



**WORLD'S
GREEN LUNGS**

AGROFORESTRY

2011

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Brief summary of the project

In the coming decades, it will be a priority to restore critically endangered and vast natural ecosystems necessary for the existence of humanity and for life on Earth.

AgroForestry pilot project is located in the Democratic Republic of Congo, Maniema province, where the World's Green Lungs (WGL) has 17,700 square kilometers of the country available.

Economic forest and fertilized soil will be used to ensure a continued food supply for local residents, along with environmental protection. We want to maintain the forests Green Lungs of the World in exchange for development cooperation. Planting of the forests is always accompanied with fertilization of the soil (Terra-Preta), agricultural development, building of the infrastructure, schools and health facilities and all of that in active cooperation with local residents. Benefits of the project will affect local residents immediately (increased food production, creation of workplaces, affordable social services), population all over the world gradually and in long-term horizon (restored forest ecosystem services).

Costs will be borne by the developed countries of the world, including local developing ones. They will make land and labor available. This huge transfer of funding and research capacity, which will in size and importance overshadow the current flows of foreign aid, is the best thing that can be immediately done for a real effort to eliminate food shortages, saving forests and prevent climate change.

The procedure of implantation of the project in the province of Maniema:

1. Construction of electrically independent base and research center for the reforestation of the landscape in an area that is relatively accessible and connected to local roads.
2. Establishment of a system of tree nurseries and experimental plots suitable for growing seedlings.
3. Designing a suitable species composition of permanent afforestation and economic uses of land, which will provide sufficient food production.
4. Construction of light wooden buildings and apartment houses from material available on site for the purposes of research and operation of the base.
5. Testing of appropriate technologies, machines and equipment for specific local restoration conditions and growing of the forest.
6. Construction of appropriate transport infrastructure and processing of grown products.
7. Securing affordable health care for project staff and local residents.
8. Introduction of technical preparation of key local experts who will manage the reforestation work and associated services. Emphasis will be placed on their moral quality and incorruptibility.

1 Description of the initial state

Due to the acquisition of agricultural land the rapid burning of forests takes place in Africa. The soil is degraded and the landscape becomes barren semi-dry savanna. Renewal of the forest is not possible in a natural way. Without the deliberate cultivation, thus destroyed areas are irretrievably lost for forest, agriculture and human life. African Forests burn continuously. At the same time significant amounts of CO₂ are released into the atmosphere. *See Annex 6, the Earth is crying*

200 million hectares of tropical rainforest are located in the Congo River basin, which is approximately one fourth of the area of the world's tropical rainforests. If the destruction of forests continues today's pace, millions of people will be left without shelter and food.

In the province of Maniema, one family consumes approximately 600 m² of agricultural area per year. In this particular case, only Balanga community counts 18,000 families. This represents an average of 10 800 000 m² (1,080 hectares) of deforested area per year!

The only way to prevent further devastation of rainforests is to ensure sufficient food production in place for the local population.

1.1 Tools for drawing grants and donations are non-existent

- A. **National methodologies** - standards for evaluating and monitoring of offset projects
 - Congo Basin countries have no national standards for evaluation of ecosystem services of their forests. It is hard for them to verify and monitor the capacity of CO₂ sequestration in forests and C fixation in the soil.
There is no accepted methodology to measure and monitor long term changes in the reforested landscape towards its ecosystem and social functions during its persistent economic use.
- B. **Complex programs** of the protection and restoration of forest ecosystems, while ensuring social needs of the residents
 - There are no implementation programs for the location of rainforests preservation grants and donations.
 - Appropriate areas weren't available.
 - There were no landowners willing to undergo the reforestation experiment.
- C. **Know-how and specialists** for the recultivation of forests and introduction of sustainable forest-agricultural economy

1.2 We have a dramatic negative examples of deforestation

Prof. Gabriel Salumu Ngolo Wa Balanga:

- I was born in 1954 in Katakokombe. I was used to go bathe in Thasala lake in the Lokala savannah, which was then measuring 5 x 8 km. I was currently surprised, that the lake is partially nonexistent and the savannah has substantially grown and now measures 7 x 9 km in size! 24 km² of the rainforest disappeared.
- Further finding (still Katakokombe, Kindu IV), water spring called Balanga disappeared two and half years ago. This spring supplied fresh water to ± 12 000 persons.
- Another particular phenomenon, in the city of Kindu, small lake 120 x 200 m in size called Alfio, which was a centre of local recreation youth went there to bathe, also suddenly disappeared.

