



Key Project Areas:

- Education, Awareness, Participatory learning, Experience sharing, and local capacity building in conservation practices.
- Data collection and policies review.
- Restoration of degraded portions.
- Livelihoods Alternative among pro-poor forest dependents.
- Management of Mangrove sites.

Local implementer:

Tropical Research and Conservation Centre (TRCC)

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Aim: The project is aimed at enhancing biodiversity management capability through education and awareness among communities; restoring degraded portions as well as ensuring sustainable use of the Niger Delta mangroves for ecological, environmental and socio-economic (livelihoods) benefits.

Project summary: This project is about education, participatory learning, restoration and sustainable management of the Niger Delta mangroves adopting the participatory/citizen science approach. Nigeria has extensive mangrove forests in the coastal region of the Niger Delta, considered one of the most ecologically sensitive regions in the world. About 70% of the Nigerian mangrove ecosystem fall within the Niger Delta region. The Niger Delta is located in the Atlantic coast of Southern Nigeria, cutting across nine states. The site falls under the Niger Delta wetlands region of Nigeria, considered a global biodiversity hotspot.

The mangrove swamp of Niger Delta covers an area of is considered a global biodiversity hotspot. The Niger Delta basin occupies the Gulf of Guinea continental margin in equatorial West Africa, between latitudes 3° and 6° N and longitudes 5° and 8° E.). Niger Delta mangroves together with the creeks and rivers are a major source of food and livelihood for millions of people. The Niger Delta mangroves perform all four categories of ecosystem services identified in the Millennium Ecosystem Services report: regulating,

provisioning, cultural, and supporting services. These include atmospheric and climate regulation, flood and erosion control, wood and forest crops for cooking fuel, construction, and traditional medicine, nutrient cycling, and habitat for fish nurseries. This ecosystem also plays important role in climate change mitigation because of its high blue carbon sequestration potential. This is particularly important because of continuous gas flaring in Niger Delta from petroleum operations, which releases carbon dioxide among other gases into the atmosphere. Mangroves constitute important nurseries for fishes, crustaceans, sponges, algae and other invertebrates, and also acts as a sink, retaining pollutants from contaminated tidal water. Mangroves are also used as shelter and breeding grounds by mammals, shore birds, reptiles, many insects etc. Unfortunately, this unique ecosystem is on the decline and at the verge of been totally lost. Mangrove forests are affected by oil exploration/exploitation activities, some portions converted to farmlands and the trees are cut for timber, fuel, house construction and so on without restoring. Consequently, many coastal communities in the Niger Delta are losing their lives and primary livelihoods due to increased vulnerability to floods as a result of the disappearance of mangroves which usually serve as defense in times of coastal flooding. They are also now exposed to the high intensity of sunlight and heat waves as the land lay bare of trees to regulate sun rays. Therefore, there is urgent need to restore/conservate the mangroves of the Niger Delta region.

This project will involve community/public education, participatory learning, restoring of degraded portions, local capacity building in conservation practices, experience sharing, data collection and policy review. It would improve methods and technologies that support the sustainable use of biological resources, identify, promote and support suitable livelihood alternatives among key mangrove dependent. Here links on mangroves which can help one learn more about importance of mangroves: <https://www.youtube.com/watch?v=cwTZhyA57mA>; <https://www.bbc.co.uk/news/in-pictures-54241533>

Tropical Research and Conservation Centre' (TRCC): Tropical Research and Conservation Centre' (TRCC) is a nongovernmental organization which focuses on sustainable agriculture, environmental resources conservation, community livelihoods and indigenous resources preservation. The organization was founded in 2001, as a result of the founder's concern for rural dwellers and the sustainable use of natural resources. For more information about organisation please visit the site: www.tropicalconservationcentre.org

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Objectives: The objectives of this project are:

