

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

<b>Country/Region:</b>	Burkina Faso	<b>1. CIF Project ID#:</b>	
<b>Project/Program Title:</b>	<i>Climate change mitigation and poverty reduction through the development of the cashew sector in Burkina Faso</i>		
<b>Date of Endorsement of the Investment Plan:</b>	Endorsed (subject to improvements) in June 2011		
<b>Funding Request (in million USD equivalent):</b>	Grant: N/A	Non-Grant (loan):3 615 000 \$	
<b>Implementing MDB(s):</b>	African Development Bank	<input checked="" type="checkbox"/> Private sector arm <input type="checkbox"/> Public sector arm	
<b>Executing Agency:</b>	Wouol (farmers' association)		
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### **I. PROJECT DESCRIPTION**

#### **Project proponent**

The Wouol farmers' association operates at national scale and aims at improving the livelihood of rural population through the sustainable management and valuing of natural and cultural resources. Wouol operates in 20 communes in the Regions of Cascades, Hauts Bassins, and Sud Ouest, at the boarder of Mali, Ivory Coast, and Ghana.

Wouol gathers 69 cooperatives and more than 2,500 farmers, of which 70% are women. Farmers are active in the production, processing, and trading of cashew nuts, mangoes, sheanuts, maize, and vegetables. As a transversal activity, Wouol promotes the protection of the environment and environmental education. In the last years, Wouol achieved the following:

- Creation of four mangoes drying units and five cashew nuts processing units. Wouol processes 150 tons of dried mangoes and 210 tons of cashew nuts per year. Assuming a processing rate of 16%, it represents around 1,250 tons of raw cashew nuts per year;
- Development of commercial links with foreign buyers and investors, esp. in the Netherlands: in 2012, Wouol received a working capital of 1.33 M\$ from Triodos Bank; European buyers purchase over 1,000 tons of almonds per year;

- Double certification under organic (EcoCert) and fair trade (Flo) certificates for a major part of their mangoes and cashew plantations, respectively 400 ha and 1,400 ha on a total of respectively 525 ha and 2,075 ha.

## **Objectives**

The objectives of the project are the following:

- **To mitigate climate change:** through (i) the development of cashew tree plantations that sequester carbon and (ii) the reduction of forest degradation and deforestation in the neighboring forests, by providing economic alternatives to non-sustainable practices (identified as such in the RPP: cropping of cotton, soy, groundnut, sesame, overexploitation of NTFP);
- **To restore degraded soils:** cashew trees have the capacity to achieve it in a cost-efficient way. It is worth noting that cashew planting was first introduced in Burkina Faso for this purpose, not for the production of cashew nuts;
- **To increase incomes of the rural populations,** particularly women.
- **To showcase the economic profitability and environmental sustainability of certified organic and fair trade agriculture.**

## **Activities**

The main activities will consist in:

- Enhancing cashew production through plantations with selected varieties and improved management practices;
- Improving cashew processing capacities;
- Strengthening the capacities of the Association and its members, especially in terms of trading of agricultural products (higher quality, stronger networks) and agroforestry.

### **→Comp. 1: Increasing the quantity and improving the quality of raw cashew nuts**

Most of the cashew production is presently coming from poorly managed cashew tree plantations or hedges, using non selected planting material. As a consequence, yields and quality of cashew nuts are usually low. This component includes the following activities:

- Strengthening farmers' and processors' cooperatives (awareness raising, training, legal registration, etc.);
- Revamping the central nursery and establishing two decentralized nurseries for seedling production from improved planting material (455,000 plants to be produced during the project lifetime);
- Developing 5,300 ha of new cashew plantations: 5,050 ha of plantations, 250 of agroforestry plantations (inter-row is between 3 to 5 m for forest plantation and between 7 to 10 m for agroforestry plantations, intercropped with ginger, hibiscus, sesame, beans, peanuts). These new plantation will produce up to 4,320 tons of cashew nuts, assuming a yield of 900kg/ha (according to the National institute for environment and agronomic research – INERA, the yield can even increase up to 1,200 kg/ha. A conservative value is considered here)
- Maintaining the plantations and agroforestry plantations;

### **→Comp. 2: Enhancing cashew nut processing capacities and performance**

A key issue in Burkina Faso is to increase the processing rate of agric products, in order to keep the added value in the country. Currently, 90% of the raw nuts are processed abroad. In addition to that, the average processing yield is around 16% and the percentage of entire almonds is 55%, which are quite low.

