Common Format for Project/Program Concept Note for the Use of Resources from the FIP Competitive Set-Aside

1. **Country/Region**:	The Democratic Republic of Congo (DRC)	2. **CIF Project ID#**:	
3. **Project/Program Title:**	*Community acacia and palm oil plantations on degraded lands to reduce deforestation in the Bandundu Province*		
4. **Date of Endorsement of the Investment Plan:**	June 2011		
5. **Funding Request (in million USD equivalent):**	*Grant:* N/A	*Non-Grant (loan): 10 MUSD*	
6. **Implementing MDB(s):**	African Development Bank	☒ Private sector arm ☐ Public sector arm	
7. **Executing Agency:**	Gecotra SPRL		
8. **MDB Focal Point and Project/Program Task Team Leader (TTL)**:	*Focal Point:* Mafalda DUARTE Chief Climate Change Specialist, AfDB m.duarte@afdb.org	*TTL:* Albert MWANGI Senior Forestry Officer, AfDB a.mwangi@afdb.org	

Update: August 26, 2014.

RESPONSES TO CONCERNS RAISED BY THE SET-ASIDE EXPERT GROUP REVIEW

***"Weaknesses:** From the proposal it is not possible to evaluate if the executing agency, GECOTRA SPRL, has the experience and team to successfully plant and manage 4000 hectares of plantations. It would appear that this is a company with very limited assets and technical capability. It is important that the BMD check the financial statements and annual report of GECOTRA carefully" (p9).*

1. With regard to the "experience, team, technical capability and assets", the following can be said:

- GECOTRA employs directly 39 agents in Kinshasa's headquarters and 242 agents in the field, where the company generates thousands of jobs. Nearly a third of the local population of Masi-Manimba and Idiofa works with GECOTRA. The company is divided in two departments (*Oil mills and Plantations* – 3 sub-departments: Garage, Factories, Plantations – and *Transports* – 5 sub-departments: Equipments, Logistics, Informatics, Human Resources, Accounts) plus the Service of Financial Affairs. They are under the responsibility of the Managing Director who reports directly to the Board of Directors. The top management is highly skilled in business management and has specific experience in the Palm oil industry. The senior agronomists and deputy agronomists working with GECOTRA have also a long track record in the Palm oil industry and in rural development in general. The proposed project will be managed by a Project Team (Project team leader and 2 accountants) under the direct supervision of the Managing Director. An analytical accounting will be carried out using GECOTRA's accounting software. Monitoring and Evaluation of socio-environmental safeguards will be externalized.

- GECOTRA has a proven technical track record in Palm oil industry in DR Congo. The company operates in palm plantations for more than a decade. It has a total of cerca 4 500 ha

of land registered under the “emphythéose” system (long-term lease securing land tenure). In 2001, the company started a replanting program in Mokamo (640 ha) and Mangai (360 ha) to replace old, unproductive palm trees plantations. These new plantations (160 000 palm trees) are mature since 2009 and currently produce 150 tons of palm oil per month in average. Each plantation site has its own equipments: nursery, oil extraction and maintenance facilities, trucks to evacuate the production, etc. Palm fruits (bunches) are collected by more than 500 small farmers and sold to GECOTRA at the market price. Each farmer is responsible of 2 ha, guaranteeing regular revenues for his family.

- GECOTRA's upscaling project will benefit from this pilot experience acquired by managing 1 000 ha of palm trees plantations during the last 13 years to overcome main organizational challenges. The future 2 000 ha palm plantations will be divided into 3 to 4 sites. Each site will have a dedicated management team, equipments and facilities. They will be divided into plantation blocks of 125 ha (each block having a nursery), on which 60 temporary workers (future farmers) will be assigned under the supervision of a deputy agronomist. GECOTRA believes that the best way to maximize the results is to create an early connection between the farmer and the trees. In the past, it appears that the palm trees productivity was lower than expected in some areas, mainly due the absence of initial zoning (some areas proved to be less productive) and perhaps the absence of fertilizers. In the future project, the company will carry out a mapping of soils to support the installation process.

- GECOTRA's experience will also be useful for the establishment of 2 000 ha of acacia plantations. The silviculture of *Acacia auriculiformis* and *A. mangium* is far less demanding than the culture of palm trees, because these species are less sensitive to drought and to poor soil conditions. In organizational terms, the same scheme can be used for acacia plantations (e.g. dividing sites into blocks assigned to future farmers). This has already been tested successfully in the Bandundu province for decades in the Mampu agroforestry farm (8 000 ha, funded by the EU) and the Novacel Ibi Batéké biological carbon sink (2 500 ha, funded by the World Bank and private investors). In both cases, farmers were able to cultivate cassava, peanuts, maize, etc. in association with acacia trees.

- GECOTRA already owns a "flotille" of agricultural engines and on-ground facilities (nurseries, garages, processing units). To be able to collect, transport and trade its oil palm, GECOTRA invested in tractors, trucks and the rehabilitation of hundreds of kilometers of rural roads. Besides, in parallel to the palm oil production activity, GECOTRA first core business activity since 1997 is river transport to deliver goods, including agricultural products, inside or from the inner country (from Kinshasa to Bumba and Kisangani – three to four rotations per year per boat). GECOTRA is a medium-size enterprise in the river transporting business. The company owns 4 pusher crafts and 12 barges, with a total transport capacity of 6 430 tons. The company also owns trucks and tanks for terrestrial transport. The company has thus several assets making it possible to produce, process and transport agricultural commodities from inner-territories to the Kinshasa's market. For the future needs of the project, GECOTRA will increase its on-ground transport capacity (tractors, trucks, etc.) and will rehabilitate hundreds of rural roads, which is crucial in the Congolese context.

- Finally, the company can count on its experience of more than 13 years in the oil palm business, as well as on the experience and capacities of its top management who has a very long track record in terms of business management in the oil palm sector.

2. With regard to the “financial statement and report”, the following can be said:

From the past three years, GECOTRA's annual turnover increased from USD 3.2 million (2011), to USD 4.2 million (2012) and USD 4.5 million (2013). Operating costs represent between 75% and 80% of the annual turnover.

