



Consortium for  
Improving Agriculture-  
based Livelihoods in  
Central Africa

## CIALCA Progress Reports **04**

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### Launching meeting of CIALCA-II Bujumbura, 28-31 October 2008

'Improving agriculture-based livelihoods in  
Central Africa through sustainably increased  
system productivity to enhance income,  
nutrition security, and the environment  
- CIALCA-II'



Supported by the Directorate  
General for Development  
Cooperation, Belgium



## Consortium for Improving Agriculture- based Livelihoods in Central Africa

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Following a call for proposals of the Directorate General for Development Cooperation (DGDC – Belgium) in April 2004, three proposals were approved:

- ‘Sustainable and Profitable Banana-based Systems for the African Great Lakes Region’, led by the International Institute of Tropical Agriculture (IITA), Kampala, Uganda.
- ‘Enhancing the resilience of agro-ecosystems in Central Africa: a strategy to revitalize agriculture through the integration of natural resource management coupled to resilient germplasm and marketing approaches’, led by the Tropical Soil Biology and Fertility Institute of the International Center for Tropical Agriculture (TSBF-CIAT), Nairobi, Kenya.
- ‘Building Impact Pathways for Improving Livelihoods in *Musa*-based Systems in Central Africa’, led by the International Network for the Improvement of Banana and Plantain of the International Plant Genetic Resources Institute (IPGRI-INIBAP), Kampala, Uganda.

As the above projects proposed to operate largely in the same parts of Rwanda, Burundi, and the Democratic Republic of Congo (DR Congo), with similar national partner institutes, and due to the complimentary nature of the activities proposed, above institutes agreed to operate as a Consortium to ensure cooperation and complementarity and avoid technical and financial duplication at the national level.

Whereas under the first funding phase (2006-2008) CIALCA still consisted of three separate projects, under the second funding phase (2009-2011) CIALCA operates officially as one project under the title ‘Improving agriculture-based livelihoods in Central Africa through sustainably increased system productivity to enhance income, nutrition security, and the environment’

The Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA) is a Consortium of the International Agricultural Research Centers (IARCs) and their national research and development partners that aims at close technical and administrative collaboration and planning in areas of common interest, thereby enhancing returns to the investments made by DGDC and accelerating impact at the farm level.

# **Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA)**

'Improving agriculture-based livelihoods in Central Africa through sustainably increased system productivity to enhance income, nutrition security, and the environment - CIALCA-II'

## **Launching meeting of CIALCA-II**

Bujumbura, Burundi, 28-31 October 2008



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## 1. Introduction

From 28 till 31 October, 2008 about 50 people met in Bujumbura, Burundi for the CIALCA-I review and CIALCA-II planning meeting (**Annex 1 and 2**). The meeting was officially opened by the DG, ISABU, the Attaché of the Belgian Embassy in Bujumbura, the DG, IRAZ and the Minister of Agriculture. The overall launching meeting was preceded by a meeting of the CIALCA Consultative Committee that aimed at setting the scene in terms of administration and overall project implementation for the CIALCA-II project (**Annex 3**).

The objectives of the meeting were to (i) review the progress of CIALCA-I (Jan 2006-Dec 2008), and (ii) plan the way forward for the CIALCA-II project (Jan 2009-Dec 2011). The first two days of the meeting were devoted to reporting research and development activities and outputs on banana and leguminous crops of the first phase of the CIALCA project. Based on this feedback, a list of promising CIALCA products was compiled (**Annex 4**). The second part of the meeting focussed on planning the second phase. Working groups discussed enhanced dissemination of technologies (**Annex 5**), scaling up and out, science issues (**Annex 6**), improved communication strategies and integration aspects (**Annex 7**). All the meeting presentations and reports are available on [www.CIALCA.org](http://www.CIALCA.org) (under heading "Resources" / "Planning meetings").