Last but not the least, butane is presently the main source of energy to heat the raw nuts and dry the almonds. Driers can use nut shells to dry raw nuts, in place of butane, thus reducing GHG emissions, assuming cashew nut shell liquid is extracted before burning.

This component includes the following activities:

- Increasing the storage capacities (building of storage warehouses, store-keeper training, etc.) and thus avoiding losses from insects and other pests;
- Improving the processing capacities, both in terms of processing yield (from 16% to 20%) and volume (from 1,250 tons/year of processed raw nut to 6,050 tons/year), with the purchase of new processing machines and the modernization of existing ones;
- Improving the quality through the use of autoclaves, peeling machines, etc.
- Using raw nut shells for heating raw nuts and drying almonds;
- Setting up a cashew shell pressing unit;
- Training of processing units' staff: entrepreneurial management of processing units, maintenance of equipment and hygiene, classification and sorting of almonds according to international standards, etc.

### **→Comp. 3: Marketing improvement**

Part of the cashew nut production is already certified as organic and fair trade. Wouol intends to certify 100% of its products. This component includes the following activities:

- Reinforcing the internal quality management system: hiring one quality manager per processing unit, creating a quality manual to respond to international standards, setting up a laboratory to routinely measure moisture content, impurities, pH, average weight, etc., creating a database to ensure the traceability all over the value chain (including social-economic impacts on farmers and processors);
- Getting 100% certified under the organic and fair trade standards;
- Prospecting foreign markets: market studies in the EU, participation to salons in Europe, actively outreaching potential buyers, production of advertising materials.

### **Project sites (plantations and processing units)**

The following map presents the location of Wouol activities. Provinces where Wouol works with producers are highlighted in green. Numbers inside circles indicate the processing units (see table hereunder).



### Plantations:

Existing plantations are located in 20 Communes, in the Provinces of Comoé, Léréba, Kéné Dougou, Poni, and Nubiel. These plantations will be extended and new ones will be created in Communes not yet covered. 3 Communes already expressed their interest (Niamologo, Midebo and Sifarasso) and their selection will be decided during a General Assembly in September.

The potential sites for the plantations are either agricultural areas or degraded savannas. To plant on savannas, a land owner has to get the go-ahead of the Water and Forest services (some tree species are protected by the Forest Code).

### Processing units:

The five processing units are distributed among the existing plantations and new plantations will be created within the same areas. These processing units are the following:

	<b>Location</b>	<b>Name</b>	<b>Processing capacity (tons of raw nuts)</b>
1	Bérégadougou	GTAB	594
2	Orodara	UTAK	297
3	Dakoro	WOLAPIE	297
4	Kampti	UTASO	297
5	Banfora	BOUNOUNA	396
<b>Total</b>			<b>1 881</b>

## **II. Rationale**

Cashew trees in the national context can play an important role: income generating activity and fight against poverty, mitigation of climate change, and environment protection and restoration.

The FIP Investment Plan for Burkina Faso states that successful implementation of REDD+ will require strengthening the capacity and interest of local communities for managing forests and agro-forestry assets and allowing them to fully benefit from emerging carbon markets and other funding schemes. In that context, reforestation is identified as a promising activity.

The project is also in line with national policies out of the REDD+. In particular, it is aligned with the liberalization policy: Burkina Faso is engaged since 1991 in a wide program of economic reform aiming at developing a liberalized economy, where the private sector would be the main source of growth. In that respect, the action plan for oilseeds sector redefines the role of the State and promotes the industrial development.

