COBECORE Workshop

Het Pand, Gent

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INEAC – INERA

Experiences from prof. Em. Eric TOLLENS

KU Leuven,

Centre for Bio-Economics

“Les mines feront le Congo, l’agriculture le sauvera”
LEOPOLD II

The situation of Yangambi when I arrived there

- **I arrived in Yangambi in October 1973 at the opening of the academic year 1973-1974**
- **The 3 Faculties of Agriculture of UNAZA in Zaïre (Kinshasa, Lubumbashi & Kisangani) were merged into one (IFA: Institut Facultaire d'Agronomie) at Yangambi as part of the Master Plan to relaunch INERA and benefit from mutual strenthening**
- **Belgium supported this plan through institutional support for INERA (CTB) and support to IFA (CTU; project 15); I became that CTU project leader**
- **Canada supported the forestry department (Laval university) and we had several professors from Romania (ATG)**
- **The 1970s were the golden years of the Mobutu regime, at least till the zairianinization starting at the end of 1973 and in 1974**
- **Because of the zairianinization, first OPEC crisis (1974/1975) and the two Shaba wars, and lack of funding, this move to Yangambi failed as the infrastructure was not renovated sufficiently, lack of electricity, fuel and difficult living conditions**
- **The CTU project ended in 1977 and Belgium withdrew its support, also because political relations between Belgium and Zaïre became very strained**

- **Connections to Kisangani at 100 km from Yangambi were always very problematic; poor dirt road, 7 bailey bridges and a ferry over the Lindi river close to Kisangani**
- **We entirely depended on Kisangani for fuel, mail, food, medical care and telex communication with the cooperation section at the belgian embassy in Kinshasa**
- **Interactions with INERA were limited as INERA itself was struggling**
- **In 1975 there was the Rudolph Contant plan from ISNAR to restructure INERA, with some support from Rockefeller foundation**
- **In that plan, Yangambi because of its isolation and focus on perennial tree crops did not play a major role, as the focus then was on annual food crops**
- **In the meantime, USAID supported food crop research in Kinshasa through the RAV project with PRONAM (maïze), PRONAM (cassava), PRONA (grain legumes)**
- **INERA M'vuazi, Kiyaka, Gandajika, Mulungu were the main INERA stations focused on food crops**
- **Hereafter two slides of Yangambi from Daniel Grossman that appeared in The Guardian**

My discovery of INEAC/INERA Yangambi

- Site of 25 km X 25 km
- Splendid view on the Congo river
- Rainforest environment, hot and humid
- Beautiful research infrastructure buildings, well preserved
- Factories at the beach for palm oil and rubber and stores for goods
- 200 villas for personnel, cities for workers, swimming pool, tennis courts, theatre, ...
- UNESCO Man and Biosphere site
- Bullet holes and broken windows from the past rebellion
- The first IBM computer installed in Africa in 1956 for the biometrics unit
- The gasplant, brick factory, huge stores with spare parts, huge library, lab infrastructure, collections,...
- Continuous wondering why Belgium had invested so much there, what motivated them, what was the vision...obviously long term

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MAN AND BIOSPHERE

LA RESERVE DE BIOSPHERE DE YANGAMBI ET LA CONVENTION DE COOPERATION SCIENTIFIQUE ENTRE LE WWF AVEC L'ERAIFT ET LES INSTITUTIONS FEDERALES BELGES

Par
Laurent Nsenga
Assistant de chaire à l'ERAIFT
Program Manager WWF-Bas-Congo/RDC