**Photograph 1: Opening ceremony (from left to right): Ambassador Salvator Ntihakose (DG, ISABU), Ntahondi Emile, Head of the Cabinet of the Ministry of Agriculture and Animal husbandry; Dr Kathelijne Craenen (BTC, Burundi) and Prof Gerard Rusuku (DG, IRAZ).**

## 2. CIALCA Consultative Committee meeting

Some of the major outcomes from the CCC meeting were:

- (i) A CIALCA-Burundi office will be opened in Bujumbura. Bioversity will manage the office administratively. The office will also house the CIALCA Knowledge Resource Centre (KRC), which will collect, organize, translate results and disseminate products to the end-users (farm, extension, and research bodies).
- (ii) The national agricultural extension body in Rwanda (RADA) will be invited to become a part of the CCC, given their increasing role in CIALCA-II.
- (iii) CIALCA will explore opportunities for an international agricultural conference in 2010 in the Great Lakes region. Themes, size, and location will be investigated.

The full CCC meeting report can be found in **Annex 3**.

### 3. Overview of the different outcomes of the CIALCA-II launching meeting

#### 3.1. Summary of the major findings of CIALCA-I

(a) Although there are large similarities in farming systems between the three countries, households located in Northern Burundi and South Kivu sites are particularly food insecure. More than 60% of households in these sites reported being food insecure compared to 36% in Rwanda, 10% in North Kivu (Butembo-Beni-Mutwanga) and 42% in Bas-Congo. There is a positive link between areas with high food insecurity and low farm sizes, high illiteracy levels and poverty status as proxied by variables such as livestock ownership, ownership of durable goods and house construction materials.

(b) Most of the households (>75%) sell their agricultural produce at the farm gate or the nearest local market. Only about 25% of the households sell to urban or regional markets which are associated with lucrative prices. This shows that majority of the households have difficulties in accessing such markets.

(c) Drought (<1200mm/yr) and poor soil fertility have great impact on banana yields. Pest (weevil, nematodes) pressure is generally low >1300m, but *Fusarium* wilt severely impacts yields of exotic bananas, while *Xanthomonas* wilt and bunch top virus (BBTV) are spreading more rapidly as has been observed respectively in North Kivu and Bas Congo. *Xanthomonas* wilt has expanded to South Kivu and East Rwanda.

(d) Constraints in legume production, which occupy up to 30% of the farm area in the different mandate areas, are predominantly related to low soil fertility. New legume germplasm has a very significant positive influence of yields in South-Kivu and Bas-Congo, while in Rwanda local varieties (commonly occurring as a mixture) are already relatively productive.



**Photograph 2: Participants interacting during one of the tea breaks.**

Additional information on the surveys, research activities and outputs of CIALCA-I can be found in the annual reports which have been posted on [www.CIALCA.org](http://www.CIALCA.org) (under heading "Resources" / "Annual reports").

## 3.2. CIALCA-I products – Technologies ready for dissemination

Following detailed presentations on progress with CIALCA-I activities, a list of 16 CIALCA products that are ready for dissemination was established. These included:

1. Improved leguminous crop varieties
2. Bean-maize rotation
3. Integration of leguminous crops in cassava cropping systems
4. Evaluation of technologies at the household level
5. New banana varieties
6. Xanthomonas Wilt control options package
7. Macro propagation of bananas and plantains
8. Detection and eradication of the Banana Bunchy Top Virus (BBTV)
9. Clean planting material
10. Banana zero-tillage mulch systems
11. Banana-bean association
12. Improving nutrition by promoting soybean products
13. Integrated seeds systems approach
14. Development of a business plan for small-scale farmers
15. Strengthening of farmer association for collective marketing of agricultural products
16. Improving nutrition by promoting an improved and diversified food basket

A detailed description of each of the products can be found in **Annex 4**. Product name, product description, essential components, potential modifications, required inputs, region/agro-ecological zone where the product can be applied, potential risks and appropriate dissemination modes are described for each product.

