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WECHIAU COMMUNITY HIPPO SANCTUARY

Ghana



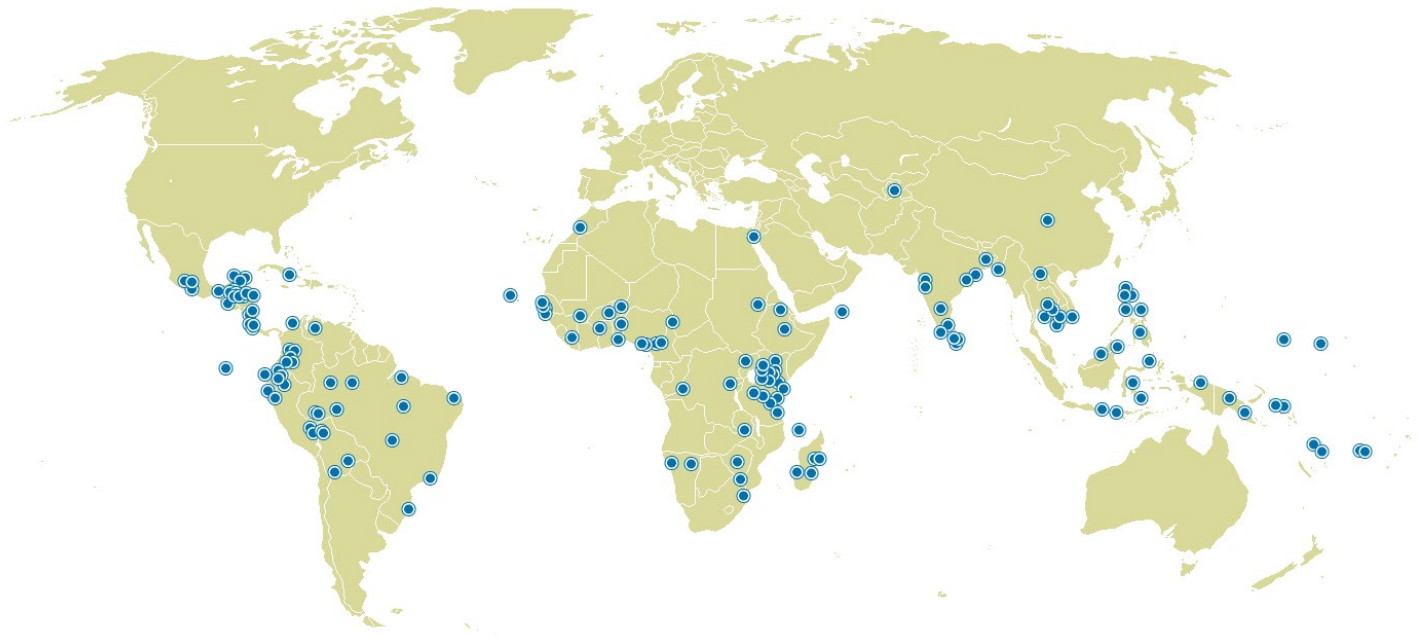
Equator Initiative Case Studies

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.



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WECHIAU COMMUNITY HIPPO SANCTUARY

Ghana

PROJECT SUMMARY

This community-managed wildlife sanctuary consists of a 34-km stretch of riverine forest, floodplain, and savannah woodland along the Black Volta River, in northwestern Ghana. Created in 1998 in response to the decline of hippopotami in the region due to high levels of hunting, the sanctuary has used revenue from ecotourism to deliver infrastructure investments for the residents of its seventeen member communities.

Through a balancing of ecological and social needs, the sanctuary has delivered substantial conservation and socioeconomic benefits: poaching has been eliminated and the hippo population has stabilized within the sanctuary's core zone, while investments in schools, health facilities, solar lighting, and water infrastructure have improved the wellbeing of approximately 10,000 residents of the sanctuary's development zone. In 2009, the initiative was used as a model for the design of Ghana's Community Resource Management Area legislation.

TABLE OF CONTENTS

Background and Context	4
Key Activities and Innovations	6
Biodiversity Impacts	8
Socioeconomic Impacts	9
Policy Impacts	11
Sustainability	12
Replication	13
Partners	13