At local level, the cashew production is perfectly adapted to the ecological, social and economic conditions. The areas where Wouol operates are major production areas in Burkina. A report from the African Cashew initiative (iCA, 2010) estimated the cashew development as one of the best way to fight poverty in these areas.

Presently, the cashew value chain does not fully benefit to the country, because local processing companies face difficulties to access both to working capital and investment credits and the cashew market is dominated by foreign companies. A major part of the cashew production is therefore exported as raw nuts. The development of new processing units will address this issue.

### **III. Consistency with Investment Criteria**

#### **Climate change mitigation potential**

Climate change mitigation will be achieved through:

- the storage of carbon in the biomass and in the soils (350,478 teCO<sub>2</sub> for the lifetime of the project, deducting emissions due to fires), and
- the reduction of emissions of the transformation process (21,051teCO<sub>2</sub>):
  - o extraction of cashew nut shell liquid, reducing the GHG emissions due to nut shell burning,
  - o drying of almonds by burning nut shells, no more by using butane.

As the volume of processed raw nuts will increase, the project will generate around 5,000teCO<sub>2</sub> (for transformation and transport, including export).

These estimates do not take into account the effect on the protection of existing forests through a switch from activities which are drivers of deforestation and forest degradation (other types of agriculture, overexploitation of NTFP, etc.). Calculations are detailed in **annex I**.

#### **Demonstration potential at scale**

As explained in section VII, cashew sector has a very high development potential. Many improvements achieved through this project will interest other farmers and transformers: use of selected planting materials, intercropping, organic and fair trade certification, replacement of butane, etc.

#### **Cost-effectiveness**

The cost of mitigation (around 18\$/teCO<sub>2</sub> sequestered) is higher than the average carbon market price (5 to 10\$/teCO<sub>2</sub>). Nevertheless, it can be considered cost-effective in the Soudano-Sahelian context, with low plantation productivity. The carbon revenue alone would probably not justify the development of such projects, but as cashew almonds production is a profitable activity, investors will see carbon revenues as a mean to ensure a higher profitability of their investments.

### **Implementation potential**

Wouol already benefits from loans which allow it to start the project immediately. Even if training and capacity building are foreseen in the course of the project, the staff has the required capacities to start the activities.

Contacts have already been taken to purchase the needed equipment and to sell the products. BioVisio, a firm from the Netherland, already expressed his willingness to buy at least 1,000 tons of almonds every year, roughly what could be achieved by the project.

### **Integrating sustainable development (co-benefits)**

#### ***Ecological impacts***

According to a study carried out by GIZ in the frame of the African Cashew initiative (iCA, 2010), the cashew tree is considered as a reforestation tree allowing to preserve the environment and improve soils fertility. Cashew was introduced in Burkina Faso during the 60's to restore soils and fight against desertification. As explained, the development of the cashew sector will also allow protecting forests currently under pressure (cotton, soy, maize, peanut and other types of agriculture leading to deforestation, overexploitation of NTFP).

Currently, 1,400 ha of a total of 2,075 ha of cashew plantations supplying Wouol are certified organic (with EcoCert certification) and Wouol would like to get 100% of its plantations certified. Some farmers are already in a transition phase (switch from conventional practices to organic practices).

This standard guarantees no chemical input is used in the field or during the processing. The certification also requires implementing soil and water protection activities. Finally, regular training is provided to the staff and members of the Wouol network on environmental quality.

#### ***Social impacts***

iCA (2010) identified the cashew nuts production as a valuable activity to fight against poverty in certain areas, particularly where production is the highest (like Wouol's intervention area). Wouol manages the plantations of more than 300 small farmers and employs 800 staff in its processing units (esp. women, who represent 70% of the membership): benefits are widely shared. These benefits will be further increased if 400 new farmers are involved in the creation of new plantations and 1,200 staff are hired in the new of revamped processing units.