- Finally, I want to mention narrowing of the river channel Lotola 8 km in length, which measured 4 m in width. Today, it does not measure more than 2.5 m, length is the same.

1.3 We do not have the positive examples of restoration of devastated forest areas on a large scale

The main pitfall is the size and originality of the project AgroForestry, and with it associated extensive content of works. This large project requires a great quantity of people, and will be very challenging especially on the organization and logistics. All other problems, although essential, are solvable.

For soil preparation the machinery equipment will be used. Therefore these works proceed relatively quickly. Complicated is likely to be the protection of agricultural crops and planting against weeds, insects and animals. It is obvious, that a certain percentage of the plantings will be influenced by these factors, but the agricultural and forestry technologies know ways how to protect and fight against these pests. The biggest problem occurs in protection against weeds. It arises the need for a large amount of handwork in a relatively short period.

Feasibility of the project however illustrates the similar projects, although significantly smaller, with another intention or purpose, which were and are realized across the rainforest belt since the Second World War to the present:

- 20 000 ha - newly founded forests on the territory of Tanzania, mostly Caribbean pine;
- 340 000 ha - 2 billion seedlings for planting social forests, India in the 80-ies;
- 54 000 ha - Teak and Caribbean pine, Fiji and other Oceania Islands;
- 15 000 ha - mainly Teak and Mahogany, currently at the Urra dam, Colombia;
- the plantations, mainly of Teak and Eucalyptus in countries throughout the equatorial zone.

1.4 Ecosystem services (ES)

Millennium Ecosystem Assessment 2005 (MEA) focuses particular attention on the mutual relations between the ES and the human life quality, which is affected by food and social services availability. The people are seen as an integral part of ecosystems.

1. Supply services

Products that people receive from ecosystems, such as:

- production of food, timber, biofuels, fodder, fiber;
- drinking water;
- mineral raw materials.

A higher food supply, the landscape can temporarily offer by forest conversion for agricultural land. Afterwards the delivery of other ES drops, which will have, in the coming years even more importance, such as floods regulation, or drought restrictions, clean drinking water, CO₂ sequestration, fertile layer or places for ecotourism creation.

2. Regulatory services

- water retention, reduction of flooding;
- soil erosion reduction - can not be replaced in any other way than by ES development;
- CO₂ sequestration; the vegetation, by photosynthesis, consumes CO₂ waste gas from the human activities;
- oxygen production;
- water purification;
- climate fluctuations equalization, improving of the thermal and moisture regime;
- ground-level air filtration, dust and noise reduction.

3. Supporting services

They are necessary for the creation of all other ecosystem services:

- pollination of plants;
- soil cover creation, that is the storing of solar energy reserves in humus;
- creation of fertile soil Terra- preta.

4. Cultural services

- recreation opportunities and ecotourism, if properly managed, brings with it a strong economic incentives for nature preservation and restoration ture in the region.

1.5 Project location

The Democratic Republic of Congo (Kinshasa) is situated in central Africa. Its area of 2.345 000 km² is one of the largest on the continent.

The political situation: The Democratic Republic of Congo (DRC) has currently a democratic system. As a result of the democratic process , and of free elections in 2006.

The sphere of World's Green Lungs activities in the province of Maniema is defined by coordinates:

E. longitude 23°45' ÷ 26°15'

S. latitude 1° ÷ 3°45'



Obrázek 1 Oblast působení World's Green Lungs

In the RDC there are four geographical regions:

- 1) Coastal Plain in the west;
- 2) The central basin, formed by lowlands, highlands terrace arranged - the vegetation is characterized by dense equatorial forest;
- 3) The plains in the north, northeast and south - the vegetation here is mostly tropical;
- 4) Mountain massif in the east, south and west;

In the RDC, the climate is characterized by rainfall water in sufficient quantity, long time of sunshine with the temperatures favorable.

Table 1, Average temperatures and rainfall

	Min. (°C)	Max. (°C)	Rain (mm)
January	21	31	135
February	22	31	145
March	22	32	196
April	22	32	196
May	22	31	159
June	19	29	8
July	18	27	3
August	18	29	3
September	20	31	30
October	21	31	119
November	22	31	222
December	21	30	142

Table 1 Average temperatures and rainfall

2 Integration of AgroForestry in portfolio of environmental projects

The forests planting is always accompanied by development of agriculture, with emphasis on food production, infrastructure, schools and healthcare facilities building, in active cooperation with local residents.