GECOTRA's financial affairs department is run by two accountants strictly controlled by the Managing Director who reports to the Board of Directors. The department uses a specific accounting software allowing to control operating revenues by business unit and workstations. GECOTRA's accounts are audited every year by an independent accountant who communicates the financial statements to DRC's tax authorities in Kinshasa. Tax authorities may carry out counter-verifications and certify that the company complies with its tax obligations.

RESPONSES TO CONCERNS RAISED BY THE US EXPERTS

Reasons for and additionality of FIP financing for this project; further examination of whether activities under this project would actually reduce forest clearing.

1. With regard to the “reasons and additionality of FIP financing”, the following can be said:

Additionality of FIP financing is explained in details in **Chapter 2** (p.9) and is mainly due to the incapacity of the traditional banking sector to invest in innovative agricultural projects in DR Congo with reasonable interest rates for the project developers.

2. With regard to "whether activities under this project would actually reduce forest clearing", the following can be said:

As explained in **Chapter 2** (p.8), agriculture is identified as one of DRC's seven strategic pillars to reduce deforestation and forest degradation. Slash and burn agriculture is a major driver of deforestation. In absence of soil fertility management, forests are cleared to provide the basic nutrients to produce food crops. With increasing pressure on fallows which do not have enough time to reconstitute suitable levels of fertility, intact forests are highly under pressure. Wood-based charcoal production is also a major factor of deforestation and degradation. The demand for this product is very high in urban areas, and this generates thousands of rural jobs, in a context of severe unemployment crisis. Therefore, it is really necessary to develop alternatives to slash and burn agriculture by promoting soil fertility management systems (such as agroforestry with acacia and palm trees) and to promote charcoal production based on renewable sources. Creating alternative jobs will help alleviate poverty while preserving natural resources. The management of soil fertility in degraded lands and savannas, as well as the production of charcoal based on renewable sources, are the keys to reduce forest clearing.

RESPONSES TO CONCERNS RAISED BY THE UK EXPERTS

Include full details of the origin of figures and assumptions made in the calculation of climate change mitigation potential e.g. including a table detailing the tC/ha associated with palm, plantation, agricultural land and forest/ land that will be cleared to plant cassava - so that a thorough picture of mitigation impact can be made.

Further details on how the project will account for, and mitigate against, leakage. The project assumes that to decrease the area of slash and burn, participants will use profits from palm to buy cassava to prevent expansion into agricultural areas (allowing only .5ha to be expanded). How will the project ensure that forest is not cleared in other areas, outside of the project, to cultivate cassava?

Further clarifications and details on the type of agricultural activity that the communities are practicing. Is this shifting cultivation, does the baseline account for areas where vegetation is recovering?

Further clarification on the type of land that palm and acacia will be planted on, pg 1 refers to degraded land however pg 5 & 6 imply that trees will be grown on already existing agricultural land used to grow cassava.

How will the project ensure food security of the participants? (e.g. if markets for palm oil decline).

1. With regard to the "origin of figures and assumptions made in the calculation of mitigation potential", the following can be said:

Firstly, it is important to highlight that these estimations are preliminary because data are lacking in most of the DRC, especially on emission factors. Biomass and carbon mapping projects financed by international organisations (GIZ, WWF, FAO, JICA) exist in the Bandundu province, but their results are not yet available. Remote sensing analysis and carbon inventory fieldwork are needed to develop a monitoring system fully consistent with IPCC guidelines (or other approaches such as *High carbon stock* approach promoted by TFT and Greenpeace). However, the project developer does not have yet the financial resources to carry out these tasks. Thus, preliminary estimations are based on the following hypothesis:

Hypothesis related to the productivity and price of palm products are presented in **Chapter 12** (Annexes). Productivity rates are coming from the company that commercializes the palm seeds (ASD Costa Rica). Processing rates are coming from the Malaysian Palm Oil Board (MPOB). Carbon sequestration rates of palm trees on savannas are provided by Thenkabail et al. (2004).

Hypothesis related to the productivity, carbon sequestration rates and installation costs of acacia plantations come from the Novacel Ibi Batéké biological carbon sink project (similar biophysical conditions).

Hypothesis related to the slash and burn annual rates (e.g. 1 ha/year/household) is empiric and based on field observations.

Scenario	Hypothesis	Source
All	Carbon sequestration in forests: 250 teqCO2/ha	Conservative hypothesis extracted from DRC's National REDD+ Investment Plan
	Carbon sequestration in acacia plantations: 3,15 tC/ha/an	Result from Novacel Ibi Batéké biological carbon sink
	Carbon sequestration in palm trees: 2,95 tC/ha/an	Thenkabail et al. 2004: Biomass estimations and carbon stock calculations in the oil palm plantations of African derived savannas using IKONOS data
	Carbon sequestration in savannas:	*Not taken into account at this stage.*
Baseline	Slash and burn: 1 ha/year/family	M. Rodriguez (FIP Technical assistant in Kinshasa), *Comm. pers*.
Project scenario	Palm productivity, prices and processing rates	ASD Costa Rica, Malaysian Palm Oil Board
	Acacia productivity and installation costs	Adapted from Novacel Ibi Batéké biological carbon sink

2. With regard to the "accounting and mitigation of leakage", the following can be said:

The risk of leakage exists if the farmers installed on palm plantations buy cassava produced outside of the project's area and if this cassava is produced at the expense of forest (which is likely to happen). The best option to mitigate this risk would be to encourage the acacia farmers to produce cassava at their maximum capacity (2 ha) and sell the surplus to the palm farmers. This will imply to start the acacia plantations three years after the palm trees plantations, because during the first three years, palm trees farmers can be autosufficient. However, after five years, the acacia farmers would not be able to provide the palm farmers with cassava (no

more surplus). To solve this problem, an option would be to increase the total area of acacia plantations up to 4,5 ha per acacia farmer so that his surplus corresponds to the needs of a palm farmers family (e.g. creating 9 000 ha of acacia plantations, or reducing the number of farmers participating to the project). The other options would be to increase cassava productivity (which has a significant potential of being improved) to limit the project size.

