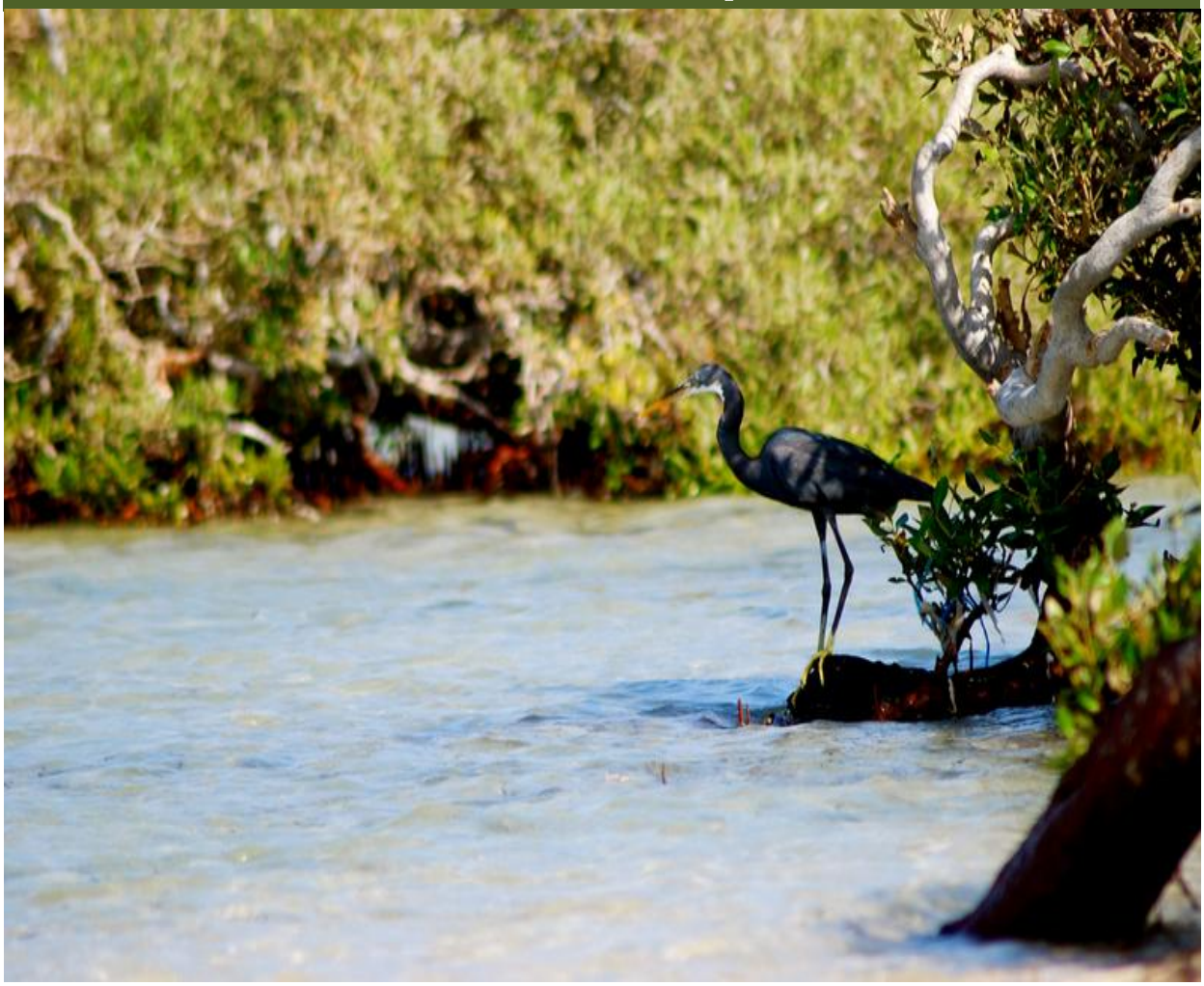
Promoting Green Economy Solutions at Protected Areas of Egypt

An Initiative Proposal



Deliverable # 014-3668-013

Strengthening Protected Area Financing and Management Systems Project

Cairo 2013

3668 Egypt
Strengthening Protected Area Financing and Management Systems Project
Ministry of State for Environmental Affairs
Egyptian Environmental Administrative Agency- Nature Conservation Sector
Global Environment Facility – United Nations Development Programme

وزارة الدولة لشئون البيئة
جهاز شئون البيئة - قطاع حماية الطبيعة
مرفق البيئة العالمي - برنامج الأمم المتحدة الإنمائي
مشروع تعزيز أنظمة الإدارة والتمويل للمحميات الطبيعية

Promoting Green Economy Solutions at Protected Areas of Egypt

An Initiative Proposal

Deliverable # 014-3668-013

By

Professor. MOUSTAFA M. FOUDA
National Focal Point of CBD

Director, Strengthening Protected Area Financing and Management Systems Project

Mahmoud Sarhan

Technical Officer, Strengthening Protected Area Financing and Management Systems Project

Cairo, Egypt

January 2013

Promoting Green Economy Solutions at Protected Areas of Egypt - An Initiative Proposal

This report is an output of Strengthening Protected Area Financing and Management Systems Project, a co-financed national project financed by Global Environment Facility and Ministry of State for Environmental Affairs and executed by United Nations Development Programme and Nature Conservation Sector, under the project document number 3668.

The project aims at the establishment of a sustainable protected area financing system, with associated management structures, systems and capacities needed to ensure the effective use of generated revenues for priority biodiversity conservation needs as well as remove or significantly reduce a wide range of barriers to sustainable financing. The project will maintain a sustainable PA system operated by an autonomous NCS having the financial wherewithal and management capacities needed for effective management based on the following pillars: (i) Legal, policy, regulatory and institutional frameworks that support sustainable PA financing; (ii) Tools and practices for revenue generation and mobilization, and (iii) Business planning and other tools for cost-effective management

Contents

Executive Summary

A green economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalyzed and supported by targeted public expenditure, policy reforms and regulation changes. This development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and source of public benefits, especially for poor people whose livelihoods and security depend strongly on nature.

A green economy does not favour one political perspective over another. It is relevant to all economies, be they state or more market-led. Neither is it a replacement for sustainable development. Rather, it is a way of realising that development at the national, regional and global levels and in ways that resonate with and amplify the implementation of Agenda 21.

This document reviews the current knowledge on green economy (based on UNEP publication on “Green Economy” 2010), the current situation in Egypt, initiatives by different stakeholders, donors and experts. It also provides a situation analysis and assessment of green economy activities in protected areas, and hope to provide a common vision, policy, and means of implementation.

It also presents an innovative and recent green economy initiative at Borneo Island, Indonesia, extracting lessons and benefiting from knowledge.

Is also explores implementation of green economy solutions at protected areas in Egypt. The study also provides cost benefit analysis for some of the proposed solutions to examines the feasibility for implementation.

The document has concluded that green economy is new approach for sustainable development. It has also proposed that the *Green Economy Initiative in Protected Areas of Egypt* consists of several components whose collective overall objective is to provide the analysis and policy support for investing in green sectors and in greening environmental unfriendly sectors. The Initiative includes three sets of activities:

1) Promoting the **Green Economy Approach** and related research materials, which will analyse the macroeconomic, sustainability, and poverty reduction implications of green investment in a range of sectors from renewable energy to sustainable agriculture and providing guidance on policies that can catalyze increased investment in these sectors.
2) Providing **advisory services** on ways to move towards a green economy in specific sectors.
3) Engaging a wide range of **research**, non-governmental organizations, business and national and international donor partners in implementing the Green Economy Initiative.

Finally, Adopting green economy solutions at protected areas of Egypt is expected to result in better environmental management, biodiversity conservation together with economic and social development. It is therefore recommended for decision makers and officials to incorporate the green economy within the framework of protected areas management. A menu of green economy solutions are presented, and steps should be taken to mainstream this approach.

Introduction

a) BACKGROUND

Green economy in the context of sustainable development and poverty eradication was one of the principal themes of the United Nations Conference on Sustainable Development (UNCSD) (2012). The Conference affirmed that there are different approaches, visions and tools available for each country to achieve sustainable development, and green economy is considered one of the important tools, guided by the RIO Principles, Agenda 21, Johannesburg Plan of Implementation (JPOI) Development Goals (MDGs). A paragraph on Green policy addressed, inter alia:

- National sovereignty over natural resources;
- Participation by all relevant stakeholders;
- Sustained and inclusive growth;
- International cooperation on finance, among other matters;
- Unwarranted conditionalities on Official Development Assistance (ODA);
- Trade discrimination;
- Technology gaps;
- Local peoples and non-market approaches;
- Poverty eradication;
- Social protection floors;
- Sustainable consumption and production (SCP); and
- Overcoming poverty and inequality

On implementation of policies; there is recognition that each country can choose an appropriate approach, resource efficiency, equitable growth and job creation, and of the importance of evaluating a range of social, environmental and economic factors in decision making. On partnerships and networks, RIO+20 noted positive experience in some countries, including in developing countries, of adopting green economy policies.
There was recognition of the power of communication technologies, of linking financing, technology and capacity building, and in emphasis on the importance of governments in showing leadership.

Relevant stakeholders, including UN organizatiers, were invited to develop sustainability strategies that integrate green economy policies. RIO+20 also addressed the role of cooperatives and micro-enterprises, public-private partnerships, the critical role of technology and technology transfer with reference to Johannesburg Plan of Implementation (JPOI), and assistance. Thus, green economy requires new institutional framework for sustainable development.

b) GREEN ECONOMY: GLOBAL VIEW

Most economic development and growth strategies encouraged rapid accumulations of physical, financial and human capital, but at the expense of excessive depletion and degradation of natural capital, which includes the endowment of natural resources and ecosystems. By depleting the world's stock of natural wealth – often irreversibly – this pattern of development and growth has had deterimental impacts on the well-being of current generations and presents tremendous risks and challenges for the future. The recent multiple crises are symptomatic of this pattern.

Existing policies and market incentives have contributed to this problem of capital misallocation because they allow business to run up significant, largely unaccounted for, and unchecked social and environmental externalities. To reverse such misallocation requires better public policies, including pricing and regulatory measures, to change the perverse incentives that drive this capital misallocation and ignore social and environmental externalities.

At the same time, appropriate regulations, policies and public investments that foster changes in the pattern of private investment are increasingly being adopted around the world, especially in developing countries.

The last few years have experienced an increased recognition of the importance of advocating "green economy" as a tool for achieving sustainable development and poverty eradication. Because of the many concurrent crises (e.g. climate change, biodiversity loss, fuel, food, and water security) and market failure, experienced recently, including the financial and economic crisis of 2008, a new economic paradigm-one in which material wealth is not delivered at the expense of growing environmental risks, ecological scarcities and social disparities-is emerging.