2.1 REDD+ (Reducing Emissions from Deforestation and Degradation)

The project AgroForestry elaborates the objectives of the international REDD+ concept into concrete steps, as the land reclamation of degraded areas and the economic forests planting, to prevent further tropical forests burning. It offers evaluation and monitoring of these activities, in terms of CO₂ fixation, in the specific conditions of Africa. On insists on food and social services provision for local people.

See Annex 5, WGL Forest Conservation Program

The virgin forests will be certainly destroyed, unless the project AgroForestry is implemented with the aim:

- overshadow the soil and new trees planting, in order to retain water in the landscape;
- create a layer of humus soil by use of biocarbon, fallout, green manure, compost;
- produce foodstuffs, wood for construction and heating, and other crops for local residents;

1 ha of forest, preserved as a result of reforestation project AgroForestry, fixes 1 392 t CO₂.

2.2 The fight against hunger

Land reclamation. The fertile soil Terra-preta is created by depositing of up to 50 t / ha of biocarbon into degraded soils; the biocarbon increases the ability to bind nutrients in the soil.

Terra preta - the storage of 50 t/ha of biocarbon into soil, binds a long time 150 t CO₂/ha.

2.3 Climatic Change Mitigation

The WGL Carbon Standard makes available an independent method, how to express the difference between deforested degraded land and economic landscape after the project AgroForestry implementation. It appreciates the newly planted area in terms of CO₂ sequestration. The methodology is based on the Good Practice Guidance on LULUCF (IPCC 2003).

1 ha of new forest sequester 31 tons of CO₂ per year, for at least 30 years of its age.

2.4 Preservation of forests in exchange for development cooperation

WGL has created the Carbon Standard (WGLCS) as a transparent instrument for governments and potential investors in the AgroForestry program. In fact, it is a highly sophisticated methodology, for evaluating and monitoring of ecosystem services in specific conditions of Africa. WGLCS provides a methodology for inventory and valuation preserved virgin forests in terms of CO stored . It provides a tool to express the virgin forests loss financially. The results can be used as a scientifically based argument for obtaining grants and subsidies within the REDD + projects

See Annex1, WGL Carbon Standard

This methodology, focused on forest and land revitalization, offers the WGL to governments of Congo Basin as the national methodology for obtaining arguments and verified materials for grants and subsidies applications for in forest conservation. By adopting of this methodology the government manifests to potential investors and donors willingness and readiness to act within the international rules.

The historical data show that the emissions caused by land use change, mainly deforestation, account for roughly a quarter of all greenhouse gases (IPCC Special Report on Land Use, Land Use Changes and Forestry - LULUCF).

3 Stakeholders

3.1 The Balanga collective land and forests owners in the Maniema

There are approximately 180 000 inhabitants. As key beneficiaries are involved in all phases of the project, including its preparation. In cooperation with WGL made available land. Built infrastructure remains their property. All groups have equal access to the benefits of the project AgroForestry at the time of its implementation and after.

3.2 The international scientific community

Reforestation project on large-scale AgroForestry, on the area in order of thousands km², makes possible to conduct a comprehensive analysis of ecosystem services changes in at the region Balanga, in terms of its potential to ensure a sustainable environment for local residents.

3.3 World population

The project AgroForestry affect climatically adjacent and remote areas. To determine the degree of this influence is the aim of the project research partt.

3.4 The project bearer

The project bearer is a nonprofit organization World's Green Lungs (WGL). WGL contributes to the preservation of tropical rainforests in the Congo River basin, by program creating of the ecological exploitation of their wealth, with an emphasis on food production and on living and social conditions improvement of local residents.

WGL is based on its fouders know-how, obtained during operations in West Africa since 1985. Information on the activities of WGL is available at www.greenlungs.net.