10.02.2010



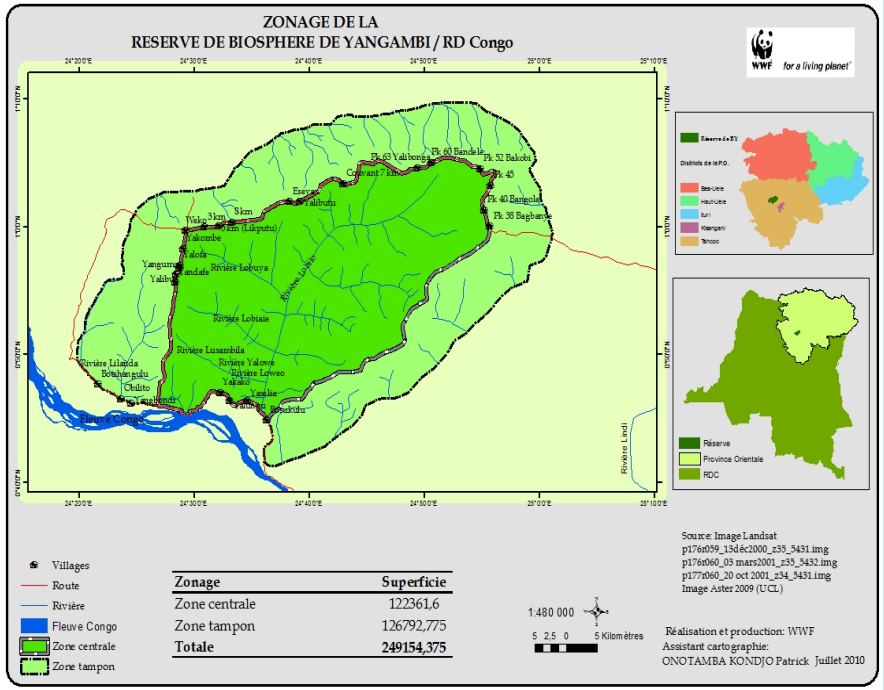




Plan de présentation

1. Concept de réserve de biosphère
2. Réserve de Biosphère de Yangambi;
3. Convention de coopération scientifique.

2. Réserve de biosphère de Yangambi



Domaine boisé de l'État créé en 1933 et placé sous la gestion de l'INEAC (aujourd'hui INERA). Reconnue comme Réserve de Biosphère de Luki (RBL) en 1979 par l'UNESCO et placée sous la gestion du comite National MAB-RDC

Superficie estimée : 250.000 hectares .Présence de trois structures étatiques (INERA, le Projet MAB, IFA Yangambi)

Site historique de la recherche forestière de renommée nationale et internationale

Réserve importante d'un point de vue de la biodiversité floristique et faunique;

Grandes forêts de l'écosystème de type tropical humide; Sylviculture et des études climatiques ainsi que des expériences sur la régénération du couvert végétal; 5 programmes nationaux de recherche :Cacao, Caféier, Palmier à huile, Riz : Gestion et conservation des ressources naturelles (agro- climatologie, sciences du sol et agroforesterie), Palmier et hévéa sont les 2 principales cultures industrielles de la station. ; Présence des infrastructures viables; Bailleurs de fonds, PAM, FAO, FIDA, PNUD, UE, Coopération Belge; Présence de l'Herbarium national.







MERCI DE VOTRE AIMABLE ATTENTION

Par

Laurent Nsenga

Program manager Bas-Congo

WWF-RDC







Evolution after my departure

- **In 1985, the INERA plantations were privatized and in 1986 there was another restructuring of INERA with support from Belgium, with the general direction moving from Yangambi to Kinshasa**
- **In 1990 another ISNAR report induced a restructuring of INERA with 4 stations retained, Yangambi not included**
- **A 45 million $ World bank project was to support this restructuring but the pillages and political unrest of 1991 and 1993 prevented the start of this project**
- **Yangambi is still struggling to survive, with intermittant electricity, doubtful connections with Kisangani, practically no research activities as even IFA relocated to Kisangani**
- **On could say that in a certain sense, Yangambi has become irrelevant, despite its numerous collections still being there, its numerous buildings (in good shape) and infrastructure potential, especially for tree crops**
- **In 2010, SOCFINCO plantation company drew up a plan to relaunch agricultural research in Yangambi and revive the plantations (12.000 ha palmoil, 10.000 ha rubber and 3.000 ha cocoa) through a public-private partnership. SOCFIN would put in at least one million $ per year gradually increasing to 3,5 million $ by 2020**
- **This never materialised...**
- **In 2011-2013: CTB intervened in Yangambi as part of the APV project (support to plant production)**
- **The IFAD project for the Orientale province (PRAPO) was based in Yangambi**

CTB

Intervention de la CTB à Yangambi et District de la Tchopo

1. Historique
2. Activités en cours
3. Activités prévues à court terme
4. Prochain Programme Indicatif de Coopération

BUILDING
A FAIR WORLD

Appui à l'amélioration de la production végétale

Historique

- 2004, Evaluation des capacités opérationnelles des stations de l'INERA, réalisée par la FAO sur financement EU.
- Projet Appui à l'amélioration de la production végétale (phase I) dans 4 provinces **Bas-Congo, Kasaî Oriental, Katanga et Bandundu**
- Septembre 2011 démarrage de l'extension du projet APV à la province orientale **district de la Tchopo et INERA Yangambi**,
- En cours de négociation: deuxième extension du projet APV à Yangambi, dans le cadre du programme de relance agricole du PIC 2010-2013, phase de transition.