3. With regard to the "details on the type of agricultural activity that the communities are practicing", the following can be said

Shifting cultivation based on slash and burn to produce food crops is the main agricultural activity for the Congolese rural populations. Cassava is by far the main agricultural commodity produced and consumed in DR Congo. Cassava production is very simple and its harvest can be delayed over the year to ensure a constant supply of food. The plant is adapted to the poor sandy soil conditions of the Bandundu province. Farmers may sell their surplus of cassava to increase slightly their revenues. Sometimes cash crops (like peanuts and maize) are also cultivated in association with manioc or a few months before installing manioc, at the beginning of the rainy season, but not on all possible soils. Forests and fallows are burnt each year to release nutrients that will benefit to the crops. There is no soil fertility management once the crops are harvested, the unfertile land is simply abandoned and returns to fallow. With an increasing demand on lands suitable for agriculture (due to high demographic growth), fallow periods are shorten, and forests remain the only proper reserve of fertile lands. Small-scale market gardening (gombo, pili-pili, moringa, bulukutu, etc.) also exists but has no impact on deforestation and degradation.

4. With regard to the following question "does the baseline account for areas where vegetation is recovering", the following can be said

No, these are preliminary estimations. As explained above (question 1), data on emission factors are scarce in DRC and the project developer does not dispose yet of the financial resources to analyze remote sensing images and conduct fieldwork and needs external support.

5. With regard to the "types of land that palm and acacia will be planted on", the following can be said

Palm trees will be replacing old plantations and be planted on degraded lands that used to be forests once. These degraded lands are shrubs and young trees, grasslands and open lands with low carbon stocks. Young regenerating forests will not be replaced by palm plantations. This approach is directly inspired from the *High carbon stock* good practices recommended by TFT and Greenpeace for the palm oil industry.

Acacia trees will be planted on savannas and degraded lands (lands with shrubs and young trees, grasslands, open lands...) having low carbon stocks. It is important to note that there is a huge reserve of savannas that is suitable for agriculture but not used because the communities do not have the capacities to do so. Acacia trees (and all N-fixing tree species) will be planted on newly opened parcels but they may be introduced on existing croplands without compromising the agricultural production (in contrary, they will act as natural fertilizers).

5. With regard to "Food security", the following can be said:

Agroforestry systems are suitable with both acacia and palm trees. Thus, each farmer will have the possibility to produce a diversity of food crops (e.g. cassava) and cash crops (e.g. peanuts) on its parcel, ensuring food security.

1. PROJECT DESCRIPTION

GECOTRA SPRL ("Gecotra") is a limited company established in the Democratic Republic of Congo. The company operates two main activities: fluvial transport and agriculture. The company exploits a private concession located in the Bandundu province, planted with palm trees (in Mokamo, 500 ha). The concession is a 25-year lease (2002 to 2027). The project is expected for a 20-year period thus until 2033. Palm oil is transformed locally and transported to Kinshasa where it is commercialized. Gecotra generates thus hundreds of local jobs, in a rural area severely affected by unemployment.

According to UNEP (2009), deforestation and degradation in the Bandundu province is mainly due to slash and burn agriculture and wood-energy production. The National REDD+ Strategy identifies agricultural intensification as a promising way to reduce deforestation and degradation by providing economic alternatives to slash and burn practices. Increasing the sources of sustainable wood-energy through reforestation is also a major concern.

Gecotra intends to reforest 4000 ha of degraded lands with agroforestry systems based on Palm trees (2000 ha) and Acacia (2000 ha) implying 2000 rural households.

- Palm: local households will be responsible for palm nuts collection. Gecotra will install the plantations, allocate 2 ha of palm plantation per household, provide technical support and buy the palm nuts which will be transformed locally. The local households will increase their incomes by selling palm nuts to Gecotra (sole offtaker), whereas Gecotra intends to minimize its operational risks (land tenure conflicts, bush fires, etc. affecting the plantations).
- Acacia: Gecotra will support the installation of acacia plantations (2 ha per household) and train local households to manage them and produce charcoal efficiently (improved carbonization). The company will benefit from the extension of the total area suitable for agriculture (potential out-growing opportunities) and, again, will minimize its operational risks. The local households will benefit from the plantations products (food, wood-energy, fodder...) and from improved local livelihoods.

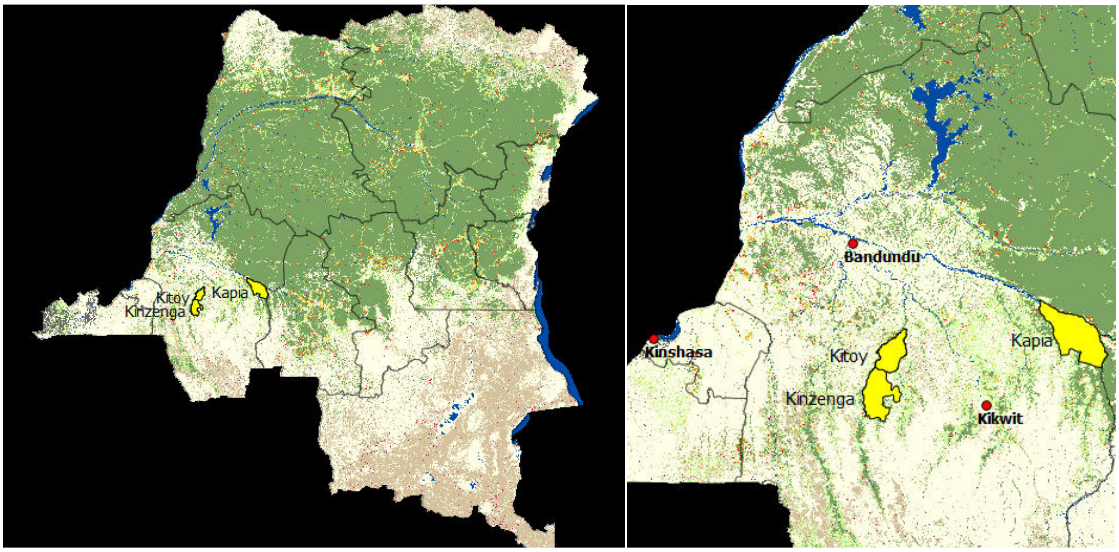

Fig.1: *The 4000 ha project will take place in the Bandundu province, on three sites: Dunda (Kitoy sector; Acacia: 1500 ha; Palm: 500 ha), Kalonda (Kinzenga sector; Acacia: 500 ha; Palm: 1000 ha) and Mangai (Kapa sector; Palm: 500 ha). Kalonda and Dunda were two concessions exploited by the SEKAE ("Société Economique du Kasaï et de l'Equateur") during the 1970's*

Gecotra intends to minimize its operational risks. With the support of the local communities and customary authorities, land tenure conflicts with potential households entering the concession are expected to decrease. Increasing the total area planted with palm/acacia around the concession is expected to create a buffer zone, contributing to reduce the quantity of bush fires entering the concession.

