



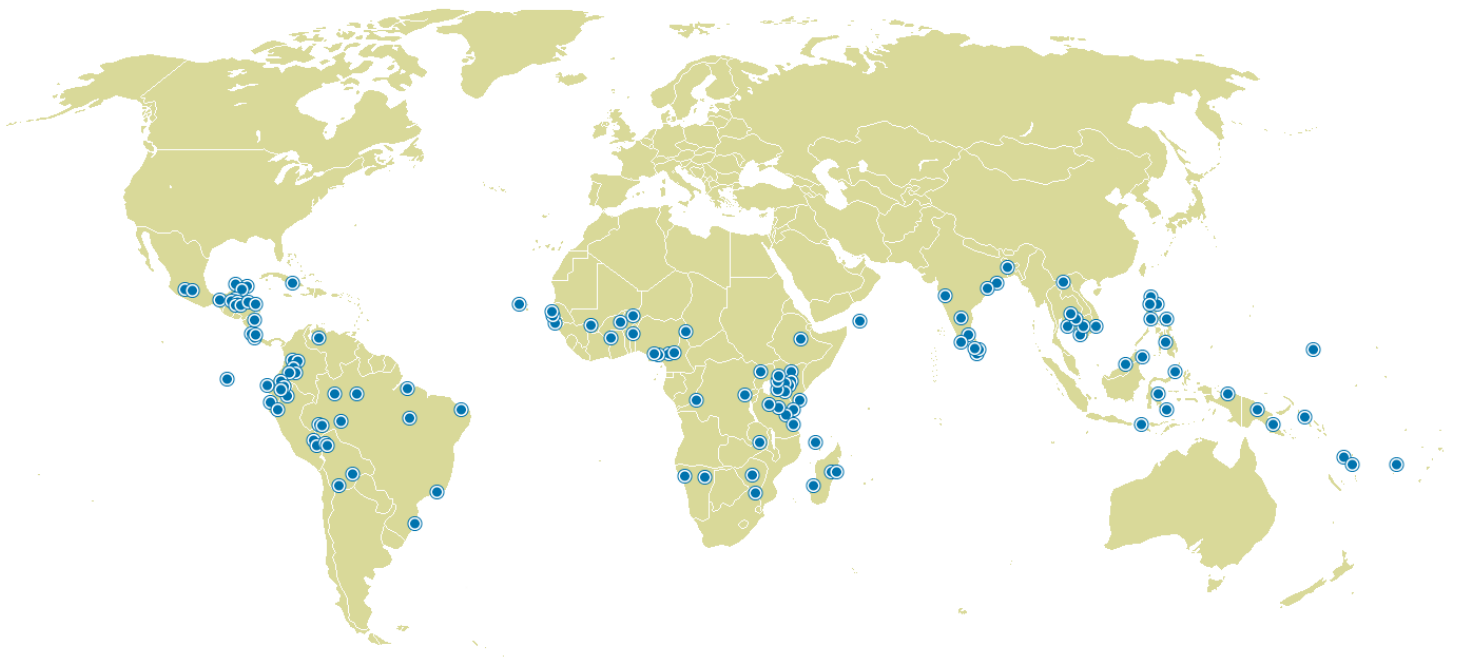
## Equator Initiative Case Studies

Local sustainable development solutions for people, nature, and resilient communities

# UNDP EQUATOR INITIATIVE CASE STUDY SERIES

Local and indigenous communities across the world are advancing innovative sustainable development solutions that work for people and for nature. Few publications or case studies tell the full story of how such initiatives evolve, the breadth of their impacts, or how they change over time. Fewer still have undertaken to tell these stories with community practitioners themselves guiding the narrative.

To mark its 10-year anniversary, the Equator Initiative aims to fill this gap. The following case study is one in a growing series that details the work of Equator Prize winners – vetted and peer-reviewed best practices in community-based environmental conservation and sustainable livelihoods. These cases are intended to inspire the policy dialogue needed to take local success to scale, to improve the global knowledge base on local environment and development solutions, and to serve as models for replication. Case studies are best viewed and understood with reference to *'The Power of Local Action: Lessons from 10 Years of the Equator Prize'*, a compendium of lessons learned and policy guidance that draws from the case material.