4 Research concept of the project

- 1) Evaluation of the documents available of Balanga and their evaluation - provinces and administrative regions border, types of water bodies, terrain slope, populated places, fields, networks, etc. They will be used topographic maps at different scales, settlement plans, aerial photographs and satellites images.
- 2) Furthermore, we prepare
 - Evaluation of satellite thermal images. This represents the fundamental basis for obtaining information on the temperature in five resolution degrees, the amount of biomass and chlorophyll and information about humidity.
 - Input information acquisition about the characteristics of components and elements in the landscape (landscape types, soil quality and typesoil, soil erosion, land cover types).
 - Analysis of biotic, abiotic and socio-economic phenomena in the area and their enrolment into maps.
 - Accomplishment of ecological and economic analysis, focusing on the current ecosystems state and on his performance of ecosystem services delivery.
- 3) Determination of appropriate land use, ie. suggest, based on the landscape features indicators, an optimal functional landscape layout, or the optimal localization of forests, fields and other human activities in the landscape (requirements versus limits)).
- 4) Development forecasts elaboration in horizon the next 50 years, including the possible climate and ecosystem services development, land use and land management, human population growth, and economic activity. Following, determination of conditions the ecological and economic stability, which should be sustainable, far into the future, in order to meet basic material needs of the population, with emphasis on the adequacy and the life quality.
- 5) Processing of a basic information system about the environment in region Balanga, composed of several types of eco-databases, describing different classes of landscape type. The systém will be applicable into other areas of equatorial Africa. The methodology of creating and maintaining these ecological databases will be created, in terms of insight into relationships between different components of the landscape in specific areas of the Congo River basin.

5 Development concept of the project

The project development objective is, to establish the permanent ecologically sustainable forest management and agricultural, allowing food production for local residents consumption, to avoid having to burn the forest aimlessly. The aim is to learn the local people to manage their own land, with particular emphasis on education in fertile soils (Terra-preta) regeneration, and in economy forests cultivation, as sustainable sources of food and energy.

The growth cycle of forest trees (eg. Limbali, Palm-oil tree) and their appropriate arrangement, permits to cultivate below them the farm crops such as: sugarcane, corn, rice, bananas, vegetables, cashew nuts etc.

The effort to land use change, using the system AgroForestry, ought to alleviate the pressure on the virgin forest burning, in order to meet the increasing food need for growing population in Africa.

See Annex 2, Model project AgroForestry.

The project count with utilization of renewable energy sources. In particular this means:

- small hydroelectric power plants for local communities supply;
- solar energy for water heating;
- palm oil as biofuel for diesel engines.

6 Social concept of the project

The project social objective is to increase overall food production and adjust the water distribution in the landscape, improve access to health care including remedies for project participants. Further, to promote a local food and wood production as a way of employment creating and income source for local residents.

This so-called local social investment will help the province to reduce its requirements for importing goods, so as to meet its needs. This again allows to reduce the goods packing and transportation cost into the country and thereby to reduce the CO₂ emissions.

7 What has been done

Through the " Forest of Friendship " the project AgroForestry has started in Kindu of year 2010 , in the Democratic Republic of Congo. Reforestation work started by planting of plots to verify the influence of mycorrhizal fungi and slow release fertilizer on the trees growth. The investigated effects we test at species Limbali (*gilbertiodendron dewevrei*). Individual plots are separated by two rows of large-fruited palm oil samplings (*elaeis guineensis*).

See Annex 7, Expedition Kindu 2010 - Final report

In the frame of scientific project realization, the terrain exploration was conducted and extraction of various types of soil and natural materials samples ensured. The sampling was planned in order to describe effects of the current destructive management on soil and landscape water conditions.

See Annex 9, Analyse of soils nutriments measurement

8 Next steps of project implementation

8.1 Pre-project preparation

8.1.1 Pre-feasibility study

8.1.1.1 Terrain reconnaissance

Reconnaissance includes the collection of informations available till now about the project area and their analysis. The aim is to bring materials for the elaboration of pre-feasibility study (Étude de préalable faisabilité).

This phase includes the following areas of investigation:

- 1) Local investigations (in situ) and rough terrain mapping, available data processing of Balanga and Watambolo areas and their evaluation:
 - provinces and administrative regions boundaries;
 - populated places, transportation network, etc.;
 - forests, savannas, fields, ground slope;
 - types of water bodies and water resources;
 - topographic maps at different scales, settlement plans, aerial photographs, images from satellites;
 - cadastral maps;
 - using GIS mapping equipment;
 - pictorial documentation, shooting of the document
- 2) Description of landscape types, quality and soil types, soil erosion, land cover types. Following the analysis and qualified future capacity of the ecosystem in Balanga Watambolo area, in terms of its potential to provide the ecosystem services consistently and sufficient subsistence for local residents.