In addition to that, the fair-trade certification guarantees minimum prices to farmers, a high level of governance in the cooperatives and regular training for all the members.

The improvement of the processing yield will allow increasing added-value in the country, therefore promoting both rural development and national development.

Finally, pilot activities to promote agroforestry practices and diversification of the agric production (intercropping of ginger, hibiscus, sesame, beans, and peanuts) should also contribute to an improvement of the livelihood of local populations.

### **Safeguards**

**Organic and fair-trade certifications:** the respect of these high quality standards - based on environment and socio-economic criteria - to access to international markets will be important safeguards.

**REDD+ safeguards:** To be in line with UNFCCC's safeguards, the project will seek to be compatible with existing programs and conventions, to ensure transparency during the implementation, to respect local knowledge and rights, to promote participation and to conserve natural forests, biodiversity and forest ecosystems based cobenefits. Wouol will therefore apply World Bank's operational policies, notably O.P. 1.01 on environmental assessment, O.P. 4.04 on natural habitats and O.P. 4.20 on gender issues.

**Forest code:** contracts between Wouol and the farmers will refer to the forest code and replacement of native tree species (shea tree, néré, baobab, etc.) by cashew plantation will be forbidden.

**Local development plan and land tenure:** Wouol is used to collaborate with the Communes, in order to ensure a good integration of its plantation activities into the Communal Development Plans and maximize its contribution to local development. In turn, Communes are also committed to support farmers' cooperatives through ad hoc Protocols. In particular, Wouol, the Communes and the cooperatives are represented within "*Commissions villageoise de conciliation foncière*", which were created by the 2009 Rural Land Bill and aim at promoting local mediation to address land tenure conflicts.

#### **IV. Type of Private Sector Engagement**

The project will be a solely private sector project. Wouol will be the beneficiary of the loan and will support both the processing units and the farmers. Farmers' Cooperatives and processing units are part of the Wouol association but legally independent.

However, all these members will contribute to the funding of the project: each processing unit will afforest 25ha (125 ha in total) and each producer will support at least 20% of the plantation costs (in addition to providing the land).

Reimbursement will be secured through the signature of contracts including cooperatives, farmers and Wouol, in which the farmers' cooperatives are hold responsible jointly with Wouol for the reimbursement of the loans (via a mutual guarantee fund fed by 5% on each sale of raw or processed cashew nuts, and – in case the mutual guarantee fund is not sufficient - the possibility to seize the productions of the farmers, using the "warrant" system).

As an umbrella for the farmers' cooperatives and processing units, Wouol coordinates all the activities (planting, harvesting, storage, processing, marketing, etc.) and is able to know the reimbursement capacities of each of his member, which should avoid tapping into the mutual guarantee fund or, even worst, ceasing the production.

## V. Innovation

**Securing the supply of raw cashew nuts:** unsecure supply of raw nuts is one of the most important barriers for the development of the cashew processing industry. Presently, supply is erratic and depends on the demand of few foreign buyers. The development of a strong partnership between farmers' cooperatives and processing units is an innovation, which should allow the development of the sector.

**Using selected cashew varieties:** they will be selected in Burkina by the National institute for environment and agronomic research (INERA). Presently, farmers are using un-selected varieties and get low results both in terms of yield and quality of the nuts. This innovation, alongside an improvement of plantations management practices, should allow increasing the yields from 400 kg/ha of raw nuts to more than 1,000 kg/ha (NB: to be conservative, we used the estimate of 900 kg/ha in our calculations).

**Improving peeling techniques:** the processing units will be equipped with modern Indian machines (autoclaves and peeling machines), which have proven high performances in this country and are installed in semi-industrial units in Burkina Faso (SOTRIAB, ANATRANS). Combined with an improvement of the storage capacities and conditions, this innovation should allow increasing the processing yield from 16% to 20% and the percentage of entire almonds from 55% to above 62%.

