

Green Ologbo: an integrated project for sustainable development of oil palm plantation

**VERWILGHEN A.¹, RENEVOT G.², SOENGAS LOPEZ B.³,
CHAMBON B.⁴, MCALEER V.⁵**

¹ CIRAD, UPR Systèmes de Pérennes, Benin City, Nigéria ; CIRAD, UPR Systèmes de Pérennes, Montpellier, F-34398 France.

² CNEARC, Montpellier, F-34398 France.

³ ENGREF, Montpellier, F-34398 France.

⁴ CIRAD, UPR Systèmes de Pérennes, Montpellier, F-34398 France.

⁵ PRESCO Plc / SIAT, Benin City, Nigeria.

Corresponding author:

Aude VERWILGHEN

CIRAD-PerSyst, TA-B 34/02, Avenue Agropolis,
34398 Montpellier Cedex 5, France.

Telephone : + 33 (0)4 67 61 71 29

E-mail: aude.verwilghen@cirad.fr

Abstract:

Presco Plc, a member of the Siat group, is a company operating in Nigeria producing and processing oil palm for the domestic market. The company decided to extend its plantation and implement a sustainable project, the “Green Ologbo” project, promoting biodiversity conservation and ecosystem services as well as enhancing local development and social well-being. The project is carried out in collaboration with Cirad (French Agricultural Research Centre for International Development), with support from many other stakeholders.

This paper aims at sharing experience gained on this project about oil palm extension and minimization of environmental and social negative impacts.

A first step, in addition to investigations about agricultural capacity, was to conduct environmental and social impact assessment, with emphasis on high conservation value (HCV) areas identification.

Results of these studies were integrated into planning, with the production of a land use map of the concession, integrating conservation areas into the oil palm plantation and the development of a conservation action plan.

An active protection policy was implemented to combat the threats to the conservation areas. In addition, an environmental and conservation awareness / education programme has been initiated among surrounding communities so as to strengthen the protection efforts. Besides this, the company is progressively supporting local

development of these communities through employment, social actions and development of an outgrowers scheme, in order to enhance positive social impacts of the new development of Presco and to reduce pressure on the protected area by providing alternative economic activities.

With a view to guiding the action, ecological and socio-economic monitoring has also been initiated to assess the impacts of the Ologbo project both on the human and natural environment and to measure progress made.

Although this project is so far quite an achievement, some difficulties were faced and questions raised, mainly linked to biodiversity and social issues.

This specific field case has shown that oil palm growers, in coordinated efforts with all interested stakeholders can, and definitely have to be actors of conservation. But it also reminds us of the complexity and sensitivity of integrating social issues as the key to success for sustainable development. Indeed, it is not easy to change our mindset in order to move from a “sustainable production” approach to the sustainable management of a complex agro-socio-ecosystem.

Key words: conservation action plan, environmental and social impact assessment, high conservation value, land use map, Nigeria, oil palm.

1. Introduction

Presco Plc, a member of the Siat group, is a company operating in Nigeria (*figure 1*) producing and processing palm oil for the domestic market.

The company is acquiring about 11,000 ha of new land in the Ologbo area for oil palm development. It wants to implement, a sustainable project, the “Green Ologbo” project, promoting biodiversity conservation and ecosystem services, as well as enhancing local development and social well-being. This project is conducted in partnership with Cirad (French Agricultural Research Centre for International Development) and with the collaboration of many stakeholders.



Figure 1 : Location of Presco.

A first step was to complete the environmental and social impact assessment, with emphasis on high conservation values (HCV) identification, in addition to investigations about agricultural capacity. The studies carried out in the framework of this integrated assessment have served to produce a land use map of the agroecosystem, integrating conservation areas into the oil palm plantation, and to develop a conservation action plan. Protecting the area set aside for conservation (patrolling, sensitization of local communities, etc.), implementing good agricultural practices, enhancing local

development (water facilities, electrification, education, outgrowers scheme, etc.) and putting in place ecological and socio-economic monitoring are also part of the project.

This paper aims at sharing experience gained on this project about oil palm extension and minimization of negative environmental and social negative impacts, in line with Roundtable on Sustainable Palm Oil (RSPO) principles and criteria (RSPO, 2006). The different activities will be presented, reflecting the “assess, plan, act, check” process, and then difficulties encountered, lessons learnt and questions raised will be discussed.

2. Assessing the agricultural capacity of the concession and the environmental and social issues

In the framework of an integrated assessment, we aim to evaluate the foreseeable impact of Presco’s extension in the zone and prospects for development, as well as to identify potential actions/measures that could lessen negative impacts and enhance positive ones.

A formal environmental impact assessment (EIA) has already been conducted by a government accredited body (BLUE FIN, 2004) but it appears to be insufficient to comply with RSPO principles and criteria and for decision making (VERWILGHEN, 2005).

It therefore seemed important to carry out additional work, in order notably:

- to assess the agricultural capacity of the concession;
- to identify the conservation value of the concession in respect of exceptional or critical ecological attributes (e.g. endemic, endangered species or ecosystems), the services provided by the ecosystem (e.g. erosion control, watershed protection) and social functions regarding cultural, ecological, economic or religious significance (e.g. non-timber forest products, holy sites);
- to take a more in-depth look, at a local level, at the social dynamics and the natural environment exploitation dynamics (demography and population distribution, history of settlement and land use, customary rights, level of dependencies of local communities on land and natural resources, etc.).