8.1.1.2 Pre-feasibility study processing in the Czech Republic

Pre-feasibility study will include:

- identification of land suitable for reclamation and afforestation, the coordinates determination of for the subsequent detailed aerial photography;
- determination of the species and type of afforestation (alley, plantations, windbreaks, continuous forest);
- selection of types of farm crops for food production;
- carry-out of expert estimation of the current performance of areas suitable for afforestation;
- description of the communications, infrastructure with proposals for the first construction works;
- creation of the first lapse video document about the state of the landscape, forests and people for own work on the project and promotion of the project AgroForestry.

8.1.2 Field survey engineering

- 1) Mapping of selected areas and development of reforestation plans.
- 2) Survey and definition of land for reclamation and afforestation.
- 3) Reconciliation of plan in place with the local government. Variants selection and listing of requirements of the local population.
- 4) Preparation of second lapse document, image and mapping documentation acquisition.

8.1.3 Opponency and variants selection

8.2 Project preparation

- 1) Feasibility study formulation
 - costs of construction
 - operating costs
 - investment requirements
 - expected revenues
 - administrative and legal obstacles
 - risks and hidden dangers
 - technical implementation
- 2) Stakeholder Consultations in the province of Maniema.
- 3) Project Design Document.
- 4) Host Country Approval.
- 5) IFER - Designated Operational Entity.
- 6) Registration with the WGL.

8.3 Project Execution

8.3.1 The establishment of nurseries and experimental fields

- 1) Access roads construction.
- 2) Tthe campus and buildings construction, energy and water provision.
- 3) Terrain clean up of for the nurseries and fields.
- 4) Earthworks drainage construction, irrigation and other infrastructure.
- 5) Sowing and seedlings und undergrowth planting.

8.3.2 Land preparation for planting and fertilization

- 1) Access roads construction.
- 2) Removal of existing vegetation for reclamation works.
- 3) Earthwork, terracing, drainage.
- 4) Construction of farm buildings and equipment.
- 5) Planting of trees.

8.3.2 The establishment of fields for accompanying crops

- 1) Admeasurement of fields and beds.
- 2) Preparation and cultivation of fields and beds, incorporation of biocarbon.
- 3) Planting and sowing of accompanying crops.

8.3.3 Growing and harvesting works

- 1) Application of fertilizer.
- 2) Use of controlled agrochemistry.
- 3) Cultivation, weeding.
- 4) Harvest.
- 5) Transport of crops for processing or sale.

8.4 Research works

- 1) Measurement of precipitation, temperature, humidity, wind.
- 2) Monitoring of flows in watercourses.
- 3) Measurement of selected elements and substances in soil and water in time.
- 4) Time-lapse document processing.
- 5) Breeding and propagation of trees and utility plants.

8.5 Teaching and learning activities

9 Project staffing - project research team

- Ing. František Nekovář
- Prof. Salumu Ngolo wa Balanga Gabriel
- Ing. Jan Tošovský
- Ing. et Ing. Josef Trochta, MBA
- Doc. Ing. Emil Cienčila, Ph.D.
- Ramazani bin Kithima Didier
- RNDr. Lucie Erbanová
- Ing. Jiří Bartoň, CSc.
- Ing. Martina Pásková, Ph.D.
- RNDr. Miroslav Vosátka, CSc.

10 Project AgroForestry financial analysis

The AgroForestry project is designed to be able to generate sufficient revenues to fund the post implementation period, when the loss of virgin forests will be stopped and forest area will continue to grow. The project cost are enumerated below in stages. The capital return or interest rate is not considered.

Potential major financing source will be the sale of emission allowances. We propose that the competent authorities of the EU take over the WGL Carbon Standard for the offset projects in Africa. It is necessary to allow the conversion of such arising emission allowances VER to CERs for companies in the next period.

See section 10.3 Sources of project financing

10.1 The project basic parameters

- Estimated project cost: € 991 million;
- The period of reforestation and reclamation activities: 20 years;
- Annual costs: € 49.55 million;
- The annual need of seedlings: 13.75 million pcs.

10.2 Costs

Project financial costs at each step:

- 1) **The second expedition in Kindu** **0,38 million €**
Experts sojourn costs, equipment and services purchasing.
See Annex 4, The technical installations of the project AgroForestry base

- 2) **Pre-project preparation** **0,72 million €**

- 3) **Construction of bases and research centre** **7,04 million €**
At first, it will be built the central base. Subsequently one research center and four regional mechanized and energy independent basis, networked about 450 km narrow gauge (600 mm) railway. It will be a simple initial grant on part of donors for the project implementation.