KEY FACTS

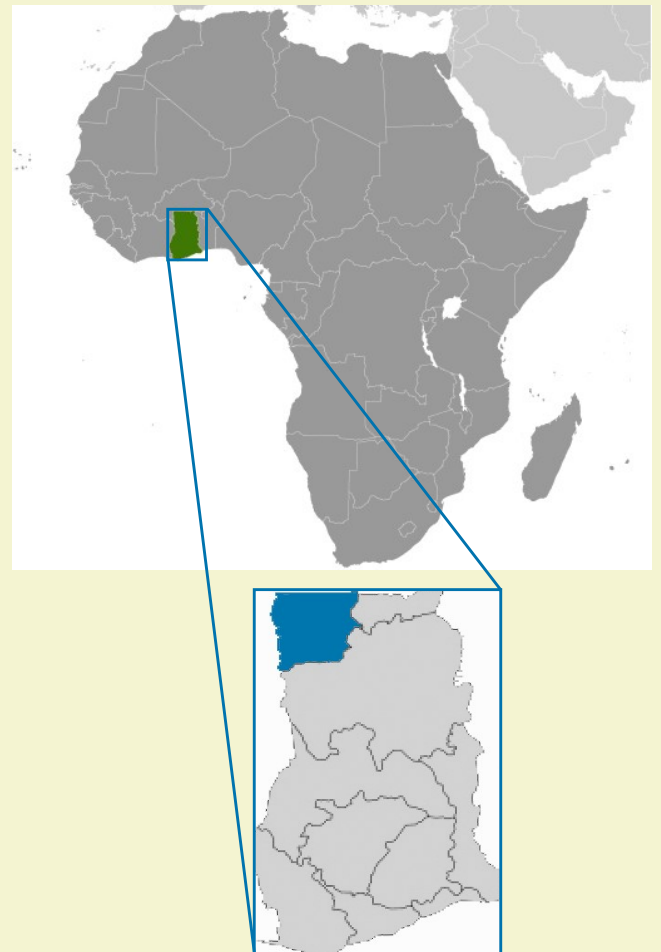
EQUATOR PRIZE WINNER: 2008

FOUNDED: 1998

LOCATION: Upper West Region, Ghana

BENEFICIARIES: 720 local households

BIODIVERSITY: 237 bird, 50 mammal and 32 reptile species



Background and Context



Wechiau Community Hippo Sanctuary (WCHS) is a community-based initiative in north-western Ghana that conserves hippopotami (*Hippopotamus amphibius*) and their riparian habitat while promoting human development for indigenous local populations. Founded in 1998, the sanctuary consists of a 34-kilometre stretch of riverine forest, floodplain, and Guinea savannah woodland along the Black Volta River, which forms Ghana's Upper West Region's boundary with Burkina Faso. Through eco-tourism, substantial improvements in infrastructure, and income-diversification projects, the initiative has been able to conserve a population of around twenty hippos, one of only two remaining populations in Ghana.

Project catalysts and evolution of the sanctuary

Situated in one of the poorer corners of Ghana and the world, WCHS operates in a region where comparatively little land is under formal protection, wildlife serves as a primary source of protein, hippopotami are generally in decline, and even protected areas are often devoid of animals. The sanctuary was proposed in 1998 by the Paramount Chief of the Wechiau Traditional Area, his sub-chiefs, and other local opinion leaders. These community leaders are elected among rotating traditional constituencies, and had previously rejected proposals by Ghana's Wildlife Division to establish a government-run hippopotamus reserve in the area. Instead, they elected to establish a community-managed sanctuary that would protect the hippopotami, prevent further habitat degradation, and restore habitat and extirpated wildlife species, while also assuring community participation in decision-making for development projects.

Sanctuary zoning

The sanctuary is divided into two zones: the core zone and the development zone. The core zone, which includes the Black Volta River, its islands, and a 1-2 kilometer wide riparian belt, is protected by prohibitions on farming, bush-burning, hunting, the cutting of

plants and trees, and vehicle access, as well as restrictions on fishing, oyster collection, livestock and the harvesting of shea nuts (*Vitellaria paradoxa*) and locust beans (*Parkia filicoidea*). The core zone is home to at least 226 plant, 237 bird, 50 mammal, 32 reptile and 9 amphibian species.

The adjacent development zone extends 5-10 kilometers to the east of the core zone boundary, and consists of wooded savannah interspersed with human settlements and farmland. There are 17 resident communities within the development zone, roughly 720 households, and 10,268 people, with the total number of children estimated at approximately 5,620.

The implications of ethnicity for land rights

Communities living within the development zone comprise four ethnic groups, each with distinct languages, namely Wala (known locally as Wechiege), Birifor (or Lobi), Hausa and Dagaabe. The Wala settled the area in the 17th century and have customary rights to the land, whereas the other three ethnic groups do not. Wala chiefs and 'tendamba' (land priests) hold the land in trust for the use and welfare of the entire community. The Birifor migrated from Burkina Faso during the 1920s and are more numerous than the Hausa and Dagaabe, who immigrated after the 1940s. Of the sanctuary communities, Wechiau and Tokali are primarily Wala. This is vital to the sanctuary's work, due to Wala land rights and tenure security.

Wechiau is also the seat of the Paramount Chief for the Wechiau Traditional Area and is the gateway to the rest of the sanctuary. The remaining fifteen communities are primarily Birifor, although Dagaabe are interspersed and six Birifor settlements include Hausa fishing camps. Originally located by the river, these camps were moved to the development zone in 2002 to enhance core zone habitat protection. The need to resettle the 14 households involved was determined by the Sanctuary Management Board in agreement with representatives from the affected communities.