**Switching from butane to nut shells for the drying:** this innovation was developed by a Swiss NGO, SNV, firstly for the drying of raw nuts. It will be adapted to the drying of almonds and improved with the extraction of the cashew net shell liquid to reduce GHG emissions from burning and value this liquid (in the car industry in particular). Presently, 0.5 tons of butane are used to dry 1 ton of almonds. This investment of 2 013 000 \$ will allow to avoid the emission of roughly 7 400 tCO<sub>2</sub>e (28\$/tCO<sub>2</sub>) considering current cashew production or 119 700 tCO<sub>2</sub>e (1,8 \$/tCO<sub>2</sub>e) considering the increase of processing due to the project.

**Certifying agric products:** the double certification, organic and fair-trade, should add a real added-value to access international markets and increase the sale price for producers (20% of premium, compared to non-certified raw nuts as detailed in section VII).

## VI. Business Model

The costs will be the following:

Components	Costs in US\$	Percentage
Component 1: Increasing the quantity and improving the quality of raw cashew nuts	3 452 000	53
Component 2: Enhancing cashew nut processing capacities and performance	2 282 000	35
Component 3: Marketing improvement	779 000	12
<b>Total</b>	<b>6 513 401</b>	<b>100</b>

As supply is a limiting factor in the cashew processing activity, the project focuses on plantations that will supply the processing units in the future.

Securing exiting markets and seeking new opportunities are not neglected, marketing representing 11% of the budget.

The table hereunder summarizes the contributions:

<b>Components</b>	<b>Wouol's contribution (US\$)</b>	<b>Producers' contribution (US\$)</b>	<b>Grants (Oxfam and BioVisio) (US\$)</b>	<b>Loans (FIP ad AfDB) (US\$)</b>
Component 1: Increasing the quantity and improving the quality of rawcashew nuts	195 000	1 794 000	10 000	1 453 000
Component 2: Enhancing cashew nut processing capacities and performance	219 000	0	18 000	2 045 000
Component 3: Marketing improvement	147 000	0	114 000	518 000
<b>Total</b>	<b>561 000</b>	<b>1 794 000</b>	<b>142 000</b>	<b>4 017 000</b>
Percentage	9	28	2	61

Plantations being the basis for the development of the sector, farmers contribute significantly to the project through the provision of land (67%), harbour (24%) and cash (9%). Contribution from Wouol will include cash (62%), expertise (28%) and the provision of materials and equipments (10%).

Activities have been designed with the objective to increase the production while decreasing costs per units of products. The impacts of the investments on these two variables will be the following:

<b>Steps</b>	<b>Traditional practices</b>	<b>Improvements brought by the project</b>
Nursery	No use of selected varieties	Improved methods through training -> reduction of costs Selection of varieties -> participates to the increase of the yield from 400kg/ha to 900 – 1000kg/ha.
Plantation	Non optimized practices	Improved methods through training -> participates to the increase of the yield from 400kg/ha to 900 – 1000kg/ha. For plantation maintaining, intercropping -> new revenues (estimated around 10% of the production)
Plantation maintaining	Low maintenance by producers	
Harvesting	Non optimized practices	Increase of storage capacities -> participates to the increase of volumes processed from 1250 to 6050 tons of raw nuts per year
Raw nuts storage by producers	Loss due to weak storage capacities	
Raw nuts storage before processing	Limited capacities which would make difficult an increase of the processed volumes	
Nuts heating	Heating with nut shells without extraction of	Nut shells treatment (CNSL extraction) -> mitigation of climate change and new incomes

