – Brazil, China, Ghana, India, Kenya, Nepal, Pakistan and South Africa). The project has four components – development of a knowledge base, extension and promotion of pollinator friendly bet management practices, capacity building and awareness raising and finally sharing of experiences and dissemination of results<sup>32</sup>.

#### **4.1.4 The case for the urgent need to mobilize taxonomic information to support livelihoods, food security and ecosystem resilience.**

In spite of all these initiatives and responses highlighted in the sections above, the key issues in poverty alleviation and environmental conservation - availability of information, sharing of capacity and experiences and networking - are still unresolved. The New Partnership for African Development (NEPAD) Action Plan for the Environment therefore recommends support for national and regional capacity to collect and use multi-sectoral information in decision making processes and build capacity to collect and analyze such data.

Using Eastern Africa as an example, in order to contribute to ensuring food security in the region as part of the Association for Strengthening Agricultural Research in Eastern And Central Africa (ASARECA) ten year Strategic Plan, it was noted quite early that there was a specific and urgent need to mobilize existing information to end-users. Hence, the ASARECA Regional Agricultural Information Network (RAIN) was set up as a result to collect, organize, repackage and disseminate agricultural information in the Eastern and Central African regional as well as to promote information exchange. Similar constraints have been identified by the African Network for Agroforestry Education (ANAFE) in their analyses of agricultural education problems noting the inadequacy of teaching and learning resources and tools.

The International Association for Agricultural Information Specialists (IAALD), noting that Africa was lagging behind in dealing with the constraints noted above, held its first IAALD Africa Chapter Conference in Nairobi, Kenya in May 2006<sup>33</sup>. The theme of the Conference was 'managing agricultural information for sustainable food

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<sup>31</sup> FAO. Afican Pollinator Initiative. Plan Of Action. <http://www.fao.org/ag/aGp/agps/C-CAB/Castudies/pdf/apipoa.pdf>

<sup>32</sup> Ivan Angulo & Linda Collette (FAO), 2004. Pollinators and Pollination at the International. Presentation to the APIMONDIA conference. Costa Rica. <http://www.una.ac.cr/cinat/Conference/conference2/PRESENTATIONS/FAO%20-%20IVAN%20ANGULO%20&%20LINDA%20COLLETTE.pps>

<sup>33</sup> [http://www.iaald-africa.org/program\\_en.html](http://www.iaald-africa.org/program_en.html)

security and improved livelihoods in Africa'. The conference highlighted the need for African agricultural professionals in Africa to actively contribute to the attainment of the United Nations Millennium Development Goals (MDGs), especially *Goal No. 1: Eradicate Extreme Poverty and Hunger*, whose targets are to reduce by half the proportion of people living on less than a dollar a day, and reduce by half the proportion of people who suffer from hunger, and to the various efforts being made to improve food security and livelihoods especially among the rural poor or communities who depend on rural activities for large parts of their livelihoods, notably those by NEPAD and the Forum for Agricultural Research in Africa (FARA) and others.

The conference however noted that this can only be possible if information professionals on the continent have the capacities to manage and deliver appropriate and relevant information services to various stakeholders in the agricultural information consumption chain. The meeting called for the use of a combination of already established and effective information and knowledge communication systems with new information and communication technologies and techniques to produce, manage, and disseminate information in an efficient and effective way. At the same time, the meeting noted that there is a need to pay attention to the ever widening digital divide between agricultural information consumers who can afford access to the new technologies and digital information resources and those who cannot.

The conference addressed the following sub-themes:

- Building capacity in agricultural information resources management,
- Enabling policy for agricultural resource management,
- Narrowing the digital divide,
- Knowledge sharing and information systems for networking and Partnerships, and
- Meeting the information needs of stakeholders.

Useful models for remedial responses can be found in Asia, through initiatives undertaken by BioNET-ASEANET, the ASEAN-endorsed regional LOOP of BioNET. ASEANET has been very proactive in providing taxonomic solutions and addressing information gaps related to pests through various interventions. These have included needs assessments in taxonomy for Arthropod Pests of Plants in Countries of South East Asia- Biosystematics, Collection and Information Management<sup>34</sup> which have helped define locally optimised products and services to the plant quarantine and pest management communities. Further, through initiatives such as PESTNET<sup>35</sup> which is an online network that helps people in the Pacific and South East Asia obtain rapid advice and information on plant protection, including quarantine. It links the Pacific and South East Asian regions with plant protection specialists worldwide and is free to members.

PESTNET has developed innovative, user friendly and relevant tools and products such as online photo galleries, pictorial guides of the insects of Solomon Islands and Insect Pests of the Maldives. They have piloted other projects such as linking to farmers by providing information in user friendly, simple and low-tech formats.

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<sup>34</sup> [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0007/146914/needs\\_assess\\_arthropod\\_sea.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0007/146914/needs_assess_arthropod_sea.pdf)

<sup>35</sup> <http://www.pestnet.org>

These provide useful models to address some of the aspirations of the African Plant Protection Strategy 2020.

## 4.2 The response of the BioNET SWEDBIO PROJECT - Priorities

Two aspects of the taxonomic impediment in Africa will be addressed by this project, thereby providing timely and relevant solutions to the crises and challenges in African agriculture, food security and environmental conservation. First, there is a need for mobilization of biodiversity information and secondly there need to be improved tools that add value to that information, package it into appropriate formats and make it amenable to key target audiences. These tools include biodiversity informatics tools that enhance access to biodiversity data and ability to produce tailored taxonomic outputs for end-users.

The policy and strategy documents identified in the preceding section highlight the inadequacy of taxonomic information needed to underpin conservation action and planning, promote sustainable agriculture and secure ecosystems on which the livelihoods are dependent. In addition, there is a paucity of relevant tools and technologies for interlinking taxonomy to conservation and sustainable use, creating up-stream constraints in meeting the national, regional and international commitments including the implementation of the NEPAD Action Plan on the Environment with respect to IAS, the African Plant Protection Strategy with respect to pests and the African Pollinator Initiative, among others.

