Project Update : December 2014

Relevance of the Project

Englerophytum oblanceolatum (Syn. *Bequaertiodendron oblanceolatum*) is probably one of the most endangered native plants species in Benin Republic. It is a species with edible fruit belonging to the Sapotaceae family, which to date, is not listed in the Red List of Benin plants, although it is restricted to the semi-deciduous remnant forests.

The project aimed to strengthen abilities of communities in conservation and domestication in areas where the species is found, using participation and field education programmes. Intervention practices for the implementation of activities followed a *bottom up* approach based on discussions and exchanges, rather than *top down*. The latest progress report focuses on the results of vegetative propagation, includes a species distribution map in Benin Republic, and an extra survey to deepen our understanding of local perceptions.

September 2014

Propagation of *Englerophytum oblanceolatum*

The objective is to save as many different genotypes of *E. oblanceolatum in situ*. We saved by propagation methods, 10 'ortets' (mother tree or clone head), randomly selected within 10 small separate populations (> 125 meters apart at least). We selected 10 well-developed, healthy ortets, with strong vertical shoots supported by side branches. Ortets are individual trees that have grown from a seed or sexual reproduction and then, by cloning, give genetically identical new individuals. Hence, an ortet is the ancestral individual that provides subsequent 'ramet' or clone after vegetative propagating. We developed with the local communities appropriate silvicultural techniques to domesticate *E. oblanceolatum in situ*.

We tested inexpensive and easily reproducible vegetative propagation (VP) techniques (photos 1 to 12) such as: air layering (AL), root cutting (RC) and vertical root sucker induction (RI) on trees. The air layering method is a propagation technique conducted directly on branches of trees. The aim is to induce the formation of adventitious roots on the branch while it is still attached to the ortet or "mother tree". Thirteen air layers (AL) were produced from 10 ortets by selecting a plagiotropic branch at the extremity, around 2 to 3 cm diameter, and accessible from ground level (1.5 m at most). The bark was removed completely from a 10 cm section (Photo 1) and the unsheathed portion covered with a transparent (Photo 2) plastic bag with a relatively neutral substrate such as peat moss mixed with natural sand (without hormone). The air layer is severed from the ortet once branch selected has produced roots in plastic bag by performing a cut removing the plastic bag, and planting the air layer as a new tree.

Twenty-four RC cuttings were taken from 8 ortets. The method consisted in harvesting segments of roots from a suitable mother tree or ortet that were first planted in a controlled environment and then transplanted out in the field.

Forty-eight RIs were induced from 8 ortets (1.5 and 2.5 cm diameters), subsequent growth was observed. A root sucker is a new plant originating from a root. The method is to induce minor stress to the mother tree generally on shallow roots, in order to artificially generate the formation of root suckers.

Ramets sampled from the 10 ortets were encoded with each assessment: No of AL, RC or RI; position No or B=Branch & R=Root; tree No or G=Genotype. AL are encoded AL01B1G01 to

AL13B1G10; RC are encoded RC01R1G01 to RC24R1G08 and RI are encoded RI01DG01 to RI20DG08 for distal and RI01PG01 to RI20PG08 for proximal.

The experiment was conducted in Ewe-Adapklame remnant forest, from Thursday 3rd to Sunday 12th April 2014. Communities were actively involved as self-appointed volunteers for handling of vegetative materials, subsequent observations (rooting, budding, number of leaves etc.), and monitoring of experimental design (1 watering daily, if there is no rain, weeding). The success rate was 84.6% for AL (i.e. 11 AL produced from 10 ortets), only 16.6 % for 1.5 cm diameter cutting of RC (i.e. 4 cutting of RC produced from 8 ortets) and only 54.16 % of distal RI (8 ortets are currently growing). Proximal RI cuttings did not provide any sprout or regeneration during the experimentation.

The first observation of AL rooting was recorded on July 27 or 3 months after the experiment starting. Two ALs did not survive after separation from the mother tree and transplanting to the nursery. The transplanting substrate was composed of a homogeneous mixture of a fertile soil of clay and sand containing humus and topsoil recovered on the station after digging. The appearance of RI leaves lasted nearly 5 months.

The ramets obtained were replanted randomly in a mixed population with seedlings (sown at the same time for comparison) on the field of conservation established by the local team (Photo 13 & Figure 1). Currently, there are 87 young trees of different genotypes of *E. oblanceolatum*, growing on the conservation field established by the local communities of Ewè. Ten selected genotypes of this endangered species have been saved by vegetative propagating while others genotypes were also rescued by seeding of seed collection campaign during March April 2014.