	CNSL.	from balm valorization.
Nuts opening	Manual	More performing opening machines -> participates to the increase of entire almonds from 50% to 65%, increase the transformation yield from 1/6 to 1/5 and to the increase of the mean price of a kg of almonds from 5,8 to 6,2US\$.
Almonds drying	Almonds are dried by using butane	New dryer -> suppression of butane allowing to mitigate climate change (7 400tCO <sub>2</sub> e to 119 000 tCO <sub>2</sub> e, depending if we consider the avoidance of emissions due to the drying of the future production) -> Decrease of the production costs (67US\$ per ton of almond)
Peeling	Manual	Peeling machine -> reduction of costs
Almonds sorting	As almonds are qualified in different grades, having different prices, weaknesses in sorting decrease the mean price of each kg of almonds	Improvement through training -> participates to the increase of the mean price of a kg of almonds from 5,8 to 6,2US\$.
Almonds packing	Non optimized practices	Improvement through training -> reduces loss and participates to the increase of the mean price of a kg of almonds from 5,8 to 6,2US\$.
Almonds commercialization	Insufficient quality for some customers	Improvement of the quality of nuts and -> better acceptance on international markets allowing to sell the production  Increase of the certified part of the production up to 100% and better promotion of EcoCert and Flo certificates -> participates to guarantee higher selling (up to 6.8 \$/kg instead of the 5.8 \$/kg estimated for non certified nuts). Conservatively, we can consider the price will be 6,2US\$.

During the preparation of the concept note, we have attempted to develop a full operation account integrating discount rates, interest rates and inflation, but too many assumptions remain to clarify to establish a reliable one.

## **VII. Market**

The first cashew plantations were set up in Burkina in the 60's by the "Centre Technique Forestier Tropical" (CTFT). The aim was to restore degraded soils in the savanna area and to fight against desertification. The sale of cashew nuts started only in the 80's.

Nowadays, cashew plantations cover around 66,000 ha in Burkina and cashew producers are estimated around 45,000 persons. Area per producer is between 0.5 and 50ha, mostly between 2 and 10ha. Some plantations over 100 ha appeared recently, but remain very rare. Cashew plantations are found principally in the regions of Cascades, Sud-Ouest and Hauts Bassins, in the South-West of the country.

The following map shows production regions in Burkina Faso. The darker is the region, the more important is the nut production.



Nuts are harvested from January to May. Yields are generally very low (around 400kg/ha) and due to the use of un-selected cashew trees and a lack of good plantation management practices (iCA, 2010). 25,000 to 30,000 tons of raw nuts are produced each year in Burkina (around 1% of the global production) and only 10% is transformed in Burkina.

The raw nuts and almonds are exported, mainly to India (raw nuts), the EU and the USA (almonds). Raw nuts are purchased by subsidiaries of international companies based in Burkina, local sellers (few) and occasional foreign buyers.

The farm gate price is highly variable and depends mainly on the Indian market, which absorb a large part of the global production. This price is between 220 and 875\$ per tons of raw nuts, ensuring a farmer revenue estimated between 150 and 450\$/ha/year (hypothesis of 600kg/ha). The price is usually around 500US\$. The fair-trade and organic certification maintain the price above 600 \$/ton or raw nut (20% of premium, compared to non-certified raw nuts).

The Free On Board price for almonds is around 5,8 US\$/kg for non-certified nuts and 6,8US\$/kg for certified ones (15% of premium, compared to non-certified almonds). The difference is quite small (17% of the non certified product), but certified products benefit from a better access to international markets, especially in the EU and the USA.

The trading of raw nuts does face problem: everything is exported and the global demand is on the rise for the last ten years. Installed capacities are far below the level of production of raw nuts (8,200 tons/year of processing capacity in 2010, around 27% of the production) and local processing units are competing with foreign buyers for their supply of raw nuts: there is a high potential in developing plantations and processing units alongside, in order to market locally-produced and processed cashew nuts.