Mounting evidence also suggests that transitioning to a green economy has sound economic and social justification. There is a strong case emerging for a redoubling of efforts by both governments and private sector to engage in such an economic transformation. For governments this would include leveling the playing field for green products by phasing out subsidies, reforming policies and providing new incentives, strengthening market infrastructure and market-based mechanisms, redirecting public investment, and promoting green public procurement. For the private sector, this would involve understanding and siezing the opportunity offered by transitioning to a green economy across a number of key sectors, (natural capital such as agriculture, fisheries, coral reefs, mangroves; investing in energy and resource efficiency such as renewable energy, manufacturing, waste, building, transport, tourism, and cities) and responding to policy reforms and price signals through higher levels of financing and investment.

UNEP defines a green economy as one that results in "improving human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low-carbon, resource efficient, and socially inclusive".

It focuses on improving human well-being and reducing social inequity over the long term, without exposing future generations to significant risks and ecological

scarcities. It seeks to do so in two ways. First, by increasing investment in the sustainability of ecosystems upon which much of the poor people depend, it ensures that the environment can continue to be used for the benefit of current and future generations. Second, by developing strategies for economic growth on the basis of the sustainable use of natural resources and the environment, a green economy generates the long-term jobs and wealth that are needed to help eradicate poverty. A green economy also recognizes that conventional economic indicators, such as GDP, provides a distorted indicator for economic performance. This is because such indicators fail to reflect the extent to which production and consumption activities may be drawing on natural capital.

Certain enabling conditions (regulations, measures) need to be created and maintained so that private sector actors will have an incentive to invest in green economy activity. Enabling conditions are defined as conditions that facilitate investment in green sectors. They create a context in which economic activity increases human well-being and social equity, and significantly reduces environmental risks and ecological scarcities. Enabling conditions can be created by a wide range of actors and institutions (e.g. governments, NGOs, for a, multilateral agreements, private sector, etc.)

Moving towards a green economy has the potential to achieve sustainable development and eradicate poverty on an unprecedented scale, with speed and effectiveness. This potential drives from two concurrent changes. First, there is a changed playing field in which our world and the risks we face have materially changed. These changes require a fundamental rethinking of our approach to the economy. Second, there is a growing recognition that the natural environment forms the basis of our physical assets and must be managed as a source of growth, prosperity and well-being.

Changing the economic environment in this way is an ambitious undertaking which requires a holistic set of policies to overcome a broad range of barriers across the investment landscape.
These are six key areas of policy making which most governments will need to focus on in order to correct the incentive structures in current unsustainable markets and to alter investment landscapes in the short to medium-term. These policy tools are:

1. Promoting investment and spending in areas that stimulate a green economy (green public infrastructure and procurements).
2. Addressing environmental externalities and market failures (taxes and tradable permits).
3. Limiting government spending in areas that deplete natural capital (reforming harmful subsidies).
4. Establishing sound regulatory frameworks (standards, property laws and access right, negotiated and voluntary agreements, information based tools)

5. Investing in capacity building, training and education.
6. Strengthening international governance.

Carefully designed investment and spending can stimulate the greening of economic sectors. While the bulk of green economy investment will ultimately have to come from the private sector, the effective use of public expenditure and investment incentives can play a useful role in triggering the transition to a green economy.
Taxes and market-based instruments are powerful tools to promote green investment and innovation. Significant price distortions exist that can discourage green investments or contribute to the failure to scale up such investment. In a number of economic sectors, negative externalities, such as pollution, health impacts or loss of productivity, are typically not reflected in costs, thereby reducing the incentives to shift to more sustainable goods and services. A solution to this problem is to internalize the cost of externalities in the price of a good or service via a corrective tax, charge or levy closer to the source of pollution or, in some cases, by using other market-based instruments, such as tradable permit schemes.

Government spending in areas that delete environmental assets is counterproductive to a green economy transition. Artificially lowering the price of goods through subsidization can encourage inefficiency, waste and overuse, leading to the premature scarcity of valuable finite resources on the degradation of renewable resources and ecosystems such outdated subsidies can also be socially unfair. Moreover, they can reduce the profitability of green investments. Reforming environmentally harmful and economically costly subsidies can therefore bring both fiscal and environmental benefits. However, short-term support measures accompanying the reform may be necessary to protect the poor.

A well-designed regulatory framework creates incentives that drive green economy activity. The use of regulations and enforcement of legislation is necessary to address the most harmful forms of unsustainable behavior, either by creating minimum standards or prohibiting certain activities entirely.
Investing in capacity building and training is essential to support a transition to a green economy. A shift towards a green economy may require capacity to analyze challenges, identify opportunities, prioritize interventions, mobilize resources, implement policies and evaluate progress. Temporary support measures may be required to ensure a just transition for affected workers to new jobs.

Strengthening international governance can assist governments to promote a green economy. Multilateral environmental agreements, which establish the legal and institutional frameworks addressing global environmental challenges, can play a significant role in promoting green economic activity.

Green economy was one of the main topics discussed during the World Summit on Sustainable Development (June 2012, RIO +20). Discussions included approach (s),

vision, models, tools, sustainable innovation, enabling environment, green jobs, criteria for green economy, environmental coast and benefits when green economy implemented, legal and regulatory frameworks, investment in green economy transition, trade barriers, funding and international cooperation, technological communications, institutional reforms, international platform / fora on green economy, partnerships, networking, information exchange, national strategies and action plans, database and information needed, gap analysis, political guidelines, voluntary technology transfer, national legislation, and means of implementation (funding, science and technology, capacity building, trade and compliance).

Section 1: Green Economy Initiative in the Protected Areas of Egypt

Section 1: Green Economy Initiative in the Protected Areas of Egypt

a) Current Situation Of Green Economy In Egypt

At RIO+20, Egypt confirmed that it is moving towards green economy. Development priorities included water, food, national security, and energy, transition to green economy and nature conservation. During the same month (June 2012), Egypt celebrated with the world, during the International Environment Day, under the umbrella of UNEP "Green Economy".

However, situation analysis for green economy in Egypt, has indicated that green economy still at an embryonic stage. It is true that there exist many policies and initiatives dealing with green economy, including Egyptian Council on Clean Development Mechanism (CDM) (Ministry of Environment), Supreme Council of Green Building (Ministry of Housing), Industrial Modernization Centre and the National Cleaner Production Centre (Ministry of Industry).

Resources are being directed towards adapting and undertaking mitigation measures to combat climate change and other environmental challenges (e.g. air and water quality, waste management, coastal and marine pollution, nature protection, desertification,). Government is directing mitigation measures toward energy (wind power), manufacturing (12% of the water force) agricultural (agricultural, waste management:Reuse of rice straw, organic farming, tourism (Green cities at Sharm el-Sheikh and Sheikh Zayed city), and transportation (encourage use of natural gas in public transportation, taxis and private cars).

There are also many private initiatives such as Al-Azhar Park (where accumulation of solid waste were transformed into Cairo lungs), Basata village at the Gulf of Aqaba (example of ecotourism), use of existing old design of building (e.g. Sehemi House at Al-Azhar area, composting in many governorates by individuals and private companies (e.g. Soil and More: SEKEM, and many others).

In addition, there are highly qualified personal in many fields of green economy at the Universities, Research centers, and private companies.

Basata eco-lodge

In spite of all government and private sector efforts, there is a lack of an integrated approach in developing environment strategies, plans and programmes, which resulted in duplication and / or conflict in green economy implementation. There is also a lack of proper enforcement of legislation already adopted, and sometimes a need for more detailed and elaborate legislation to protect the environment. Implementation mechanisms are largely missing, leading to an ad hock uncoordinated implementation efforts, which jeopardize the achievement of green economy transition.

Possessing the right skills for green jobs is a prerequisite for making the transition of green economy. These skills needs have not yet integrated into the formal education and training systems. Linkages between environmental policy-making, education and training policy-making are nonexistent. These also seem to be a lack of awareness of the need to respond to the anticipated demand for green jobs.

Transitions to a green economy do not happen automatically. Political frameworks and sound institutional set-up need to be in place to ensure that market can develop, innovation takes place that technologies are adopted and implemented to the benefit of local labour markets. Therefore, International Labour Organization (ILO), GIZ (Germany), Canadian International Development Agency (CIDA) and other donor agencies organized a workshop (November 2012) on skills for green jobs in Egypt. The workshop brought together decision-makers and experts from concerned ministries, industry, academia, civil society and worker representatives. The workshop aimed at initiating a process for the development of a vision, strategy and action plan for composting and renewable energy, with a special focus on skills policies and support sector growth. The following questions were discussed:

1. How many people are currently working in composting and renewable energy?
2. What is the job creation potential in the two sectors?
3. Are skills shortages holding back sector development? If so in which areas?
4. What are other barriers to sector development, in particular with regard to financial and policy framework?
5. What is needed to stimulate sector growth and develop the required skills?

It was clear that there is a lack of an official structural skills response strategy to greening in Egypt. There is currently no entity responsible for collecting systematic data on the skills and knowledge base of the workforce necessary to sustain the shift to a green economy. This could be attributed to the lack of coordination between the multiple ministries and agencies working in education and training, and businessmen and those working on environmental issues.

However, potentials for green jobs are huge; 2 – 3 million jobs can be created for composting alone with minor investments, provided that harmful subsidies are gradually diverted to investment in green economy.

b) Situation Analysis In Protected Areas

Many aspects of green economy have been implemented in protected areas for some years, others ceased due to the lack of financial and technical resources. The following is a brief on main activities related to green economy in protected areas

Saint Catherine is one of world's most amazing areas, not only for its natural landscape, but also for its medicinal plants diversity that is attracting national and global interest, Among the 472 species present 19 are of global significance, more than one hundred species are used for medicinal purposes. The Bedouin communities who live in the Saint Catherine Protectorate (SKP) have developed an extensive knowledge over the past millennia of the various ways in which medicinal plant species can be used. This in turn has formed a part of their integral economic value while living in a delicately balanced environment.