Gecotra also intends to increase its profitability. On the mid- to long-term, the extension of the area suitable for agriculture (and farmer's organizations reinforcement) is expected (i) to bring more palm nuts on Gecotra's oil transformation unit, and (ii) to increase the local needs for transportation services to evacuate the products (which is one of Gecotra's economic activity).

The expansion will take place within Gecotra's concession but also on lands owned by the surrounding communities (out-growing model).

The 4,000 ha plantations of palm trees and acacia trees will be split between lands "owned" by the company (concession) and lands "owned" by the local communities (or "*terres des communautés locales"* according to the congolese Law on land tenure).

Inside the concession, the concession regime allows Gecotra to use and valorize the lands during a renewable 25-year period. As it is usually the case across DRC, there are households living inside the concession. They will be responsible for the collection of palm nuts produced within the concession. This type of partnership with communities has been implemented in the Mokomo palm trees plantations (500 ha) for years and gave satisfactory results to Gecotra and the implicated households.

Outside the concession, local community lands are used by households (mainly for agriculture) and managed by customary authorities, as defined by the congolese Law. Plantations on lands outside the concession will indeed require both the farmers' and the local customary authorities' agreements (free prior and informed consent). They already showed their interest to Gecotra: the project is seen as an opportunity to valorize large areas of low fertile, community lands, with a strong technical support from Gecotra, as well as an opportunity to create jobs and generate new revenues.

The palm trees varieties foreseen (*Elaeis guineensis* var. deli-ghana, var. deli-nigeria and var. deli-yangambi) are more suitable for forest-types environment. They will be introduced on deforested land and intercropped with cash crops (maize, peanuts) and N-fixing cover-species (*Mucuna sp., Vigna sp.*) to restore/conserve soil fertility. They will also be used to restore abandoned or unproductive palm plantations. Acacia trees (*A. auriculiformis* and *A. mangium*) are adapted to a wide range of conditions, including the low fertile soils found on the Bandundu province. They will be introduced on degraded savannas and intercropped with cassava (mainly), as well as with N-fixing cover species to restore/conserve soil fertility. Both Gecotra and the local households will benefit from improved soil fertility.

2. RATIONALE

Agriculture in DRC and Bandundu Province: historical perspective

From 1950 to 1970, intensive agriculture was led by private industrial and religious groups in association with populations. Bandundu was the main source of the DRC oil production and

exportations. At that time, DRC was the second exporter of Palm Oil in the world after Malaysia but before Indonesia (World Bank, 2012).

In the 1970's, a succession of political choices transformed the economy and the whole country: Zairinisation (1973), Radicalization (1974) and Demonetization (1979). New orientations provoked rapid and intensive destruction of rural economies. The successive civil wars since that time did not allow the agricultural sector to recover.

In the Bandundu Province, production centers became inoperative, foreign investments and companies retracted, plantations were abandoned (Palm, Coffee, Rubber), commercial circuits were dismantled, degraded infrastructures isolated areas with high potential, etc. Social-economic impacts (unemployment, rural exodus caused by poverty, etc.) hit the population strongly. Agricultural practices turned towards subsistence and led to farming systems based on slash-and burn to produce cassava, peanuts and maize (on best soils), with decreasing fallow periods due to high population growth and land shortage/conflicts.

With 80 million hectares of arable lands and less than 10% exploited, the country remains amongst the main reserves of arable lands in the world. Moreover, the sector "employs" today more than 70% of the population. However, the agricultural sector budget share in the government portfolio is less than 2%, far from the 10% targeted by the Maputo Agreement in 2015.

Agroforestry systems based on N-fixing trees and crops

More recently, a large literature on the relevancy of agroforestry systems based on N-fixing species of trees (especially *Acacia sp., Albizzia sp., Cassia sp.*) intercropped with cassava and/or cash crops (maize, peanuts, niébé) and/or cover crops (*Stylosanthes sp.*, etc.) appeared in DRC. Projects such as "Ibi Batéké carbon sink" (Novacel SPRL), "Mampu agroforestry farm project" (Fondation Hanns Seidel, CIRAD, European Union), "Projet Makala" (CIRAD/CIFOR, UE) contributed to disseminate information on the suitability of these systems in the Bandundu and Bas-Congo Provinces.

National REDD+ Framework Strategy (2012)

Agriculture is identified as one of DRC's seven strategic pillars to reduce deforestation and forest degradation. The global objective is to reduce the negative impacts of agriculture on forests and to contribute to food security and economic growth.

Several aspects of the project are directly in line with strategic axes:

- *Investments are directed towards degraded ecosystems* (e.g. savannas for acacia plantations, former plantations and degraded forested areas for palm plantations);
- *Slash and burn activities are targeted in order to reduce pressure on forests;*
- *Improved farming techniques are encouraged* through the development of agroforestry systems;
- *Value chains are developed* (e.g. for oil palm and charcoal).
- *Support services are provided to small-farmers to develop new business opportunities in sustainable agriculture* (e.g. through contract farming schemes).