*Click on the map to visit the Equator Initiative's searchable case study database.*

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# INSTRUMENT OF PEACE SCHOOL (EIP-NIGER)

Niger

## PROJECT SUMMARY

The village of Saga, located south of Niamey on the banks of the Niger River, was the initial setting for an innovative experiment in converting a troublesome invasive species in the river basin into an economic opportunity for the local community. Water hyacinth (*Eichhornia crassipes*) has clogged local irrigation systems, limited navigability of the river, restricted access to local markets, and decreased the viability of the local economy, as well as severely impacting ecosystem health and water quality.

École Instrument de Paix has mobilized community members to collect water hyacinth from the river, before drying the plant material for use in a number of income-generating activities. The organization has been particularly successful at promoting local production of fuel briquettes, which are made of both dried water hyacinth and agricultural waste. These briquettes help to generate income through their sale and improve energy access for marginalized riverbank communities.

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## KEY FACTS

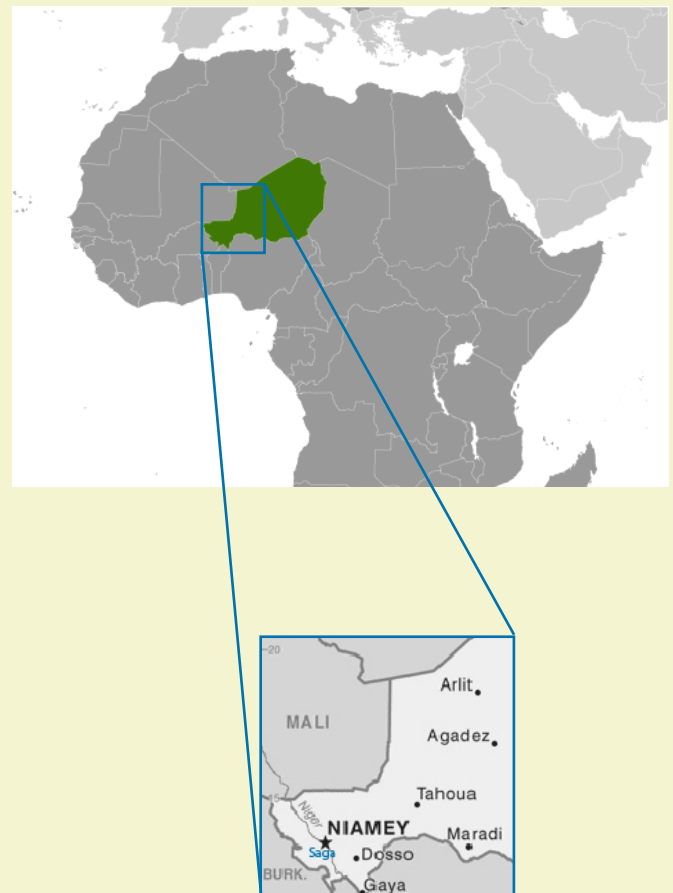
EQUATOR PRIZE WINNER: 2004

FOUNDED: 1999

LOCATION: 7 km south of Niamey on Niger River

BENEFICIARIES: 9 women's groups, 24 local schools

BIODIVERSITY: Mango, moringa, sahelian apple





# Background and Context



The Instrument of Peace School (*École Instrument de Paix* - EIP) employs an innovative natural resource management strategy, which transforms the water hyacinth, an invasive alien species, from an environmentally destructive problem into a poverty reduction solution. The community-based organization uses the water hyacinth as the central theme of its environment and development activities. It aims to improve local livelihoods and food security by manufacturing and selling hyacinth compost, woven products and cooking briquettes. While the organization works with communities all along the Niger River – extending from the northern border with Mali to the southern border with Nigeria – the majority of its activities and interventions are undertaken in the village of Saga.

## *Environmental, social and economic challenges*

The village of Saga is located seven kilometers south of Niamey on the banks of the Niger River. The community faces many of the socioeconomic challenges common to rural Niger over the last several decades. School attendance is extremely low, particularly among girls. More than 80% of the population is illiterate. Food insecurity is an ongoing challenge due to droughts, desertification and the degradation of soil. Freshwater access is limited, adding water-borne diseases such as cholera to a local health burden that also includes widespread malnutrition and parasitic diseases such as schistosomiasis. Women generally lack access to maternal health care services, which has produced high rates of maternal and infant mortality.