It is also quite clear that there is additional need to generate taxonomic tools and products, to further support the implementation of the Conventions on Biological Diversity (CBD), the International Plant Protection Convention (IPPC) and World Trade Organisation Sanitary and Phytosanitary Agreement (WTO-SPS). A critical contribution is to the Convention on Biological Diversity's 2010 target; *to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth*. In addition, taxonomic expertise, resources, research, information and services are needed to backstop action aimed at achieving some of the MDGs such as lessening poverty and hunger (Goal 1), combating disease (Goal 6 and indirectly Goals 4 and 5) and to environmental sustainability (Goal 7). The project will therefore focus on the following priorities:

### Priority 1: Taxonomic knowledge bases

The first step is to develop taxonomic knowledge bases of biodiversity in accessible formats for selected IAS, pests and pollinator species. Working in the context of the Global Strategy on Invasive Alien Species, the NEPAD Action Plan on the Environment, the African Plant Protection Strategy, the African Pollinator Initiative, the African Chapter of the International Association of Agricultural Information Specialists and the Global Biodiversity Information Facility; the project will seek to develop baseline reference datasets and databases on selected taxa using global and regional standards and supplementing already available data from world-wide sources. The outcome will be an interoperable platform of national databases for selected taxa that can be used as the reference for national planning, prioritisation; conservation action; and investment for trade, food security, health agriculture and economic development.

### Priority 2: Deliver locally optimised taxonomic tools and products

The second priority is to develop user friendly tools that mobilize the available technical information, packaged in appropriate formats for end users. For example, to enhance ecosystem functioning and resilience, especially to sustain livelihoods for rural communities that rely directly on natural habitats and communities, there is an urgent need to provide information on invasive alien species, including national lists, invasion pathways, prevention and management. To strengthen biodiversity based agriculture, there is need for lists and publications/handbooks on pollinators, their identification, conservation and monitoring. Likewise, using the models of PEST-NET, in order to support the farmers, with agriculture being the main stay of the national economies in the region, there is need to provide relevant updated electronic references for pests. To support trade, there is need for technical information support implementation of the Conventions such as updated information on the lists of pests of quarantine importance, updated information on national invasive species lists and checklists for pollinators.

### **Priority 3: Disseminate and promote tools and products in appropriate formats**

While most of the national research institutes, universities and museums hold representative natural history collections, with valuable information such as presence data, distribution, use and related indigenous knowledge, this knowledge is not directly available to the end users. Yet, the end products of taxonomy have to be demand driven and client responsive if the taxonomic sector is to compete successfully for investment.

Taxonomists are often not trained to develop such products, but working in interdisciplinary partnerships and networks is an opportunity to mobilize the massive technical information hosted by the various museums, universities, government agencies and research institutes and present it in user friendly and accessible formats.

Using the knowledge base generated under priority one and the tools and products under priority two, and collaborating with initiatives such as RAIN and IAALD, the project will work with communication experts to disseminate pertinent information on IAS, pest and pollinators in easily accessible, user friendly, appealing platforms, including low-tech. Again, the project will seek to share experiences with BioNET-ASEANET, and others.

### **Priority 4: Strengthen institutional capacity in East Africa to deliver timely tools and products and enhance sustainability.**

The underlying challenge is that biodiversity conservation, sustainable agriculture and ecosystem management is hampered by the lack of application of taxonomic information in Africa. The key sectors of agriculture, trade, health, development, regulatory agencies, implementers of key policies and strategies such as Poverty Reduction Strategies and Millennium Development Goals, as well as local communities and NGOs in the development sector, all need relevant taxonomic information delivered in a timely and appropriate format. In Eastern Africa, BioNET-EAFRINET is purpose built to mobilize such information.

Already, EAFRINET has demonstrated its potential, having been a key player in the development of regional initiatives such as BOZONET and the African Pollinator Initiative. IAS, Pests and Pollinators are just some of the challenges requiring taxonomic intervention. There are other needs for mobilizing taxonomic information, such as conservation planning, climate change impact prediction and mitigation work, biodiversity bioprospecting, biological control, biodegradation of agricultural wastes, diversity studies, disease control, environmental education; and many other second-

ary uses. This truly is the ultimate goal of BioNET – to build the capacity of regional taxonomic networks to generate locally optimized and relevant tools, products and services in response to national, regional and international obligations.

The project will provide national institutions with ICT equipment, training, technical partnerships and opportunities for show casing how EAFRINET can mobilize and build capacity for long term sustainability of strategic institutions in East Africa.

### 4.3 The context for the project - Linkages

The Kenyan, Tanzanian, and Ugandan governments have ratified the CBD and its work programmes, the IPPC and other related MEAs. However, there are still major challenges constraining their implementation at national and regional level. One of the biggest constraints is the inadequacy of regional knowledge and information on biodiversity. Our project addresses this challenge, focusing on the provision of three types of information (IAS, pests and pollinators), and will work in the context of other regional initiatives such as: BOZONET, RAIN, APPO, API, ICIPE, GISP, GBIF, and IUCN and the JRS/BGCI East Africa Project.

Overall, the project will seek to establish linkages with other like minded projects in the region such as the **JRS / BGCI East African Regional Project** on the CBD Global Strategy for Plant Conservation (GSPC). This aims to advance implementation of the GSPC in the East African region by establishing a baseline for further investment in biodiversity informatics as a key to biodiversity conservation and sustainable development.

The JRS project seeks to address three identified constraints – inadequate information on taxonomy, plant biodiversity status and sustainable use. Together, this information provides the baseline for monitoring, assessing and setting priorities for conservation and sustainable use for plants. In addition, it seeks to build capacity and infrastructure for these three types of primary data to enable regional implementation of the GSPC. In particular, the JRS project aims to:

- a. Enhance understanding and build regional consensus on GSPC & Global Taxonomy Initiative (GTI) priorities by hosting a regional workshop.
- b. Build capacity and skills by holding training workshops on: information management; biodiversity informatics; conservation status assessments using the IUCN Red Listing Criteria; and sustainable use prioritising plants used for medicinal purposes.
- c. Increase regional capacity for biodiversity informatics by providing IT equipment and training to National Competent Authorities.
- d. Build on existing digitisation initiatives for plant specimens in the region to enhance availability of a widely accessible working list of plant biodiversity data.
- e. Collate and synthesize existing sustainable use information on medicinal plants, creating an interoperable platform, which can be easily accessed by stakeholders and end-users.
- f. Produce a joint Red List of Threatened Plant Species and Conservation Assessment and Management Plans (CAMP) for medicinal plants in the region.
- g. Strengthen networks and linkages between stakeholders.