Relevancy with DRC's FIP Investment Plan (2012)

The project is in line with DRC's FIP Investment Plan because:

- *The main local drivers of deforestation are targeted*, e.g. both direct causes (slash-and-burn and wood-energy production by small-scale farmers) and indirect causes (poverty and unemployment);
- *A collaborative model engaging communities and the private sector is targeted,* e.g. through the implementation of contract farming schemes to minimize operational risks and improve local livelihoods;
- *Specific investment areas are targeted* e.g. agroforestry activities, including afforestation-reforestation, improved charcoal making techniques and reinforcement of communities' capacities to manage sustainably their forest resources. All combined, they represent the largest budget share in the FIP Investment Plan;
- *Project sites are located within Kinshasa's supply area for agricultural commodities*, palm oil being commercialized by Gecotra in Kinshasa: the three FIP areas in Congo are defined as "supply basins" (namely for wood-energy and by extension for agricultural commodities);
- *It allows to reduce and avoid GHG emissions and alleviate pressure on natural resources through sustainable management techniques;*

Financial additionality of FIP financing

Potential sources of financing are scarce in DRC. The country is facing major challenges in terms of business environment (it is ranked 181/185 on the Doing Business Index 2013). Rural credit for agriculture is scarce: commercial banks barely start to finance private operators, but it is very preliminary and they do not propose attractive rates. Moreover, the country is under "observation" by the IMF and the World Bank: negotiations are on-going around a "matrix of economic governance" between IMF/WB and the Government of DRC. Finally, the State budget for agriculture is less than 2%, despite the enormous needs. In this context, it is difficult to raise financing for private agro-investments.

Access to a financing at low interest rate is impossible in DR Congo, especially for innovative agro-investments. The overall banking system is not adapted: national banks do not invest in Agriculture nor Forest sectors because they assess higher risks (and lower IRR) compared to the Real estate or Mining sectors for instance. Credit agencies propose loans with high rates of interest. For example, the "Fonds de promotion de l'industrie" (Fund for Industrial Promotion) interest rates is comprised between 12 and 20% (possible 10% in some cases). Development finance institutions such as Proparco, KfW, Finnfund, etc. specialized in equity investment are not or shyly present in DRC. The governmental agency specialized in Agriculture project support (the Bank of Agriculture) practices loan conditions similar to private banks.

3. CONSISTENCY WITH INVESTMENT CRITERIA

Climate change mitigation potential

Local historical deforestation rates are higher than the country's average:

Site N°	Location	Sector	Forest / Non forest (%)	Deforestation rate (%/year)
1	Dunda	Kizinga	37 / 63	0.58
2	Kalonda	Kitoy	53 / 47	0.33
3	Mangai	Kapia	70 / 30	0.60
…	…	Bandundu	53 / 47	0.25
…	…	DRC	63 / 37	0.23

Tab.1: *Historical deforestation rates (2000-2010) in the 3 project sites, Bandundu Province, DRC. Source: Terracongo.*

The project intends to reduce deforestation and forest degradation by providing an economic alternative to slash and burn and through the reconstitution of carbon stocks to be sustainably managed. The mitigation potential is estimated as follows:

- Baseline: according to estimations made in the Bandundu Province, each household opens 1 ha of forest through slash and burn to produce cassava (Rodriguez, 2011, comm pers.), corresponding to 40 000 ha in 20 years for 2000 households.
- Project scenario - mitigation potential is around **9.2 MtCO2eq** :
  - *Avoided deforestation through palm plantations*: 2 ha of palm trees intercropped with cassava are suitable for cassava production during three years before canopy closure. Between year 3 and 6, the household converts forests to produce cassava elsewhere. After year 6, the palm trees generate revenues for the households (1215 $/year). It is assumed that the household use part of these revenues to buy cassava (675 $/year) but continues to convert 0.5 ha of forest each year to produce cassava, because it is fundamentally risk adverse. At the end of the project period (20 years), 2 000 ha of palm trees allows to avoid the deforestation of 10 000 ha, e.g. approximately 2.5 MtCO2eq.
  - *Avoided deforestation through acacia plantations:* 2 ha of acacia trees are divided into sub-plots of 0.4ha exploited on a 5-year rotation period. From year 0 to year 4, there is enough land to produce cassava for the household. After year 4, there is a shortage of 0.5 ha per year. The household converts thus forests to produce cassava elsewhere. At the end of the project period (20 years), 2 000 ha of acacia trees allows to avoid the deforestation of 12 500 ha, e.g. approximately 3.1 MtCO2eq.
  - *Carbon sequestration in palm and acacia plantations*: carbon sequestration will approximate 1.9 MtCO2e for acacia plantations (Ibi Batéké carbon sink) and 1.7 MtCO2e for palm plantations (Thenkabail et al., 2004) over 20 years.

To sum up, the project scenario (20 years) includes the following conservative hypothesis:

- For palm plantations, between years 3 and 6, the farmer produce cassava through slash and burn (1 ha/year). Same for acacia plantations after year 4 (0.5 ha/year). It is justified by the fact that there are no other alternatives;
- After year 6 in palm plantations, the farmer is expected to produce 0.5 ha of cassava per year through slash and burn practices, because it is fundamentally risk-adverse (especially in DRC), and will always cultivate a small plot of cassava.

The total area planted with palm trees will be 2 000 ha, as well as the total area planted with acacia. The total are needed for cassava production will be 17 500 ha in the project scenario, instead of 40 000 ha in the baseline.

Demonstration potential at scale

Kalonda and Dunda farmers are already aware of the success in Mokamo (500 ha of palm trees) and are interested in being integrated in a similar type of partnership. The proposed project is expected to show same success, at a larger scale (500 ha to 4 000 ha) and with complementary activities (Palm to Palm/Acacia/Crops).

In a larger viewpoint, the initiative may represent a good example of (i) deforested land restoration and (ii) sustainable palm oil agri-business. The intensive model of palm oil plantations especially in South East Asia shows its limits in terms of natural resources degradation, conflict with populations and political issues.

In addition it may help to learn lessons on Agriculture and REDD+ strategies alignment in DRC, which in return could foster other investments in the agri-business sector.

Cost-effectiveness

FIP funding will be leveraged at least 1:3. If we divide the total investment cost by the number of tC02e, we get a cost-effectiveness in terms of carbon sequestration of about **1.1 $ per ton**.

Implementation potential

The project can begin rapidly with land preparation and plantations a few months (3 to 6 months as estimated by Gecotra) after the funding agreement, according to the agricultural calendar.

As stated above, outside the concession, Gecotra, the local communities and customary authorities will have to agree on lands to be planted with palm or acacia. This activity may take time, since the participative identification of suitable plots has not been started yet outside the concession. In the contrary, inside the concession, Gecotra already identified the plots to install new plantations. It is the reason why plantations are expected to start in the concession first. Given that the potential plantation plots outside the concession have not been clearly identified, as well as the households who will benefit from it, it is not possible to define precisely yet the exact area that will be impacted by the project.