2.1. Methodology

To gather information about natural resources, socio-economic dynamics, local perceptions and local knowledge, we have combined biophysical and ethno-ecological approaches, based on tools and methodologies such as HCV identification (JENNINGS *et al.*, 2003), multidisciplinary landscape assessment (SHEIL *et al.*, 2002), agrarian diagnosis and typology of household activity systems.

External expertise from local and international non-governmental organizations, research institutes and universities was called in and various methods were used:

- village-based activities: census, participatory mapping (*figure 2*), data collection (surveys and scoring exercises) among representative groups (youth, females, elders, etc.) and key informants (hunters, medicine men, traditional leaders, etc.), market and household surveys. There was a preliminary overview of all human settlements in the area, then representative villages were chosen for more detailed surveys;

- field-based activities: landscape analysis, topographic and soil surveys (*figure 3*), vegetation surveys, fauna surveys (*figure 4*) focused on bio-indicator groups (birds, butterflies, primates) and flagship species;
- expert knowledge: conservation values, national and local dynamics, etc.. The use of local experts' knowledge was made notably to characterize more effectively the conservation value of the Ologbo Forest Reserve in a regional/national setting;
- satellite image interpretation and over-flying part of the concession.

A geographical information system (GIS) was used to aggregate the data and produce maps.



Figure 2: Participatory mapping
(Source :G. RENEVOT, 2005)



Figure 3: Soil observation
(Source :A. VERWILGHEN, 2005)



Figure 4: Bird survey
(Source :A. VERWILGHEN, 2006)

2.2. Overview of socio-economic and natural environment

The surveys have highlighted a complex and differentiated human environment (*figure 5*) with a fair number of social challenges, due to a highly anthropized territory, a high migration rate and very high land pressure.

The zone is highly populated: many villages and camps are situated near, or even inside (such Well 3 Camp), the estate concession. Ologbo is the largest settlement, with approximately 11 500 inhabitants ten years ago (BLUE FIN, 2004).

As reported by BLUE FIN (2004), VERWILGHEN (2005), RENEVOT (2005) and SOENGAS LOPEZ (2005), different types of populations of various ethnicities have settled in the zone: natives, migrants who have been settled for more than 25 years, and recent migrants who have settled permanently or who are present during the week but return to Benin City at the weekend.

All these populations partly depend on the concession for their subsistence: hunting, plant gathering and fishing are commonplace and play an important role in some families (SOENGAS LOPEZ, 2005). But the main activity remains agriculture and for that purpose the concession is a land reserve of major importance (VERWILGHEN, 2005; RENEVOT, 2005). Despite the forest reserve status, exploitation of the zone by the local populations (native and non-native) goes back a very long way (poaching, illegal forestry and farming). When Presco acquired the land in 2003, it was already widely farmed by the local populations: mostly subsistence farming on the agriculture/forest frontier in the West Ologbo concession; while the Obasyui concession was completely cleared and exploited, mostly for food cash crops (VERWILGHEN, 2005). More recently, the pressure on the remaining forest area has greatly increased.

The territory is roughly divided into two major ecological zones (figure 5, figure 6).