However, it should be noted that the JRS project focuses on botanical aspects and not fauna.

### Linkages - Knowledge bases

BOZONET: This was a large project to be funded by the Global Environment Facility (GEF), which aimed to remove regional barriers to the flow of taxonomic information and to assist end-users in the use of this information for the sustainable conservation of biodiversity. The network was to focus on technical, institutional and economic barriers constraining the flow of both plant and animal taxonomic information within the region. Even though it was not funded, the major contribution of the PDFB process enabled the four Eastern Africa countries to review the status of taxonomy and identify national and regional needs in taxonomic capacity and information systems. The project brought together key stakeholders at national and regional level hence providing a framework on which this project can build on.

GBIF: The Global Biodiversity Information Facility has facilitated the development and wide adoption of tools and standards for biodiversity informatics including software for establishing portals for interoperable databases. GBIF provides training and capacity building in many aspects of biodiversity informatics and recently provided technical and financial support for capacity building in biodiversity informatics, for the regional project on the implementation of the Global Strategy for Plant Conservation, in partnership with BioNET, the JRS Biodiversity Foundation, BGCI and local partners. National authorities in East Africa are actively considering joining Tanzania as a member of GBIF and interoperable data sources generated by this project will be a useful demonstration of the value of sharing primary (taxonomic) biodiversity data.

### Linkages - Invasive Species

CABI - The CABI Regional Project on removing barriers to IAS management in Africa funded by the GEF includes Uganda. One of the activities in the project is to develop knowledge bases for eight priority taxa. Lessons learnt from this project, will be of value to the other Eastern Africa countries, Kenya and Tanzania. In addition, this project will build on the priorities and gaps identified by the project and collaborate as appropriate.

GISD - The Global Species Database hosted by IUCN/ISSG already contains lists of IAS by country for the Eastern Africa Region. These lists provide a template for further developing knowledge bases, taxonomic tools and products related to IAS in Eastern Africa. In addition, GISD will provide guidance on standards and formats for database development in line with the Global Invasive Strategy for Invasive Alien Species and the NEPAD Action Plan for the Environment.

### Linkages - Pests

RAIN: The ASARECA Regional Agricultural Information Network brought together various stakeholders in Eastern and Central Africa undertook a needs assessment for agricultural information, assessed the status of information systems in National Agricultural Research Centres and through partnership with CTA, FAO and other partners have organised training programmes in bioinformatics.

APPO: The African Plant Protection Organisation and the IAPSC of the African Union have developed the list of quarantine pests in Africa working closely with the

focal quarantine national organisations and regional blocs. These lists form a useful baseline for developing taxonomic knowledge bases for selected taxa to enhance policy development, dissemination, public awareness, research and pest management at national and regional level.

ICIPE: ICIPE was set up primarily to address the pest challenge in Africa. To date, ICIPE has developed capacity in biosystematics, integrated pest management and bioinformatics with various programmes such as the African Fruitfly Programme. In addition, ICIPE was host, in partnership with EAFRINET, for the BOZONET PDF B phase among other projects and so is a key player in any regional initiatives related to pests in Eastern Africa.

### **Linkages - Pollinators:**

API: The African Pollinator Initiative, which links to the International Pollinator Initiative, provides a strategic framework for the work on pollinators. Already EAFRINET, the Eastern Africa LOOP of BioNET is the Eastern Africa node for the API. The project will therefore strengthen synergies with the new GEF project on the conservation and sustainable use of pollinators. Kenya is the only country in the region that is part of the GEF project.

## **4.4 Design of the project and summary of approach**

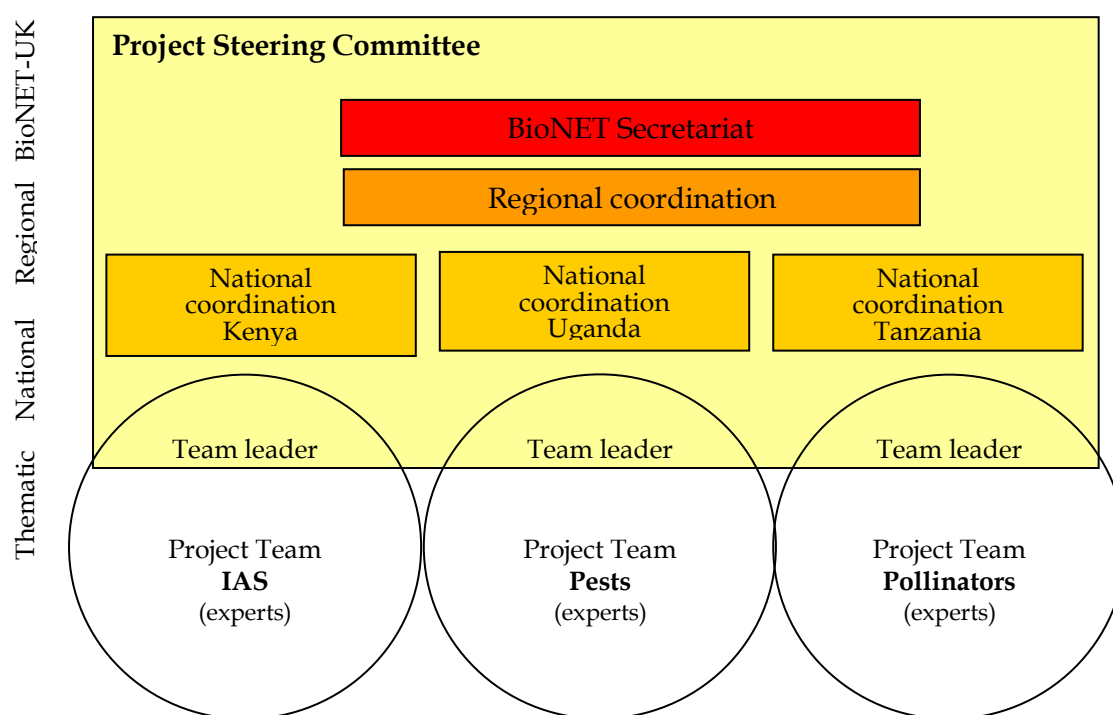
### **4.4.1 Stakeholder involvement in project development**

A regional project planning workshop was held from 28-29th March 2008 in Kenya to bring together key experts in the region, including the BioNET-EAFRINET national coordinators, with BioNET and GBIF representatives to define the project themes, goals, objectives, outputs, timeframes and budget and agree the main project elements. The workshop was supported by Botanic Gardens Conservation International, BioNET, BioNET-EAFRINET, GBIF, the JRS Biodiversity Foundation and the National Museums of Kenya.