- 4) **The afforestation cost in the range of 5.000 km²** **991 million €**
1 982 €/ha

See Annex 3, Calculation of afforestation - segment 1 000 km²

10.3 Sources of financing

Grants and subsidies

The realization precondition of the proroject first phase is the mobilization on the part of donors in the form of subsidies and grants. Within this phase, lasting 16 months, it will be built economic background of the project.

10.3.1 Prodej obchodovatelných ekosystémových služeb (ESS)

1) CO₂ sequestration by new forests planting

Newly established forest vegetation sequesterate around **31 t CO₂/ha/year** from the atmosphere, ie **938 t CO₂/ha/30 years** (rotation period).

2) Reducing Emissions from Deforestation and Degradation (REDD+)

- The project AgroForestry realization prevent further forests burning.
- The forests are the natural carbon sink. By destroying of one hectare of the forest it is released around **1 392 t CO₂** into the atmosphere.
- Through fertilization of 1 ha of degraded land it is possible to save 1ha of the forest from burning every year. I.e.that one hectare of fertilized land, in the first year of the project realization, saves during the project AgroForestry duration, which is 20 years, 20 ha of virgin forest. This represents prevention the release of approximately **27 840 t CO₂** (20 x 1 392 t CO₂) into the atmosphere.

3) Waste wood carbonizing in retorts

On the areas burned remain parts of trunks and strong branches, which subsequently decompose with release CO₂. When cleaning surfaces prior to reclamation and of economic forests planting, it is possible produce from this waste, for a mean of 74 t/ha, approximately 17 t of biocarbon/ ha. Biocarbon is the fine fraction of carbonization ≤ 20 mm, suitable for rehabilitation of degraded soils, creating fertile Terra-preta.

In the soil it can be stored up to 50 tons of biocarbon/ha, ie approximately 150 t CO₂.

The comprehensive information about the balance of biomass and CO₂ sequestration/fixation on the project area gives the table below.

BIOMASS BALANCE		Reforestation	REDD+
Aboveground woody biomass	t/ha	722	893
Belowground woody biomass	t/ha	361	447
Deadwood	t/ha		268
Woody biomass TOTAL	t/ha	1 083	1 607
Aboveground woody biomass	t/ha/year	24	
Belowground woody biomass	t/ha/year	12	
Deadwood	t/ha/year		
Woody biomass TOTAL	t/ha/year	36	
CO₂ BALANCE		Reforestation	REDD+
Fixation/sequestration CO ₂	t/ha	938	1 392
Production O ₂	t/ha	657	974
Fixation/sequestration C	t/ha	281	418
Fixation/sequestration CO₂	t/ha/year	31	
Production O ₂	t/ha/year	22	
Fixation/sequestration C	t/ha/year	9	

Table 2 Balance of biomass and sequestration/fixation CO₂ on the project area.

11 Factors of quality and sustainability of project results

1) Support of the project by the beneficiary country

- The land for afforestation and base construction is made available, based on a closed-Join Venture Contract, the commonwealth of Balanga and Watambolo Nord. There is the Governor of the province of Maniema personal support for the project AgroForestry activities. The project supports the development program announced by President RDC J. Kabyla.

2) The project ownership

- The future beneficiaries are involved in all phases of project preparation and implementation. All groups of final beneficiaries have equal access to the benefits of the AgroForestry project during its implementation and after completing.
- Final beneficiaries (forest owners) make available land within the cooperation with WGL. Built infrastructure remains their property. All buildings, machinery and base equipment remain under the WGL administration throughout the project implementation. Contractually they will define the rules of further cooperation.

3) Social and cultural factors

- The WGL aims are ecological as well as social. WGL employs the local residents. The staff has an 8-hour working time with adequate breaks for rest. The new jobs arise, the purchasing power of population increases.
- To the employee families the fertilized soil Terra Preta (about 600 m²) is given to use, for growing their own food. The surplus, which grow, are sold in local markets and provides an additional families income. The WGL also offers to its employees a material assistance in building their own familie houses or in repair and modernization of existing dwelling.
- Occupational training provides WGL by their own professionals.
- The school teachers and medical staff to medical facilities provide NGO partners in cooperation with local government authorities.