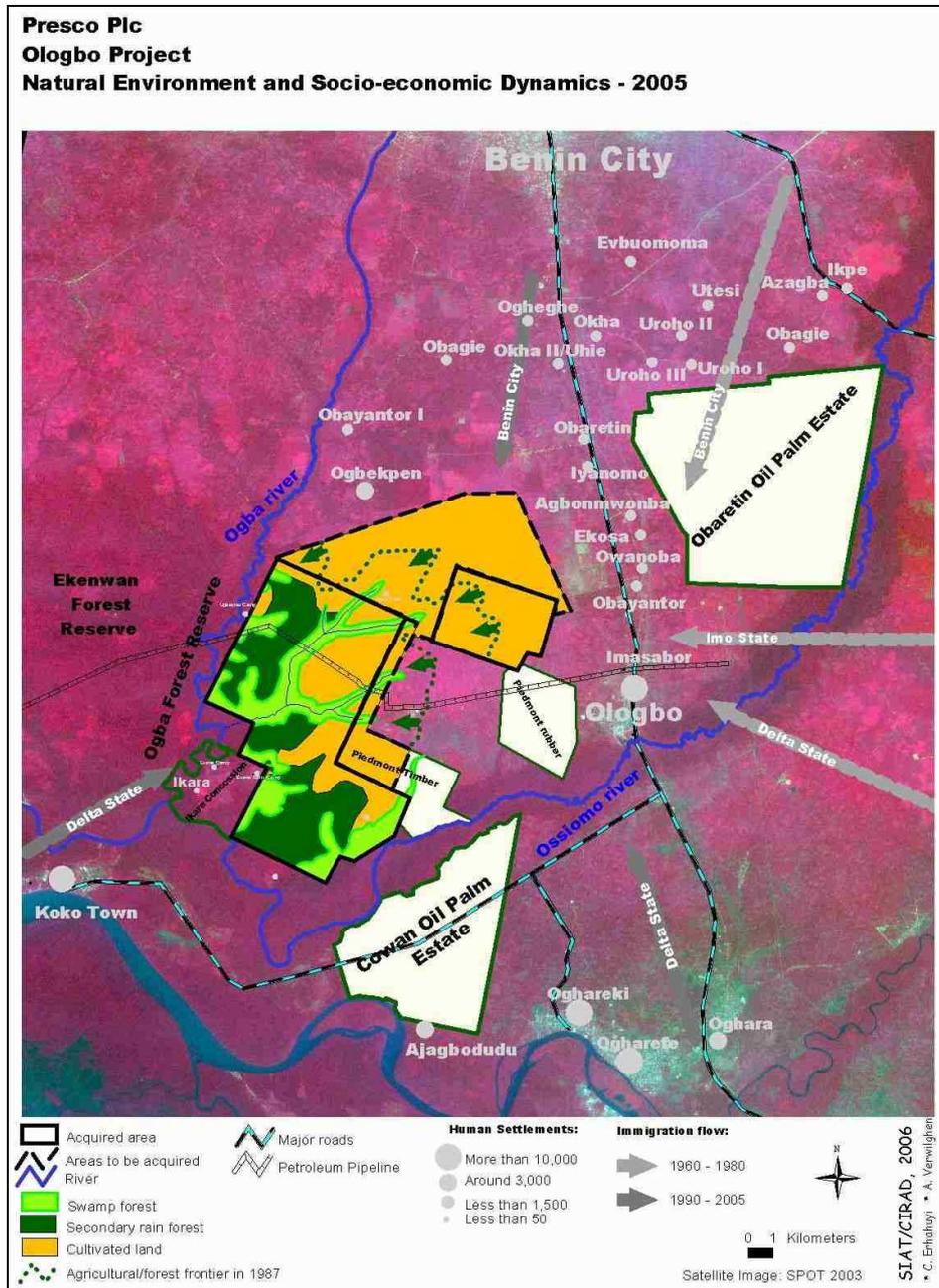


Figure 5: Natural environment and socio-economic dynamics.

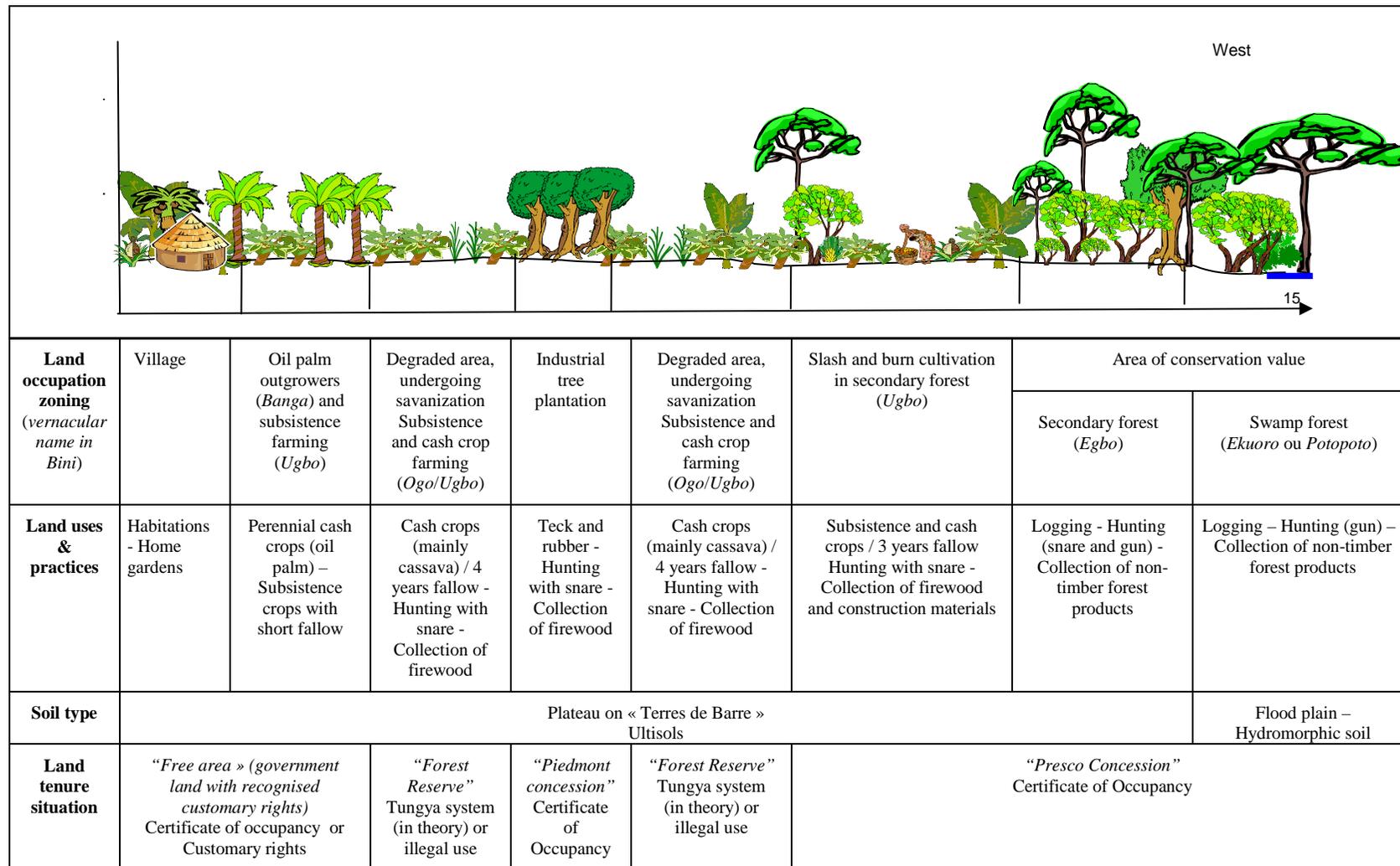


Figure 6 : Typical toposequence in the Ologbo area. Source: adapted from RENEVOT (2005) and SOENGAS LOPEZ (2005).

The northern area (including the already acquired former Obasuyi concession and the northern part of the Ologbo Forest Reserve), a patchwork of young fallow and cultivated land (slash and burn agriculture, mainly cassava as cash crop), is of very low conservation value from an ecological point of view but has good agricultural capacity (even if already degraded by cassava cropping).