The local population also suffers from limited economic activities. The primary livelihood in the village is subsistence agriculture, the majority of which (98%) is carried out in small-scale plots and gardens. Overdependence on agriculture has led to the aggressive and intensive use of chemical fertilizers, which quickly exhausts the soil and has proven damaging to natural ecosystems. Small-scale, artisanal fishing is another traditional livelihood. In recent decades, marine resource abundance has plummeted due to overfishing and destructive fishing techniques. A number of environmental challenges

have made it increasingly difficult for this economically marginalized community to capture and benefit from its natural capital. A lack of alternative energy access – and prohibitively high costs for electricity in the village – has led to widespread deforestation and tree felling. As local forests have been cleared, women have been forced to walk further and further (usually several kilometers) to find the wood and fodder needed to meet cooking needs.

## *Turning an invasive species into economic opportunity*

The Instrument of Peace School was founded to turn an environmental challenge affecting the Niger River Basin into an economic opportunity. Water hyacinth is an invasive alien species that has overtaken the region. It has severely clogged local irrigation systems, limited navigability of the river, restricted access to local markets, and decreased the viability of the local economy. In addition to the negative impacts the water hyacinth has had on the local economy, it has also adversely affected ecosystem health and water quality. It covers a large percentage of the river's surface, suffocating local biodiversity and blocking light from reaching underwater flora. (The organization estimates that more than 60% of normal biomass





has deteriorated since the water hyacinth has been introduced into the region. This has impeded the reproductive patterns of native fish and had predictably detrimental effects on endemic plant and animal species).

EIP uses water hyacinth to create income-generating opportunities for the local community and to meet energy needs, in particular through the manufacture of cooking briquettes. The organization has used the invasive alien species as the cornerstone of its environmental education and social change programs. They apply an integrated and participatory approach, which engages the local population in people-centered sustainable development solutions with a particular emphasis on women and youth. EIP has become a platform for the delivery of health, education and livelihoods programming and prioritizes women and youth rights, good environmental

governance, and the active conservation of biodiversity and natural resources.

The organization is guided in its programming by several key objectives. It sets out to promote environmental education in both the formal and informal education systems (and to instill positive behavior change in the management and conservation of local systems); create conditions for people to recognize and actualize their rights to a healthy environment; promote the rights of women and children to education (in particular for girls); develop viable community development projects which draw on natural capital and respect ecosystem health; and strengthen community capacity to autonomously manage their resources. EIP works primarily through nine women's self-help groups and a number of local schools.



*“Projects in developing countries generally suffer from a lack of follow-up after the conclusion of the work. When funding dries up, ongoing poverty reduction efforts are strained. We appeal to donors to provide long-term funding to community-based initiatives, and to support with the monitoring and evaluation that can help local organizations meet reporting standards.”*

*Salifou Assane Seiny, Coordinator, Instrument of Peace School*



# Key Activities and Innovations



EIP has taken a major environmental problem – the proliferation of invasive aquatic plants, in particular water hyacinth – and used it to improve local incomes and generate positive social change. In all of its activities, the organization employs an integrated, community-based approach that aims to include all segments of society. By creating village management structures, EIP supports a process of consultation, reflection, evaluation, and action through which local people become lead agents in community development.

## *Energy briquettes from water hyacinth*

One of EIP's primary activities is the collection of water hyacinth for use in the production of compost, handicrafts, and, most notably, plant-based fuel briquettes. The community is mobilized to collect the invasive alien species from the Niger River, where it has clogged channels of transportation and commerce and threatened the integrity of local ecosystem health. Plant material is then dried and used in a number of income-generating activities. The organization has been particularly successful at promoting local production of fuel briquettes, which are made of both dried water hyacinth and agricultural waste. In addition to providing an extra source of income, the plant-based fuel briquettes reduce the need for wood in cooking, thereby reducing the pressure and stress placed on local forests. The briquettes contain the same amount of energy as charcoal and provide the local population with a measure of energy independence. EIP engages in ongoing research to explore how the energy pellets can be improved and how water hyacinth collection methods can be enhanced. For example, the organization designed and distributed a simple but effective floating grapnel, which has boosted productivity and allows villagers to harvest plant material from the shore or canoes, reducing exposure to leeches and water snakes.