Workshop participants prioritised three themes for the project: pests, pollinators and IAS. Participants noted that whilst much information relevant to these issues is already held by experts and in biological collections and libraries at institutional level, it is not readily available for the development of user defined taxonomic tools and products. Further, there targeted additional work is needed to augment existing information in order to develop demand driven and policy relevant products. This work includes documenting indigenous knowledge and technologies as well as generating best practice tools such as guidelines and handbooks.

### **4.4.2 Project team and Terms of Reference**

The Project Team will operate on four levels: UK (BioNET Secretariat), regional, national (Kenya, Tanzania and Uganda), and thematic (Figure 1). In addition, there will be consultants for specific tasks such as strategic reviews, taxonomic information needs assessments or ICT support. The BioNET Secretariat, including Director, Programme Officer and Office Manager, will focus on the project oversight, management and administration, technical support and international linkages. The regional and national personnel will be responsible for delivery of project outputs, project co-ordination and sharing of experiences. Personnel at the thematic level will focus on

**Figure 1: Project coordination and operation**

the technical and scientific aspects of delivering project outputs. They will also develop a network under their theme encompassing researchers, end-users, policy makers and educationists.

The Terms of Reference for the four levels UK, regional, national and thematic are given below. The fee levels and number of days for personnel at each level are given in Section 5.2.

#### **Terms of Reference – UK, BioNET Secretariat**

##### **Lead: Director, BioNET**

- Oversee delivery and provide technical support to the project.
- Oversee project expenditure, procurements, contracts and budgetary allocations.
- Supervise and support regional project coordination.
- Coordinate financial administration of the project with CABI.
- Ensure fund requests and contracts are developed and processed in a timely manner.
- Provide regular technical and financial reports to SwedBio.
- Secure co-financing and commitments from international and pan African partners and stakeholders, including other BioNET LOOPS, in project delivery and dissemination.
- Facilitate monitoring and evaluation.
- Promote the project methodology and outputs internationally.
- Strengthen existing partnerships and facilitate creation of new strategic partnerships for the project.
- Participate in the Project Steering Committee.



**Terms of Reference – Regional level (East Africa)****Lead: Regional Project Coordinator with the EAFRINET Regional Coordinator**

- Be responsible on a day-to-day basis for project implementation, through definition of the project work plan with milestones and a framework for evaluation.
- Ensure timely delivery of project outputs working closely with national and UK offices and consultants.
- Prepare regional project reports and ensure national and thematic reports are provided to UK office in a timely manner.
- Plan, coordinate and monitor regional-level activities including consultancies, ensuring personnel, consultants and other project service providers deliver competently on their terms of reference.
- Manage project accounts and coordinate with UK to ensure funds are available for the project teams.
- Organise technical and logistic aspects of regional workshops and meetings, and support planning for national activities and meetings.
- Support UK office in securing co-finance.
- Support EAFRINET strategic planning.
- Working with UK office, establish new linkages with regional and international initiatives and strengthen existing ones.
- Play an advocacy role for the project at regional level and enhance the role of the EAFRINET network at regional level.
- Participate in the Project Steering Committee.

**Terms of Reference – National level (Kenya, Tanzania and Uganda)****Lead: EAFRINET National Coordinators**

- Plan, coordinate and monitor activities at the national level.
- Facilitate delivery of the project elements at national level through provision of information, logistical arrangements, providing access to institutions and relevant staff etc.
- Promotion of project methodology and dissemination outputs at scientific, decision-maker and end-user forums nationally and regionally.
- Support EAFRINET strategic planning.
- Manage national level finances.
- Organise dissemination workshops, national meetings and support national needs assessments.
- Ensure timely delivery of services from project consultants and other service providers at the national level.
- Working with the regional coordinator, establish new linkages with national and regional initiatives and strengthen existing ones.
- Provide the regional and UK offices with reports and accounts in the prescribed formats to facilitate project reporting and planning.
- Participate in the Project Steering Committee.

## Terms of Reference – Thematic level (invasive alien species, pests and pollinators)

### Lead: Thematic Leads

- Plan, coordinate and monitor the development and delivery of the knowledge base, tools and products.
- Organise of training workshops for data base management and product development.
- Advise on product dissemination to end-users.
- Timely technical & financial reporting.
- Participate in the Project Steering Committee.

### 4.4.3 Project objectives, mission and goal

There are five project objectives:

- a. *Develop taxonomic knowledge bases on biodiversity in accessible formats for selected invasive species, pests and pollinators of African relevance, using East Africa as a case study.*
- b. *Generate user friendly tools and products that mobilize scientific information in appropriate formats and packages for end users.*
- c. *Disseminate taxonomic knowledge, tools and products in appropriate formats to end-users and provide training in their use for users including farmers, local communities and decision-makers.*
- d. *Strengthen institutional capacity in East Africa to help provide a sustainable platform for delivering timely and locally optimised taxonomic tools and products.*
- e. *Ensure appropriate project coordination and communication to guarantee the timely delivery of project outcomes and develop a mechanism for up-scaling the project and sharing experiences at a pan African level.*

Making species information from African institutions available freely via online databases and linking this using “interoperable data standards” with freely available data from international sources is high on the agenda of biodiversity institutes across Africa. This project will serve as a practical and replicable example of how to mobilise taxonomic data to develop a knowledge base for generating taxonomic tools and products with immediate relevance to poverty reduction and ecosystem management. Both the methodology and outputs of this project will therefore have wide relevance in Africa. Efforts to involve and distribute benefits from the project across Africa will be made through supporting the involvement of strategic institutions in the initial and final project workshops, ongoing engagement and by working with GBIF and its members (BioNET is a founding member of GBIF). BioNET will also assist institutions in other regions of Africa in seeking resources to replicate or build on this project.