1. To ensure sustainable mangrove ecosystem management that encourages community-based participation.
2. To ensure restoration, conservation and management of mangrove wood and non-wood resources on a sustained yield basis; developing effective measures for protection and/or rehabilitation of mangrove ecosystems; mitigating climate change effects in the process.
3. To ensure management and protection of mangrove areas for fisheries, erosion control, coastal stabilization and biodiversity conservation; intensifying the protective function of the mangrove forest along riverbanks, estuaries, and all other marginal forestlands,
4. To increase public awareness and education on the benefits of the mangrove forests; consolidate existing mangrove information and make it available in forms which are meaningful and accessible.
5. To strengthen capacities of the institutions/stakeholders responsible for mangrove management.
6. To promote research and education on conservation and management of mangrove and associated ecosystem.

7. To facilitate partnerships and networking among mangrove dependent communities, private enterprises/companies operating in mangrove communities and the government in order to promote and ensure best practices.



Commercial harvesting of mangrove for fuel wood, Photo by Nkanta

Stakeholders, Collaborators and Partners: The project will bring together relevant stakeholders/institutions: relevant governmental ministries/departments; NGOs, CBOs, academics, research institutions, schools (Primary, Secondary and higher institutions), private sector, Community Development Officers, Forestry Officers, Agricultural Officer, environmentalists, rural communities, media. They will participate in: education, awareness, participatory learning, local capacity building, data collection/information gathering, policy review, knowledge sharing, mangrove restoration, livelihood alternatives establishment, sustainable mangrove ecosystem management.

Some of the confirmed stakeholders, collaborators and partners are:

- State Department of Forestry and Environmental Conservation, Ministry of Environment (government): will provide technical assistance/expertise in mangrove restoration/management and legal support.
- Youth Initiative on Environment Local Development (YIELD), a youth led NGO, will assist in planting the mangroves, mobilizing more local youths to participate (as volunteers) in the project.
- Society for Women and Vulnerable Group Empowerment (SWOVUGE): will mobilize advocate and for active women participation.
- Foundation for Conservation of Environment and Nature (FOCEM), Will assists in community education; participatory learning
- Sustainable Livelihood for All: Livelihoods: will assist in developing and monitoring livelihood alternative enterprises among pro-poor mangrove dependents.
- Landcare Nigeria: Will assists in community education, participatory learning.
- Passion for Nature (PfN), an NGO: will assist in community mangrove education;
- People Resources and Conservation Foundation, (Will provide support in Mangrove restoration).

Justification, Local and International Relevance:

The Niger Delta mangroves perform all four categories of ecosystem services identified in the Millennium Ecosystem Services report: regulating, provisioning, cultural, and supporting services. These include atmospheric and climate regulation, flood and erosion control, wood and forest crops for cooking fuel, construction, and traditional medicine, nutrient cycling, and habitat for fish nurseries.. The area conserves significant cultural as well as aesthetic value, with many sacred sites for indigenous communities dotted around the landscape. The project will develop local capacity in sustainable utilization of mangrove resources, sustainable farming practices and will introduce them to agro livelihood alternatives, with some pro poor locals gaining skills/support in bee farming and snail farming for commercial harvesting. In addition, to restoring the degraded mangrove forest, it is expected to lead to an increase in the numbers of juvenile crabs, fish, shrimps, periwinkles, turtles, etc. as their habitat is improved for their survival, thus protecting and sustaining an important food and crop source for the communities. Sustainable resource use will ensure continuous availability of timber and non-timber products. The timber products are used by the furniture and building industry, while non-timber forest products (NTFPs) include medicinal herbs and pharmaceutical products used locally to treat certain ailments. Other NTFPs like tannin, dyes, gum, resin,

ropes, wild fruits, and leaves can be collected by the marginal forest-dependent people to sell in the local markets. There is the need to develop an effective mechanism (measures and policies) that would enhance mangroves ecosystem conservation in Akwalbom State, along the Niger Delta Mangrove Belt of Nigeria.