Both Wala and Birifor people have legends and taboos that contribute to the local conservation ethic. Wala myths maintain that their people escaped enemies in the 1800s after being carried across the river by hippopotami. The Birifor believe that the forest houses Kontoma (bush spirits), who hang from tree branches along the river to warn hippopotami of danger. Hippopotami also play a role in creation stories and puberty rites, and are considered children of the river spirit. Both the Birifor and the Wala have hunting taboos surrounding the species.

Governance and organizational structure

The Sanctuary Management Board is composed of the Wala chiefs, Wala and Birifor community representatives, and non-voting advisory bodies that include the Ghana Tourist Board, regional government representation in the form of the Wa West District Assembly, and the Nature Conservation Research Centre (NCRC), a Ghanaian conservation non-governmental organization (NGO). Along with the Calgary Zoological Society (Canada), the latter provides technical assistance and advice on external funding, programme administration, and capacity building.



Key Activities and Innovations



The main Wechiau Community Hippo Sanctuary areas of work are ecotourism, alternative livelihood generation, conservation monitoring and infrastructural development.

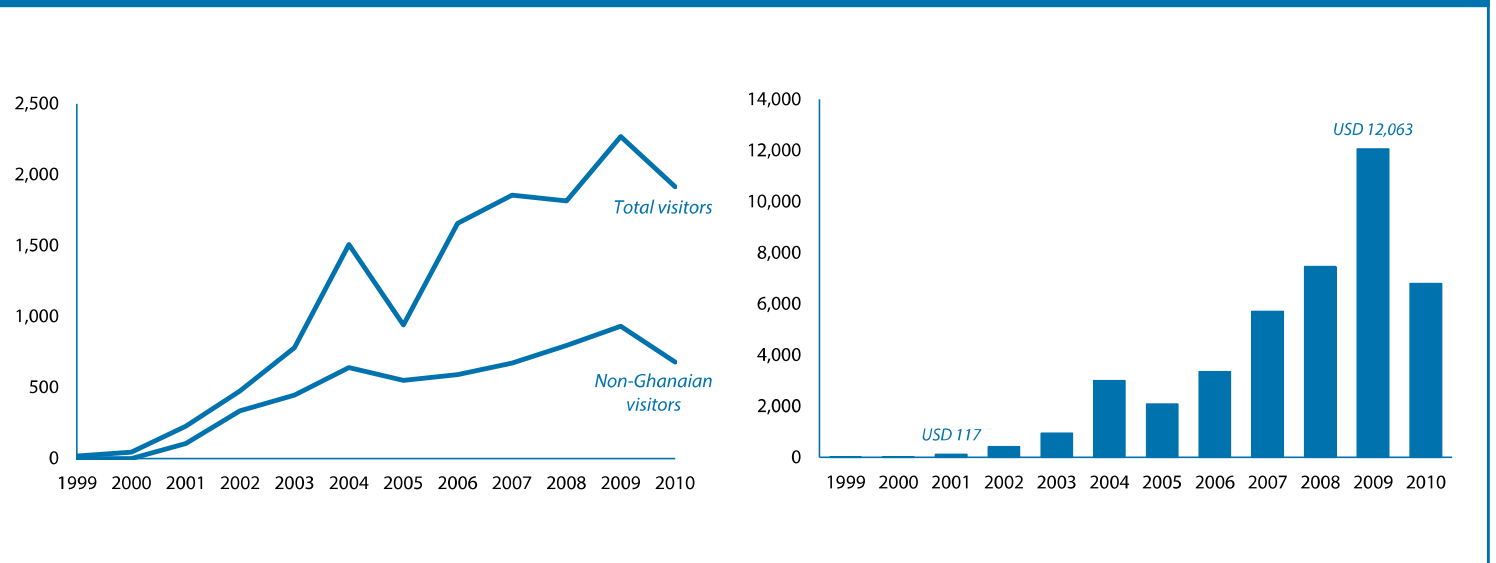
Ecotourism

The initial project focus was on developing the sanctuary as an ecotourism destination, and this has remained a consistent goal. Tourists are able to take river safaris by boat or use hides to view the hippopotamus population in their natural habitat. The group has also ventured into ethno-tourism, offering visitors cultural tours of the Lobi communities and Wechiau village. Visitor numbers have increased steadily since 1998. In 2009 there were over 2,200 visitors, although this fell to around 1,900 in 2010 after a serious flood washed

away a section of the road leading to the sanctuary. Roughly fifty community members receive regular income from operating the sanctuary.

Revenues from eco-tourism have been used to cover the operational costs of the sanctuary since 2004. The Wechiau Community Hippo Sanctuary operates as an independent venture, with staff salaries and tourism infrastructure maintained by the Sanctuary Management Board through visitor fees. Additional financial and technical support from local and international partners enables the undertaking and expansion of community development initiatives.