These project objectives and the activities involved are further described in the following sections. The project milestones are summarised in Annex 1.

#### **Project Mission:**

*Mobilize vital taxonomic knowledge to support human well being and Ecosystem health in Eastern Africa.*

#### **Project Goal:**

*Improve livelihoods, food security and ecosystem resilience in Eastern Africa.*



#### 4.4.4 Objective A: Development of a knowledge base for product delivery

In order to define a baseline for the project, an initial review at national and regional/international levels (gap assessment) will be undertaken to establish existing knowledge in terms of projects, initiatives, programmes and databases with species and management information on IAS, pollinators and pests. A meta-data base of the existing resources and data will be hosted on the website established for EAFRINET (Objective D) to ensure wide accessibility.

In addition, an end user needs assessments will be conducted based on the three themes to identify the critical needs related to taxonomic tools and products. Both these assessments will build on the broader regional needs assessments for taxonomy that were undertaken under the PDF B framework for the BOZONET Project.

To define the scope and priorities for the project in detail, an initial regional project workshop will be held to bring together key national and regional stakeholders and international partners. Among other things, the workshop will use focus group discussions using information generated by the assessments to prioritise exemplar taxa for pollinators, pests and invasives as well as agree formats and contents of taxonomic tools and products. The project objectives, actors, outputs, timeframes and budget will be further elaborated and linkages and synergies streamlined. An activity plan and institutional, co-ordination and management roles will be agreed.

Once the target taxa are identified, the project will seek to identify relevant sources of information at national, regional and international level, establish collaborative partnerships in order to facilitate data repatriation and sharing and other such modalities. Overall therefore, the project will seek to develop a taxonomic knowledge base in Objective A, as a baseline from which user defined taxonomic tools and products can be developed under Objective B.

#### 4.4.5 Objective B: Generate taxonomic tools and products.

The taxonomic tools and products generated through this project will include

- Interoperable databases with specimen and occurrence data established at the national level and accessible via a regional portal that synthesises data served nationally with available data from global providers.
- New demand-driven taxonomic tools and products for IAS, pests and pollinators such as updated national checklists, maps, guides, portals, booklets, keys, handbooks, posters, websites, CDs etc.

There are **two types of end users** – the first category comprises the research and policy sector while the second is the farmers, local communities and extension services personnel. The tools, products and services for these two groups of end users are different, and it is crucial therefore that needs assessments are undertaken at the beginning of the project (Objective A) so as to ensure that the project outputs are demand-driven, user defined and relevant for each category.

Project outputs for the research and policy sector will help

- enhance the local research potential for pests, pollinators and IAS;
- local development of appropriate policy and strategy frameworks in line with national, regional and global agricultural, development and environmental policy.

For the second group of end users – the farmers, local communities and extension services personnel – the project will develop specific, user-friendly taxonomy products. This will involve for example the development of floral calendars for pollinators as tools for farmers and extension workers; farmer-oriented pest management technologies and methodologies for optimising indigenous knowledge and technologies.

Recognizing that for some species the available information may be insufficient and may need to be augmented with additional information tailored to particular end users, the project will undertake some selected applied field research.

Experts in developing communication products for the target users will advise the thematic teams on product development and dissemination.

#### **4.4.6 Objective C: Disseminating taxonomic tools, products and services in appropriate formats and platforms.**

Dissemination of relevant taxonomic tools, products and services is as, if not more important than their production. It is not sufficient to make taxonomic information available; it needs to be prepared in appropriate formats and disseminated according to the demands of the ultimate end-users. Linked to the objective of strengthening the EAFRINET network (Objective D), dissemination of project outputs and ensuring access to information generated by the project will be undertaken using four channels:

1. The project will work closely with the national agricultural research organizations which have extension networks to local farmer levels. This will provide one dissemination channel linked directly to the grass root level.
2. National launch events will be organized by the EAFRINET network and its partners. This will link to all stakeholders, including community groups, NGOs and government agencies.
3. Promotion of outputs at international and regional meetings and policy forums concerned with plant protection, agricultural development and biodiversity.
4. Engaging strategic partners across Africa in project delivery and dissemination will provide a channel for disseminating outputs across Africa and sharing experiences and best practice.

At all levels, media will be engaged to enhance the reach, uptake and impact of products.

Activities furthering this objective include

- development of a communication strategy;
- organization of the final regional project workshop to promote products as well as best practice; participants to include:
  - the existing initiatives;
  - policy and research organisations (providers of data and 1<sup>st</sup> category of end users);
  - farmers, extension services and environmental education sector (2<sup>nd</sup> category of end users);
- dissemination, promotion and end-user training at the national level;

- dissemination and promotion of project methods, lessons and outputs in Africa and internationally in decision-maker, regulatory, scientific, agricultural development and biodiversity forums.

#### 4.4.7 Objective D: Strengthen institutional capacity in East Africa.

In order to build long-term capacity for mobilizing taxonomic knowledge in response to user demands, the project will strengthen the capacity of key institutions and EAFRINET itself. Further, outputs and lessons learned will be shared throughout BioNET's four African partnerships. The taxonomic impediment is a challenge in Eastern Africa and given the human, technical and institutional constraints in taxonomy, it is only through a networked environment that many of these challenges can be effectively and rationally addressed.

Specifically, the project aims to

- provide adequate technical resources (ICT equipment & software) based on ICT needs assessment (see Objective B) for development of the knowledge base
- Host training workshops to
  - instruct data base managers (1x)
  - build product delivery capacity (e.g. workshops on software, Imaging, etc) (3x)
  - improve resource mobilisation, leadership development, communication (1x)
- conduct a strategic review of EAFRINET;
- develop and launch the strategic plan for EAFRINET 2010-2015;
- re-develop the EAFRINET website, including a project output dissemination portal;
- engage resource people from strategic partners in Africa and other BioNET-LOOPS in project delivery;
- EAFRINET representatives attend meetings to influence policy and mobilise resources.