The project is in line with the "Poverty Reduction Strategy" which supports improving local resource management as a key element of poverty reduction. It is also in line with the Convention on Biodiversity (CBD) ratified in Nigeria in 1994; the African Convention on the Conservation of Nature and Natural Resources; the Convention on Nature Protection and Wildlife Protection in the Western Hemisphere; Agenda 21; the RAMSAR Convention on Wetlands of International Importance. It is also consistent with aims and objectives of the National Biodiversity Strategy and Action Plan (NBSAP). It is also in line with UNIDO and Niger Delta Biodiversity Bio-diversity Programme recommendations for mangrove conservation within the region.

The project activities are all in line with the aims and objectives of the National Biodiversity Strategy and Action Plan (NBSAP) which are:

- To improve methods and technologies that support the sustainable use of biological resources and eliminate or minimize adverse impacts on biodiversity resulting from resource use;
- To promote sustainable use of biological resources and ensure fair and equitable sharing of benefits for poverty reduction;
- To reduce the adverse impacts of land use practices on forest, watersheds, soils, other ecosystems and species;
- To enhance biodiversity management capability through education and awareness, appropriate formulation of policy and legislation, research and international cooperation.

The importance of restoring and protecting mangroves is reflected most clearly in Sustainable Development Goal (SDG) 14, which focuses on sustainably governing our oceans and coasts and recognises mangroves' immense value to local communities. But restoring mangrove forests also supports the achievement of many other SDGs, including eliminating poverty and hunger (SDG 1 and SDG 2), ensuring livelihoods and economic growth (SDG 8), taking actions against climate change impacts (SDG 13) and halting biodiversity loss (SDG 15).

The reasons are:

1. Mangrove forests are productive and species-rich hubs for marine life.

Restoring mangroves means regaining extremely productive ecosystems that provide breeding and nursery grounds and ideal habitats for a variety of plant and animal species. Poor and vulnerable populations can especially benefit from these readily available sources.

2. Diverse opportunities from mangroves can offer sustainable income.

The sustainable harvest of mangrove products for market sales can create valuable business for local communities and small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers (2.3). Moreover, local income opportunities can be created through the creation of management and planning jobs involved in restoration projects (8.5).

3. Mangrove forests are carbon-rich protective buffer zones between land and sea.

Restoring mangrove forests directly targets goals related to climate adaptation and mitigation. Mangrove belts of sufficient width act as storm barriers that strengthen the resilience of coastal zones from climate-related hazards such as storm surges and sea-level rise and control coastal erosion (13.1).

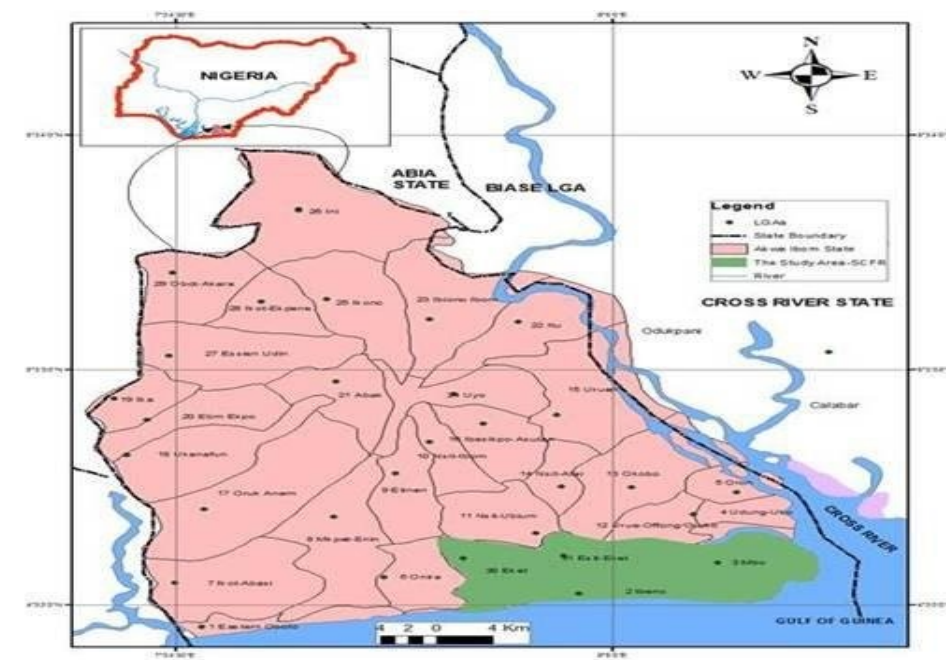
Mangrove restoration sites can also be strategically placed to contribute to upgrading infrastructure with greater adoption of environmentally sound technologies (9.4) through applying 'green-grey infrastructures' for coastal protection. These actions build the resilience of vulnerable coastal communities by reducing their exposure to climate-related extreme events and environmental shocks and disasters (1.5).