These facts are summarized below, in a SWOT analysis of the sector carried out by iCA:

<b>Strengths</b>	<b>Opportunities</b>
<ul style="list-style-type: none"> <li>• A major part of cashew plantations with young trees or at full production. 30 000 tons available</li> <li>• Links with the European market</li> <li>• Existing support structures</li> <li>• Labour force available</li> </ul>	<ul style="list-style-type: none"> <li>• Growing international demand</li> <li>• Stakeholders improve their practices on a voluntary basis</li> <li>• Existing financing structures</li> <li>• Government interest for the sector</li> <li>• New sources of funding</li> </ul>
<b>Weaknesses</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Weak organization of the value chain</li> <li>• Variability of the raw nuts prices</li> <li>• Insufficient quality of nuts</li> <li>• Lack of knowledge of the good practices for production and transformation</li> <li>• Weak synergies between support organizations</li> <li>• Low availability of working capital</li> <li>• Low processing capacities</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease of the price of raw nuts on international markets</li> <li>• Difficulties to sell raw nuts</li> <li>• High variability of the foreign demand for exported raw nuts</li> </ul>

### **VIII. Financial Plan (Indicative)**

<b>Source of Funding</b>	<b>Amount (USD million equivalent)</b>	<b>Percentage (%)</b>
Project developer	561 174	9
Producers	1 793 641	28
BAD	401 656	6
FIP	3 614 902	55
Bilaterals (grant from OXFAM and BioVisio)	142 028	2
<b>TOTAL</b>	<b>6 513 401</b>	<b>100</b>

### **IX. Expected Results and Indicators**

<b>Results</b>	<b>Indicators</b>
Degraded lands restored with cashew tree plantations	Area planted on degraded land → 5,300 ha
Added-value of the cashew value chain maintained in Burkina Faso	Volume of raw nuts processed → 85,000 tons of raw nut
Mitigation of climate change through carbon storage in plantation and avoided deforestation	Carbon balance of the project → 363 000 teCO <sub>2</sub>
Better plantation management practices adopted	Yields

by the producers	→ 900 kg/ha
Incomes of rural population increased	Incomes from the cashew selling → 400 \$/ha/year
Creation of jobs with the increase of the production	Number of new employees/farmers → 1,200 employees and 400 new farmers

## **X. Implementation Feasibility and Arrangements**

The project can start as soon as the loans are delivered by the FIP and the AfDB. This project has been identified since many months and Wouol was looking for investors. Producers to mobilize, equipment to buy and training to provide are presently being identified. Early 2014, the first activities will be the following:

- Plantations: increase of the nurseries capacities, contracting with identified producers, and firsts training on planting practices;
- Processing: purchase of the equipment and building of warehouses;
- Marketing: setting up of the laboratory for analysis of finished products, training of agents responsible for quality, and elaboration of a quality manual.

→ **Expected FIP Sub-Committee approval date: 1, November 2013**

→ **Expected MDB Approval date: 1, January 2014**

## **XI. Potential Risks and Mitigation Measures**

<b>Risks</b>	<b>Level of risk and measures</b>
Deforestation	Cashew is not identified as a driver of deforestation, neither in the R-PP nor in the FIP IP. However, some forested lands (notably savannas) could be replaced by cashew plantations. Under the project and in line with the Forest Code, it will be forbidden to replace savanna areas by cashew plantations.
Land conflicts	The mix of traditional vs “positive” land tenure system sometimes creates misunderstanding on the nature of the land transactions. These transactions are sometimes contested by third parties. Wouol with work closely with the Communes and the <i>Commissions villageoise de conciliation foncière</i> , and verify land titles before creating new plantations.
Fires	A study carried out by the GIZ (2009) estimates that 4% of the cashew areas are burnt every year. Plantation management practices promoted by Wouol include fire prevention practices (fire breaks, grass cutting, etc.)
Lack of market access	This risk seems low: Wouol already receives many offers from foreign buyers. Organic and Fair-trade certification increase Wouol's

	capacities to trade almonds in European and American markets. As underlined earlier, a wide part of the global market is still accessible.
Credit default by planters	The part of the loans dedicated to the planters is under 500,000 US\$. In case of credit default, seizing the cashew productions would allow reimbursing the loans within 2 years.