4) Equal access of women and men

- The organization ensures equal access for men and women to the benefits of project AgroForestry in the long run. In mechanized operations, transport, forests planting the men will dominate. Women find employment in forest nurseries and foo cultivation.

5) Appropriate technology

- Machinery and equipment shall be mainly mechanical, hydraulic as little as possible, they are less failure and require minimal maintenance and operator skills. Appropriate technology choice, machinery and equipment and their maintenance, will be tested in this pilot project.
- The transport in rivers will be provided initially by indigenous Pirog. Transport capacity of these indigenous vessels is limited. Later, own boats will be used, powered by bio-fuel (palm oil), even over long distances.

6) The environmental impacts

- The project AgroForestry emphasis on sustainable forest management development and food production on degraded, fertilized soils. The basic reason is, that the forests burning of is the only source of family livelihood in many areas of tropical forests. WGL believes that the project of forest planting, and degraded soils fertilization, is a solution of saving the original virgin forests.
- The soil, in the first years after planting, is protected by trees and farm crops. The trees grow faster and retain water in the landscape. Vegetable residues and biocarbon fertilize subsequently the soil. The main goal is to grow food, fuel and timber for the local population.

7) The economic viability of the project

- The base and research center construction, in the first phase, depends on the international financial subsidies.
- The AgroForestry project, after it is completed and accomodated with working capital, generates additional funds for the machinery rehabilitation and become self-sufficient.
- The demand for building materials (beams, planks, slats, flooring, etc.), food and fuel on the local market, continues to grow.
- Even in a state hospital the residents do not the right to free treatment. Medication they must buy. The fee for a physician is required, so that the local people more respect the care and do not think, that everything that comes from the abroad is free. The families are always offered, that anyone work off the staying and care in the hospital.

8) Management and organization

- For the successful AgroForestry project realization it is available a group of European experts for the the base and research center construction and for management, as well as for further local staff training. The Export and marketing of traditional products out of Africa will be managed by WGL for all project participants.
- Within the AgroForestry project, it will be ensured key local experts training, who will manage the reforestation in the other areas. For these experts special emphasis is placed on their high moral quality and incorruptibility..
- Built infrastructure remains forest ownwrs property. All buildings, machinery and base equipment will remain under the administration of WGL throughout the project life. Contractually, they will be defined the collaboration rules.
- The WGL calculates with permanent presence of its experts in project AgroForestry management in Congo.

12 What is necessary to do?

We have to give local residents a different, easier alternative of livelihood. The administrative bans of the next forests burning will never be effective, because the hunger and the fight for bare survival are, and always will be stronger.

On average, every year, one family uses about 600 m² of new agricultural surface, at the expense of virgin forest. In the province of Maiema, only Balanga community counts 18 000 families. This represents 1 080 ha of deforested area every year!

Here is the list of the most important steps that should urgently follow:

1) Project AgroForestry Implementation

- The project AgroForestry is currently the only known way how to prevent further loss of tropical forests and the subsequent environmental degradation. It will learn the local residents how to plant production forests and how fertilize previously degraded land. It will change the migratory agriculture into durable land use. By vegetation cooled surface and water retention, it will make the country suitable for agro-forestry farming.
- To stop the forests burning, only in the community Balanga (18 000 families), it is necessary:
 - clean up 3,240 ha burnt forest;
 - produce 54 000 t of biocarbon;
 - fertilize 1 080 ha of degraded soils;
 - reforest 2 160 ha, ie to produce 1 188 000 pcs of containerized forest trees seedlings (550 pcs/ha).

See Annex 2, Model project AgroForestry

2) The WGL Carbon Standard methodology adoption for valuation of ecosystem services

- The WGL Carbon Standard is tailored to the specific conditions of Africa. By adopting this sophisticated methodology the Congo basin Governments manifest to potential investors and donors the willingness and readiness to act within the internationally recognized rules.

See Annex 1, WGL Carbon Standard

3) Enabling the conversion of VER emission allowances, created under WGLCS, to CERs

- The EU competent authorities should take over the WGL Carbon Standard for its offset projects in Africa, and grant patronage over the project AgroForestry, as the pilot project with great economic potential.

4) Environmental instructors training

It is necessary to provide local environmental instructors training, through workshops and internships in order that the forest protection, forests plantation and farm land reclamation has become part of the local people culture.

See Annex 8, Program of seminars