Because mangrove forests are highly efficient carbon sinks, nations will be able to apply mangrove restoration efforts towards the operationalisation of integrated policies and plans to adapt to adverse impacts of climate change (13.2).

Some Benefits derived from the Niger Delta Ecosystem:

- Wildlife (duikers, civets, monkeys, cane rats (grass-cutters), porcupines, pangolins *Manis* sp., giant rats *Cricetomys* sp., squirrels, bush pigs, monitor lizards *Varanus niloticus*, otters, water chevrotains); snails, giant snails *Achatina* sp., swamp and lake/pond fish, oysters crabs and periwinkles.
- Medicines: Animal parts and skins for traditional medicine and trophies
- Many fruits, leaves, roots, barks and nuts for medicine, food, and spices (e.g. “ogbono” or bush mango *Irvingia* sp., “afang” leaves *Gnetum* sp., charcoal from *Rhizophora*, and kola nuts *Cola* sp.)
- Plant parts and extracts for cosmetics, dyes
- Rattan for canes, ropes, fish drying racks
- Honey
- Wine from Raphia palms
- Plant and animal parts for traditional cultural uses or arts/crafts.
- Shells and saplings for road and path surfacing
- Leaves for wrapping foods for preservation and steaming
- Saplings/vines for construction, fishing equipment and utensils, etc.

Pilot Area: The project will be piloted in ten mangrove communities in Akwalbom State, Niger Delta Region of Nigeria: Eket, Esit Eket, Onna, Mbolbeno, Ikot Abasi, Oron, Eastern Obolo, Mkpa Enin, Okobo, Udung Uko. Four of the communities (Eket, Esit Eket, Mbolbeno) cuts across the Stubbs creek Forest Reserve (SCFR), the only mangrove forest reserve within the region.



Stubbs creek forest Reserve (SCFR):

The Stubbs Creek Forest Reserve (SCFR) was gazetted in 1955 as a forest Reserve and lies approximately between latitudes 4°32' N and 4° 38'N and longitudes 7°54'E and 8°18'E. It is located at the Southern end of the Akwalbom State, stretching from Enwang to James Town. It forms a buffer zone between the Atlantic coast and the Akwalbom State mainland. The reserve originally covered an area of 310.78km² between the Atlantic Ocean in the south, the Qua Iboe terminal of MPNU in the west, the Cross River Estuary in the East and Stubbs Widdenhams creeks in the north. The vegetation is a mosaic of lowland rain forest and mangrove swamp forest. In the state, Stubbs Creek represents the only remaining natural coastal swamp forest of any significant size (Tooze *et al.* 1998a; Tooze *et al.* 1998b) and the only mangrove forest reserve in Nigeria. It cuts across four rural communities namely: Eket, EsitEket, Mbo and Ibeno. The major occupations of the communities are farming and fishing. An assessment of the threats to the Stubbs Creek reserve indicates an increase in timber-extraction, clearings and further degradation. The ecosystem serves as a reservoir for many species of fauna, some of which are rare and of global importance, e.g. the endangered African grey parrot, pigmy hippopotamus, Sclater's guenon (an endemic Nigerian monkey) and red-capped mangabey, as well as many others, such as the Mona monkey, putty-nosed guenon, Colobus monkeys, Alligators, crocodiles, turtles, tortoises, whales and African manatees etc. The area conserves significant cultural as well as aesthetic value, with many sacred sites for indigenous communities dotted around the landscape.