## *Reforestation and alternative energy*

Reforestation and creating viable alternative energy options for the local population are complementary project activities that are

also priorities for EIP. In partnership with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), PROFROMA (a Niger-based non-governmental organization), and Éco Industrielle, the organization maintains a village tree nursery. This central nursery is used to populate several smaller nurseries, which are operated by women's self-help groups. Tree cultivation and propagation is focused on species with oilseed value, such as jatropha (*Jatropha curcas*) and neem (*Azadirachta indica*). Seedlings are sold to the general population for planting in their fields, are used in the production of biofuels, or are used in reforestation efforts that focus on desert and degraded areas in the village. Biofuel produced from the trees is used to meet local energy needs, in particular the operation of multi-use mills and water pumps (which provide irrigation for local gardens). EIP has also partnered with the University of Leiden on a 'green belt' project that aims to combat desertification by planting buffer strips of trees, and particularly those with medicinal and commercial values for the local population. Jatropha has been a species of choice because of its high potential for biofuel production. The village has planted a green belt to the east of its borders to protect the village from wind erosion. Within the belt, the local population can find trees and plants with traditional medicinal value.

## *Environmental education and youth*

A central aspect of EIP work is environmental education, with a particular focus on youth outreach and engagement. The organization oversees a network of youth troupes that use singing, dancing and storytelling to inform and educate the general population on locally relevant environmental and social issues. Performances are carried out in local languages and attempt (where it is possible and appropriate) to incorporate human rights issues. Special emphasis is given to women's rights, such as the right to own property, the right to marry by choice, and the right to marry at an appropriate age. EIP also develops educational tools for local schools and for the wider community. To date, the organization has produced five booklets on a range of conservation and sustainable resource management

themes, one comprehensive guidebook on environmental stewardship and children's rights, and a number of documentary films (for use as teaching aids in schools). The guidebook was so successful that the Ministry of Education has included it as part of core curriculum in several regions of Niger. EIP has also coordinated an environment exchange program that has interns from Canada visit the community, live in the village, and work with the local people on environmental awareness campaigns. Exchange students have also been enlisted to work on school vegetable gardens, where produce is sold in markets to generate an alternative source of income.

### *Rotating fund, solar dryers and fuel-efficient stoves*

EIP also works in a number of other fields of community development, including credit and savings services. The organization has helped to establish a rotating credit fund, a savings scheme that is

common throughout West Africa. Group members contribute small sums of money at each meeting of the group and take turns receiving the pot. This is a valuable service for women who tend to be excluded from more formal credit and savings systems. Money is most commonly invested into household repairs and small business development. An additional area of activity for EIP is the marketing and sales of vegetables produced by local women in their home gardens. This has provided women with collective bargaining capacity to ensure they receive fair prices for their produce. A portion of the proceeds from the collective sale of vegetable is invested into the rotating fund to help women purchase gardening tools and seeds. Lastly, EIP commissions the production of solar dryers and fuel-efficient stoves by local artisans, which are distributed to participating women's groups. Solar dryers help to preserve surplus vegetables for consumption in the lean season, while fuel-efficient stoves allow families to reduce energy inputs and smoke inhalation.



*“Our community has been affected by climate change. Just this year, torrential rains fell, leaving thousands homeless. The overflowing river submerged several hectares of arable land. Biodiversity conservation is a prerequisite for reducing the negative impacts of climate change. By protecting biodiversity, we strengthen the resilience of economies and ecosystems. And by doing so, we protect the environment for future generations”*

*Salifou Assane Seiny, Coordinator, Instrument of Peace School*



# Impacts



## BIODIVERSITY IMPACTS

The water hyacinth has proven an effective rallying point for mobilizing community action. By focusing on the eradication and productive use of an invasive alien species, EIP has been able to combat broader environment challenges (such as deforestation and desertification) and to conserve biodiversity. By turning collected plant material into fuel briquettes, the organization has helped remove a species that was clogging local ecosystems and damaging the local economy.