Appui à l'amélioration de la production végétale

Activités en cours a Yangambi

- Achat de matériel agricole: tracteur, **charrue, herses, charrue, herse, épandeur d'engrais, pulvérisateur tracté, semoir et remorque agricole**
- Aménagement et équipement des locaux: Bâtiment Météo (internet, générateur de courant, informatique,etc)
- Recrutement du personnel
- Un véhicule 4x4
- Défrichage et emblavement de 19,3 Ha au Km 5

Yangambi
Partenariat Public Privé

1. Objectifs :

- Recréer un centre d'excellence en recherche et expérimentation agronomique tropicale
  - Formation de cadres et de chercheurs
  - Référence en matière de variété tropicales
  - Protection de la biodiversité du bassin du Congo

- Relancer l'exploitation des terres afférentes au Domaine de Yangambi, sur des bases commerciales et privées (palmier à huile, hévéa, cacao, cultures vivrières, dans un contexte industriel et villageois)

YANGAMBI

Study on the economic returns to INEAC research 1934-1959

- I did a study in 1986/1987 on the economic returns to the agricultural research of INEAC during the colonial period for agriculture in RDC, Rwanda and Burundi
- I gave a presentation of the results at the Royal Academy of Overseas Sciences on 23 July 1987
- Unfortunately, I never published the results in a scientific journal, basically because of methodological difficulties encountered in doing the study (reviewers!!!)
- Many working hypotheses had to be formulated: all increases in yields per ha of crops vis-à-vis a reference period are the result of INEAC research and extension of cultivated area due to other factors; yield increases due to fertilizer use (13.222 t in 1959), pesticides (6.749 t in 1959, mainly for cotton) or irrigation (still very limited during colonial times, mainly bananas, sugar cane)) or infrastructure investments were basically attributed to INEAC
- First there was a student thesis on the subject by Patricia Sieuw
- Collecting the necessary data (time series) over 1934-1959 was a major challenge

- **The INEAC archives were not in one place, and SERDAT (Royal Library Albert 1) in Brussels only had the technical archives of INEAC**
- **All administrative and financial reports of INEAC were in 1973 sent to the General Royal Archives, but not classified and not open to the public**
- **We did an investment analysis of the time series of total costs and total benefits**
- **In 1959, INEAC had 420 european agents, of which 200 researchers, 12.000 congolese agents and a regular budget of 319 million belgian francs (DRC)and an extra-ordinary budget of 91million belgian francs (DRC) (expenses for the 10-year plan). Own income was 137 million belgian francs. Total costs of INEAC = total expenditures = subsidy + own income = 547 million belgian francs.**
- **In US$ terms, the budget was 10,94 million $ (one US$ = 50 belgian francs), inflated to 2017 $: 92,026 million $ (large!!!)**
- **We focused on the internal rate of return (IRR) of INEAC research over the time period, i.e. how much interest on average one $ invested in INEAC yielded over time. Benefits = yield increase over base period X planted area X producer price**
- **For INEAC as a whole, the IRR was 39% in nominal terms, and 26% when inflation is taken into account, i. e. very high and comparable to other studies on the returns to agricultural research. The benefit-cost ratio for all commodities was 2,27.**

- **For individual crops, with only the specific costs related to research on that crop taken into account, the IRR was always high (32% to 170%), except for coffee and cocoa**
- **The best results were achieved for cotton (198%), followed by rubber (88%) and oilpalm (79%). Food crops yielded 58%. Coffee and cocoa had only 14%**
- **If also general INEAC costs (overheads) are taken into account the IRR drops to 114% for cotton, 50% for rubber, 62% for oil palm, and 46% for food crops. For coffee and cocoa, it becomes negative**
- **Very good results were also achieved for food crops (cassava, maize, rice, groundnuts)**
- **INEAC's contribution to basic research on the tropical environment surpassed probably its contribution to specific crops. Also, the social benefits to society (economic growth, employment, etc.) are excluded in the analysis**
- **I consider our calculated IRRs as minima**

- **The research on oil palm breeding, with the discovery in 1939 by A. Beirnaert in Yangambi on the mechanism of the hybrid nature of the Yangambi tenera type, by crossing the dura and pisifera types, by itself probably paid for all INEAC research**
- **The monohybrid character of the thickness of shell of palm fruit was a world class discovery**
- **It started with the discovery of a highly productive palm tree, the "SP540" tenera, also called "Djongo" tenera, identified at the Eala Botanic gardens near Mbandaka. This tenera palm had 55 % mesocarp and 30 % oil per bunch, against about 10 % for wild tenera types. This tripled palm oil production by just planting tenera**
- **Artificial pollination necessary for tenera production is very labor intensive, and it only took off after the second world war. As a result, the Congo became the largest palm oil exporter in the world. After 1960, Nigeria took over for a limited period, then Malaysia**
- **All planted oilpalms in the world today are of the Yangambi tenera type**
- **The big palm oil exporters like Malaysia and Indonesia profit the most**

Conclusion

- **One can conclude that even during the colonial perid in the DRC, there was underinvestment in agricultural research, given its very high productivity**

- **The results also showed that agricultural research in tropical Africa can be very profitable but also that a certain time span is necessary before uninterrupted, continuous research yields its benefits for agriculture and the population**

- **INEAC and particularly Yangambi are some of the best kept secrets about the impact of agricultural research in a tropical environment**

- **This demonstrates the relevance and importance of COBECORE**