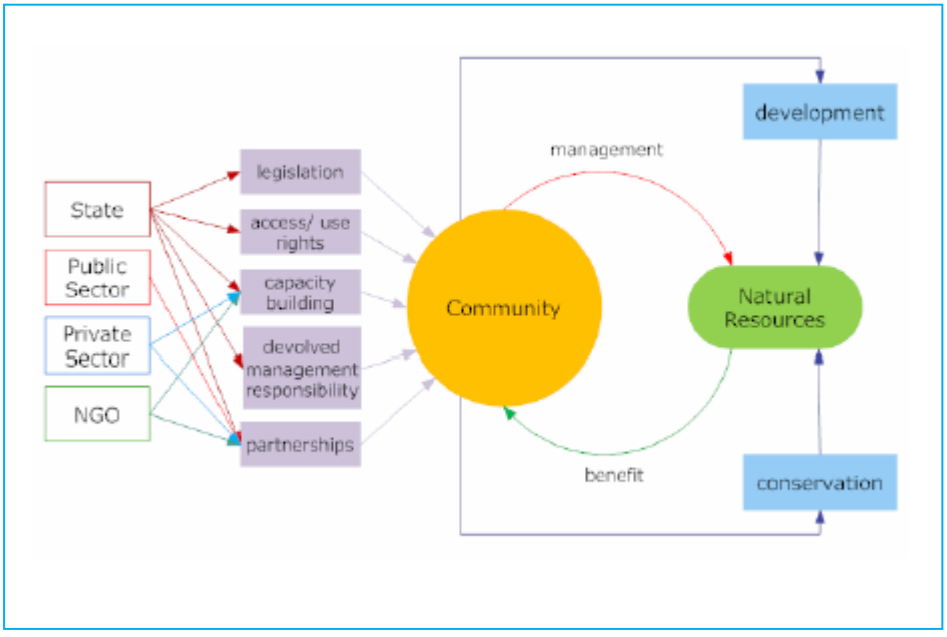
"IF YOU HELP ME TO STAND UP I WILL WALK THE REST OF THE WAY"
This is a novel approach in involving Local Communities in Conservation Management and Enhancing their Livelihood. It is based on the Medicinal Plants Conservation Project (MPCP) funded by the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP), and implemented by the Egyptian Environmental Affairs Agency (EEAA). The aim of the project was to develop and empower the local communities to conserve, sustainably use and benefit from the Globally Significant MAPs of SK.

The MPCP has made significant and notable progress as follows:

- Set up a national legislation on access of biological resources (BR) and traditional knowledge (TK) and the equitable sharing of the benefits of the management thereof (ABS). Creating such enabling environment for MAPs conservation and sustainable use will define and regulate the local community's rights to access their BR and to share the resulting benefits, which will be achieved through an effective Egyptian National ABS legislation.
- The National MAP Strategy and Action Plan applies the CBD and CITES provisions, strategies, actions plans and programs and builds upon knowledge available at the national and community levels. It relies on *in situ* and *ex situ* conservation and restoration as primary approaches. The implementation of the strategy will be coordinated by the MSEA and executed by the relevant ministries.
- The development of a Community Based Natural Resources Management (CBNRM) system in SKP marks a new approach by the EEAA towards collaborative conservation. It can be considered as the most advanced formal

CBNRM approach in the region. The main thrust for these interventions is to address the issues of tenure of, and access to the MAP resources ensuring that benefits are returned to those closest to the resource and who are bearing the costs of conservation management. Since its establishment in 2007 the CBNRM program has achieved the following results;

- A MAPs collectors Association has been established and has identified 42 wild MAPs collectors of which 40 are women. It was the first time that women had been included in the deliberations when discussing issues of apportioning benefits and developing a Bedouin Tribal Law.
- The CBNRM process has resulted in strengthening democratisation and accountability at the local level and is collaborating with the Bedouin collectors and traders.
- The Constitution, rules and regulations of the MAPs collectors Association was approved by the local community, SKP and the Nature Conservation Sector (NCS) of Egypt.
- The program improved the SKP management plan and set out the terms and conditions necessary for sustainable wild collection and trade.
- MAP resources will be managed by the MAPs collectors Association based upon an official agreement between the community, SKP and NCS.
- In order to improve the livelihood for the local community an innovative product line for wild MAPs was developed, organically labelled, and is being successfully marketed.



The CBNRM process

The Medicinal Plants Association (MPA), established by the MPCP, was chosen as one of 25 winners of the Equator Prize 2012, and the award received at the UN conference on Sustainable Development (Rio+20) in Brazil, June 2012. This award acknowledges the effort of MPA in protecting endemic species of medicinal plants in

SKP and in successfully developing a model that links conservation with job creation, women empowerment, and the improvement of livelihood for the Bedouin population.

The MPA joined an elite group of Equator Prize winners, now numbering 152 and constituting an influential grassroots movement of local and indigenous best practice in sustainable development solutions.

Given this proven and globally acknowledged and commended successful experience in SKP, it is hoped through contribution partnership to replicate such experience in other protected areas in Egypt. This will be considered as a "key of success" for further promote the conservation agenda and improve the livelihoods of the protectorate's communities.

Natural products

Organic farming practices were initiated for several years in Wadi El-Rayan Protected Area, with support given by Italian cooperation to both Ministry of Agriculture and Ministry of Environment.

There exist in Wadi El-Rayan a village called Sidi El-Khedr which was built by the Ministry of Agriculture and Land Reclamation for farmers as compensation for those who suffered from a legislation dealing with land owners and farmers. The total area was 3000 acres, and it was supposed organic farming will be practiced in the protected areas. A total of 100 acres were allocated, but only 20 acres were used for organic farming.

Financial and technical support were given to farmers, resulted in a very good production of several crops. However, this practice did not continue for several reasons. First, there was no plan for marketing these organic crops. Farmers and citizens of Fayoum Governorate nearby Wadi El-Rayan did not know the difference in price between organic and non organic production. Most of production were left nearby fields, and were sold cheaply. The lack of financial and technical resources for processing organic food at the fields and allocating exists for organic food in Cairo supermarkets resulted in ceasing these activities with usual traditional agricultural ones (e.g. use of pesticides).

The original idea of organic farming was to transfer a considerable agricultural area into some sort of agro-industry to enhance the livelihood of poor farmers, and at the same time have environmentally friendly agriculture produce, hence improve nature protection.

Organic products at the supermarkets

Integrated solid waste management at St. Catherine PA was initiated more than 15 years ago, where at that time, European Union (EU) funded the development and management of the newly protected area in Egypt (St. Catherine). There are collecti on and sorting sites in the town, and a land-filled site outside the town by about 10 km. Staff of the protectorate are in charge of Mousa mountain (visited by about 1000 persons daily), and the city council deal with waste in town. Several studies were made earlier and have indicated the system is not economically viable. There exist now a huge land fill where the system is based only on collection and transported to the land fill site. Sorting station established by the protectorate did not attract private sector for composting, as organic remains are so small compared with other sites in Egypt. Organic materials are picked by goats, but land fill site is accumulating a

considerable waste, mostly plastics, glass, paper and other. There is a need to evaluate the existing solid waste management as it seems there are rooms for improvements.

Egypt has a long history of tourism. In the past, tourism was based on the cultural heritage of Egypt, mostly antiquity. During the last 20 years, areas rich with cultural heritage (e.g. protected areas in the Red Sea, Sinai, Western Desert), became a major destination. Potential for nature-based tourism include diving around coral reefs, adventure (both in the Red Sea for shark watching and Sinai for its spectacular mountains), trekking, desert safari, bird watching, and many others. The natural heritage of Egypt offers spectacular landscape, rich terrestrial and marine biodiversity, geological features, whale fossils, and culture of very interesting tribes along the Red Sea coast, Sinai and western desert.

Therefore, a national ecotourism strategy was prepared in 2006, with the following objectives:

- Establish Egypt as a world class ecotourism destination.
- Establish the conservation of Egypt's natural heritage as the corner stone of the ecotourism industry.
- Ensure an equilibrium between tourism development needs and natural resource conservation fundamentals
- Encouragement of tourism patterns which do not degrade the resource base.
- Enhancement of the environmental management of tourism activities.
- Establish procedures for environmental monitoring and evaluation of tourism activities, as well as tourists satisfaction.
- Support ecotourism through enforcement of relevant legislation.
- Promote the use of "clean technologies".
- Enhance public and corporate awareness and understanding of ecotourism.
- Promote cooperation and networking amongst stakeholders.
- Maximize benefit to local people from tourism.

Protected areas of Egypt (30) are scattered all over 15% of the country territory. Examples include Ras Mohammed National Park (known as one of the global top 10 sites for coral reefs), St. Catherine (World Heritage site), Burulus protectorate (example of wetlands), Siwa (both cultural and natural heritage), Wadi El-Rayan heritage site), Elba along the southern Egyptian Red Sea (extension of African landscape with the Red Sea Resources), Gilf El-Kabir (where rock art reflect the hunting and settlement era in the western desert).

Visitor facilities and services provided at the protected areas include mooring (to protect coral reefs from ships anchorages), trails, visitor safety, visitor management (Samadi where dolphins occur all year round), visitor centres (15), ecolodge, bird watching, handicrafts, and information (CDs, brochures, videos, books, booklets, maps, etc).

More than 4 million tourists visit protected areas annually. However, more is needed to make Egypt world class ecotourism destination. New policies, legislation and regulatory framework should be established within what is called "institution reform". The first step is being made, where protected areas will be separated from Egyptian Environmental Affairs Agency, to be autonomous agency (Nature Conservation). Partnerships with all stakeholders need to be consolidated for better development and management of protected areas. Local community development needs to be enhanced to benefit from tourism. The approach ideal to be implemented in protected areas.

Green buildings in protected areas were first initiated at Saint Catherine where the visitor centre was built from local raw materials of rocks similar to the surrounding museum with all support given to local people. The visitor centre units (natural history, geology, cultural heritage) were built at different levels to resemble the surroundings to the extent that you cannot distinguish the visitor from a distance. Meanwhile, the internal design accommodates the appropriate technologies to suit the whole place of St. Catherine.

Similarly green buildings at Wadi El-Gemal were made of local materials and the design was based on Roman ruins where rocks were brought from different places to give the impression of the same landscape of the different sites. Infrastructure at the Valley of Whales (Wadi El-Rayan) were made primarily of mud bricks, cafeteria, toilets, interpretation sites (10) etc. Solar energy were used in most buildings.

Valley of Whales Visitor Centre

Eco-lodge of Al-Karm, 30 km from St. Katherine, was based on old ruins of the sites, and included few rooms, solar energy to provide hot water (electricity not allowed).

Al-Karm Eco-lodge, St. Katherine

Solar energy were used first at Gulf of Aqaba protectorates, primarily at Nabq, Abu Galloum, Taba and also at Wadi Allaqi protectorate, but buildings were traditional (the concept of green buildings was not visualized by the decision makers during nineties. Solar energy were used to provide electricity at staff accommodation and the visitor centres. However, maintenance was so expensive to the extent that most of solar panels are not functioning now.

Handicrafts are common in most of the protected areas, and varied greatly according to the site and local communities. For instance, in St. Catherine protectorate, it started with one girl to make dresses of local Bedouins; investment and support were given where now a company of 500 women is established, local dresses and tools used by local communities became world fashion, by and international Italian Company (Bourgou) as well as German designers. In other protectorates like Qaroun, Siwa, most of handicrafts were made of palm leaves, pottery, ceramic, etc., whereas in the white desert protectorate, handicrafts were primarily made of sand rocks of the site, and in Elba protectorate, handicrafts were made of camel leathers, etc.