Key Project Activities, Methods/Approaches:

(a) Education, Awareness, Participatory learning, Experience sharing, and local capacity building in conservation practices.

These will involve:

- Meetings with relevant stakeholders, consultations, participatory workshops, public/community education on mangrove ecosystem conservation needs.
- Developing local capacity in conservation practices. Eg sustainable harvesting; organic farming, agro forestry, promoting adoption of fuel efficient biomass cook stoves as this would help reduce deforestation for fuel wood.



-Facilitating partnerships, networking and awareness, knowledge sharing among key ecosystem users:

The project will help establish a "State Mangrove Ecosystem Users Forum" comprising the government, NGOs, mangrove communities, companies and private business operators, (mangrove wood harvesters, land users/farmers, fisher dryers, miners, oil extractors etc.) to increase awareness; promote, educate and share ideas/experiences on best practices or options available for mangrove stakeholder communities and individuals dependent on mangrove ecosystems and resources, e.g. exploitation based on acceptable standards, sustainable harvesting among mangrove wood harvesters, adoption of fuel efficient cookstoves by locals, adoption of fuel efficient fish drying and modernized fish drying system by fish dryers, adoption of farming practices that are mangrove ecosystem friendly local farmers; introduction of suitable eco business cases.

-Participatory learning programs including visits to mangrove communities.

(b) Restoration of degraded mangrove portions.

The project proposes planting back about 1,000,000 trees in the next 10 years within the Niger Delta region. The first phase is a pilot in ten communities in Akwalbom State namely: *Eket, EsitEket, Onna, Mbolbeno, IkotAbasi, Oron, EasternObolo, MkpaEnin, Okobo, UdungUko*. It targets planting back about 100,000 mangrove trees in the next 2-3 years with each tree at the cost of \$0.5. On successful implementation, it will be upscale (expanded to other mangrove communities within the region) in subsequent years. The project has already mobilized about 100 local youths as volunteers to assist in planting/managing the mangroves.



(c) Information gathering/Data collection/Sharing: The project will conduct a participatory study to determine the present status of mangrove ecosystem and resources in the state, engaging relevant stakeholders. The available information on mangroves of state will be gathered and reviewed with respect to the vegetation size, vegetation boundary, regeneration rates, species composition, community composition, livelihoods, utilization, economic contributions, climate change effects and mitigation/adaptation measures, sustainable eco ventures in mangrove ecosystem, relevant opportunities like REDD+, PES etc. Additional data will be collected from the field and analyzed.

The project will help generate locally-relevant information on natural ecosystems (e.g., economic valuations of ecosystem services) to influence political and economic decision-making in favor of conservation. Lack of assessment of the economic value of biodiversity and the cost of its loss is noted as one of the reasons for the lack of integration of biodiversity objectives in economic policy and planning. The state, if properly aware of the beneficial contributions that mangrove ecosystem services make to its development is very likely to effectively mainstream it. The project will make assessment of the economic value of biodiversity: using economic valuation methods to demonstrate the economic importance of biodiversity. The project will therefore identify and analyse the relationship between

mangrove ecosystem and different production sectors such as agriculture, forestry, fisheries and other related issues like poverty reduction, local livelihoods employment etc.