To conclude, it should be noted that, this first project was restricted to a single season, but each technique should be tested in different seasons (short and long rainy seasons, short and long dry seasons) to bring out the best method desired. We must emphasize that this were preliminary tests to guide future trials (with a number of repetitions and statistically appropriate and valid experimental design to be undertaken in phase 2) and to encourage local people to be exposed to and involved in these easily reproducible and inexpensive techniques.

It should also be noted that:

- For preliminary testing of vertical RI, position may not have been met at 100% and another test of buried horizontal RC position should be performed in phase 2.
- The loss of plants from AL, RC & RI may be due to a handling problem or an unsuitable transplanting substrate and this should be improved in the second phase.

Nevertheless, aptitude of *E. oblanceolatum* to be vegetatively propagated is now assessed. The results are currently being used to integrate this threatened species in agroforestry systems of Benin while furthering the conservation program in compliance with environmental standards.

Photo 13: Field of conservation established & managed by local team members

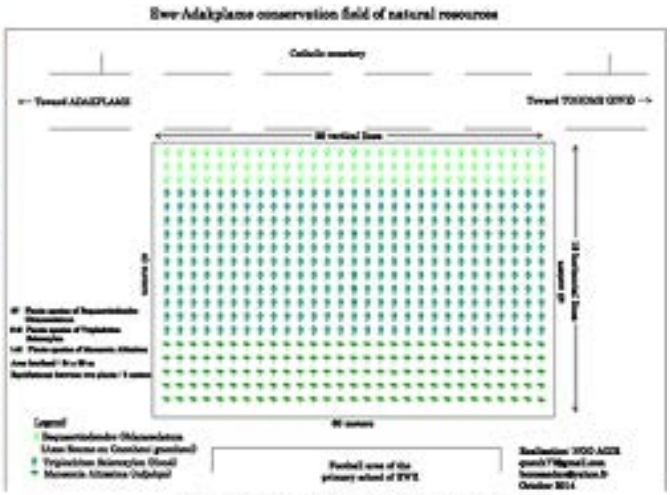


Figure 1: Plan of the field of conservation

October 2014 Update

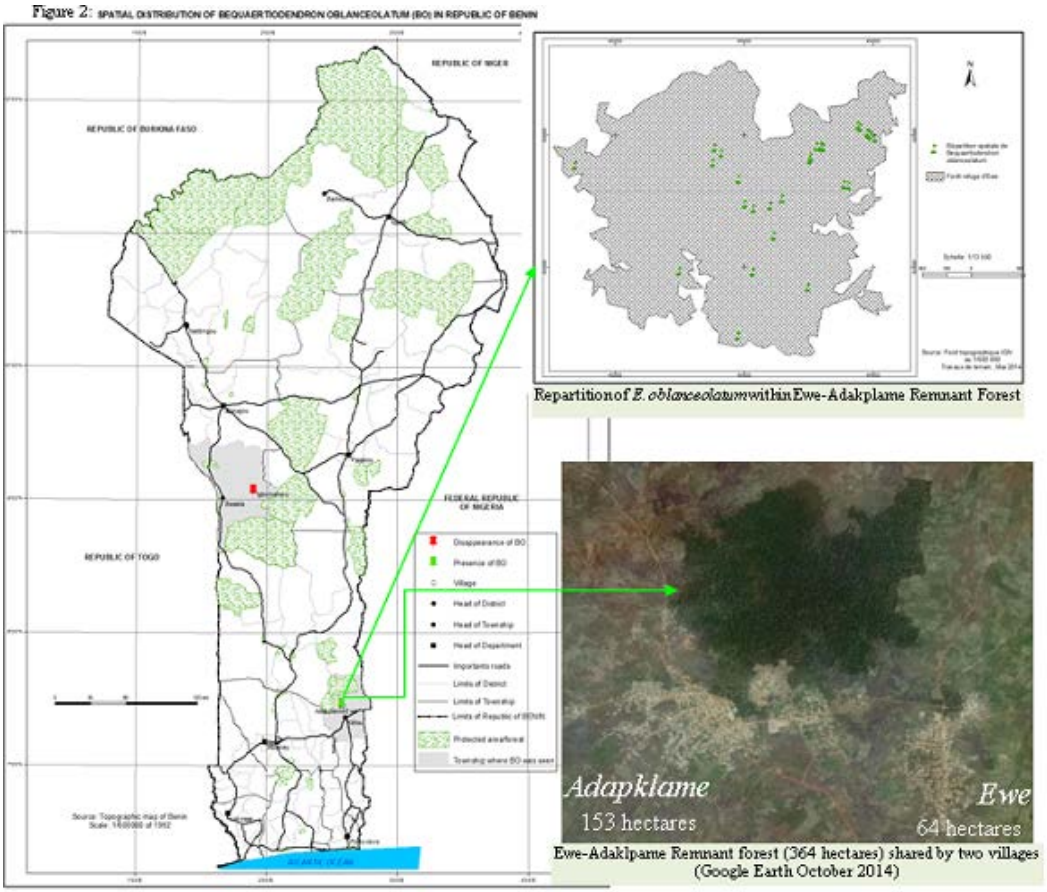
Distribution map of *Englerophytum oblanceolatum* in Benin Republic