Since the initiative began, endemic flora and fauna have regenerated and resumed normal breeding patterns. There has been a particularly notable increase in fish diversity and abundance. Plant-based fuel briquettes have also reduced local pressure on forests for wood and fodder. In addition, compost made from collected water hyacinth is used to nourish native tree seedlings in local nurseries and to enrich the sandy, overextended agricultural soils.

EIP has also been actively involved in reforestation efforts to combat desertification. Oilseed and biofuel tree species like *Jatropha curcas* and neem (*Azadirachta indica*) are planted in strategic areas of the village. To also bolster secondary livelihood options and local food security, the organization has also started planting mango (*Mangifera indica*), Sahelian apple (*Ziziphus mauritiana*), moringa (*Moringa olifera*), and gum (*Acacia senegal*) trees. Fruit and non-timber forest products from these trees are collected by local women and sold in regional markets. The organization is currently reforesting at a rate of one and a half hectares annually, requiring more than 9,000 seedlings from the central nursery. Reforestation has had positive biodiversity benefits, with several bird and animal species returning to the region.

The organization commissions solar-dryers and energy-efficient stoves from local artisans, and then distributes to women's self-help groups. Slow-burning, fuel-efficient stoves use seven times less

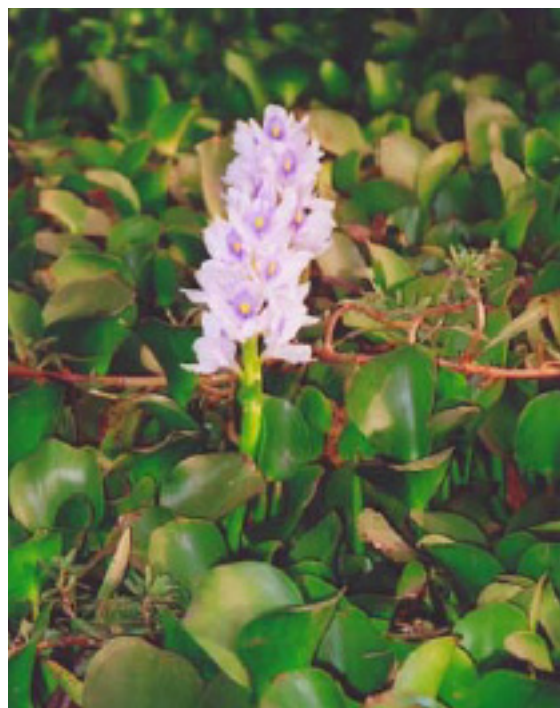
wood than conventional stoves and are designed to use water hyacinth-based fuel briquettes. These technologies have provided the local community with energy autonomy and reduced pressure on local forest resources.

Environmental education is the thread that binds all EIP work together. Working primarily through local schools – but also through local cooperatives, federations and unions – the organization works to promote awareness of environmental challenges and actions the community can take to ensure sound environmental stewardship. Teaching aids and educational guidebooks (largely on alternative energy, but spanning other topics in biodiversity and ecosystem services) are used in training workshops and to mainstream conservation into school curriculum.

## SOCIOECONOMIC IMPACTS

EIP works through nine women's self-help groups, a network of 24 teachers, and schools in the village (attended by over 2,800 students). Socioeconomic benefits are delivered primarily through training sessions and workshops on a wide variety of topics ranging from environmental education, sustainable agriculture, alternative energy, and human rights. The primary objectives are to improve agricultural productivity, strengthen energy autonomy and improve local incomes and livelihoods. Specific trainings are regularly held at the EIP central workshop on making natural compost from water hyacinth, ecoagriculture techniques, crop rotation, and food drying. Participating farmers and women's self help group members receive skills training and build their capacity to manage natural resources through the application of locally-appropriate technologies. All participants are trained in the manufacture and processing of biofuels and plant-based fuel briquettes and pellets. This alternative energy source is used to run biofuel generators. Youth receive training on the maintenance of biofuel equipment, managing compost, and the marketing of local vegetables, which has generated employment and reduced out-migration.