Because of the spread of handicrafts that varied from one protectorate to another, many NGOs were established with the support of protected areas staff to improve the products and market them in touristic sites, hotels, and in large cities (Cairo, Sharm El-Sheikh and even some products were exported to Europe.

Handicrafts at Saint Katherine

Innovative thinking of green approach was encouraged to some local individuals that made significant contribution to the local community development. Mr. Ahmad Mansour on locals and tourists call him Dr. Ahmad Mansour, and he call himself Hakim (wise) Mansour of St. Catherine is a very good example.

He is known as a man who provide herbs to treat some diseases such as cold, Rhomatoides, muscle pains, etc. He inherited a remarkable experience on medicinal plants for several generations from his father and grandfather, but his children were not interested in what he is doing, and they are mostly working as tourist guide or governmental clerk. Support was given to him to build a herbal school for boys and girls of St. Catherine. Within one year, and after a good success of the trial, more parents requested Ahmad Mansour to accept their children at his school during summer months (annual holiday of traditional government schools). Most of these kids, who are now young people have jobs not only in herbal activities, but also in the eco-lodge built also by Ahmad Mansour. That attracted more people to work with him in cultivating medicinal plants, to produce wild honey that is sold at high price, and also to establish small enterprises such as animal husbandry. Few water small wells were built to provide water for drinking and agriculture for small community in the surrounding mountains. According to Ahmad Mansour, we cannot depend entirely on tourism but we have to provide food for the survival of local communities living in the mountain.

c) Assessment of Green Economy In Protected Areas

Many activities of green economy occur and are scattered all over the protected areas, depending on the visionary people who provided their skills, financial and technical resources. It has to be stated very clearly that most of green activities were supported by donor projects funded from Europe, USAID, Italian cooperation and Global Environmental Facility (GEF), and a handful of individual initiatives by certain individuals of decision-makers and local community. Therefore, sustainability of these activities ceased when financial resources ceased, except few cases like

handicrafts, medicinal plants that succeeded in establishing NGOs, and were supported from other sources in some cases, not in all protected areas. Most of these initiatives were not marketed properly outside protected areas to attract investors, after donor projects were completed.

Most of these initiatives were not marketed properly outside protected areas to attract investors, after donor projects were completed. Partnerships with different stakeholders were hindered by the governmental bureaucracy, resulted in many investors did not continue
supporting local communities, hence very few financial resources are available.

Proper green economy in protected areas requires a clear vision, policies, and means of implementation (finance, capacity building, science and technology, trade and commitments).

VISION

The green economy concept approach(s) and tools will serve as a catalyst for transforming protected areas into a greener economy, and to provide a better quality of life within the ecological limits of ecosystems.
Multi stakeholder dialogue will be organized through workshops to explore green economy concept, approach(s) and tools within the main principles of sustainable development, and to map out what transitioning to green economy would entail for protected areas. Stakeholders will be well-networked so that information flows improve, innovation increases, and partnerships are found to achieve shared goals).

MISSION

Egypt has exceptional wild resources (coral reefs, spectacular desert land farmers, rich fossil deposits, and vast bird migration) that underpin the economy and offer it a comparative advantage in the massive and growing nature tourism industry. Recognizing the value of its biodiversity and its critical role in maintaining and enhancing the well-being of the country, government, in partnership with stakeholders, will implement a green economy initiative where protected areas competitiveness will be improved through a preferential focus on the diverse, productive and sustainable operation for the benefit of people living in outside protected areas.

MANDATE

- Government will fulfil its accountability for conserving Egypt's natural resources and their sustainable use through the Minister for Environment's approving an autonomous Nature Conservation Council, in consultation with affected stakeholders.
- Government, through the council, will provide leadership and incentives for creating greener economy enabling environment, setting high standard across

all protected areas, and runs its own operations in a consistent, green and ethical manner.

- Private sector will lead green growth, takes initiatives and transforms itself to become more efficient and inclusive.
- Domestic investment will be mobilized, and responsible foreign investment will be attracted towards green infrastructure, technology transfer, goods and services.
- Value of natural ecosystem within protected areas will bring economy and accounting for its sustainable use.
- Partnerships will all stakeholders will be implemented to improve governance of protected areas, allocate resources for capacity building, sustainable production and consumption patterns.
- Social protection will be integrated into green economy.
- Knowledge share will be disseminated through communication, education, and public awareness.

d) Priorities For Setting Goals, Policies and Means of Implementation In Protected Areas

There many activities of green economy exist in protected areas system in Egypt, initiated by government, donors, private sector and local communities. These include:

- Biodiversity conservation, ecosystem services and good
- Economic activities such as:
    - Ecotourism
    - Handicrafts
    - Medicinal Plants
    - Agriculture, fisheries, and mining
- Some sort of green buildings and renewable energy.
- Limited integrate waste management.

However, certain enabling conditions (regulations, measures by the government) need to be created and maintained so that private sector actors will have an incentive to invest are suggested for further discussions. These include:

- Evaluating social, environmental and economic factors in protected areas (more than one million people live inside and at the periphery of protected areas where their livelihood depend on natural resources (e.g. tourism, fishing, agriculture, and many others) challenges for investment need to be identified and evaluated.
- Partnerships with all stakeholders should be visualized through legal and regulatory framework, private-public partnerships should be established very soon.
- Financing should be linked with technology transfer, capacity building, and establishment of cooperatives, and micro enterprises.

- Establish market for green products (for sustainable production and consumption patterns).
- Individual innovative initiative should be encouraged (e.g. example of Mr. Ahmad Mansour at St. Catherine).
- Coordination mechanisms with both government and private sectors should be formalized with well defined responsibilities of each partner to avoid duplication efforts and improve efficiency of resources.
- Local communities should benefit from the use of natural resources in protected areas to improve their livelihood.
- Criteria for setting priorities and planned activities.
    - Some of the above mentioned ideas will be highlighted to assist in setting goals, policies and implementation of green economy in protected areas.

Financial Sustainability

Financial sustainability is the ability to secure stable and sufficient long-term financial resources, and to allocate them in a timely manner and appropriate form, to cover the full costs of PAs(direct and indirect) and to ensure that PAs are managed effectively and efficiently with respect to conservation and other objectives.

Thus, achieving financial sustainability will require major changes in the way PA funding is conceptualized, captured, and used. PA financial sustainability will also require reinforcement of PA management capacity, in particular to:

- become more responsive to changing opportunities and external demands;
- strengthen institutional capacity to use financial and business planning tools;
- establish more supportive economic policy and market conditions;
- involve a wider range of stakeholders in PA management.

<u>Elements of financial sustainability:</u>

- Building a diverse, stable and secure funding portfolio (minimizing funding risks and fluctuations (e.g. tourism is the main funding);
- Improving financial administration and effectiveness (allocation / spending of funding);
- Taking a comprehensive view of costs and benefits;
- Creating an enabling financial and economic framework (overcoming market and pricing policies that act as obstacles to PA financing);
- Mainstreaming and building capacity to use financial tools and mechanisms (PA planning).

Challenges for Financing

The first challenge is that many benefits of biodiversity and ecosystem services are considered "public goods" This means firms / authorities who provide public biodiversity benefits cannot easily charge consumers for enjoying them, while at the same time people who are made worse off due to biodiversity loss cannot easily extract compensation from those responsible for the damage. Thus, markets tend to ignore biodiversity altogether. This challenge can be solved using mechanisms that "internalize" the public good value of natural capital in private production and consumption decisions, for example, green commodities, subsidy reforms, payment for ecosystem services and environmental offset schemes. Such mechanisms have the dual merit of directly addressing the economic drivers of biodiversity and ecosystem loss, while some also help to reduce pressure on government budgets.

The second challenge facing financing biodiversity and ecosystem services is that many of the public benefits are enjoyed at a distance from the site of conservation where funding is needed (locally). This disconnect poses a particular financing challenge, mainly how to elicit sustainable funding from distant beneficiaries to compensate local communities for their loss of access to natural resources. Modest sustainable uses such as eco-tourism or bio-prospecting do not yield short-term profits for local communities. International funding is needed to bridge the gap between the global beneficiaries and local providers of biodiversity and ecosystem services.

The third challenge is that we still have limited knowledge of the extent and value of natural capital, especially in marine environments. We may be nearing ecological thresholds, where further biodiversity loss would result in the collapse of certain ecological functions, and a dramatic decline in ecosystem services.

Decision makers don't know which ecosystem or which components of biodiversity most need to be conserved in order to maintain and increase human prosperity. Thus, there is an urgent need to develop the natural capital knowledge base, particularly on the links between biodiversity, ecosystem services and economy.

In addition, there are few immediate steps that need to be taken towards a more rational approach to biodiversity finance:

- Track all that is currently being spent on biodiversity;
- Assess the relative effectiveness of different financial mechanisms;
- Better understand the conservation funding gaps for different components of natural capital, by preparing objectives expressed in terms of conservation outcome and quantitative indicators.

Partnerships

A collaborative management approach, in which some or all of the relevant stakeholders (governmental, non-governmental) are involved in substantial activities, is proposed by this project.

Building capacity for financial and business planning is essential. NCS has to develop partnerships with relevant stakeholders and specify and guarantee their functions, rights and responsibilities. In general, the partnership should identify:

- The range of sustainable uses PAs can provide;
- The functions and responsibilities assumed by each stakeholder;
- The specific benefits and rights granted to each stakeholder;
- An agreed set of management priorities and management plan;
- Procedures for dealing with conflicts and negotiating collective decisions about all of the above;
- Procedures for enforcing such decisions;
- Specific rules for monitoring, evaluating and reviewing the partnership agreement, and the relative management plan, as appropriate.

The approaches to establishing partnerships for improving the management of protected areas are built on the following 10 principles:

1. Providing benefits to local people;
2. Meeting local needs;
3. Planning holistically (management of PA's and that of adjacent areas must be planned together);
4. Planning protected areas as a system;
5. Defining objectives for management;
6. Planning site management individually;
7. Managing adaptively;
8. Fostering scientific research;
9. Forming networks of supporting institutions;
10. Building public support.

Development & Technology Transfer

Technological solutions are essential drivers in the transition towards a green economy. Environmentally sound technologies include a variety of cleaner production process and pollution prevention technologies as well as end-of-pipe and monitoring technologies.

Moreover, they cover total systems including know-how, procedures, goods and services and equipment as well as organizational and managerial procedures.

Technology transfer therefore includes soft technologies, such as the knowledge, systems and management approaches that can be employed in making the transition to the green economy. This highlights the need for engagement of business, training, and educational institutions. Technology solutions do not originate from abroad. Some green technologies already exist in Egypt at affordable prices. The use of such technologies is not yet widespread largely due to the lack of information, education, financing, and technical support.