Fig. 1: Growth of WCHS ecotourism volume and revenue (1999-2010)



LEFT: Ghanaian and Non-Ghanaian visitors (1999-2010) RIGHT: Ecotourism revenue (USD) (1999-2010) Source: WCHS

Improving community infrastructure and livelihood options

Since the initiative began, infrastructure development and improvements have been ongoing within the development zone. One project has been a highly successful borehole drilling scheme, which provides the local community with access to clean water. This project has targeted groups that would otherwise be forced to cross the core zone to reach the river.

Another infrastructure focus has been energy access. The organization has instituted a solar lighting initiative which benefits a number of sanctuary communities, only one of which is currently connected to the national electricity grid.

Investments in the infrastructural capital have been complemented by investments in human capital. Through various funding arrangements with international partner organizations, WCHS has established two primary schools in the development zone, and also provides scholarships for local high school students.

Meanwhile, health needs have been addressed through the regular distribution of medical supplies to the three health clinics within the sanctuary area. The 'Hope for Health Project' sends regular shipments of basic medical supplies from Canadian hospitals.

As part of its commitment to providing the local population with alternative livelihood options, WCHS has developed a value-added secondary processing program for shea nuts. The program currently employs more than 1,000 women in the production of organic shea butter. Since 2008, the sanctuary has received a conservation premium from a shea exporter on all organic nuts collected within the sanctuary boundaries.

Conservation and monitoring in the sanctuary

The conservation priorities for WCHS include ensuring the security of wildlife in the core zone, raising conservation awareness through environmental education, and monitoring the numbers of species in the area. A team of ten sanctuary rangers is responsible for the maintenance and upkeep of the Talawona Tourist Lodge, the hippo tree platforms, and the Visitor Centre. This same team of rangers is responsible for policing the sanctuary. Rangers monitor human incursions into the core zone and on the Black Volta River. Their work is mandated by WCHS bylaws, and they report to the Sanctuary Management Board.

An additional measure taken to ensure the security of wildlife within the core zone was the introduction of motion-activated wildlife cameras in 2008. These cameras were successful in both documenting and monitoring wildlife species, as well as collecting photographic evidence of poachers and hunters trespassing within the core zone.

Since 2007, the core zone has been visually delineated within the sanctuary by planting fire-resistant mahogany trees along its boundary. This natural boundary is complemented by a 'fire belt' which is cut into the landscape to prevent seasonal bush fires from spreading across into the riverine forest.

Trained tour guides and research teams carry out regular biodiversity monitoring within the core zone. Monitoring focuses on hippopotamus counts, but includes avifaunal and invertebrate species as well. Additionally, since 2005, almost three thousand environmental education booklets have been printed and distributed at community meetings to raise awareness of conservation issues. Surveys of attitudes among local communities towards WCHS have revealed largely positive responses.



Impacts



BIODIVERSITY IMPACTS

The main conservation focus at WCHS is the hippo population. Between 1995 and 1997, there were 11 recorded incidents of hippopotami being killed within the area. Since the founding of the sanctuary in 1998, however, there have been no recorded cases. The cessation of poaching has helped to stabilize the size of the hippo population, with an average of fourteen hippos counted in regular monitoring exercises since 2000.

Hippo monitoring

Hippo surveys are conducted within river transects to establish the distribution and abundance of hippos in the sanctuary. Local dugout canoes paddled by experienced boatmen and wildlife guides are employed for the surveys. The 34 kilometer stretch of river within the sanctuary is divided into four transects, which are traversed concurrently between 7:00am and 10:00am. Records are made of the numbers of hippos sighted by sex and age, in addition to exit points along the banks. All positions are marked using GPS coordinates whenever possible. Until 2004, surveys were undertaken by Earthwatch Institute teams, including a scientist and local volunteers. Since then, quarterly surveys have been undertaken by sanctuary staff. Funding for hippo abundance monitoring is provided by the Conservation Outreach Department of the Calgary Zoological Society.

Biological monitoring and surveys

Wechiau Community Hippo Sanctuary also undertakes avifaunal monitoring, with the most recent bird counts taking place in 2007 and 2008. Counts were taken within the sanctuary, but also in comparable areas outside the sanctuary to provide a point of comparison. Bird species were chosen as reliable indicators of broader habitat integrity. All surveys were undertaken by a local bird guide along permanently marked transects: four within the sanctuary and three outside it. The transects were surveyed multiple

times in both dry and wet season months, with a total of 167 species encountered: 156 inside the sanctuary and 120 outside. The species richness per sample was similar inside and outside the sanctuary during the wet season, but was significantly higher in the sanctuary during the dry season, indicating that greater habitat quality within the conservation area provides a refuge for species when resources are scarce.

Other monitoring activities have included terrestrial arthropod and invertebrate sampling, with species collected and sent to the University of Calgary for analysis. In 2009, a tsetse fly eradication team sprayed areas of vegetation along the Black Volta River to combat spread of the disease. Two WCHS riverine forest sites were selected for pre- and post-monitoring to determine the success of the spraying exercise, and the levels of incidental species bycatch. Comprehensive invertebrate monitoring activities have been carried out at WCHS since 2005, with species collected and sent to the University of Calgary for analysis.