The concession regime allows Gecotra to use and valorize the lands during a renewable 25-year period. After this period, the State decides whether or not the concession contract is renewed. The rule is that, when a concession is valorized (with crops or trees), the concession contract is automatically renewed. In agricultural concessions, planting trees is considered as a possible option to valorize lands (according to the congolese Law on land tenure). The risk of non-renewing Gecotra's concession contract at the end of the 25-year period is thus very low.

This project intends to plant acacia and palm trees intercropped with crops. Technically, the plantations implementation will not to encounter major agronomic barriers.
The project location is close to Kinshasa (less than one day of travel by car) where the company's headquarters are located. It means that the project can be easily implemented and monitored.

Integrating sustainable development (co-benefits)

This intervention integrates sustainable development of local population in their natural and social environment. It targets rural development and REDD+ objectives. Thus co-benefits are numerous:

- Social: generate employment opportunities and related revenues, decelerate rural exodus by providing activities and long term vision in rural localities;
- Environmental: biodiversity erosion decrease, maintaining the capacity of ecosystems to provide environmental services (quality of pound and river water; diminution of land erosion and soil chemicals lixiviation), increase and sustain forest resources (medicine, forest meat, non timber forest products);
- Agronomic: stabilize and increase agricultural yields, diversify productions with a marked effect on food security and on environment preservation;
- Economic: give an impulse to local economy by creating or renovating production and transformation centers, attract foreign investments, increase possibilities to use abandoned plantations and generally allow valorization of deforested lands with high soil potentialities, increase commercial exchanges and market structure, increase secondary communication axes (connected to the RN1), provide access to remote areas and develop their activities and their relation with the country life.

Safeguards

Environmental and social safeguards

The Ministry in charge of environment (MECNT) published a regulation in February 2012 (n°004/CAB/MECNT/012) aiming at setting minimum social and environmental requirements and safeguards for REDD+ projects. Gecotra will have to abide by this regulation in order to be registered in the national REDD+ registry of DRC.

Besides all benefits brought to the population a certain number of safeguards will be respected:

- No newcomers from other zones will be allowed to plant. Farmers are enough around the project sites so they have priority. Land allocation is decided by Gecotra in accordance with farmers groups and local authority;
- The price of Palm fruit is fixed in advance by Gecotra and corresponds to the market price. In other terms, farmers would earn same benefits than if selling to further companies.
- As specified earlier the only rule required for the business functioning is that valorized lands where palm fruits collection are not carried out will be re-attributed to another farmer family.

4. TYPE OF PRIVATE SECTOR ENGAGEMENT

This project is a solely private sector project. No intervention are expected from public organizations (NGOs, central government), the only public element is the financing from the FIP set aside budget and from a potential multi-lateral development bank (to be determined).

Gecotra is engaged to:

- ✓ Provide lands to land less farmers,
- ✓ Support establishment of acacia and palm plantations: provision in planting material, agronomy advice and follow-up,
- ✓ Buy palm fruits with fixed purchase prices, and transport it to the factory,
- ✓ Buy and install transformation units,

- ✓ Transport and sell oil to Kinshasa market to industrial companies involved in production (for consumption) and transformation (cosmetics).

Gecotra engagement leaves farmers the entire use and benefits of their lands:

- ✓ All intercropped annual crops (notably in first stages of plantations)
- ✓ Plantation products are wood and Palm fruits. They belong as property to farmers. A contract nevertheless engages them to sell Palm fruits to Gecotra exclusively
- ✓ Wood belongs to farmers either to use, sell or transform (in charcoal) before selling or using. That is why acacia production costs appear in the business plan and not the Acacia revenues. Nevertheless, transformation *i.e.* carbonization will be supported by Gecotra team and agronomists.

5. INNOVATION

An innovative business model in DRC

The first innovative element of the project is its business model. All project costs are entirely covered by palm oil revenues. In other words, the project foresees to set up 2000 ha of palm trees plantation whose incomes will provide:

- ✓ Cash for maintenance and sustainability of palm plantations
- ✓ Cash for farmers (proportionally to fruit collection)
- ✓ Corn, cassava, peanuts (and optionally fodders) for farmers from palm and acacia inter-cropping
- ✓ Wood and charcoal for use or sell
- ✓ Palm oil for consumption.

Gecotra, from philanthropic interest for the region and for sustaining its business (plantation security and efficiency), creates all conditions enabling the success of this community initiative based on contract farming.

Technical innovation

Mix agroforestry systems. Many experts (and the REDD+ national strategy as well) recognized the intensification of agriculture as a central element to fight deforestation. Although risk and complexity of the implementation of the agriculture intensification exist, ER potential is very high.

6. TECHNOLOGY, PRODUCT AND/OR BUSINESS MODEL

Justification of loan, loan interest and grace period

Budget: to obtain a real impact on natural (forest) resources preservation, the project considered a total area of 4 000ha. From first investigations, low and good fertility areas are share almost as 50%/50% ratio, thus the acacia and palm plantations are planned to cover 2000 ha each. Given literature data, 2000 ha of Palm needs an initial investment of 6 MUSD and 2000ha of Acacia 3 MUSD. Adding 10% of management and administrative costs, the project implementation needs a minimum budget of 10MUSD.

Grace period: the project financial feasibility is based on palm plantations. Those are productive from the 7th year, thus no “official” incomes are generated before. Thus a grace period (in between those no reimbursements are asked) of seven years at least is justified. Also, the

possibility to reimburse over 20 years – the project life span – is an ineluctable advantage to reduce business risks thus to increase project feasibility and sustainability.

Loan interest rate: (i) at Kinshasa average (between 12 and 20%) bank conditions, as described as more than 15%, the project does not generate income. (ii) At best DRC bank conditions, the project is possible (showing its robustness) but benefits are low and if that is coupled with no additional concessional conditions, i.e. no grace period and short reimbursement period, the project becomes impossible. No investors will try it. (iii) Within concessional loan conditions, an interest rate inferior to 5% makes the investment attractive. Although revenues are enough to cover costs (including Palm fruits collect payments and Acacia plantation management), the final profit for the private company is not that attractive but concessional conditions could reinforce interests.