Many groups have been active in providing support, training, and capacity building for the diffusion of such technologies in Egypt and other developing countries (e.g. India, South Africa). Their efforts should be scaled up with the support of both

domestic and external resources and enhanced international cooperation, from both the private and public sector.

▪ Criteria for setting priorities and planned activities

The following evaluation criteria are identified:

- Relative importance (as compared to the outcome and the other activities)
- Commitment of "Government"
- Commitment of the "Private Sector"
- Possibilities of Success
- Possibilities of Replication
- Estimated time of implementation of activities
- Estimated participation of Egyptian Experts
- Estimated participation of Foreign Experts

e) Towards the Green Economy Initiative in Protected Areas in Egypt

The Green Economy Initiative in Protected Areas of Egypt consists of several components whose collective overall objective is to provide the analysis and policy support for investing in green sectors and in greening environmental unfriendly sectors. The Initiative includes three sets of activities:

1. Promoting the **Green Economy Approach** and related research materials, which will analyse the macroeconomic, sustainability, and poverty reduction implications of green investment in a range of sectors from renewable energy to sustainable agriculture and providing guidance on policies that can catalyze increased investment in these sectors.
2. Providing **advisory services** on ways to move towards a green economy in specific sectors.
3. Engaging a wide range of **research**, non-governmental organizations, business and national and international donor partners in implementing the Green Economy Initiative.

Section 2:Green Economy Solutions

Section 2:Green Economy Solutions

This chapter discussed the role of governments and in particular the use of economic policy to enable instruments capable of helping to shift the economy to one that values natural capital. However, a green economy will not emerge through the efforts of governments alone. A wide
range of stakeholders each has a role to play in accelerating the transition to a green economy. This chapter therefore presents a variety of on-the-ground solutions which can be part of a mosaic of land uses in the PAs, all in different ways contributing to sustaining natural capital. In doing so, it highlights the roles of other, nongovernmental stakeholders along with some critical next steps needed to realize the Vision.

This chapter presents these on-the-ground solutions; some are sector specific and aimed at building local revenue, generating a more inclusive distribution of benefits and reducing pressures to deforest. Others are cross-cutting and essential to avoiding costs related to depletion of natural capital, including damaged ecosystem services in particular.

a) Protected areas contribute to EU's green economy

Europe's protected areas play a key role in protecting biodiversity. But they are also a critical component of the continent's economy, contributing over EUR15 billion a year in jobs, food, and other services for the people of Europe, says the European Environment Agency (EEA).

This position at the intersection of the economy and nature makes protected areas a key part of Europe's drive for sustainable development and for the creation of a green economy. The production of food and creation of employment within their boundaries are the most easily measured economic benefits of protected areas. But there are a host of indirect services provided by protected areas that also contribute to our economy.

These include so-called 'ecosystem services', such as the provision of clean water as well as the regulation of the water cycle carried out by forests, wetlands and watersheds, all of which help to mitigate flooding.

Well-managed protected areas also prevent soil erosion and desertification, and help sequester carbon. In marine environments, protected areas can maintain fisheries stocks at sustainable levels by providing areas for fish to breed and grow without being caught. On land they can ensure safe environments for pollinating insects, which ensure the viability of much of Europe's agriculture.

A recent research for the European Commission suggests that the economic benefits from the largest European network of protected areas - the Natura 2000 network - are between three and seven times its annual running costs of EUR5.8 billion.

In Europe today there are two main networks of protected areas: the Natura 2000 network, established as part of the 1992 Habitats Directive; and the Emerald Network, set up in 1996 by the Council of Europe, and comprising 45 countries, many of which are outside the EU.

But these networks need to be improved and extended. Better coordination of data collection would improve the quality of information available to stakeholders and scientists.

Also, given the success of many protected area policies in a variety of fields, these measures could also be extended beyond protected areas. The European Environment Agency will publish a more comprehensive report on protected areas later this year.

b) Green Economy Solutions – The Case of Heart of Borneo

Borneo is the third largest island in the world and is located north of Java, Indonesia, at the geographic centre of Maritime Southeast Asia. The island is divided among three countries: Brunei, Indonesia and Malaysia. Approximately 73% of the island is Indonesian territory. The Malaysian states of Sabahand Sarawak in the north occupy about 26% of the island. The sovereign state of Brunei, located on the north coast, comprises about 1% of Borneo's land area. Borneo is home to one of the oldest rainforests in the world.

The Borneo rainforest is 130 million years old, making it the oldest rainforest in the world. There are about 15,000 species of flowering plants with 3,000 species of trees (267 species are dipterocarps), 221 species of terrestrial mammals and 420 species of resident birds in Borneo.[3] There are about 440 freshwater fish species in Borneo (about the same as Sumatra and Java combined).[4] It is the centre of evolution and radiation of many endemic species of plants and animals. The Borneo rainforest is one of the only remainingnatural habitats for the endangered Bornean Orangutan. It is an important refuge for manyendemic forest species, including the Asian Elephant, the Sumatran Rhinoceros, theBornean Clouded Leopard, the Hose's Civet and the Dayak Fruit Bat. The World Wide Fund for Nature has stated that 361 animal and plant species have been discovered in Borneo since 1996.

The World Wide Fund for Nature divides the island into seven distinct ecoregions. TheBorneo lowland rain forests cover most of the island, with an area of 427,500 square kilometres (165,100 sq mi). Other lowland ecoregions are the Borneo peat swamp forests, the Kerangas or Sundaland heath forests, the Southwest Borneo freshwater swamp forests, and the Sunda Shelf mangroves. The Borneo montane rain forests lie in the central highlands of the island, above the 1,000 metres (3,300 ft) elevation. The highest elevations of Mount Kinabalu are home to the Kinabalu

mountain alpine meadow, an alpine shrubland notable for its numerous endemic species, including many orchids.

The island historically had extensive rainforest cover, but the area shrank due to heavy logging for the Malaysian plywood industry. Half of the annual global tropical timber acquisition comes from Borneo. Furthermore, Palm oil plantations are rapidly encroaching on the last remnants of primary rainforest. The rainforest was also greatly destroyed from the forest fires of 1997 to 1998, which were started by the locals to clear the forests for crops and perpetuated by an exceptionally dry El Niño season during that period. During the great fire, hotspots could be seen on satellite images and the haze thus created affected the surrounding countries of Brunei, Malaysia, Indonesia and Singapore.

Heart of Borneo: Investing in Nature for a Green Economy has been developed in support of the three-country Heart of Borneo (HoB) Initiative.

- Home to approximately 6% of the world's biodiversity, the Heart of Borneo (HoB) is one of earth's richest biological treasure troves. HoB's forests cover upstream and midstream portions of 29 river basins and provide important ecosystem services across an area of 54 million ha, more than 70% of Borneo, benefiting over 11 million people.
- HoB's natural capital has tremendous social and economic value at local, national and global levels. This includes social values related to traditional knowledge and sacred sites, the value of biodiversity and ecosystems in creating resilience to a changing climate and the value of ecosystem goods and services used as inputs within multiple sectors of Borneo's economy. However, the many values of HoB's natural capital remains poorly recognized.
- While still of great importance, HoB's natural capital has been sharply eroded in recent years. As natural capital is lost, ecosystem goods and services decline. Climate change, coupled with deteriorating ecosystems and biodiversity from land use change, is having further impacts, including sea level rise, risk of floods and fires and changes in the duration and intensity of wet and dry seasons.
- Borneo's economy is currently neither supporting readiness for climate change nor adequately serving the needs of its people. The unsustainable practices of one economic sector are having impacts on other sectors and on local people. Few industries are taking into account the high costs of reduced or lost ecosystem services, which are eroding their long-term economic prospects and viability. According to a Business-as-Usual (BAU) scenario, by 2020 the env ironmental costs of economic growth are estimated to outweigh revenues from natural capital.
- The many values of HoB's natural capital—including its critical role in the economy, in supporting broader human welfare and in creating resilience to climate change—remain poorly recognized. Traditional economic measures

such as GDP fail to account for natural capital's role in determining productivity, while most ecosystem goods and services lack markets and prices.

- Shifting to a green economy that values and invests in natural capital would help to sharply reduce many of these negative trends, while supporting climate change mitigation and adaptation. Its creation depends on the incorporation of natural capital values into economic policies and private sector decision making.
- A modeling approach indicates that shifting to an alternative, green economy which recognizes the value of natural capital is feasible. The potential benefits of such a shift include reduced poverty, more rapid growth, stronger local economies and enhanced resilience to climate change. In the long term, growth will increase more rapidly under a Green Economy (GE) scenario where natural capital is sustained. A green economy is essential to ensuring long-term, sustainable economic growth and development.

- HoB is a prime example of a coordinated transboundary approach in which a green economy vision—as outlined in the HoB Declaration—is being transformed into reality. However, urgent action is still required by governments and other stakeholders, working in partnership. The cost of action is far less than the cost of inaction.

The Green Economy Solutions

1. Building a biodiversity-based sector
    a) Biodiversity based products from community-managed areas
    b) Transboundary community-based ecotourism
    c) Future biodiversity business
2. Greening high impact sectors
    a) Certification for responsible timber supply
    b) Certification for responsible palm oil cultivation
    c) Responsible development of sustainable hydropower
    d) Responsible mining
3. Innovative green sectors
    a) Energy and biogas
    b) Microhydro-power
4. Crosscutting solutions
    a) Participatory ecosystem-based spatial planning
    b) Integrated watershed management
    c) Expanding protected area networks and improving connectivity

The Role of Other Stakeholders

- Role of business and green business network
- Role of global community
- Role of civil society
- Hob branding and role of media

Critical Steps to Success

- partnership forum
- center of excellence
- Cross-sectoral green growth assessment
- policy package
- finance facility for green growth

c) Building a Biodiversity-Based Sector Green Economy

a) Biodiversity based products from community-managed areas

Communities are directly involved in marketing biodiversity based products, thereby building local economies, alleviating poverty and reducing pressures to resources. Examples include honey, palm products, and medicinal plants

b) Trans-boundary community-based ecotourism

This involves market-based mechanisms that recognize natural capital as an asset, thereby creating financial value. Examples include bio-banking, bio-prospecting and ecosystem restoration as a commercial service.

c) Future biodiversity business

An integrated strategy for ecotourism would enhance biodiversity and local livelihoods while helping to sustain culture.

1) Greening high-impact sectors

Large-scale, high-impact sectors, including logging, palm oil cultivation and mining, require a range of investments to enhance their sustainability (including land swaps). These efforts need to be supported through incentives for following certification processes and internationally
recognized sustainability standards and through penalties for unsustainable practices.

2) Innovative green sectors

This includes green energy such as micro-hydro power and technologies which turn waste into raw materials for generating energy or other useful products (e.g. processing of palm oil effluent to energy).