Finally, medicinal plants surveys were undertaken within the sanctuary area in 2007 and 2008. Plant species were photographed and documented. Eighteen species were identified as having medicinal uses, and specimens were analyzed at the University of Ghana. The study helped to define appropriate and potential uses for the local population. No harvesting of identified species has yet been permitted by the Sanctuary Management Board.

Conservation through alternative livelihoods

The positive biodiversity impacts seen in sanctuary – stabilization of the hippo population and the maintenance of greater species richness and diversity within the conservation area – have been achieved with the cooperation and support of local communities. Sanctuary bylaws prohibit farming, bush-burning, hunting, the cutting of plants and trees, and vehicle access within the sanctuary area. These same bylaws restrict fishing, oyster collection, keeping livestock, and harvesting of various crops. By removing these

traditional income-generating activities, it has been necessary to provide local residents with alternative livelihood options and conservation incentives.

WCHS provides training in value-added secondary processing, which gives the local population a market premium for sustainably harvested, organic products. The organization has also demonstrated the benefits of conservation for local wellbeing. Perhaps most importantly, revenues from ecotourism and other conservation activities have been invested into local infrastructure and to fill service gaps in education, health and energy.

Environmental education and outreach has helped to improve local awareness about sanctuary activities and the imperative of biodiversity conservation. WCHS has produced three publications titled 'What is the Wechiau Community Hippo Sanctuary?', 'Farming and Fishing', and 'Facts Living with Wildlife'. These have been distributed to almost three thousand community members at informational events. A fourth publication, 'Balancing Conservation and Tourism', was distributed in 2011. Ecological awareness assessments carried out in 2004 and 2007 found a high level of awareness of WCHS activities (and the benefits associated with their work) among primary and middle-school students in the sanctuary's seven schools.

Local bylaws and the core zone

Local bylaws have been reinforced through demarcation of the core zone, employing rangers within the sanctuary area, and the installation of wildlife cameras. In 2007, preliminary steps were taken to establish a permanent and visible boundary line between the core zone and the development zone. In 2008, over 100 mahogany saplings were planted during the early rainy season for this purpose. Mahogany was selected because it is fire-resistant, is indigenous to the sanctuary, and is non-edible. A wide fire belt was also cut along the demarcation line to prevent the spread of seasonal bushfires from farmland in the development zone. Much of this planting was undertaken by the sanctuary's team of ten rangers, who conduct maintenance within the sanctuary and monitor human incursions through regular patrols. In 2007, the rangers were issued bicycles, while Calgary Zoo supplied them with boots and machetes. Illegal human activity within the sanctuary area has also been limited by the motion-activated wildlife cameras. The cameras have served a dual purpose of capturing images of the sanctuary's rarer wildlife species, as well as evidence in cases of illegal poaching or hunting by community members.

SOCIOECONOMIC IMPACTS

The social and economic benefits of WCHS work in the sanctuary communities have been substantial. The ecotourism venture alone has generated over fifty jobs for local residents. The organization has also been active in promoting alternative livelihoods through value-added secondary processing, notably including a shea butter program. Perhaps the greatest impacts however have come in the form of infrastructural improvements. WCHS has made significant investments in sustainable energy provision, fresh water access, education, and health programs. All investments in community

works have been undertaken with sensitivity to the local cultural context and respect for the various ethnic groups that constitute the local population. Survey data confirms that local attitudes to WCHS are overwhelmingly positive.

In 2010, a study was undertaken which examined the relative gains for resident communities from the sanctuary model since its inception. As a measure of infrastructure gains, new infrastructure acquired by the sanctuary's 17 communities between 1999 and 2007 was compared to infrastructure acquired by all other 93 communities in the Wechiau Paramourty during this time. (The communities outside the sanctuary are ethnically and socioeconomically comparable.) The study found that the number of new amenities – including health clinics, school blocks, new roads, and boreholes – per community was higher in both large and small settlements within WCHS.

Investments in clean water and energy access

WCHS has funded and coordinated borehole drilling in the sanctuary. This has provided all seventeen sanctuary communities with access to clean drinking water. In 2002, only seven communities had a supply of safe drinking water in their settlements. The need for water – and to access the local river – was one of the main reasons and key drivers for community incursion into the core zone. Between 2005 and 2008, eleven boreholes were drilled using funding from international donors. This has subsequently reduced human pressure on the core conservation area and improved local health conditions.