A holistic approach is necessary to understand whether a private company can be interested. With these kinds of benefits, a project is interesting especially when other elements are positively influencing the decision: suited grace period and reimbursement time frame. In conclusion the concessional option inferior to 5% is required here to motivate investor/implementer and seems to conduct to a project effective and financially stable.

In conclusion the proposed conditions are as follows:

FIP set aside loan conditions demanded for this project:
- Grace period of 7 years,
- Reimbursement over the total project duration (20 years) and
- Interest rate inferior to 5%.

Project financial risks

The lower will be the applied rate (< 5%); the lower will be the project risks.

Further elements which can reduce financial risks are:
- The business model is based on several conservative assumptions(mainly palm trees productivity);
- The opportunity to start this business may attract additional investments and/or incentives:
  - Preferential fiscal regime from the government (because of community and environment action): low income taxes, etc.
  - Possible government grants because of the innovative nature of the project,

Possible aligned funds from traditional development aid, amongst others.

7. MARKET

NB: Gecotra doesn't intend to sell carbon credits yet. The following assumptions are based exclusively on palm oil revenues.

Palm oil is the first cooking oil used in DRC

Palm tree is considered as one of the most profitable land uses in the humid tropics (Butler and Laurence 2009). DRC used to be the second world exporter in the 1960's (World Bank, 2012). National demand was estimated 300 000 tons/year in 2008 and is expected to grow alongside

with high population growth (3.16%/year in 2006 according to Saint-Simon). Despite suitable conditions to grow palm trees, DRC imports 50 000 tons/year (World Bank, 2012).

Palm oil (950 USD/t in Kinshasa market) is on the international market a good example of commodity which is not expected to suffer from asset devaluation, at least in the next decades. Indeed, the market is developing with:

- Decrease in global supply: reduction of available lands and augmentation of pressure from watchdog NGOs in main production regions (South East Asia),
- Increase demand because main consumers are emerging country populations and industrial products from the transformation of this oil are increasing in the world market (cosmetics, food).

An increase in Palm oil plantations in central Africa is anticipated from various experts. Investments will reach DRC rapidly and strongly. Action to propose alternative from exclusive/large scale and extremely profitable industrial projects have to be made now.

Current market barriers	How the project will reverse it
Lack of local investments	The project is led by Gecotra which is ready to invest. It is expected that part of the palm oil revenues will be reinvested to increase the palm plantation area by the households.
Funding and loan difficult to obtain	FIP set aside program proposes loan with attractive concessional conditions (< 5%).
Lack of production centers	Settlement of one production unit per site (three in total).
Communication axes are poorly maintained	Rehabilitation of secondary roads; possibility to develop the river transport (river in border of the Gecotra concession and Gecotra possesses in other business boats)
Plantation security	Installation of a security team to protect plantations; lands belong to planters
Land tenure security	Project plantations will be held in Gecotra concessions; concession titles exist and are not questionable in regards of customary rights because of a good relation between Gecotra and village chiefs. Land valorization will occur only in clear land tenure farmer lands (discussion with local legal and customary authorities).
No identification of land suitable for Agriculture	The project will respect high environmental standards. Plantations will be set up in deforested and savanna lands identified from a prior analysis of land suitability. For further projects, authorities can be interested in the approach and provide expected services of land analysis.
Lack of national government support	Multiplication of successful initiatives in agriculture will lead central government to pay attention and to multiply valorization of potentialities for local as well as for national economic benefices
Lack of capacities of local authorities and farmers to develop agri-business and agro-forestry business	Training of implied farmers, young and local authority agents; in a second step project sites can become training centres for neighbor planters and a visit site for donors and further development organizations

8. FINANCIAL PLAN

Financial plan (indicative proposition)

Source of Funding (fund type)	**Amount** (USD million equivalent)	**Share** (%)
Project developer: GECOTRA (provision detailed below)	6	60
MDBs: to be determined (loan)	1	10
FIP (loan)	3	30
Local banks	Possible arrangements post FIP agreement	
Other investors	Possible arrangements post FIP agreement	
Bilaterals	Possible arrangements post FIP agreement	
TOTAL	**10**	**100**

Share in the Gecotra provision: what Gecotra provides to the project and corresponding values (estimation)

Item	**Details**	**Value** (MUSD)
Land	Old plantation on site in Mangai, attributed lands for farmers in the three project sites, general land ownership	2.5
Material	Agriculture material, existing transformation factory and transport items (by road or river)	2
Expertise	Technical support and expertise from the existing trained team put at disposition for the project	0.5
Cash	Available cash and own potential co-investments especially for the purchase of 2 new production units	1
TOTAL		**6**

Gecotra guarantee (estimation)

Details	**Value** (MUSD)
Lands and buildings	2.5
Equipments and factories	0.75
Fluvial material: boat and river pear infrastructures	4
Road items (trucks, etc.)	0.4
Available cash and client port-folio	0.35
TOTAL	**8**

9. EXPECTED RESULTS AND INDICATORS

Results	Indicators/proxy
DD reduction	
Avoided deforestation	Ex post forest cover and carbon stocks Average open new field per farmer/planter implied in the project
Avoided forest degradation	Biomass energy renewability rate (% of renewable biomass used by the households, (e.g.) charcoal from plantation vs. charcoal from slash and burn).
Plantation	
Palm nuts production	Tons of palm nuts sold to Gecotra and recorded
Oil production	Tons of oil sold to Kinshasa market and recorded
Wood production	Volume of wood in acacia plantations (cubic meters)
Charcoal production	Quantity used or bags sold (in tons)
Agronomic	
Corn production	Yields/ha
Cassava production	Yields/ha
Peanuts production	Yields/ha
Fodder production	Yields/ha
Development	
Revenue	Cash per month per planter
Job	Movement in the accounting book of Gecotra Villagers/workers survey
Road	Observation ex post of secondary roads

10. IMPLEMENTATION FEASIBILITY AND ARRANGEMENTS

As described above, all conditions to realize the project are ready and Gecotra estimates the potential starting date as three to six months after the financing agreement.