3) CROSS-CUTTING GREEN ECONOMY SOLUTIONS The following are essential interventions across the landscape which require a collaborative approach among sectors:

Participatory ecosystem-based spatial planning: This tool for landscape management uses ecosystem boundaries as the delineating factor rather than district, state or other administrative boundaries. Developed in a participatory way, the approach aims at the harmonious coexistence of all living organisms—humans, plants, animals and microorganisms—together with the abiotic environment.

Expanding protected areas networks and improving connectivity: Effective management as well as increasing the size of protected areas and enhancing their connectivity helps to preserve their ecological integrity for enhanced flow of

ecosystem services while facilitating gene flow and building resilience in a changing climate.

d) Application to Egypt's Parks

The following table indicates the potential opportunity for application green economy solutions within the protected areas of Egypt as follow:

Table (1): Green Economy in Egypt's Parks

No.	The solution	Potential Opportunity for Application at PAs in Egypt
1	Biodiversity based products from community-managed areas	High
2	community-based ecotourism	High
3	Responsible mining	Medium
4	Organic certification	High
5	Organic cultivation of medicinal plants and olive oil	High
6	Wild honey production	High
7	Energy and biogas	Medium
8	Role of business and green business network	Medium
9	Expanding protected areas networks and improving connectivity:	Medium
10	biodiversity business	High
11	Solar energy solutions	High
12	Green hotels and eco-lodges	High

e) UNEP - The Global Green New Deal1

The Global Green New Deal (GGND) presented here has three broad objectives. It should make a major contribution to reviving the world economy, saving and creating jobs, and protecting vulnerable groups. It should promote sustainable and inclusive growth and the achievement of the MDGs, especially ending extreme poverty by 2015. Also, it must reduce carbon dependency and ecosystem degradation – these arekey risks along a path to a sustainable world economy.

Our consultations and our commissioned research3, summarized here in this Policy Brief, make a strong case for the active "greening" of proposed fiscal stimulus packages. However, this must also be backed by necessary changes in international and domestic policy architectures, as the current framework is biased in favour of resurrecting an unsustainable "brown" economy. Our proposals (see Section 3) are therefore grouped under three categories – targeted stimulus spending in 2009-10, changes in domestic policies, and changes in international policy architecture.

Furthermore, we recognize that many less developed countries do not have the resources of their own and will have to rely on foreign aid and support, both financial and non-financial.

Green Economy – Sectoral Analysis

We outline in this section those "Green Economy" sectors which will be particularly important in terms of their impacts on employment and GDP, and where the environmental benefits in terms of reduced carbon dependency or reduced ecological scarcity are the most significant. These are efficient buildings, renewable energy, sustainable transport, sustainable agriculture, freshwater, and ecological infrastructure. We do consider other sectors to be very important (materials efficiency and waste management), but they are either not able to deliver "quick wins", or they have not reached a state of widespread dissemination of process knowledge and technology such that governance and risks are easily managed. On the sectors below (A to G), we have no such concerns, and they do deliver "quick wins" on the employment and growth front.

[1] UNEP: GLOBAL GREEN NEW DEAL POLICY BRIEF March 2009

Table (2) Green Economy – Sectoral Analysis

No.	Sector	Brief Description	Potential Opportunity for Application at PAs in Egypt
A	Energy Efficient Buildings	This sector is not just about the retrofitting and the use of insulation and other current technologies, but also about adaptive and resilient design – that allows easier retrofit of new technologies as they become cost-effective (for example, pre-wired for rooftop photovoltaic systems) and constructed to withstand, not just existing variations in weather, but also anticipated local impacts of climate change, such as more intense hurricanes and extreme weather, fire and drought.	Medium
B	Sustainable Energy	Investing in renewable energy makes economic sense, apart from its contribution to emission reductions. About 2.3 million people have in recent years found new jobs in the renewable energy sector, even though these provide only two per cent of global primary energy.	High
C	Sustainable Transport	An increase in energy efficiency and a shift away from energy-intensive modes in both passenger and freight movement are required in order to achieved the necessary reductions from transport greenhouse gas emissions within the next 50 years.	High
D	Freshwater	Apart from meeting basic human needs for clean water, investing in the water sector is also a good business. Globally, the market for water supply, sanitation, and water efficiency is estimated at US$253 billion and will grow to US$658 billion by 2020.	Low
E	Ecological Infrastructure	Ecological infrastructure refers to healthy ecosystems like water catchments and river systems, wetlands, soil, forests, oceans, and coral reefs, which provide substantial economic services at national and in many cases global level. Healthy ecosystems provide food and fiber as well as natural medicines and pharmaceuticals.	High
F	Sustainable Agriculture	In developing a GGND, developed countries should allocate part of their stimulus packages to the development of sustainable agriculture in developing countries. They should also enhance the sustainability of their own agricultural systems and open their markets to sustainably-produced farm produce from developing countries.	Medium
G	Other Green Economy Sectors	Waste management and recycling In considering public funding support to renewable energy technologies, green transport, and efficient buildings, for example, governments should encourage the use of materials and products recycled or remanufactured from waste.	Medium

Section 3:Cost Benefit Analysis

Section 3:Cost Benefit Analysis

Cost–benefit analysis (CBA), sometimes called benefit–cost analysis (BCA), is a systematic process for calculating and comparing benefits and costs of a project, decision or government policy (hereafter, "project"). CBA has two purposes:

a) To determine if it is a sound investment/decision (justification/feasibility),
b) To provide a basis for comparing projects. It involves comparing the total expected cost of each option against the total expected benefits, to see whether the benefits outweigh the costs, and by how much

CBA is the comparison of the potential costs of a project to its benefits. The analysis produces information for determining whether project's benefits exceed costs. The benefit and cost calculations are influenced by accuracy of the data, validity of assumptions, and estimation methodology.

In recent years the use of “cost-benefit” analysis to set environmental standards has attracted a large and high-profile group of supporters. According to its advocates, cost-benefit analysis offers a way of achieving superior environmental results at a lower overall cost to society than other available approaches.

This chapter provides CBA for two proposed solutions of green economy applications that could be implemented at Egypt's Parks; cultivation of Medicinal & Aromatic Plants and beeping.

Case (1)

Benefits and Costs of Medicinal & Aromatic Plants in Saint Katherine Protectorate in Egypt

"Both wild harvesting and cultivation of MAP can both be an effective mean of providing income for the poorest sector of society and contribute to social stability while supporting conservation"

The Uniqueness of Saint Katherine's Medicinal & Aromatic Plants

The Saint Katherine Protectorate (SKP) is rich in flora and contains the country's highest endemic plant species – about 44% of the total endemic plant species. The medicinal and aromatic plants (MAP) are of utmost importance to the country and among the 316 species that were recorded in SKP, 102 species can be considered as medicinal species (including plants for medicinal-, aromatic-, cosmetic- and culinary uses). This number represents 32.3 % of the recorded species. Furthermore, 47 species are considered potential medicinal plants (14.8%), 9 species are used in veterinary medicine (2.8%) and 158 species are used for other purposes (50%). On a regional scale the climatic and topographic of SKP are unique due to the overlapping of the Mediterranean and Irano-Turanian flora regions. Together with the suitable biodiversity ecosystems the SKP area gives great survival opportunities for its rich plant species.

The diversity of both landforms and geologic structures of SKP leads to the differentiation of a number of micro-habitats with particular environmental conditions and unique flora in which the endemic species grow, such as farsh-, wadi-, terrace-, slope-, cave-, and gorge micro-habitats. However, there are a number of threats to the MAP and their habitats, such as tramping, vegetation clearance, smothering and leaching, over-collection, over-grazing, and fuel and wood collection. Many efforts have been made for conservation and sustainable use of MP. The Medicinal Plants Conservation Project (MPCP) is playing a significant role to eliminate the root causes of biodiversity loss and threats to the conservation and sustainable use of globally significant MAP and their habitats in the arid and semi-arid regions of Egypt, focusing on SKP, through the implementation of its outcomes. MAP have provided the Egyptian civilizations with the spiritual and medical sustenance of life and today it has become essential to preserve the traditional knowledge of the Bedouin people. The plants have many important and useful uses for medicinal and culinary purposes as well as there being an international trend with a large trade and market for MAP products. This has raised the plants' economic value relying on their market price. Cultivation, conservation and sustainable use of MAP should be, and is currently being developed together to preserve these important and endangered species.

Economic and Social Benefits of Medicinal & Aromatic Plants

MAP possess a variety of economic and social benefits. The cultivation (production) of medicinal plants generates direct revenues (benefits) from sale in addition to other indirect benefits that support the livelihood of local communities and the local economy, especially for large scale production countries. Most people in rural areas rely primarily on MAP for treating health problems and for other uses such as cosmetics, perfumes and food. Some of their benefits are the result of direct resource use and can be valued according to market price. Other benefits, such as those from tourism, depend on direct human use of MAP, and these benefits can be valued in various ways. However, many benefits are hard to measure in monetary terms; they are instead in favor to individuals or society and are frequently referred to as social

benefits and are the primary justification for conservation of medicinal plants. SKP MAP have a variety of benefits such as; tourism, ecological processes, biodiversity, education and research, consumptive- and non-consumptive values, and future values. MPCP is implementing programs and activities to serve the goal of highlighting and increasing these benefits.

The Medicinal Plants Cultivation Program in SKP has generated a variety of benefits to the local community. Many job opportunities have been generated, which directly contribute to the enhancement of livelihood conditions for Bedouins. Other benefits include learning (knowledge) of the importance of medicinal plants, conservation, cultivation, and harvesting- and post harvesting processes. The MPCP has also spent great efforts on the protection of the Bedouin traditional knowledge regarding the use of MAP. A focus is put on intellectual property rights protection through the preparation and introduction of the Access and Benefit Sharing Law (ABS). Such a law will ensure that fair returns will return to the SKP community whenever any entity uses their knowledge for commercial purposes.

Teaching Necessary Skills through the Medicinal Plants Cultivation Program

Installing irrigation networks.

Placing seedling bags with participation of the local Bedouin community.

Inside a MAP drying tunnel.

Inside a gene bank greenhouse.

Through the implementation of the Medicinal Plants Cultivation Program, the project aims at building the capacity of the Bedouin community by making them more familiar with MAP cultivation, harvesting and post harvesting operations. This could be considered a successful tool for income generation besides being an effective approach towards limiting the over-collection of some MAP species from the wild. Out of 26 investigated sites, 11 sites were selected in which Bedouin MAP cultivation farms were established. Six of the 11 farms produce MAP as well as serving as demonstration farms for tourists to see how the various farm activities function. To establish the cultivation farms, the project went through the following steps: 1) Site selection, 2) agreement with the selected site's representative, 3) installation of irrigation network, 4) field preparation, 5) seedlings cultivation, 6) irrigation, 7) manures, weeding and inter-culture operations, 8) technical supervision and follow up, 9) harvesting, 10) and post harvesting operations.