The success of the borehole project gave the organization the confidence that other improvements to local infrastructure were possible and ultimately inspired the Wechiau Solar Lighting Initiative, started in 2005. Of the seventeen sanctuary communities, only the Wechiau town site qualified to be connected to the national electricity grid, leaving the remaining settlements without electrical light sources. With funding from Canadian Hydro Development Incorporated and solar-powered LED lighting systems designed by the Light Up the World Foundation of the University of Calgary, WCHS set a target of installing 550 individual units in the seventeen communities. They accomplished this goal by 2009. Lighting systems



came in the form of box lights and pole lights and were initially installed in the houses of chiefs and headmen. Installation required an initial tariff fee of around USD 8.25. Community contributions were paid into a local banking firm to establish a capital investment fund, which has been used to cover the maintenance costs of the program. By the end of 2006, the fund had accrued over USD 2,000.

Investments in health and education

The organization has attracted international donors to fund primary and secondary schools in the sanctuary communities, as well as three health clinics. Between 2005 and 2007, a primary school building with a teacher bungalow was constructed between the communities of Bulinche and Talawona in the WCHS development zone. The school was inaugurated in September 2007 by the school's patron and namesake, Heather Graham, as part of an official delegation from the Calgary Zoo. Today, the Heather Graham Primary School serves over 200 children. Six teachers offer instruction in seven grades. The success of this first project led to the construction of a second primary school, with a site in the north of the sanctuary. The Cynthia Philips Primary School, constructed in 2009, serves the communities of Tuole, Kpanfa and Teme. Children in these communities previously had to walk a great distance to attend school. So too, seasonal flooding of the road prevented attendance for some communities for more than half a year. WCHS has also established a school twinning program, which partners schools in Canada with the sanctuary schools and facilitates the transfer of school supplies

and the cultivation of cross-cultural relationships. By 2008, schools in Calgary had raised a total of USD 4,000 for schools in Wechiau and Tokali communities. Another independent effort raised around USD 1,000 in 2008 for the schools at Kantu, Tokali, and Dornye.

Older students have also benefitted from WCHS work. Two scholarship funds have enabled academically-gifted students from sanctuary communities to attend high school. The 'Friends of Wechiau' group was founded in 2004 and is based in the UK, with a global membership consisting primarily of past visitors to Wechiau. To date, donations raised through this program have paid for nine students (one female) to attend high school. The first graduate from this program returned to work for WCHS as a tour guide. The scholarship program has been supplemented by the WCHS Education Fund, which had used international donor contributions to sponsor six students in high school education by 2008.

Partnerships have also improved the delivery of health services to communities in the sanctuary. A notable partnership with the University of Calgary has facilitated the delivery of medical supplies. The program, called 'Hope for Health', was established in 2007 with the aim of providing continuous and predictable shipments of medical supplies to the health clinics of Wechiau and Dornye, and Talawona. A preliminary needs assessment was conducted, and supplies are shipped to meet these needs on a quarterly basis. These shipments have continued, and recently included a movable hospital bed.

Sanctuary employment and shea nut harvesting

Local incomes and livelihood options have greatly improved as a result of WCHS work. Most directly, community members have been employed by the sanctuary. More than 50 people receive regular income as paid sanctuary staff. Included in this group are three stipend-receiving land owners, 17 full-time employees and 31-41 commissioned staff. More than 100 additional individuals have benefited from part-time or seasonal employment as masons, painters, unskilled labourers, dancers, and artisans.

Since 2008, WCHS has also made concerted efforts to improve alternative livelihood options for local community members. Primary among these efforts, and certainly the most successful, has been income generation through the harvesting of shea nuts within the sanctuary. A baseline survey was conducted in 2007 which found significant market opportunities for shea butter. A training workshop was then held by the Savannah Fruits Company, a shea butter exporter. Two members from each community attended and were given advice on harvesting and storage techniques for shea nuts. To empower and benefit local collectors, WCHS applied for and received organic, fair trade and conservation certification for the project. The group also started exploratory conversations on the construction of a shea nut processing center and storage units within the development zone. The Savannah Fruits Company agreed to pay a 5% 'conservation premium' on shea nuts collected by sanctuary communities.



In 2008, 716 women were registered members of the organic shea nut cooperation. Their first harvest was purchased by the Savannah Fruits Company for USD 12,438. In 2010, an additional 309 women registered to join the cooperative, bringing the total number of trained collectors to 1,445. The 2010 harvest value was USD 16,000, with an organic premium of USD 2,400 going directly to the collectors at the end of the season. The total value of organic shea nuts purchased through the cooperative to date is USD 52,000.

The organic shea butter processing center is under construction and will be completed in two phases. The first phase included construction of a warehouse in the town of Wechiau where all nuts purchased in the organic certified villages of the hippo sanctuary will be stored until being transferred to Tema Harbour for shipping. A second phase of construction is scheduled to conclude in 2012.