## Annex 1: Estimation of climate change mitigation

	WOULD	ExAct	Other source	Units	Comments
<b>Production</b>					
Transformation rate	0,20	0,18			
Production of nuts	3 246			t/year	
Production of almonds	549			t/year	
New plantation areas	5 300	22 730		ha	
Mean plantation area through the project	4 107			ha	
Yield	0,90	0,40		t/year	
Emissions due to fires	0,05			tCO2e/ha/year	
Emissions due to fires	194	1 072		tCO2e/year	
Above ground biomass in a 10 year plantation	26	26		tons of dry biomass	
Carbon fraction	0,5		0,5		Source: default value from the IPCC
Carbon storage in the ABG of a 10 years plantation	47,7			tCO2e/ha	
Root to shoot ratio	0,28		0,28		Source: GDFC-GOLD sourcebook, based on IPCC default values for subtropical dry forest with aboveground biomass >20t/ha
Carbon storage in the bellowground biomass of a 10 years plantation	13,3			tCO2e/ha	
Storage in soils	0,33	0,33		tCO2e/ha/year	
<b>Transformation</b>					
Nuts heating (wood and nutshells burking)					
Emissions for a ton of almonds without extraction of CNSL	2,62	2,62		tCO2e/tons of almonds	
Quantity of almonds transformed by all artisanal units in Burkina	-	1 291		t/year	
Emissions for all artisanal units of Burkina with extraction of CNSL	-	41		tCO2e/year	
Emissions for a ton of almonds with extraction of CNSL	0,03			tCO2e/tons of almonds	
Emissions for the 263 tons of almonds produced by Wouol without extraction of CNSL	589			tCO2e/year	
Emissions for the 263 tons of almonds produced by Wouol with extraction of CNSL	8,4			tCO2e/year	
<b>Almonds drying</b>					
Butane consumption	0,5			kg/kg of almonds	
Butane emission factor			2,59	tCO2e/tep	Source: ICEDO, Belgium ( <a href="http://www.renovationdurable.eu/Notions-Valeurs-de-conversion.html">http://www.renovationdurable.eu/Notions-Valeurs-de-conversion.html</a> )
Conversion tep/kwh			11 628	kWh/tep	Source: ICEDO, Belgium ( <a href="http://www.renovationdurable.eu/Notions-Valeurs-de-conversion.html">http://www.renovationdurable.eu/Notions-Valeurs-de-conversion.html</a> )
Conversion kg butane/kWh			13	kWh/kg	Source: ICEDO, Belgium ( <a href="http://www.renovationdurable.eu/Notions-Valeurs-de-conversion.html">http://www.renovationdurable.eu/Notions-Valeurs-de-conversion.html</a> )
Emissions due to almonds drying	1,43			tCO2e/tons of almonds	
Current emissions (263 tons of almonds produced)	372			tCO2e/year	
<b>Transport</b>					
Emissions due the transport from the field to the transformation units	0,01	0,01		tCO2e/tons of gross nuts	
Emissions of export	0,30	0,30		tCO2e/tons of product	From the field to India
Total emissions per tons of almonds	0,31			tCO2e/tons of almonds	
<b>Carbon balance of the project</b>					
Project duration	20			years	
Storage in plantations	150 478			tCO2e	
Emissions due to fires	3 874			tCO2e	
Net storage in plantations	346 604			tCO2e	
Emissions due to transport	4 026			tCO2e	
Emissions due to transformation	412			tCO2e	According to the Ex-Act study, it is possible not to consume butane, electricity and fuel
Avoided emissions from current transformation	21 053			tCO2e	
Net balance (storage)	363 217			tCO2e	
Net balance (storage)	18 161			tCO2e/year	
Project cost	6 513 401			US\$	
Cost per tCO2e	17,9			US\$/tCO2e	