The southern area (the West Ologbo concession which is the former western part of the Ologbo Forest Reserve), still partly covered with secondary lowland rain forest and characterized by many wetlands (VERWILGHEN, 2005; BOURGEON, 2005), is severely degraded by intensive logging and is being rapidly encroached by farming. However, ecological surveys have shown that this forest ecosystem, due its structure and composition, has a good potential for regeneration (GREENGRASS, 2007; OGUNJEMITE, 2007) and that it is still hosting valuable biodiversity (GREENGRASS, 2006; MWANSAT, 2007; OGUNJEMITE, 2007; PRESCO, 2004; SOENGAS LOPEZ, 2005; TURSHAK and MANU, 2006; WARREN, 2007). For example, TURSHAK and MANU (2006) have identified in the Ologbo concession two species of birds that are both listed as 'near threatened' under the World Conservation Union (IUCN) threatened species category: yellow-casqued hornbill (*Ceratogymna elata*) and Hartlaub's duck (*Pteronetta hartlaubii*). The presence of the white-throated monkey (*Cercopithecus erythrogaster*), a species endemic to south-western Nigeria and southern Bénin and classified in the IUCN red list as vulnerable, was also confirmed by GREENGRASS (2006). The chimpanzee (*Pan troglodytes*), classified as an endangered species, was suspected to be present in the concession. However, according GREENGRASS (2006, 2007), if chimpanzees are confirmed to be present, they occur at a very low density and the viability of this local population is therefore questionable.

The area of the remaining forest inside the Ologbo concession is quite limited and may not be sufficient for an efficient conservation policy regarding some species, which have large habitat requirements. However, in connection with the adjacent forest reserves along its western side and the linked riparian swamp forest of the outside landscape, the Ologbo concession could act as a refuge of importance at a national and regional scale.

Indeed, as detailed by RENEVOT (2005) and SOENGAS LOPEZ (2005) in their studies, the development of Presco's plantation will cause changes to the socio-economic and natural environment, both positive and negative.

This project is an opportunity for conservation, reversing the on-going biodiversity degradation process. However, because the extension is located in a highly populated area with customary use of land and natural resources by local populations and migrants (even if it appears to be "illegal" and unsustainable use), taking social concerns into account is also a major challenge (VERWILGHEN, 2005). The company needs to seek the strong involvement and support of all stakeholders in order to avoid land use conflicts and to implement effective protection of areas set aside for conservation, finding the right balance between local development and nature conservation (VERWILGHEN, 2006, 2007).

To achieve its goals, the project requires appropriate land use planning and management measures, as well as careful monitoring.

3. Incorporating the results into planning: development of a land use map and a conservation action plan

Based on the agricultural suitability, the conservation value and the socio-economic dynamics, a land use map of the concession has been drawn up (*figure 7*).

The total planned area for Presco's development in the Ologbo zone is about 11,300 ha: 7,300 ha is already acquired (West Ologbo concession and former Obasuyi concession) and about 4,000 ha is in the process of being acquired.

The protected area, which will not be planted with oil palm but set aside for conservation, represents about 54 % of the acquired concession and 36 % of the total planned concession.