Benefit sharing between ethnic groups

Despite the disproportionate authority that Wala have as chiefs and landowners, employment and infrastructure benefits have spanned ethnic divisions, gender and the sanctuary's geographic expanse. Ethnic representation among sanctuary employees reflects their traditional skill sets and geography. For example, boatmen are usually Hausa or Birifor from Talawona, Kpanfa and Kantu, the three communities where tourists access the water for river safaris. Tour guides are Wala from Wechiau, where the visitor centre is located. Rangers are distributed throughout the development zone and include a mixture of Wala and Birifor. The shea cooperative has benefited families in all 17 communities, while infrastructure improvements and solar light installations have also been delivered across the sanctuary. A survey of attitudes among those community members most adversely affected by sanctuary work – herbalists, fishers, oyster collectors and farmers bordering the core zone – found that 72% of respondents acknowledged benefits of WCHS work to local people, particularly infrastructure (67%), but also employment (9%) and an improved economy (4%). While 33% did express grievances over lost farmland or access to oysters, firewood and forest herbs, 35% used the survey to express appreciation of what WCHS had done for the area.

POLICY IMPACTS

In 2009, Wechiau Community Hippo Sanctuary was designated as one of Ghana's first community resource management areas (CREMAs). This outcome was the culmination of a three-year process of advocacy and lobbying. The initiative is implemented by the Ghana Wildlife Division of the Forestry Commission, and is a government-designated protected area scheme which recognizes and transfers authority to local people to manage their own parklands. The Wechiau Community Hippo Sanctuary was used as a model during the initial design of the CREMA designation. Since this legal category was created, a number of other community-run programs across the country have secured CREMA status. The formal designation process for WCHS was finalized in the latter part of 2010. The Certificate of Devolution was handed over from the Ministry of Lands and Mines to the sanctuary on 5 May 2011 at a traditional durbar celebration.

Sustainability and Replication



SUSTAINABILITY

WCHS is socially and financially sustainable. Infrastructure and community development projects have a high level of support from sanctuary inhabitants, with a high level of uptake for solar-powered lighting systems and an equitable distribution of infrastructure improvements across the sanctuary communities. Forty percent of women in the sanctuary are registered members of the organic shea cooperative, which offers a viable source of income over the long-term. The financial sustainability of the shea project will only be strengthened with completion of the shea nut processing center. This combination of local engagement in alternative income-generating projects with investments in local infrastructure has underscored the success of WCHS in fostering trust and legitimacy with the local population.

One key success factor has been the governance and management structure of WCHS, notably because of its ties to local and traditional authorities. Chieftaincy remains integral to Ghana's electoral system. As land owners, chiefs are a respected authority that external agencies can engage directly. And in the relationship between chiefs a balance of power has been established that facilitates accountability, transparency and the equitable distribution of benefits. Although all chiefs are Wala, the creation of a Sanctuary Management Board has allowed all ethnic groups and communities to be represented in decisions regarding the sanctuary. Consequently, the designation of the protected core zone, the establishment of conservation-related by-laws, and the negotiated resettlement of communities were model examples of subsidiarity in practice.

Sustainability and challenges and adaptation

Despite the organization's successes, challenges remain. The rate of infrastructural improvements to date has become the status quo, and a lack of new installations in the future could lead to dissatisfaction. Future elections of chieftains whose interests are not aligned with

the sanctuary model could threaten its sustained success. Poor leadership could also allow nepotism, the marginalization of ethnic minorities, or limit opportunities to express grievances. Trained staff could seek employment outside the sanctuary with tourism operators, or the success of the sanctuary could attract migrants from Burkina Faso (this has been observed to an extent with child migrants crossing the river and core zone to attend primary school in the sanctuary area). Ecological threats also exist. Activities outside the sanctuary's control within the Black Volta River could impact the hippopotamus population. The effects of climate change, while difficult to predict, could cause droughts or flooding, both of which would impose extreme strains on the ecosystem and population.

The sanctuary has already shown significant resilience to these kinds of external shocks, however. When flooding rendered several hundred thousand people homeless in northern Ghana in 2007, the loss of homes, farms and key habitats inside the sanctuary were avoided because of prior resettlement of riverside dwellings as well as the ecological integrity of the core zone. Underpinning the sanctuary's socio-ecological resilience is the Sanctuary Management Board, which has formalized a decision-making platform upon which the community can rely when faced with emerging economic and biodiversity threats.

Another critical success variable will be the ability of the project to bring continuous financial benefits to the sanctuary population. The chief source of income for WCHS is ecotourism. The number of visitors to the sanctuary has risen steadily each year, owing in no small part to references in a number of popular guidebooks published in 2004. In 2008, there were 1,815 visitors to the sanctuary, of whom 1,018 were Ghanaian. This generated USD 7,458, which comfortably covered salary expenses of USD 3,061. The sanctuary has been self-sufficient since 2004, with visitor-generated income increasing every year apart from 2005.

WCHS has prioritized strategies that enhance the eco-tourism experience for visitors. Notably, the organization has produced high quality interpretive signs for use within the sanctuary. Similarly, the group has been working for more than four years to produce and publish a WCHS Guidebook. The book will act as a reference or spotter's guide for tourists to the area, with useful chapters on the history of the project, the people of the area, hippos, plants, birds, and other species, including a chapter dedicated to common insects. NCRC and the Calgary Zoological Society conducted a visitor survey in 2007 which provided more concrete recommendations on how to improve upon the ecotourism experience provided by the group.