In Republic of Benin, *E. oblanceolatum* was identified (http://www.gbif.org/species/2888116) at Ewe-Adapklamey forest, Ketou District (1988) and around Tchaourou District (1999). To update the species data distribution, we investigated from reported coordinates: 7.4525°N; 2.5655°E at Ketou and 9.0666°N; 1.9°E at Tchaourou. More precisely, coordinates reported in the District of Tchaourou, Department of Borgou, led us to the District of Bassila in the neighboring department Donga. In Bassila locality, like Tchaourou, the species has not been surveyed during our field study. None of the local people contacted could provide information on its local name, its uses and its habitat. The semi-deciduous forest covering the GPS pointS where the species is supposed to be had been replaced by fallows and extensive, scattered fields of burn cultivation. The coordinates reported in the District of Kétou led us to the outskirts of Adapklame Township, a current borough in full urbanization. The area has encroached the edge of the forest which has been invaded by houses and nearby fields. The results are presented on the map (Figure 2).

According to our results, Ewe-Adapklamey remnant forest is now one of the last favourable habitats of *E. oblanceolatum* in Benin Republic. The main activities undertaken for a long-lasting impact of the project consist of urgent *in situ* domestication by propagating, planting activities and environmental education.

Acknowledgements

The project staff would like to thank Clive Nuttman, Sarah L. Johnson, Ronald Bellefontaine and Rita Martins for the guidance.