Medicinal Plants Cultivation Program Goals:

- Decrease pressure on wild plants through generation of alternatives
- Establish medicinal plants farms and sites at SKP
- Spread cultivation of medicinal plants at SK Bedouin community
- Raise Bedouin community capacity on medicinal plants cultivation and harvesting
- Identify best cultivation and harvesting methods for medicinal plants
- Enhance Bedouins poor livelihood conditions
- Increase awareness towards medicinal plants conservation

Further, the project managed to obtain organic certification and is currently following the regulations of organic farming in order to cultivate MAP free from residues of pesticides and chemical fertilizers. It is also well known that organic farming has both social as well as environmental perspectives. The project also established greenhouses for the MAP in the form of drying tunnels, and seedlings-, cultivation-, and gene bank green houses. After the cultivation and harvesting processes the MAP are stored, packaged and marketed.

Challenges, Results and Success of the Medicinal Plants Cultivation Program

A few challenges were met when establishing MAP cultivation farms. The diminution of the underground water level in some of the chosen farms was overcome by the deepening of the well in one of the farms and maintaining a well when it was not feasible to do so in one of the other farms. There was a lack of Bedouin realization of MAP cultivation techniques and importance, which was overcome by conducting training programs and awareness meetings for Bedouins. The plants growth rate was slow due to the use of organic fertilizers. However, a slow growth rate is preferred than using pesticides and chemical fertilizers.

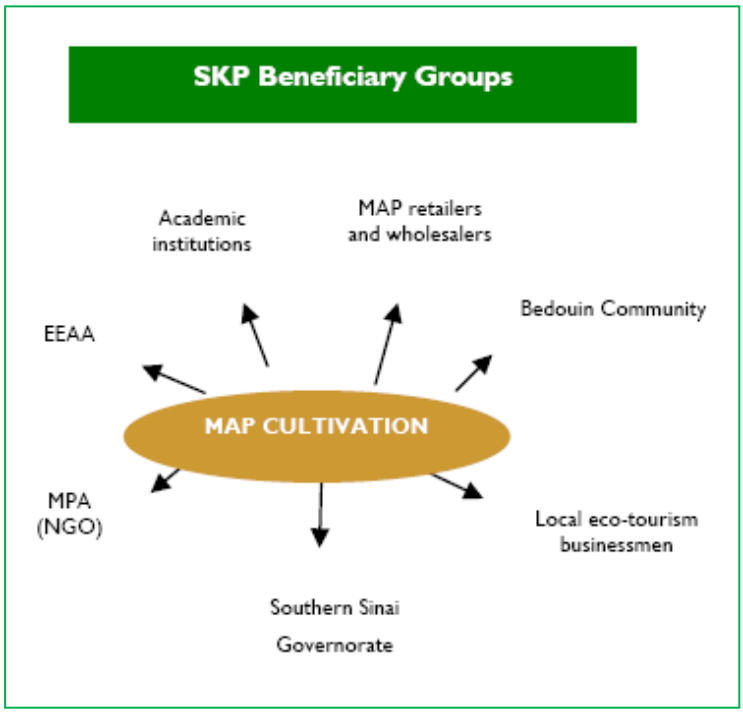
The results of the program can be concluded as follows: 1) establishment of 11 farms, 2) revenue generation for Bedouins, 3) increased MAP production in SKP, 4) establishment of 6 greenhouses for cultivation and drying, 5) demonstration farms, especially those situated near hotels and on tourist camps, have supported tourism activities within these places, 6) many Bedouins gained knowledge in cultivation, harvesting, and post harvesting operations, 7) and many job opportunities have increased. Success factors as a result of the program include; availability of water through irrigation networks, increased interest from the Bedouin farmers in cultivation, and good and fair returns from cultivation to the Bedouin farmers and the community. Both wild harvesting and cultivation of MAP have great success factors. Taken together, they can be an effective mean of providing income for the poorest sector of society and contribute to social stability while supporting conservation. However, progress on this will depend on support by government and industry.

A Cost Benefit Approach for Medicinal & Aromatic Plants Cultivation

A benefit cost analysis is the comparison of the potential costs of a project to its benefits. It produces information for determining whether a project's benefits exceed its costs. In relation to the MAP in SKP, a benefit cost analysis takes into account, while making decisions or developing strategies related to these natural resources; cultivation of MAP, developing property rights laws, and conservation and protection decisions. The property rights of SKP MAP have been a major concern for MPCP, which resulted in that the project is developing a legislation - the Access and Benefit Sharing (ABS) law, to protect the traditional knowledge of the Bedouin local community by ensuring fair benefits will return to the SKP community whenever any entity uses their knowledge for commercial purposes.

To further ensure fair benefits returning back to the Bedouin community, the MPCP is spending great efforts to spread a sustainable use of MAP concept through various project activities, especially through the Community Based Natural Resources Management system in which the Bedouin community will influence and share control over the MAP; as well as attain tangible benefits that will drive the sustainable use and management of these natural resources. There are many groups of beneficiaries from MAP cultivation, such as farmers (local community people), industrial companies, herb shops and traders, product users, NGOs, and local governments. The figure below shows the main beneficiary groups for SKP MAP.

Program Beneficiaries

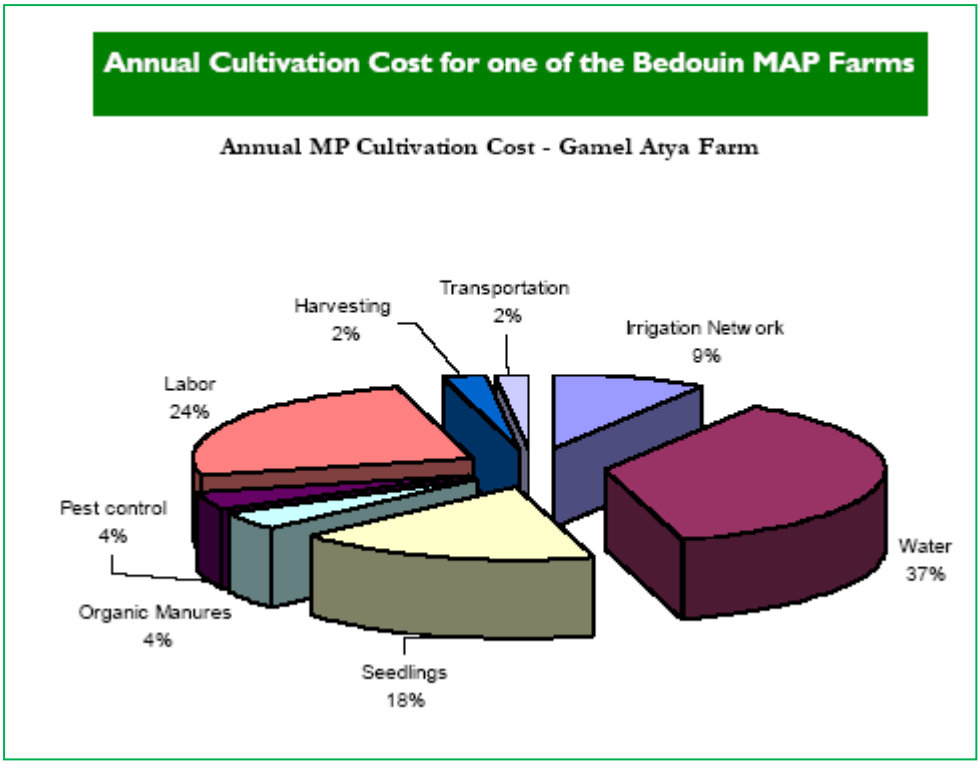


Medicinal & Aromatic Production and Cultivation Costs

To identify costs of cultivation for farms of MAP species at SKP, it is important to distinguish between project inputs and farmer inputs. The farmer is contributing to his farm through water, manures, and labour, while the project is providing irrigation networks, seedlings, organic manures, training, and technical assistance. The farmer is expected to carry out all cultivation expenses in the future once cultivation becomes beneficiary for him. The cultivation of MAP is not expensive; however, the cost is higher if cultivation is made in greenhouses.

There are nine main cost items; greenhouses, irrigation networks, water, seedlings, organic manures, pest resistance, labour (including technical assistance), and harvesting, and transportation to drying facilities. After cultivation and once the plants grow, the farmers harvest and transport them to the drying tunnels at the Medicinal Plants Association (MPA) for process of drying, sorting, storage, packing, and marketing. After the plants have been dried and processed, they are then packaged and labeled to be sold to customers. The MPA sells the final product of the medicinal plants at its outlet Store in Saint Katherine and distributes some of the production to nearby tourist places like Sharm el Sheikh and Dahab. The average price for a MAP package (50 g.) is 7 EGP, which means that one kilogram of packaged MAP will be sold at a price of 140 EGP. The total plant population at the cultivation farms (of the 12 major plant species), is 11,196 plants, with a total annual average loss rate of 9% on the farms. Among the 11,196 planted seedlings, more than 56% of them are of the species Hasalban and Bardaqosh (3,309 and 3,520 seedlings respectively).

Costs



The Received Benefits for Bedouin Farmers

After receiving the plants from the farmer, the MPA pays the farmer about 35 EGP for each kilogram of dried medicinal plants. Thereafter, the MPA puts the plants into 50 gram packs with a descriptive label and sells them to the customers. These processes generate revenues and benefits to the farmer and the local community (represented as the MPA) as shown in the tables to the right.

No	Farm	Feran Green House	Husen Farm	Gamel Farm	Auda Farm	Fox Camp Farm	Total
1	Farm size (meter)	1080	1500	729	952	351	6412
2	Production per kg	266	59	142	29	35	532
3	costs (EGP)	8387	4355	2477	3015	2383	20617
4	Revenues (EGP)	37289	8295	19880	3990	4956	74410
5	Net Benefits EGP	28902	3940	17403	975	2573	53793

Case (2)

Investing in Beekeeping

Beekeeping in ancient Egypt

"When the Sun weeps a second time, and lets fall water from his eyes, it is changed into working bees; they work in the flowers of each kind, and honey and wax are produced instead of water."[2].

The first official mention recognizing the importance of honey dates from the first dynasty, when the title of "Sealer of the Honey" is given; the oldest pictures of bee-keepers in action are from the Old Kingdom: in Niuserre's sun temple bee-keepers are shown blowing smoke into hives as they are removing the honey-combs. After extracting the honey from the combs it was strained and poured into earthen jars which were then sealed. Honey treated in this manner could be kept years. From the New Kingdom on mentions of honey become more frequent, but only four depictions of honey production and no actual hives have been found.