First steps of the project right after the FIP fund agreement would be:

- Lands allocation: after efficient consultation and decision with all stakeholders including force groups (chiefs and landlords) and vulnerable groups,
- Delimit clearly project area from Gecotra concessions (easy), new attributed lands and lands belonged to farmers outside the Gecotra concessions and belonging to the project site,
- Then delimit the larger project zone including forest to be protected through the intervention between and around the project area,
- Find out satellite image of the project zone to record forest cover, area, and assess carbon and if possible biodiversity stocks. That is to create a project carbon baseline necessary prior to start any intervention,
- Finally, start actual project activities through plantation settlement with the first target of: 400ha of Acacia (0.4ha x 1000 households) and 500ha of Palm (0.5ha x 1000 households).

11. POTENTIAL RISKS AND MITIGATION MEASURES

Risk types	Potential risks	Mitigation measures

Political	Activities not in line with Government priorities	In line with PAG 2012-2016, National REDD+ Strategy, Forest Investment Program, etc.
Policy-related	License of exploitation or transformation of wood and palm oil	Gecotra is a well-known and established company in the sector of palm oil, all regulations are respected in existing projects and will be respected in further.
Social / stakeholder related	Land and land use conflict Benefit sharing	Moral authority from the land owner Oil benefits directly depending on the farmer work; carbon benefits if relevant will be reinvested in public interests infrastructure to avoid any individual appropriation problems and to increase efficiency of the region in terms of economic activities
Macro-economic	Commodities price variation	Palm oil: Kinshasa market is indexed on international demand which is increasing alongside with industrial products manufactured with palm oil and increase in population from emerging countries who are the main consumers (BRICS countries notably)
Financial	No reception of funds or unsuited use of funds	Timeline of activities but also of time deadline for fund subdivisions supply organized in prior so no conflict between fund reception and planned activities.

12. ANNEXES: DETAILED CALCULATIONS

A) Project business plan based on Palm oil production

The Palm business plan is particularly critical because it drives the financing of the whole project.
Nota bene: all calculation detailed tables are available.

International and national mean values used to elaborate the business model are summed here:

- Initial investment required for Palm oil 3000USD/ha and Acacia 1500 USD/ha (higher than normal to be conservative).
- FFB production: 18tFFB/ha/y (source ASD company, Costa Rica). The ideal agronomic potential is around 20 to 25 tFFB/ha/y. Gecotra has nevertheless a nuanced strategy in terms of fertilizer (use fertilizers at least as possible). In addition, natural and other imponderables exist. Thus the value taken for conservative calculations is 14 tFFB/ha/year.
- Oil production is commonly calculated as: FFB x 20% = 2.8tPO/ha/y (Palm Oil HQ, Malaysia).
- Palm oil price in Kinshasa is 950 USD/tPO (corresponds to the gross benefit per ton of Palm oil).
- Inflation ratio used is 3%. Unlike products entering in plantations preparation (following inflation), Palm oil market stock variations are not predictable. Last decade showed fall and increase in prices. To be conservative, the minimum value of 950 USD expected for the next 20 years is taken.

Palm oil production

Plant production starts the 7th year and maturity the 11th year (very conservative). Maturity production from the 11th year is: 2.8tPO/ha/y x 2000ha = 5600tPO/y. This palm tree variety provides this constant production during 25 years. By limiting the project at 20 years, the approach is conservative compared to the actual potential of total production.

Year	Production (tPO)
A7	525
A8	1658
A9	2887
A10	4166
A11	5600
A12-A20	50400
TOTAL	**65235**

Benefits / Costs

Item	Cost nature	Value (USD/tPO)	Costs share (%)
1	**Total revenue** (Price of oil)	**950**	
2	FFB collect manpower	217	27
3	Exploitation	415	52
4	Transport	105	13

5	Acacia	46	5
6	Management / administrative	15	2
	Total cost (sum items 2 to 6)	**798**	**100**

Items 2, 3 and 4 are calculated from existing Gecotra plantations. They correspond to an average over 20 years taking into account an annual inflation of 3%.

Items 5 and 6 are reported to the total oil production: 65 235 tPO.
-> Acacia approximate cost is 1500USD over 2000ha = 3 MUSD / 65235 tPO = 46 USD/tPO
-> Management/administrative approximate cost is 10% of the total budget of 10MUSD = 1 MUSD = 1MUSD / 65235 tPO = 15 USD/tPO

Farmers (those implied in Palm plantations) cash benefits:
From Palm Oil over 2ha: 217 USD/tPO x 2.8 tPO/ha/y x 2ha = 1215 USD/year = **101 USD/month**
This income lasts during 14 years from 7th to 20th year; it is only cash revenues from Palm oil, without taking into account additional revenues from crops and Palm during the year 4 to 6 where Palm is already productive.

Total production of Palm oil is about 65 000 t. In full maturity the project will represent 2% of the annual country production.

Net revenue for each Palm farmer is about 100 USD/month (for comparison, rural average is about 30 USD/month).

Revenue ton: USD/ton	950
Cost ton: USD/ton	798
Margin ton USD/ton	152
Total production ton	65 235
Total gross margin MUSD	9.9

Tab 2. *Project costs and revenues over the project period*

B) Impact of concessional interest rates

Project net benefits (before taxes) are calculated under four scenarii of interest rate: more than 15, 10, 5 %.

Reimbursement is expected to be annual between the 7th and 20th year. The amount paid to reimburse the loan and the loan interests every year is indicated in the column “Reimbursement loan and interests”. Removed from the project gross margin gives the net benefits (over 20 years) and indicated per annum.

Project gross margin MUSD	**Interest rate %**	Reimbursement loan and interests MUSD	Approximate benefit MUSD (20 years)	Annual benefit MUSD
9.9	**5**	5.5	4	0.2

9.9	**10**	7.3	2	0.1
9.9	**> 15%**	> 9.9	Negative	Negative

Direct conclusions on loan conditions attractivity and benefits attractivity according to interest rates

Interest rate %	Market correspondence	Condition attractivity	Benefit attractivity	Conclusion for an alpha company whether to enter in this kind of business
> 15	Kinshasa bank	No	No	Impossible
10	Kinshasa bank best conditions	No	weak	Possible but not attractive
< 5	Mini concessions	Yes	Mid to good	Possible, and possibly attractive