#### 4.4.8 Objective E: Project coordination

Project coordination responsibilities will be shared as follows:

**Steering Committee** - (see Figure 1) Comprising the three theme leaders, the three national coordinators, the regional project coordinator, EAFRINET regional coordinator and a representative from the BioNET Secretariat and optionally external experts, will be convened to meet quarterly via e/teleconference and annually face-to-face in order to oversee the overall implementation of the project and to ensure it meets all milestones and outputs. Where possible, the steering committee meetings will be held back to back with other workshops to reduce costs.

**Regional Coordination** - The Project Coordinator will have day-to-day responsibility for the project, liaising closely with EAFRINET's Regional Coordinator and supported by an assistant to support administrative operations. For details, see section 4.4.2 *Project teams and Terms of Reference*.

**National Coordination** - EAFRINET National Coordinators will manage and facilitate country-level activities such as needs assessments, stakeholder engagement, institutional awareness, dissemination and promotion with the support of project assistants. For details, see section 4.4.2 *Project teams and Terms of Reference*.

**Thematic teams** - Theme leaders in each country will coordinate and manage the development of knowledge bases and products in their area of expertise. For details, see section 4.4.2 *Project teams and Terms of Reference*.

#### **4.4.9 Project management and administration**

The project will be led and managed by BioNET-INTERNATIONAL and financially administered by CABI, host organisation for BioNET's Secretariat. BioNET will submit both written and financial reports following the SwedBio guidelines.

Participants in the project will be consulted on their experiences as part of ongoing monitoring and evaluation throughout the project using, for example, evaluation forms at meetings and workshops.

We will also establish a photo library to provide visual documentation of the project and keep copies of all publications (including publicity/media materials) produced. Responsibilities are described in detail in section 4.4.2 *Project teams and Terms of Reference*.

## 5. PROJECT BUDGET

### 5.1 Overall project budget

The total cost of the 30 month project is \$ 952,422. BioNET is committing \$26,750 and expects to secure a further \$125,000 co-finance. Partner commitments amount to \$101,700. The **sum requested from SwedBio is \$698,972** to support the objectives listed below. Costs are summarised in Annex 2.

**Table 5.1-1: Summary indicative budget**

<b>OBJECTIVES</b>	<b>Cost (USD)</b>
A - Development of a knowledge base for product delivery.	98,200
B - Generate taxonomic tools and products.	221,900
C - Disseminate taxonomic tools and products.	112,200
D - Strengthen institutional capacity in East Africa.	140,500
E - Project coordination	228,150
<b><i>Project subtotal</i></b>	<b>800,950</b>
BioNET Project Management and Administration	106,119
Contingency (5%)	45,353
<b><i>Total Project Cost</i></b>	<b>952,422</b>
Co-finance: BioNET	26,750
Partner contributions (staff time, meeting support, technical resources, technologies tools and publications) - in kind	101,700
Co-finance: to be secured	125,000
<b>Co-finance subtotal</b>	<b>253,450</b>
<b><i>Total requested from SwedBio</i></b>	<b>698,972</b>

**Co-finance** - A proportion of the “co-finance to be secured” is anticipated from the CABI-GEF “Removing the barriers to invasives” project and the FAO-GEF “Global Pollinator” project (Kenya component). Further likely sources include the JRS Biodiversity Foundation, GBIF (seed fund awards) and CTA among others.

**Table 5.1-2: Budget per level and year**

Table 5.1-2 gives an overview on the cost for personnel, workshops, travel and operational costs for 30 months.

	TOTAL yr 1 - 3	Total year 1	Total year 2	Total year 3	Total year 1	Total year 2	Total year 3
<b>Personnel</b>	<b>\$461.069</b>	<b>184.428</b>	<b>172.516</b>	<b>104.126</b>	<b>40%</b>	<b>38%</b>	<b>22%</b>
Thematic project teams	\$143.850	57.540	57.540	28.770	40%	40%	20%
National level	\$66.750	26.700	26.700	13.350	40%	40%	20%
Regional level	\$90.350	36.140	36.140	18.070	40%	40%	20%
BioNET UK	\$119.119	47.648	35.736	35.736	40%	30%	30%
Consultants	\$41.000	16.400	16.400	8.200	40%	40%	20%
<b>Workshops</b>	<b>\$196.000</b>	<b>68.600</b>	<b>68.600</b>	<b>58.800</b>	<b>35%</b>	<b>35%</b>	<b>30%</b>
Thematic project teams	\$22.000	7.700	7.700	6.600	35%	35%	30%
National level	\$27.000	9.450	9.450	8.100	35%	35%	30%
Regional level	\$147.000	51.450	51.450	44.100	35%	35%	30%
BioNET UK	\$0	0	0	0	35%	35%	30%
Consultants	\$0	0	0	0	35%	35%	30%
<b>Travel</b>	<b>\$97.000</b>	<b>33.950</b>	<b>33.950</b>	<b>29.100</b>	<b>35%</b>	<b>35%</b>	<b>30%</b>
Thematic project teams	\$24.000	8.400	8.400	7.200	35%	35%	30%
National level	\$12.000	4.200	4.200	3.600	35%	35%	30%
Regional level	\$41.000	14.350	14.350	12.300	35%	35%	30%
BioNET UK	\$13.000	4.550	4.550	3.900	35%	35%	30%
Consultants	\$7.000	2.450	2.450	2.100	35%	35%	30%
<b>Operational costs TOTAL</b>	<b>\$153.000</b>	<b>53.550</b>	<b>53.550</b>	<b>45.900</b>	<b>35%</b>	<b>35%</b>	<b>30%</b>
Thematic project teams	\$66.000	23.100	23.100	19.800	35%	35%	30%
National level	\$58.500	20.475	20.475	17.550	35%	35%	30%
Regional level	\$27.000	9.450	9.450	8.100	35%	35%	30%
BioNET UK	\$0	0	0	0	35%	35%	30%
Consultants	\$1.500	525	525	450	35%	35%	30%
<b>Contingency</b>	<b>\$45.353</b>	<b>15.874</b>	<b>15.874</b>	<b>13.606</b>	<b>35%</b>	<b>35%</b>	<b>30%</b>
<b>SUB-TOTAL 1</b>	<b>\$952.422</b>	<b>356.401</b>	<b>344.489</b>	<b>251.532</b>			
BioNET Co-finance	\$26.750						
Partner contribution (in-kind)	\$101.700						
Co-finance to be secured	\$125.000						
<b>TOTAL</b>	<b>\$698.972</b>						



## 5.2 Personnel costs

Table 5.2 gives the fee levels and estimated amounts of time for staff and consultants involved at the different levels of the project. We will identify and contract thematic, national and regional teams from national and regional institutions.