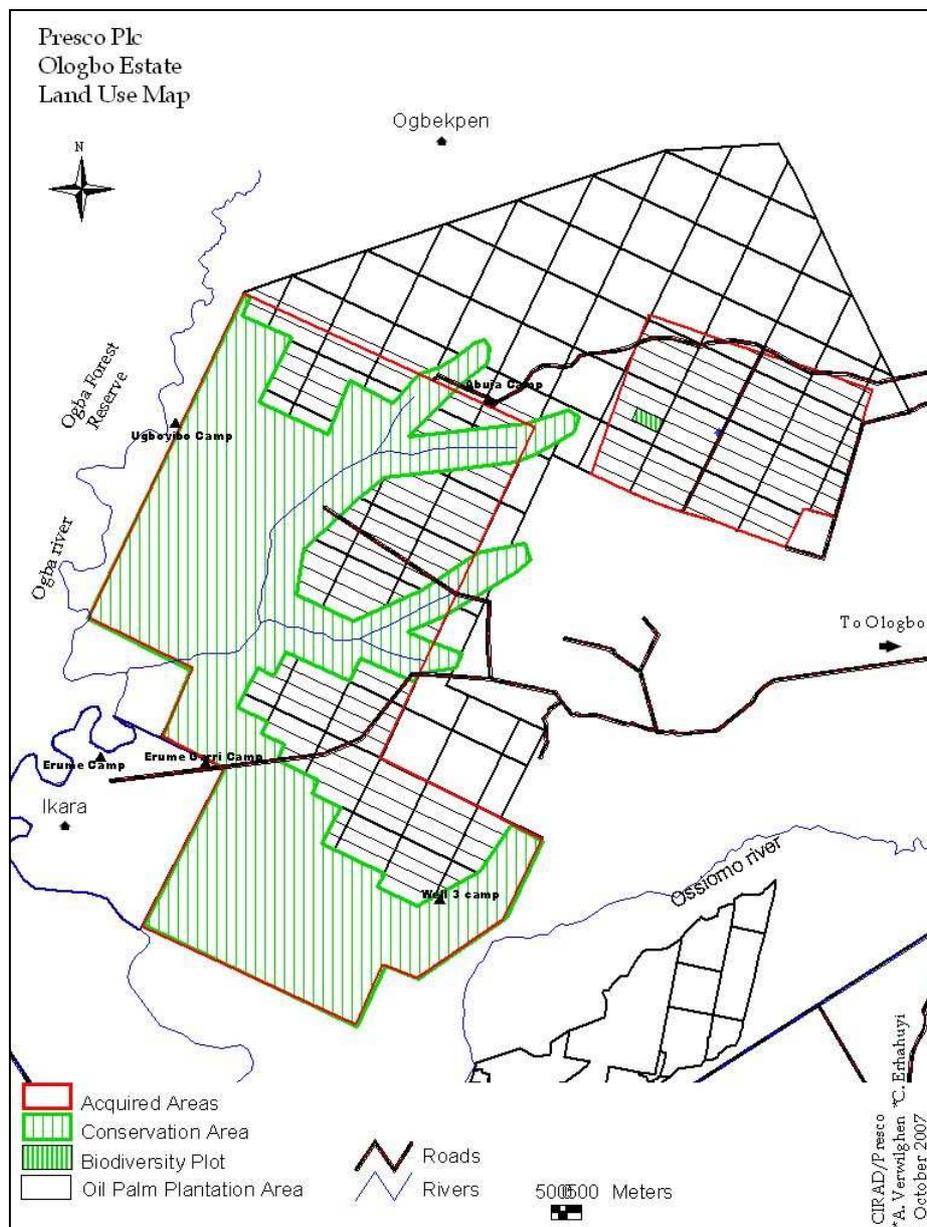


Figure 7: Land use map of Presco concession at Ologbo

This protected area includes riparian forest and swampy areas and is of no economic value in terms of plantation development (unsuitable areas: low production, high cost of drainage), although it does have significant value for protection of the river floodplain ecosystem, which is critical for watershed functioning (water catchment and flood control, sediment and nutrient retention, etc.) and for wildlife conservation. Large buffer zones along swamps and watercourses, including sloped areas (risk of erosion), are set aside from planting, and act as an additional protection of the watershed and as a wildlife corridor.

Most, if not all, of the rain forest areas left inside the concession are integrated into the protected area, notably the large patch in the north-western part of the West Ologbo concession, where chimpanzee presence was suspected.

The design of the protected area also integrates a wildlife corridor to join the northern and the southern areas of the West Ologbo concession. Moreover, as it is including part of the riparian swamp forest of the two major rivers delimitating the southern and the western boundaries of the concession (Ossiomo and Ogba rivers respectively), it will allow wildlife to move in the neighbourhood of the estate through this riparian swamp forest. The protected area inside the estate could therefore act as a refuge for surrounding wildlife at a large landscape level.

The preliminary surveys have revealed a high encroachment rate of the remaining forest on its eastern and northern sides (mainly due to human pressure from the Ologbo and Ogbekpen communities). The oil palm plantation, as defined on the land development map, will act as a buffer zone to protect the conservation area from this human pressure. However, the rivers bordering the western and southern sides of the concession are also a threat to the integrity of the protected area, because they represent a means of access, especially for illegal loggers. In order to act as a clear demarcation of Presco's concession and to allow monitoring and supervision of the most remote area, it was decided to open a road and plant a strip of oil palms along the swamps at the western and southern limits of the concession (which is not demarcated by the main plantation). This represents for the company an additional cost and will be time consuming because of the remoteness of the area. For security reasons sterile palms are preferred so as to deter fruit theft, which might be an additional threat to the conservation area. The strip, which will not represent a barrier for wildlife movement (only about 45 to 50 metres wide, including the road and three rows of palms), should reduce encroachment inside the conservation area.

The former Obasuyi concession, in the northern area, is degraded land (grassland, cultivated and fallow land) of very low conservation value. In this concession, where planting has started in 2007 (568 ha planted), a small protected area of about 12 ha (named as "biodiversity plot") has been set aside for biodiversity conservation. The area retained for conservation is an old fallow, where the vegetation was the most diverse and with a larger proportion of young trees.

In addition, where possible (because of very few trees left in this concession at the time of acquisition), one tree per field (25 ha) was left standing. This is part of the integrated pest management policy of the company: those trees will, for example, act as a refuge for birds of prey (rodents being one of the main pests in oil palm plantations).

However, it is not sufficient to set aside from planting a conservation area, the next step is to effectively protect it and to monitor the effectiveness of actions. Activities must be planned, with clear responsibilities and targeted deadlines.

Therefore, besides the preparation of the land use map, a conservation action plan has been developed and integrated into Prescco's environmental and social action plan.

4. Implementation of conservation action plan and local development

An active protection policy has been implemented, as well as an education and awareness programme, to reduce the threats to the conservation area.

Beside this, the company is supporting local development of surrounding communities, in order to enhance positive social impacts of the new development in the area and to reduce pressure on the protected area by providing alternative economic activities.

4.1. Protection of the conservation area

The conservation area needs to be protected to prevent farming, logging, hunting and over-exploitation of non-timber forest products.

For this there is first a need to clearly demarcate in the field the area to be conserved, with marking along the boundary and signboards at strategic locations. This work has started. Check-points have also been set up at strategic points to control access.

A team of 13 persons has been recruited and trained as ecoguards in collaboration with the Okomu National Park and a consultant. These ecoguards are patrolling for the protection of the conservation area. Beside their law enforcement duties, which are carried out with the support of the Forestry Department, the ecoguards are raising awareness for conservation.

Getting the support and involvement of the surrounding communities for preservation of the protected area is essential for success of conservation. Thus, in addition to the daily sensitization carried out by the ecoguards, an environmental and conservation education / awareness programme has been initiated, in collaboration with a team from the Environmental Education Unit of the College of Education, Ekiadolor, Benin City.