The God Ra wept and his tears fell to the ground and were turned into bees. The bees began to build and were active on all flowers of every kind belonging to the vegetable kingdom. Thus wax came into being, thus was created honey from the tears of the God Ra. The first official mentioning of bee-keeping dates from about 2400 BCE, in official lists of apiarists. The kind of hives depicted in reliefs are still seen in the Sudan today: woven wicker baskets covered with clay[3].

Cylindrical hives like the ones in the picture on the left from the tomb of Pabasa were made of clay.The main centre of beekeeping was Lower Egypt with its extensive cultivated lands, where the bee was chosen as a symbol for the country. But even nomadic Upper Egyptians must have kept some bees, as their use of honey in the production of green eye paint indicates. There were itinerant apiarists who loaded their hives onto boats and

[2] pSalt 825, first millennium BCE, S. Birch, *Egyptian Magical Text*, in S. Birch ed., *Records of the Past*, Vol.6, 1876

[3] http://www.texasdrone.com

shipped them upriver in early spring, following the flowering of the plants northwards.
The Egyptians seem to have valued wild honey even more. Honey hunters, often protected by royal archers, would scour the wild wadis for bee colonies.

Temples kept bees in order to satisfy the desire of the gods for honey and for the production of medicines and ointments. But demand far outran local production. Honey, like many other luxury goods was imported from Retenu and even further afield. Honey was used for sweetening, as sugar was unknown in antiquity. It was added to wine, various kinds of bread and cakes. Medicines and salves often contained honey as is attested in the Smith Papyrus where the practice was to apply honey to open wounds - a reasonable treatment considering honey's antibacterial and fungicidal qualities.

Beekeeping today in Egypt:
Egypt today is considered the most important country in beekeeping sector in the Middle East, among Arab nations and Africa. The number of hives is about 1344000 and there are about 7700 mud hives (old hives). The number of beekeepers in Egypt is about 270000.
Not many women work in beekeeping (in mud tube hives only) and only in Upper Egypt. In ancient Egypt, women didn't work in beekeeping but used to use honey and wax as preparations for skin beauty[4].

Beekeeping practices:
In Egypt, there are no taxes on beekeeping sector, which helps a lot of people establish apiaries in different places around Egypt. Subjectively, most beekeepers in Egypt have not studied anything about insects or honeybees but they keep bees by their own experience and practice. Beekeeping in Egypt is a profession that passes from one generation to another. Most hives in Egypt consist of one box only. Beekeepers prefer increasing the number of hives rather than increasing the number of boxes in the same hive. All beekeepers in Egypt deal with honeybee colonies without any protective clothes except the veil (face protecting). Also, a lot of beekeepers do not use smokers during hives inspection, in spite of the aggressiveness of colonies.

The number of queen producer in Egypt is very low. The Egyptian Ministry of Agriculture has prevented the importation of queens since1960 to control honeybee diseases. Egyptian beekeepers requeen every year by purchasing virgin queens and let them to natural mating or by rearing virgins from the existing colonies. Generally, studies in honeybee queens in Egypt are highly required. Feeding of colonies depends

4 Hossam Farag Abou-Shaara, Assistant lecturer at Faculty of Agriculture, Damanhour branch, Alexandria University, Egypt.

mainly on sugar syrup. The colony feeds on about 0.5-1 Kg. per 14 days in nectar shortage periods. The winter in Egypt is not a problem because the weather is very good around the year; not much water, no ice and no heat. However, preparing the colonies to bear low temperature is required. Most beekeepers use some pieces of clothes to keep the colonies warm and extra frames are removed from the colonies during winter season. Inspection of hives is done every week or every two weeks as the need arises. Honey is collected at the last week of each season. Beekeepers extract honey from all frames - remove all frames from the hive and cover it with the outer cover in the morning and place the frames in the hives again in the evening, after extracting the honey. In Egypt this is called full honey extracting. The Egyptians do not like to consume much honey. The person in Egypt consume about 0.5 up to 2 Kg. per year. The most of Egyptians consider honey as a natural treatment only. Also, most of Egyptians do not like to consume food that contains more sugar. Honey price is relatively high in Egypt - about 20-30 Egyptian Pounds. (3.3 - 5.0 $; 1 $ = 6 Egyptian pounds)

The Wild Honey of Saint Katherine Mountains

Bee hives are managed by the Bedouins and kept in the mountain areas of Saint Katherine.

Pure organic honey is produced and packaged to be sold to visitors at the Medicinal Plant Association.

The bees in Wadi Firan and Wadi Gebal feed mostly on the nectar of tree blossoms, such as Acacia and Christ's Thorn Jujube, as well as other medicinal plants, giving the honey its distinct sweet zesty taste and light waxy colour. The apiaries are kept by indigenous Bedouins from the Gebaleya tribe. The bees pollinate the scarce endemic medicinal plants, thus aiding the organic propagation of the tribe's invaluable resources resulting in pure, organic, superior quality honey. Because the bees feed off medicinal plants, nature's goodness and proven benefits of these herbs are harvested into the final honey jar. The apiaries, sponsored by the project, are kept by the Bedouins in the pristine mountain areas of Saint Katherine.

Costs and benefits of Wild Honey of Saint Katherine

a local NGO was started by the Medicinal Plants Conservation Project (MPCP)Ministry of Environment: the Medicinal Plants Association (MPA) that is a not- for- profit organization working to support the local community of Saint Katherine through the provision of technical and financial support to enable Bedouins to market their products and receive fair revenues that help them to enhance their livelihood. It works closely with the tourist section as they are the main group that can help increase the livelihoods of the Bedouin community by buying handmade Bedouin products. The Association depends greatly on the volunteers' efforts to play an effective role in their community to support the conservation and sustainable use of

medicinal plants. The MPA members are not only citizens from the national community of South Sinai Governorate but are also familiar with medicinal plants and their problems. The aim of the MPA is to create a better future for the subsequent generations through community development and ensuring better standards of life. In partnership with the MPCP they are working to make St. Katherine an international brand in medicinal plant exports and industry with revenues leading back to the local Bedouin community. The MPA have established and operate a successful economic development program called the Handicrafts Program. The program includes various sub-programs, such as 1) the Honey Production Program, 2) the Medicinal Plants Production Program, 3) the Microlaon Program, and 4) the Marketing Program. In addition, a MAP collector association– the Green Gold Association was created representing 48 Bedouin female collectors. These programs are creating more than 350 direct and indirect jobs, generating adequate income supporting the livelihoods of more than 1200 persons. This has been achieved by utilizing the use of local vocation; promoting local culture preservation; and providing access to niche markets through the capacity building of organizations and craftswomen for the competitive market. Moreover, these programs consider the differences among the various tribes of SK and value the diversity as well as emphasizing the local contexts.

The implementation of the programs' actions are done through the MPA, the MPCP and the local Bedouin community. The programs offer: capacity building through workshops, seminars and courses; structures for the supply chain through diagnosis and implementation of management and production methodologies; and the establishment of production schemes of events and markets for commercialization of products.

Cost and Benefits of Honey Production Program

There is no recorded data related to honey production at Saint Katherine, however; the current data refers to the following:

Item	Egyptian Pounds
Cost of 100 kg of wild honey (price of purchasing from suppliers = 160 EGP per 1 kg)	16000
Cost of packaging for of 100 kg	150
Labor and administration costs	200
Total costs	16350
Revenues from sales of 100 kg (price of 1 kg = 200 EGP)	20000
Net benefits from 100 kg of wild honey	3650

However it should be noted that if the MPA or other entity established its own beekeeping unites, the revenues will be much greater than current numbers.

Benefits of Organic Honey Certification

Increasing number of farmers, all over the world, are shifting to organic farming as it provides numerous benefits over conventional farming. Honey bee keepers are also favoring organic honey production as it is considered to have numerous benefits over conventional honey. Some of the advantages of organic honey production to the manufacturer are given below:

- **Increased price of honey:** Organic honey and organic raw honey both fetch a higher price in the market as compared to conventional honey.
- **Increased marketability:** It is easier to sell organic honey and raw organic honey as they are considered to have greater health benefits over non-organic honey. Reports of increased usage of antibiotics in Chinese honey have increased awareness about potential ill-effects of non-organic honey among health conscious consumers.
- **Qualtiy honey assurance for buyers:** Customers are assured of a quality product as the production and handling standards for organic honey are clearly defined by the certifying body. If the honey is not manufactured according to the set guidelines, the organic label is not granted.
- **Satisfaction of producing a clean product:** Many farmers shift to organic farming due to its benefits to the environment. Same is the case with organic apiculture. Organic honey bee keepers feel content at the end of the day when they do not use chemical pesticides and antibiotics.
- **Every organic honey jar can be traced:** Certified organic honey involves proper labeling of the product. Every organic honey jar can be traced to the honey bee hive from which the honey in it is obtained.
- **Increased management awareness of the enterprise:** Many conventional honey bee keepers are not aware of effective techniques to manage their apiaries. Since certified organic honey production involves following stringent guidelines, manufacturers are also educated about efficient management of their enterprise.

Concluding Notes

Green economy is new approach for sustainable development. Adopting green economy solutions at protected areas of Egypt is expected to result in better environmental management, biodiversity conservation together with economic and social development. It is therefore recommended for decision makers and officials to incorporate the green economy within the framework of protected areas management. A menu of green economy solutions are presented in this document with national and international case studies, and steps should be taken to mainstream this approach.

References

- Agnes Musyoki (2012).The Emerging Policy for Green Economy and Social Development in Limpopo, South Africa
- Hossam Farag Abou-Shaara(2010). Egyptian Beekeeping, Faculty of Agriculture, Damanhour branch, Alexandria University, Egypt.
- M. Fouda (2012). Green Economy Imitative in the Protected Areas of Egypt, Strengthening Protected Area Financing and Management Systems Project
- Sarhan M. (2011). "Cost Benefit Analysis for Environmental Management; Demonstration & practical exercise", paper presented at UNESCO technical workshop on Environmental, Ecological and Green Economics, Cairo, Egypt
- Sarhan M.(2009). Benefit Cost Analysis of Medicinal Plants Cultivation in Saint Katherine Protectorate, the Medicinal Plants Conservation Project
- UNEP (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, www.unep.org/greeneconomy, ISBN: 978-92-807-3143-9
- UNEP (2010). Green Economy: A Brief For Policymakers on the Green Economy and Millennium Development Goals
- UNEP (2012). Green Economy in a blue world
- UNEP (2009). Rethinking the Economic Recovery: A Global Green New Deal
- Why a Green Economy Matters for the Least Developed Countries (2011). A joint publication of United Nations Environment Programme (UNEP), United Nations Conference on Trade and Development (UNCTAD), and Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) for the LDC-IV Conference in May 2011.
- Van Paddenburg, A., Bassi, A., Buter, E., Cosslett C. & Dean, A. (2012). Heart of Borneo: Investing in Nature for a Green Economy. WWF Heart of Borneo Global Initiative, Jakarta.