Financial support from international donors remains critical to survival of the sanctuary. This includes both monetary and in-kind investments from the Conservation Fund at the Calgary Zoo, who have also provided technical support through Donna J. Sheppard, the long-term Sanctuary Advisor and Community Conservation Coordinator, as well as other staff members seconded to WCHS. The health and education programs have been funded by donations from specific international organizations and individuals, while the solar lighting initiative also received initial technical support from Canadian Hydro Developers Incorporated and the Light Up the World Foundation. WCHS's policy of selling lighting units to community members at concessional tariff fees, which are then paid into a capital investment fund, ensured that the project's long-term sustainability was ensured. The organic shea nut butter venture represents another viable strategy for financial sustainability.

REPLICATION

To date, the WCHS model has been replicated at three sites in Ghana. In addition, the expertise of sanctuary management personnel has been requested in conjunction with the Nature Conservation Research Centre (NCRC) for development of a comparable site in Liberia. Discussions are also currently underway for the creation of a trans-boundary protected area with Burkina Faso, with the government planning to reinvigorate forest protection along a large stretch of the Black Volta River (including areas abutting WCHS) and holding the intention to use community-based approaches to ease implementation. This potential collaboration would help secure the wider ecological integrity of the Black Volta riparian zone and the spread of lessons learned through the operation of WCHS.

One example of replication within Ghana is the Avu Lagoon Sitatunga Conservation Initiative in the south of the Volta Region. NCRC carried out an initial study in 2005 to gauge the possibility of establishing a community-managed sanctuary for the rare Western Sitatunga antelope. This led to the formation of a representative Management Board in July 2006, with regular meetings held on constitution development, boundary demarcation, and bylaw creation, all of which were modeled on the founding of WCHS. Socio-economic surveys were conducted in the area, which contains fourteen indigenous communities. The initiative applied for CREMA status at the culmination of the community engagement process.

PARTNERS

As of 2008, significant domestic and international partnerships included the following organizations and stakeholders (listed in alphabetical order): Alice Jamieson Girls' Academy; Calgary Zoological Society; Canadian Hydro Developers Incorporated; Friends of Wechiau Group, Ghana Tourist Board; Healthy Hope for Health (formerly Healthy Humans, Healthy Hippos); Light Up The World Foundation; Nature Conservation Research Centre; Savannah Fruits Company; Stanley Jones Elementary School; the University of Calgary, USAID; and the Wa West District Assembly.

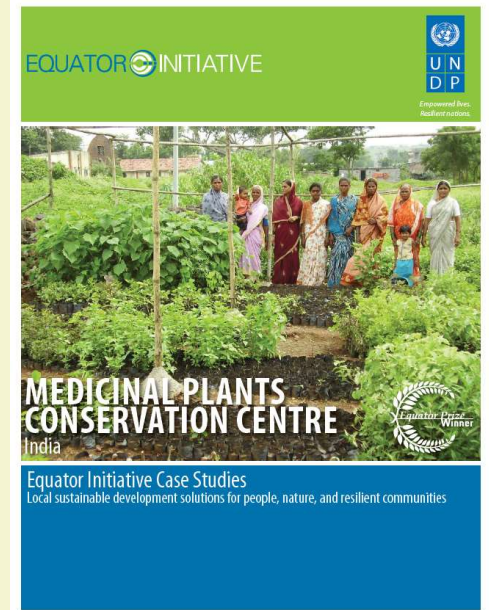
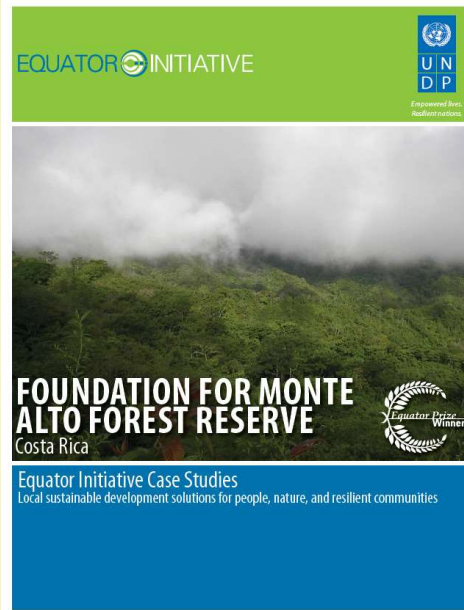
Additional support through the Conservation Fund at the Calgary Zoo includes the following benevolent funders and organizations: Alex and Heather Graham; Amanda Green; Andrea Brussa; Ashley-Harvey Family; Kinsmen Club (K-40s) of Calgary; Michael A. Kostek School; Norman Nemith and the Northmount Kiwanis Club of Calgary.



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