Various activities are being carried out by the team in order to communicate the the company's programme related to the Ologbo project and to educate surrounding local communities as well as Prescco staff on environmental and conservation issues.

In 2007, all human settlements within the area of the project influence were visited at least twice and all categories of people (notably elders and opinion leaders, youth, women) were addressed through meetings and seminars.

A one day seminar was organised for Prescco staff. Conferences were held for students and teachers of the junior and senior secondary schools in the catchment area. Conservation clubs have been set up in secondary schools. Educational materials such as posters, videos and books were used during this programme.

In addition to the intervention of the external team, in-house continuous training and awareness are also provided to Prescco staff through regular meetings and seminars.

4.2. Enhancing local development

In order to enhance positive social impacts of the new development of Presco and to reduce pressure on forest resources, the company supports local development of surrounding communities through employment, social actions and the development of an outgrowers scheme.

The new Ologbo development will provide more than 1,000 long-term jobs and some contract opportunities.

Additionally, as a general policy, one percent of the company's budgeted annual revenue is allocated to host community development in the areas of education, water, electricity, roads, employment, economic empowerment and culture, based on the identified needs of each community.

Through the outgrowers' oil palm development scheme, farmers are assisted with planting materials and technical input to develop their own oil palm farms. As a means of strengthening conservation efforts in the protected area, it represents an alternative economic activity and an agricultural intensification opportunity.

5. Monitoring impacts and checking efficiency of actions

After the assessment, planning and implementation phases, the manager needs to check the efficiency and the impact of actions taken, both on the natural and the social environment, in order to revise/update policy or the action plan.

5.1. Ecological monitoring

Ecological monitoring has been initiated in order to assess the impact of the Ologbo project on the natural environment and to measure the effectiveness of conservation measures, with the final objective of decision making.

Because it is impossible to have a complete view of biodiversity of an area, we have chosen to carry out wildlife inventories in the field (both dry and wet season surveys) targeted on certain taxa that are considered as good bio-indicators of the status of the environment (birds and butterflies). We have also targeted taxa that are in the spotlight of the conservation NGOs and the general public, i.e. "flagship species" (primates). We also aim to focus on fish because there is a dense hydrographical network in the zone. The fishery resource, as well as the condition of the hydrographical network (pollution, etc.), are of major importance to the local populations. The fish group can thus be used to assess the impact on livelihood (availability of the fishery resource) and as a bio-indicator with a view to monitoring the status of the rivers.

Complementary hydrological surveys are also carried out.

The encroachment rate inside the protected area is also monitored (forest cover, signs of timber exploitation and human activities) and vegetation surveys (vegetation structure, phytosociological indices, regeneration rate, etc.) are carried out in permanent plots set up within each habitat type of the protected area.

5.2. Socio-economic monitoring

Socio-economic monitoring has been set up to provide the company with tools to assess the impact on local populations and so to guide actions with a view to limiting conflict and enhancing local development (CHAMBON, 2006).

The aim was also to make a contribution to the social approach to sustainable development of oil palm estate, by providing initial feedback from the field regarding the criteria and indicators proposed by RSPO, in the framework of the pilot implementation period launched by the roundtable in 2006.

The survey was initiated in 2007. It is to be carried out on an annual basis. Data collection is done at the household level. The main topics studied are the farming activities, natural resource exploitation and use, relations between Presco and the communities, culture and religion as well as social facilities. In order to show the change that would have occurred in the absence of agro-industrial development and so put the impact of Presco into perspective, two control villages were included in the sample.

6. Questions raised and lessons learned from this project

So far, many of the objectives of the project have been attained. However, difficulties were encountered during the impact assessment and implementation phases.

In order to move forward, we will focus on those difficulties, and some lessons learnt and questions raised will be discussed, based on the experience we had within the framework of the project.

6.1. Impact assessment and HCV identification

Like for other projects of this kind and importance, a formal environmental impact assessment (EIA) has to be conducted to obtain government approval before the development of a new large-scale oil palm plantation.

Experience to date has shown that, in the way they were usually carried out, EIAs were not sufficient to comply with RSPO principles & criteria (notably in view of HCV identification and prevision of impacts) and for decision making by plantation management. There are often gaps in terms of information collected (quality, quantity) and data collection process (participatory method), particularly for matters such as biodiversity and social issues. This is mainly due to time constraints to carry out the EIA or because of administrative/political issues. There is thus a need to go further, with additional surveys in the framework of detailed HCV identification at the national/regional level and at the concession level, in completion to the formal EIA.

In any case, we faced some difficulties with biodiversity assessment, which could be of general concern.

Indeed, there was a lack of baseline inventories on fauna, flora, human uses, etc. and of scientific knowledge *per se*, for the area concerned and sometimes even at a regional and national scale, which makes it difficult to assess the relative conservation value of the area within a broader level.

Considerable time, resources and expertise are necessary to conduct comprehensive surveys to meet, for example, the RSPO criterion 5.2., which assumes that “The status of rare, threatened and endangered species [...] that exist in the plantation or that could be impacted by plantation or mill, should be identified [...].” In particular, because it is rare by definition, considerable effort might be needed to answer the question: is there any rare species in the area concerned and what is its status? Given that experienced and reliable expertise to carry out field surveys is sometimes hard to find (e.g.: primate specialist able to identify species through vocalizations), the problem is exacerbated. It is clear that, particularly for biodiversity issues, it is not easy to evaluate to which level of detail we must conduct field surveys, in order to balance time and resource consumption with quality (robustness, reliability, etc.) of data collected.