**Table 5.2: Estimated personnel costs**

Level	Staff	Average rate (USD / day)	Person days over 30 months	Total
Thematic	Team leaders (3x)	\$250	81	\$20.250
Thematic	Thematic teams: Pollinator / Pest / IAS	\$200	618	\$123.600
Regional	Project Coordinator (1x)	\$350	103	\$36.050
Regional	Project Assistant (1x)	\$150	200	\$30.000
Regional	EAFRINET Regional Coordinator	\$350	37	\$12.950
Regional	Regional team	\$317	36	\$11.412
National	EAFRINET National Coordinators (x 3)	\$250	165	\$41.250
National	Project Assistant (x 3)	\$150	108	\$16.200
National	National Team	\$282	33	\$9.306
UK	BioNET staff (3x)	\$434	274	\$118.916
Consultants	principally Regional	\$373	110	\$41.030
		<b>TOTAL</b>	<b>1765</b>	<b>\$460.964</b>

## 5.3 Workshops

Table 5.3 summarises the schedule and costs for each workshop. Both Year 1 workshops will be at the regional level. In Year 2, training in product delivery tools and methods will be targeted on existing expert institutions in order to provide a sustainable environment for trainees to benefit from the training in future work. The initial and final workshops will include pan-African participants. Training for database managers (Year 1) is expected to benefit from learning resources and staff support from GBIF.

**Table 5.3: Workshop costs and schedule**

	TOTAL	YEAR 1		YEAR 2		YEAR 3	
	TOTAL / YEAR	\$73.000		\$29.000		\$94.000	
		1. half	2. half	1. half	2. half	1. half	2. half
<b>Year 1</b>							
A3 Initial regional project workshops	\$61.000	\$61.000					
D5 Training workshop for data base managers	\$12.000		\$12.000				
<b>Year 2</b>							
D2 First strategic planning workshop for EAFRINET	\$7.000			\$7.000			
D5 Training on resource mobilisation, leadership development, communication				\$12.000			
D5 Training workshops to build product delivery capacity (one per country)	\$10.000				\$10.000		
<b>Year 3</b>							
D2 Second strategic planning workshop for EAFRINET	\$7.000					\$7.000	
C2 xx National dissemination workshops with ultimate end-users (farmers)	\$21.000						\$21.000
C3 Final regional project workshop	\$60.000						\$60.000
D2 Two EAFRINET strategic plan launch events	\$6.000						\$6.000
<b>TOTAL</b>	<b>\$196.000</b>	<b>\$61.000</b>	<b>\$12.000</b>	<b>\$19.000</b>	<b>\$10.000</b>	<b>\$7.000</b>	<b>\$87.000</b>

1: not including personnel for workshop organisation ( project coordination);  
and not including thematic and regional steering committee meetings (=> travel)

## 6 OUTCOMES AND IMPACT ON AGRICULTURAL PRODUCTIVITY AND POVERTY ALLEVIATION

### 6.1 Expected results

Outcomes of this project will include:

- a. Improved capacity at local and farmer levels to deal with pests and IAS and conserve pollinators as a contribution to secure livelihoods and improved ecosystem services.
- b. Improved and new end-user oriented taxonomic tools, products and services for IAS, pests and pollinators to support the implementation of the regional strategies and international conventions.
- c. National Checklists available online for IAS, pests and pollinators in line with the Global Strategy on IAS; African Plant Protection Strategy and the African Pollinator Initiative.

- d. A widely accessible reference database for IAS, pests and pollinators in response to national, regional and international conventions and obligations such as the 2010 biodiversity target, IPPC, SPS, and MDGs to underpin conservation action, planning, sustainable use and trade, thus enabling countries to respond to their regional and global obligations; hosted by EAFRINET.
- e. Strengthened regional and international purpose built partnerships and increased networking institutional, national and regional sectors to deliver timely, user friendly and relevant taxonomic products for end users.
- f. An increased capacity at institutional level and EAFRINET to mobilize existing and new taxonomic information for national and sectoral planning by public and private decision-makers.
- g. A Strategic Plan and Resource Mobilisation Strategy 2010-2015, for EAFRINET, as a model for other biodiversity / taxonomic networks in Africa and other developing countries.
- h. Increased awareness on the importance of sound taxonomic information for biodiversity and agriculture programmes in the region;

## 6.2 Impacts of the project - The poverty and end user link

Poverty in Africa is both the cause of, as well as a consequence of environmental degradation. As such, any programme aimed at enhancing human well being and sustained economic development in rural Africa must focus on the environment. While the focus on invasive species, pests and pollinators, may not be easily interpreted as poverty linked, it is quite clear that if local ecosystem functioning and resilience is compromised, any investment focused on improving local livelihoods will be short terms at best, and costly in the long term. For example, the project will disseminate end user focused and defined tools and products for pollinators, pest and invasive species to local communities and farmers through the extension service systems that exist both through the government and voluntary sectors (Table 6). These tools will provide a basis for intervention measures to reduce risks for loss of pollinators, prevent introduction of alien invasive species and manage serious pests using biodiversity friendly methods at local and farmer level. Improved knowledge enhances adequate farmer responses leading to improved productivity as has been demonstrated in case studies such as the push and pull technologies in Western Kenya pioneered by ICIPE<sup>36</sup>.