(d) Policy review and development of policy points:

As part of the project existing relevant policies and legislation will be reviewed to guide formulation of additional policies relating to mangrove protection. In Nigeria, there are forest policies and legislation in place, however, these are fragmented and not comprehensive, and do not deal with mangroves specifically. Moreover, there is no clear mandate for the management of mangrove; thus, there is no coherent policy or strategy for the management of this resource currently. Inadequate management prescriptions have hindered effective management of mangrove resources in the region. As such, mangroves have been regarded as a common property to be exploited without control.

The project will facilitate the establishment of a "State Mangrove Management Action Committee" comprising representatives of all stakeholders /institutions (relevant ministries, departments, agencies, NGOs, academics, mangroves communities, Forest associations, mangrove ecosystem users/businesses, etc

The project will involve developing policy points on mangroves based on review of existing regulations, information gathered and new data generated relating on mangroves. In collaboration with the State Forestry and Environmental Department and other actors/ relevant stakeholders a Mangrove Management Action Plan and advocate for adoption and public compliance.

This will include developing measures for mainstreaming Mangrove into the plans, strategies and policies of different economic sectors. The importance of mainstreaming is recognized by the Convention on Biological Diversity (CBD) and its Aichi targets: supporting the mainstreaming of biodiversity into the policies of key economic sectors, such as agriculture, forestry and fisheries.

(e) Developing of a Management plan. The committee will work consultatively through a series of workshops, fieldworks, literature reviews and personal contacts with expert groups and relevant stakeholders to develop a management plan. The initial drafts of the Plan will be circulated to internal and external experts for reviews. The plan will contain strategies/measures on: relevant stakeholders engagement, integrating mangrove management into integrated coastal zone management, climate change mitigation strategies ,mangroves zonation (e.g as reserve, small scale wood harvesting, bee keeping, shoreline protection,small scale capture fisheries etc),conditions for siting projects in mangrove areas (e.g conducting EIA),certifications, eco-tourismdevelopment,sustainable mangrove land use practices, sustainable eco ventures in mangrove ecosystem ,Code of Practice for Mangrove Harvesting, enforcement ,monitoring strategies, reporting etc.

It will adopt a participatory approach as the mangrove policies and management action plan cannot succeed without regard to the requirements and aspirations of all people. According to FAO (1994) Success depends inter alia, on being able to match management objectives with the interest of local populations and by extension,secure their support and commitment .The Plan will recognize the crucial role of the mangrove forest adjacent communities and will put into consideration Category 13 of the global sustainable development goals (SDG) that concerns mitigations of climate change impacts through activities in the Agriculture,Forestry and Land-use (AFOLU) sectors. It will also advocate for activities that incorporate goals 12 (responsible consumption and production) through sustainable forest management, 14and 15 through protection of mangroves as biodiversity habitats and supporting life below water and on land.Gender considerations will be integrated at all levels of plan implementation. The plan will take into consideration the need for equitable representation of all groups in meetings and decision making

processes to enhance the role played by them in the conservation of the mangrove forest resources. Gender balance will be established where possible and all groups (men, women, youth, and disadvantaged) will be considered during the composition of the various sub-committees and in management activities. The overall goal of the management plan will be to enhance mangrove ecosystem integrity and its contribution to the socio- economy of the state through sustainable management and rational utilization (sustaining supply of mangrove goods and services). A state stakeholders' workshop comprising of representatives from the state government, non-governmental organizations, local communities, and policy makers will be held to review and validate the final draft plan. The Plan would be reviewed after some years and amendments undertaken as need arise.

On successful implementation, the approach could be replicated or adopted in other states within the region/ country.

(f) Livelihoods Alternative Developing among pro-poor Forest Dependents.

In order to achieve successful, long-lasting mangrove conservation, it is therefore imperative to take community livelihoods into consideration and the project is in align with the country's "Poverty Reduction Strategy" which supports improving local resource management as a key element of poverty reduction.

It will involve introduction of key mangrove dependents/ pro poor commercial harvesters to ecofriendly enterprises (e.g bee farming, mushroom cultivation, snail farming, grasscutter production etc) which can enhance livelihoods among mangroves communities without jeopardizing the survival of the mangroves.