LEFT: Water hyacinth RIGHT: Blocked irrigation canal Source: Trudel, S. (2009)

### *Jatropha and neem seed biofuel*

The production of biofuel has had a significant and positive impact on the local economy. EIP distributes empty bags to women's self-help groups for the collection of jatropha and neem seeds, and provides training in seed 'pulping'. One harvest produces an average of 120 bags of neem seeds. EIP then purchases the seeds and processes them into a functional biofuel. During the farming season, the organization uses this fuel to run water pumps for gardening and irrigation that previously ran on gasoline. Jatropha and neem seed biofuel is also used to run two multi-purpose mills, which the community uses to process flour and crush tree seeds into oil during the day, and which provides the village with electricity at night. This local production of biofuel has resulted in greater energy independence for the village, reduced energy costs for local families, and reduced dependence on fossil fuels and timber.

### *Natural fertilizer, soil productivity and agricultural outputs*

Training sessions are also provided by EIP on the production, storage and use of natural fertilizers. These trainings target local women who farm small plots, many of whom are cultivating okra. Women are provided instruction on the collection and processing of water hyacinth, which is used as the biomass base of the compost material. To date, more than 1,500 square meters of water hyacinth have been cleared from the surface of the Niger River, providing a total of twelve tons of natural fertilizer. The compost is then used in both irrigated and rain-fed fields to grow rice and other agricultural products. Since local farmers began using water hyacinth compost, soil productivity has vastly improved and vegetable production has tripled. The collection of water hyacinth and the processing of natural fertilizer have also provided an alternative source of income for local women, who sell the compost in regional markets to farmers

working in dry areas where water hyacinth is not found. EIP has also identified a comparable invasive alien species, kariba weed (*Salvinia molesta*), which is now the target of similar collection and compost processing efforts.

### *Agricultural diversity and food security*

EIP also supports local farmers to diversify agricultural production by introducing new varieties of crops and vegetables. The objective is improving the variety and abundance of vegetables in the local diet and to reduce the prevalence and high rates of malnutrition in the community. Women's self-help groups are provided with trainings on how to effectively and productively cultivate household vegetable gardens. These groups now supply the village with new varieties of fresh produce, including carrots, onions, eggplant, garlic, and beets. Agricultural diversification has improved local nutrition, strengthened food security and provided local women with a new income stream.

Local food security has also been strengthened through the dissemination of solar dryers, which allow villagers to preserve food for consumption during the dry (or lean) season. Where before excess produce went to waste if it could not be consumed or sold before it spoiled, local farmers are now able to plan for periods of drought and retain the full outputs of their crops. The solar dryers have also reduced the daily workload of local women by an average of two hours, freeing them for other productive activities.

Additionally, the organization has succeeded in raising awareness of local health issues and motivating positive behavior change. For example, EIP has carried out awareness-raising campaigns on safe drinking water, leading to fewer people drinking directly from the river. The organization provides guidance on simple filtration tech-



niques and instruction on how to create filters from locally available materials. This campaign was closely linked to another which has convinced the local population to stop bathing in the river and to boil drinking water, two actions which have reduce the prevalence of intestinal parasites.

### *Women's empowerment and education*

In a country where Islam is the dominant cultural and religious force, the gender division between women and men is markedly pronounced. By supporting local women to improve their livelihoods and supplementary sources of income (e.g. selling compost, briquettes, and crafts from water hyacinth), the organization has given women a measure of financial independence, empowerment and economic security. EIP is also committed, however, to gender inclusion and the full and active participation of all segments of society in their work. With this in mind, the organization has made an effort to integrate men and boys into its programming and activities. The organization has delivered workshops and trainings on gender equality and the sharing of financial and household responsibilities.

An equally important emphasis for EIP has been girls' education. According to prevailing cultural norms and local tradition, girls are expected to stay home to help their mothers with domestic chores. Conditions of abject poverty reinforce this trend, as families rely on girls and young women to contribute to family income and earning capacity by collecting firewood and selling merchandise. As a result, too few girls are permitted to receive a formal education. EIP has tackled this problem through awareness campaigns that aim to convince parents of the value of enrolling their daughters in schools. This is a long-term objective for the organization, which will require patience and likely advance incrementally. Illiteracy rates are high across the sexes, and the argument for formal education above productive labor is greeted with skepticism in many segments of the population. Where the organization has seen success in this area, it has been a function of improved economic security.