Hence, the project has firstly a holistic approach to poverty alleviation, not focusing only on the potential for increased profitability for small, medium and large scale farmers through addressing pest related issues; but also securing the local habitats to enhance their capacity to provide ecosystem services that are crucial to sustainable livelihoods, such as through prevention of the spread of invasive species that would compromise water tables; and improved pollination services for a variety of crops, both on farm and off farms.

Furthermore, this project has been designed to respond to current challenges building on existing initiatives. There is a critical need to bring the aspirations, initiatives and programmes that have been developed at the global, sub regional and national

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<sup>36</sup> [www.icipe.org](http://www.icipe.org)

level on pests, alien invasive species and pollinators to the true clients. As such the project will have a strong focus on end users. The taxonomic tools, products and services will have the effect of building the capacity of local communities and farmers; extension services and environmental education agencies. Through the provision of relevant and timely material, information and knowledge, the stakeholders will be empowered to make the right decisions, invest in appropriate practices and improve farming method and conservation initiatives. This directly links to improved productivity and poverty alleviation.

**Table 6: Project focus and end user link**

Project Objective	End users	Bottleneck / Challenge addressed	Goal	Effect
<b>Objective A</b> Taxonomic Knowledge Bases	National/Regional and Global Research Institutes Policy makers Economic Planners Conservation agencies Agricultural agencies	Lack of baseline information Lack of accessible but consolidates reference databases Response to regional and global initiatives	Decision making Policy development Research Sustainable development	Improved information systems to backstop research, policy and planning.
<b>Objective B &amp; C</b> Taxonomic Tools, Products and Services (development and dissemination)	Farmers Agricultural Extension Services Environmental Education sector Conservation agencies Local Communities	Threatened agricultural base Depauperate biological resources Ecosystem imbalance	Improved productivity at farmer level Improved ecosystem functioning and resilience	Reduced pest loss, invasions and loss of pollinators. Improved profitability at farmer level Improved human well being Sustained economic development
<b>Objective D</b> Strengthened Local Network for Taxonomy - EAF-RINET	Researchers and Research Institutes Government Sectors Policy Sector Local Communities Conservation agencies	Limited coordination and sharing of experiences at research level. Duplication of effort with limited resources Problems of regional and global nature. Lack of a regional framework for action.	Limited resources optimized for impact oriented research Research outputs address local issues and agendas	Local capacity mobilized to contribute to national, regional and global issues.

# ANNEX

## *ANNEX 1: Milestones*

## ANNEX 1: Milestones

### Milestones – Year 1

Activity	Oct – Dec 08	Jan-Mar 09	Apr- Jun 09	Jul-Sep 09
<b>Assessments</b>	Project launched  Project Coordination Modalities in place by BioNET International and EAFRINET	Regional Assessments on IAS, Pests and Pollinators  Needs Assessments for taxonomic tools and products undertaken.	Steering Committee Meeting Held	
<b>Initial Regional Workshop Held</b>	Preparation for regional workshop to agree project priorities, taxonomic tools and products and institutional roles	Regional workshop held and work plan agreed  Workshop report prepared  Priority taxonomic tool and products agreed		
<b>Database Development</b>	Modalities and methodologies for data repatriation negotiated and agreed with national, regional and international partners and stakeholders.			Regional training on database development held, architecture for database development agreed
<b>Strengthening institutional capacity</b>		Partnerships with regional and international partners sought and strengthened	ASEANET, WAFRINET, NAFRINET and SAFRINET partners roles and expectation defined and mainstreamed into the project.	EAFRINET Institutional review undertaken
<b>Monitoring and Evaluation</b>			Feedback and evaluation from workshop	Evaluation of year one  First Report Submitted to SwedBIO
<b>PROJECT Management</b>		Key staff and coordination modalities at national and regional level in place.	Needs assessment for technical resources at institutional level completed	Acquisition of technical/ICT equipment with approval from Steering Committee

## Milestones - Year 2

Activity	Oct - Dec 09	Jan-Mar 10	Apr- Jun 10	Jul-Sep 10
<b>Project Development</b>		Second Steering Committee held to review progress		
<b>Database Development</b>	Mobilisation of data from national, regional and international sources	Mobilisation of data from national, regional and international sources	Metadatabase of online resources on IAS, Pests and Pollinators hosted by EAFRINET	
	Harmonisation, compilation and creation of database/s on Invasive species, Pests Pollinators			
<b>Development of National Lists</b>	National Checklists on Invasives Completed	National Checklists on Pests Completed	National Checklist on Pollinators Completed	National Checklists uploaded on EAFRINET website with links to national and other related websites.
<b>Development of taxonomic tools and resources</b>		Development of distribution maps, updated databases with species and indigenous knowledge for selected taxa	Taxonomic tools and Products developed in response to priorities defined by the initial regional workshop.	
<b>Institutional Strengthening</b>	Development of EAFRINET website	Regional Training workshops on Project Management, Effective Communication, Leadership Development and Resource Mobilisation	Strategic Planning for EAFRINET process initiated.	National EAFRINET workshops held in each country
<b>Dissemination</b>	Communication Strategy developed	Press release on invasives checklists	Press release on completed pests checklists	Press release on pollinators checklists
<b>Monitoring and Evaluation</b>				Evaluation of year two  Second report submitted to SwedBio

**Milestones - Year 3**

<b>Activity</b>	<b>Oct - Dec 10</b>	<b>Jan-Mar 11</b>		<b>April - May 2011</b>
<b>Project Development</b>		Third steering Committee meeting held to review project		
<b>Development of taxonomic tools and products</b>	Production of taxonomic tools and products completed	Taxonomic tools and products uploaded to EAFRINET website		
<b>Dissemination of taxonomic tools and products</b>	Dissemination of tools and products at national, regional and international level in collaboration with Key Partners		Final Regional Project Meeting to disseminate project outputs and agree project exit strategy	
<b>Monitoring and Evaluation</b>			Feedback and evaluation from workshop	Evaluation of year three  Project evaluation  Final narrative and financial report submitted to SwedBio
<b>Press and Publicity</b>			Press release to highlight project outcomes	Press release for final outcomes
<b>Institutional Strengthening</b>	EAFRINET Mobilisation Strategy Developed.	EAFRINET Strategic Plan to 2015 completed.	EAFRINET Strategic Plan and Mobilisation Strategy launched.	