Socio-economic issues are complex and difficult to address. Our experience has shown that preliminary surveys to clarify land issues (land use and ownership, customary rights) using, for example, participatory mapping may sometimes increase or give rise to inter-ethnic and political conflicts about those issues. There is a need for guidance for stakeholders on appropriate tools and methodologies for conflict resolution and negotiation processes.

Another issue is the role and responsibility of each of the stakeholders in conservation matters. Indeed, there is a need for prior mapping of “go” and “no go” areas for oil palm development, with HCV identification at a broader scale.

In some areas, for example in South-east Asia where the increased development of oil palm is alarming, many initiatives, often carried out by NGOs, have arisen whether for HCV identification at national or sub-national level or for production of adapted toolkits developing national definitions/interpretations, in order to support managers and others stakeholders efforts for local HCV identification. But in some areas, for example in Africa, this is lacking.

HCV identification and management involve effective conservation policy and land use planning at national and regional levels, with the strong involvement of government authorities, which is often lacking.

6.2. Decision making and implementation

Land issues are often a source of conflict and not easy to tackle. In situations where there is an overlap between legal and customary rights and where claimed customary rights are not recognised by government or commonly agreed with the other local users, decision making about the right to use the land for oil palm development and appropriate compensation to be made is not straightforward.

Even when there is no conflict of interest, decision making is not easy because of a lack of knowledge.

For example, landscaping for environmental and conservation purposes requires more research in landscape ecology and conservation biology for tropical species, in order to advice on width/shape of corridors, size of habitat and population characteristics for population viability, etc. The same applies for buffer zone the width along watercourses: there is a failure of local legislation, which often gives width of the buffer zones according to the width of the watercourses, whereas it should dependent on local

conditions (soil type, topography, vegetation cover). There are not yet widely agreed and scientifically based specific criteria to guide such decisions.

Other questions are also raised by the planter: what will be the influence of the inclusive conservation areas on pest management? Will it be beneficial, as element of integrated pest management (for example those conservations areas could represent a refuge for pest predators), or will it favour the development of pests and thus increase plant damage? Although it will act in favour of the equilibrium of the ecosystem, scientists cannot at this time say for sure what will be the consequences of this new landscaping.

After decisions about land use, comes the issue of management: how to manage those integrated areas, dealing with the issue of multi-functionality and multi-stakeholders?

Integrating the management of conservation areas into plantation management will require a change of perspective for managers, with new methods, the use of a broader expertise, etc. On this, much can be learnt from the experience of protected area management gained by conservationists and other stakeholders.

Because there is a need to compare the different options and assess their impact on the biophysical and human environment, the monitoring issue is crucial. However, consensual indicators and thresholds, based on reliable and robust data, are lacking. Research is carried out, notably on agri-environmental indicators (CALIMAN *et al.*, 2006), but there is still a lot to do on biodiversity and social issues.

Even if the tools may be available, sometimes the baseline information is not. For example, for the Ologbo project, a satellite image taken in 2003 was available but we could not acquire an updated one of good quality (because of cloud cover) for accurate assessment of the forest cover. Therefore, the demarcation of the protected area for the land development map and then the monitoring of its encroachment rate were estimated through field surveys and were not be as precise as expected.

As a major and encouraging lesson learnt, this project is showing that responsible oil palm growers can play an important role in conservation, not only by reducing the impact of their agricultural practices, but also by protecting valuable forest that would otherwise have disappeared. Indeed, we hope it will be the case for the Green Ologbo project: that development of the oil palm plantation area will represents a physical buffer to stop encroachment of the forest edge, and that the active protection policy will prevent forest clearance, hunting and logging inside the conservation area within the concession.

7. Conclusion

With leadership from Presco and Cirad, in collaboration with many others stakeholders, Green Ologbo is an ambitious project contributing to sustainable development. Thanks to this strong partnership between a private company, research, NGOs and local administration, many objectives have been achieved so far.

A comprehensive environmental and social impact assessment, including HCV identification, has been carried out. Based on this assessment land development was mapped, with more than half of the concession being set aside from planting for conservation purposes, and a conservation action plan has been developed. Effective

protection of the conservation areas is being implemented, with the support of a team of specifically trained ecoguards. A conservation sensitization programme has been initiated among the surrounding communities and the company is enhancing local development. Ecological and socio-economic monitoring is also in place.

To use the expression of DEFOER *et al.* (2007), one could consider the Green Ologbo project as an opportunity of “*co-apprentissage expérientiel*” (which could be translated as “experience based co-learning”). Many lessons were learnt, and some difficulties encountered.

The main issues raised are linked to biodiversity and social issues. For example, the lack of knowledge for decision making, notably on ecology topics (e.g. ecosystem functioning, population biology, etc.) and assessment tools (e.g. indicators and thresholds), was pointed out, putting the emphasis on the need to promote research on these topics.

To meet the target of sustainable oil palm development, in the perspective of land use planning and management, the coordinated efforts of all stakeholders are necessary for HCV identification at a regional and national scale, as initiated by RSPO.

Definitely, one has to move from a “sustainable production” approach to the sustainable management of a complex agro-socio-ecosystem.

Partnerships: AP Leventis Ornithological Research Institute (APLORI); Pronatura International; Nigerian Conservation Foundation (NCF) /Wildlife Conservation Society (WCS); Centre National d’Etudes Agronomiques des Régions Chaudes (CNEARC); Ecole Nationale du Génie Rural, des Eaux et des Forêts (ENGREF); University of Benin, Department of Botany (UNIBEN); Federal University of Technology, Akure (FUTA), Department of Fisheries and Wildlife; College of Education of Ekiadolor, Benin city, Environmental Education Unit.