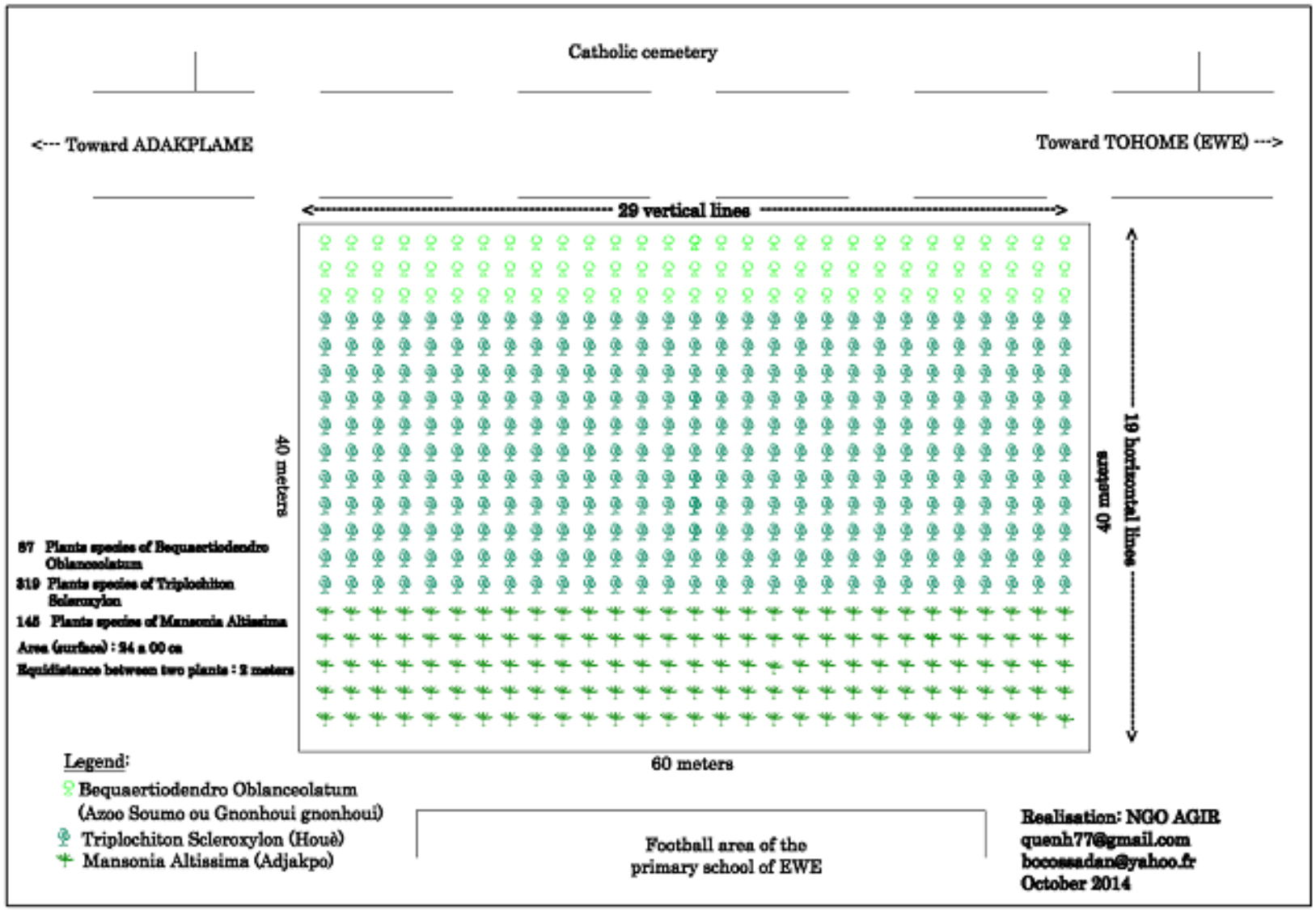
November 2014 Update

<u>Extra survey to deepen understanding of local perceptions</u>

The agglomeration of Adakplame (153 hectares) is more urbanized than Ewe (64 hectares). The community of Ewe is rooted in indigenous conservation practices but tradition and its sacred values are now in decline with the propensity of modern religions. Nevertheless, the Ewe-Adapklame remnant forest has persisted since it remained a sacred place for traditional worship. Hence, we conducted an extra non-structured survey with 37 individuals to assess the impact of modern religions on the conservation of natural resources. Ninety-six per cent of respondents agree that modern religion is the opposite of any form of traditional practices. Therefore, indigenous practices that contribute to conservation are undergoing a kind of desecration. We listed 12 religious communities on Ewe lands: 1 - Roman Catholic Church, 2- Banamè Catholic, 3 - Islam, 4 – Vie nouvelle, 5 - Eglise africaine du Réveil (EAR), 6- Eglise des Fidèles du Christ (EFC) 7- Celestial Church of Christ, 8 -Pentecostal church, 9 - Forsquare, 10- Union renaissance d'Homme en Christ, 11- Church of faith in Jesus and 12- EBENASA.

In this context, we sought to understand the contribution of modern religions in the effort of conservation practices. There was no action revealed by the modern religions benefitting nature conservation. Apart from this, the forest of Ewe is seen by the religious as an occult space to be preserved. The survey highlights the importance of integrating religious community in the conservation process at Ewe.

Ewe-Adakplame conservation field of natural resources



Posters


Conservation de *Bequaertiodendron oblanceolatum* par les populations d'EWE (KETOU)
N. Scientifique:
B. oblanceolatum ou
Englyophytum oblanceolatum.
N. local: *Azoo souman*
Fruit de *B. oblanceolatum. (en haut)*
Gnonhouin-gnonhouin nom local
Jeune pousse de *B. oblanceolatum.*
Régénération par rejet de collet
Régénération par semi
The Rufford Foundation
www.rufford.org
Méthodologie
Forêt refuge d'Ewè
Échantillonnage et relevé floristique
Techniques de multiplication végétative
Excavation des racines
Induction de drageons
Choix du diamètre et prélèvement des boutures de segments de racinaire (clones)
Production de marcottes
Usages
➢ Feuilles sont utilisées pour emballer le tabac
➢ Les fruits sont utilisés pour le traitement de l'anémie et peuvent servir à la fabrication du vin
➢ Les racines sont utilisées pour accélérer la marche chez les enfants et pour le traitement des convulsions.
Sources: Enquêtes ethnobotaniques auprès des populations d'Ewé 2014
Pépinière et plantation
1. Mise en place de pépinière de clones
2. Campagne de plantation par les populations d'Ewe


La forêt "refuge" d'Ewè au Benin: une richesse de biodiversité communautaire et un patrimoine national
Une diversité végétale exceptionnelle....
Un habitat naturel pour la faune ...
The Rufford Foundation
www.rufford.org
Un patrimoine culturel riche d'histoires et de rites...