## POLICY IMPACTS

EIP has had a significant impact at national and regional levels, in particular by providing governments with a productive alternative of dealing with invasive alien species. The organization has sensitized government agencies to the need to educate the population living along the Niger River regarding the dangers of invasive aquatic plants and potential methods for managing the problem to their benefit. As a result of advocacy and lobbying by EIP, the government no longer burns water hyacinth during its annual Fight Against Water Hyacinth Day. Instead, governments at both the regional and national levels have started to promote it as a resource that can quite literally fuel local development.

The organization has assumed a leadership role in the National Committee for Coordination of Anti-Desertification and Development NGOs of Niger. Through this network, EIP makes inputs and contributions to national environment policies, notably including the Rural Development Strategy (SDR) and the Strategy of Accelerated Development and Poverty Reduction (SDRP).





# Sustainability and Replication



## REPLICATION

The EIP model of turning an invasive alien species into a source of natural wealth for the local population has been shared with several communities along the Niger River. The organization has become a leader on community-based environment and development projects in the region, providing guidance on composting, alternative energy, and agricultural diversity. Through peer-to-peer exchange and other outreach, EIP has popularized traditional plants such as moringa and jatropha, adding value to a locally available and plentiful resource. The organization's success has also spread to Mali, where the Nigerian embassy requested their guidance on managing a similar water hyacinth problem. EIP staff visited Segou, Mali for one-month site visit to train people in the various uses of water hyacinth, a model currently being applied to eradicate aquatic weeds in the Marakala dam. The mobilization of youth into environmental education troupes has also been replicated in other areas. These troupes perform at community events and promote environmental protection, biodiversity conservation, the value of traditional knowledge, and women's and children's rights.



## PARTNERS

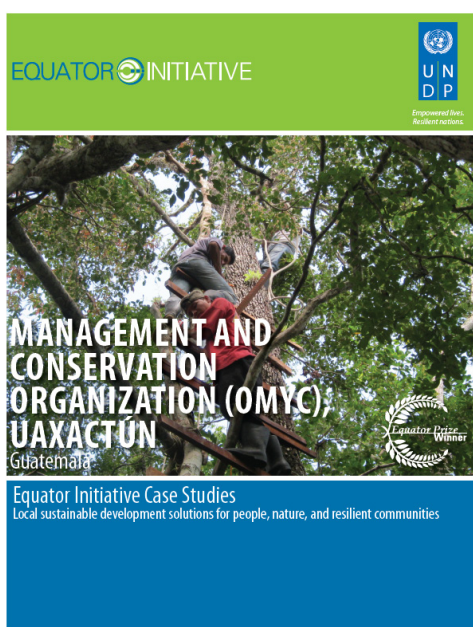
EIP has benefitted from a diverse group of partners over the years, including but not limited to the Canadian International Development Agency (CIDA), Cardinal Léger Foundation, Roncalli Foundation, the UNDP implemented GEF-Small Grants Programme, University of Leiden, UNICEF, Save the Children-Sweden, and Great Lakes United.

- Canadian International Development Agency: CIDA has been an instrumental financial partner since the project began in 2000.
- Cardinal Leger Foundation: CLF has been involved in the project since 2005 and has provided funding of CND 300,000 over three years.
- Ministry of International Relations of Quebec: MRI has contributed since 2005 to a number of projects, including biodiversity conservation and the popularization of new techniques.
- University of Leiden: This Netherlands-based university supports research and develops synergies between biodiversity conservation efforts and local work to combat desertification.
- ICRIAT: This center assists in research, and in particular the dissemination of research findings to the local population.
- UNDP implemented GEF-Small Grants Programme: SGP provided the organization with catalytic funding to launch its programming.
- Éco-Industrielle: This Quebec-based firm specializes in the production of environmentally friendly tools and industrial equipment and has been an instrumental partner in value-added secondary processing.

## FURTHER REFERENCE

- Instrument of Peace School website <http://portail-eip.org/SNC/eipafrique/Niger/Niger.html>
- Trudel, S. 2009. "River to River" Initiative: Aquatic invasive species; from curse to resource. Great Lakes United. [http://www.icaiss.org/pdf/2009abstracts/SYLVE\\_TRUDEL.pdf](http://www.icaiss.org/pdf/2009abstracts/SYLVE_TRUDEL.pdf)

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