Acknowledgments:

We are grateful to the DOEN foundation for its financial support



We thank Mr. Hubert Omont for valuable comments on the draft of the paper.

References:

BOURGEON, G. (2005). *Ologbo extension, Reconnaissance soil survey*. CIRAD, Montpellier.

CALIMAN, J.P., WOHLFAHRT J., CARCASSES R., GIRARDIN P., PEREL N., WAHYU A., PUJIANTO, DUBOS B. and VERWILGHEN A. (2006). *Agri-environmental indicators for sustainable palm oil production*. XV International Oil Palm Conference. 19-22 September 2006. Cartagena de Indias.

CHAMBON, B. (2006). *Implementation at Presco Plc, Nigeria, of RSPO (Roundtable for Sustainable Palm Oil) social criteria for relations between agroindustrial companies and local populations*. CIRAD-CP (CP_SIC 2008 UPR PERSYS), Montpellier.

DEFOER, T., WOPEREIS, M., DIACK, S., IDINOBA, P., and HOAREAU, M. (2007). *Apprendre et innover ensemble. Le cas de la gestion intégrée de la culture du riz dans les bas-fonds*. Présentation orale, 42 diapositives. [On line]. Journée Intensification écologique, 2007/08/30, Cirad, Montpellier. [2007/10/11]. <URL : <http://intranet-drs.cirad.fr/FichiersComplementaires/Presentations-intensification-ecologique/AM/Defoer.ppt>>.

GREENGRASS, E. (2006). *A primate survey of Ologbo Forest*. Report submitted to Presco Plc, Nigeria.

GREENGRASS, E. (2007). *A primate survey of Ologbo Forest*. Report submitted to Presco Plc., Nigeria.

JENNINGS, S., NUSSBAUM, R., JUDD, N. and EVANS, T. (2003). *The High Conservation Value Forest Toolkit. Part 1, 2 and 3*. Edition 1, December 2003. Proforest, Oxford.

MWANSAT, G.S. (2007). *Report of entomological assessment conducted at Ologbo Concession and Obaretin Estates, Edo State, Nigeria*. Report submitted to PRESCO Plc. APLORI (A. P. Leventis Ornithological Research Institute), University of Jos Biological Conservatory, Jos.

OGUNJEMITE, B. G. (2007). *Vegetation survey of Ologbo (PRESCO) concession, Edo State, Nigeria*. Report submitted to Presco Plc. Federal University of Technology, Akure.

BLUE FIN NIG. LIMITED (2004). *Environmental impact assessment of proposed expansion and development of oil palm estates at Obaretin and Ologbo -Edo state- and Cowan -Delta State- and expansion of factory at Obaretin estate*. Final Report prepared by Blue Fin. Nig. Limited for PRESCO Plc., Lagos.

RENEVOT, G. (2005). *Quels impacts de l'extension du palmier à huile industriel sur les systèmes d'activités de la zone d'Ologbo, Edo State, Nigeria*. Mémoire présenté en

vue de l'obtention du diplôme d'Ingénieur des Techniques Agricoles de l'ENESAD et du diplôme en Agronomie Tropicale du CNEARC. CNEARC, Montpellier.

RSPO (2006). *RSPO Principles and Criteria for Sustainable Palm Oil Production*. Guidance document. March 2006.

SHEIL, D., PURI, R.K., BASUKI, I., VAN HEIST, M., WAN, M., LISWANTI, N., RUKMIYATI, SARDJONO, M.A., SAMSOEDIN, I., SIDDIYASA, K., CHRISANDINI, PERMANA, E., ANGI, E.M., GATZWEILER, F., JOHNSON, B., and WIJAYA, A. (2002). *Exploring biological diversity, environment and local people's perspectives in forest landscape: Methods for a multidisciplinary landscape assessment*. CIFOR, Indonesia.

SOENGAS LOPEZ, B. (2005). *Evaluation des ressources naturelles : contribution à l'étude d'impact (EIE) de l'implantation d'une palmeraie agro-industrielle de palmiers à huile au sud du Nigeria*. Mémoire présenté en vue de l'obtention du Mastere post-grade « Forêt, Nature et Société », Spécialisation « Foresterie Rurale et Tropicale ». ENGREF, Montpellier.

TURSHAK, L.G., and MANU, S.A. (2006). *Report on ornithological survey conducted at the Ologbo concession and the Obaretin Estate, Edo state, Nigeria*. Survey report, submitted to Presco Plc. AP Leventis Ornithological Research Institute (University of Jos Biological Conservatory), Jos.

VERWILGHEN, A. (2005). *Report on the mission to Presco, Nigeria, in connection with the Ologbo extension project. 20/11/2004 to 28/11/2004*. CIRAD, Oil palm programme, Doc CP 1784, Montpellier.

VERWILGHEN, A. (2006). *Implementation and programming report. Scientific collaboration for agroecological support to agroindustrial plantations in Africa*. Cirad/Siat Steering Committee, December 2005. Cirad-Cp, Doc CP 1893, Montpellier.

VERWILGHEN, A. (2007). *Implementation and programming report. Scientific collaboration for agroecological support to agroindustrial plantations in Africa*. Cirad/Siat Steering Committee, January 2007. Cirad-CP, Doc 2037, Montpellier.

WARREN, R. (2007). *Report on a planning trip for surveying the butterflies of Ologbo Forest, Edo State, Nigeria*. Report submitted to Presco Plc.