Expected project results:

- Increased community knowledge and skills in sustainable mangrove ecosystem utilization.
- Degraded mangrove sites restored and sustainable managed; ensuring protective habitat for many coastal species.

- •Increased food security and economic resilience :Increased in number of juvenile crabs, fish, shrimps, snails, periwinkles, turtles etc as their habitat (mangrove) is improved for their survival, thus protecting and sustaining an important food source for coastal communities.
- Indirect employment opportunities created (for over 5000 returning fishermen and 3000 women for the collection of aquatic produce – fish, crayfish, crabs, periwinkles,shrimps,oystersetc
- Reduced coastal erosion/flood; as mangrove vegetation helps in protecting coastlines against wave damage during storms.
- Reduced exposure to the high intensity of sunlight and heat among dwellers.
- Reduced deforestation and carbon emission rate with adoption of fuel efficient biomass stoves and other conservation practices.

Assessment measures:

- Interviews with the community people;-Quarterly interactive meeting with the local people for feedbacks; Use of Pre and post-test method; pre and post project surveys.
- Community engagement: The project will facilitate community-based participatory monitoring approach to enhance transparency and accountability: Some youth will be trained in simple monitoring and evaluation (simple data collection, comparing/analysis and documentation methods) and will be requested to conduct independent project monitoring and evaluation, making presentation during meetings. The project will engage monitoring tools such as: Community Score Card (CSC); Participatory Statistics; Social mapping; Regular project site/farm visits to observation new changes.
- Engaging of External evaluators. The project will also contract external evaluators for independent evaluation.

Long term sustainability:

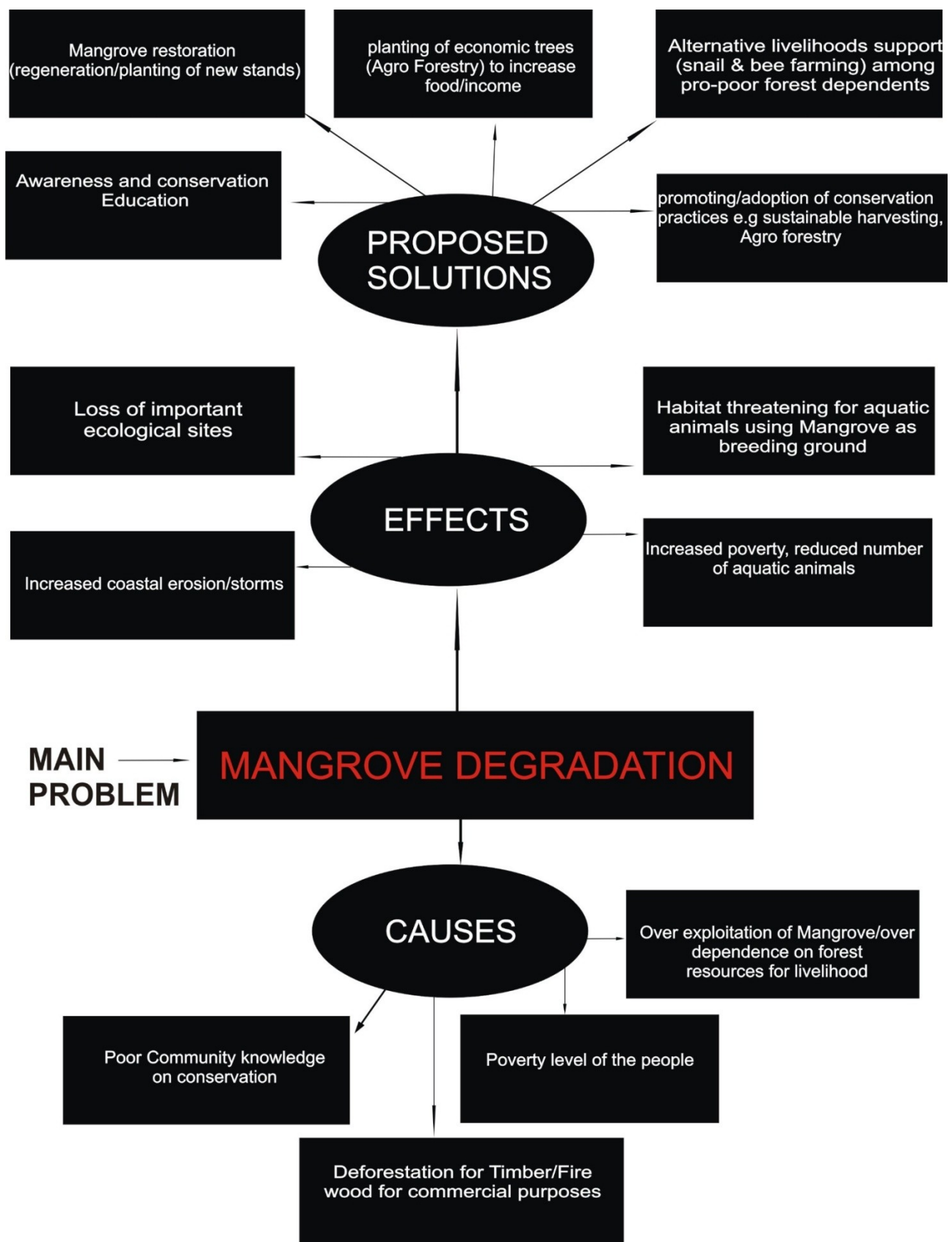
.The project design is participatory, involving the locals, local forestry department, NGOs other relevant stakeholders. The project will help builds and strengthens the existing institutions. From the very beginning, the project advocates for community support, cooperation and active participation in all project activities. Capacity-building, especially the involvement of local people will ensure sustained conservation of mangrove forests even after the end of the project. The project activities involve raising awareness, training and participatory monitoring of mangrove forestsincreased awareness will encourage the local community to make a deliberate attempt to manage mangrove forests sustainably since the community appreciates their benefits. The alternative livelihoods (bee farming, snail farming,etc) established under this project would will help reduce pressure on the forest; adoption of fuel efficient biomass stoves will help reduce forest destruction. With the involvement of the local forestry department, and other relevant institutions, continued technical (and other supports) to the local people is guaranteed.

With the establishment of a Mangrove Management Action Committee with representatives from relevant stakeholders /institutions/Actors, there is the assurance of sustainability. The governments, private sector and community are involved in planning, implementation and decision making process, the rights of communities and individual landowners.The development of sustainable plan on mangrove harvesting and promotion of ecofriendly ventures within mangrove communities in the state there will be reduction in mangrove destruction and over dependence. By capturing both environmental and socio-economic factors, an ecosystem-based policy framework can provide a way for policy makers to identify the most promising development options and make decisions based on a sound understanding of their long-term consequences.

The project will effectively engaged all relevant stakeholders, including mainstream government departments, local communities, women, and the private sector, and will invest in communication and awareness raising. It is anticipated that through education on the required operating standards, operators gradually will become the supporters of improved mangrove utilization and harvesting practices and eventually self-regulation will occur. Policy, planning and legal frameworks reviewed to identify significant impacts on biodiversity, will promote 'win-win' approaches which support both development and biodiversity objectives, and provide a supportive environment for sustainable natural resource management. More the establishment of the users' forum will enhance participation/engagement of key ecosystem users in mangrove and adoption of best practices.

Project Communication:

- Project overview booklets /fact sheets;CDRoms on the project shall be produced and disseminated to different institutions (NGOs, universities and environmental agencies, other conservation and developmental agencies) for knowledge sharing;
- Publications of results in local and o international journals and in e-newsletters
- Paper presentation on the project in relevant conferences.
- on line reports etc.



PROBLEM/SOLUTION ANALYSIS OF THE PROJECT