## 3.3. Dissemination of CIALCA technologies during CIALCA-II

After the identification of the CIALCA-I products, working groups discussed possible scaling up and out activities in order to reach large numbers of farmers, in line with the promises made to DGDC in the CIALCA-II proposal. The following activities were listed as high priority:

- For leguminous crops:
  1. Dissemination of technologies which are ready for adoption
  2. 'Traing of trainer's sessions to facilitate the dissemination of the technologies
- For bananas and plantains:
  1. 'Training of trainers' sessions focused on germplasm management and agronomic practices
  2. Installation of a larger number of macro-propagation units/chambers at the different action and satellite sites
- For markets and nutrition:
  1. Promotion of existing recipes

2. Linking the farmers and farmers associations with the most opportune markets
3. Strengthening of farmer/producer associations/organisations

More information on the proposed strategies to make this happen can be found in **Annex 5**.

### 3.4. Potential research topics for CIALCA-II

Three working groups discussed research topics and major research questions that would lead to new products to be developed in CIALCA-II. Separate working groups focussed on topics related to the banana, legumes, market, and nutrition activities.

→ The research topics for the banana work included:

- Germplasm by environment interactions
- Macro-propagation
- Collection and characterisation of banana germplasm in the region
- Soil fertility management
- Banana-leguminous crop associations
- Banana-coffee associations
- Endophytes
- Mycorrhiza
- Banana Bunchy Top Virus (BBTV)
- Fusarium control

→ The research topics for the legume crop included:

- Cowpea, pigeon pea and groundnut
- Association of leguminous crops and maize
- Erosion control techniques
- Fertilizer use
- Collection of run-off rain water
- Use of Rhizobium
- Efficient and integrated seed systems
- Banana-leguminous crop associations
- Cassava-leguminous crop associations
- Preferred and adapted bean and soybean varieties

→ The research topics for the market and nutrition work included:

- Impact of market access on integrated soil management
- Impact of past harvest products on food security status of households
- Determinants of adoption and dissemination of improved technology and economic livelihoods
- Evaluation of user preferences for technology traits
- Application of HACCP technique to assess potential hazards and health risks along the supply and marketing chain of post harvest products
- Market structure, conduct and performance and dynamics in the banana sub-sector
- Is there a trade-off between market participation and food security?

Further details on the specific research questions and their potential benefits and chances for adoption can be found in **Annex 6**.

### 3.5. Strategies to improve integration within CIALCA

Both research and extension partners have encouraged further integration of CIALCA activities and staff (**Annex 7**) – CIALCA-II was collectively designed and should allow further integration at the extension and farming systems research level. At the technical level, CIALCA has gotten, and will continue to have, a strong regional character with substantial spill-over between the regions. At the administrative level, CIALCA has adopted common procedures that are implemented locally in view of the different conditions that apply to each of the regions. Here follows an overview of current and future integration strategies at the technical, partnership, science and administrative level.

#### TECHNICAL

- **Planning and review process:** During CIALCA-I, as for the general planning process, all regions are usually represented in a single location that's changing between the regions. During such meetings, a general strategy is adopted that's similar for all regions. The detailed planning is then done with all partners at the regional level. This process will continue during CIALCA-II.
- **Protocols and their implementation:** During CIALCA-I, as a result of the above process, protocols for experimentation and evaluation of technologies are similar across the regions. However, the speed at which the different activities are implemented depended on the progress made for the different sites and varied between the regions.
- **Training related to protocol implementation:** Various cross-regional training activities took place during CIALCA-I where teams from a certain region are leading the training of teams in another region. This happened, for instance, for the PRAs, the baseline surveys, and the farm characterization surveys. During CIALCA-II, such possibilities will continue to be sought.
- **Involvement of Belgian partners:** Specific topics, lead by the Belgian partners, were planned and implemented across several regions.

#### PARTNERSHIPS

- **CIALCA Consultative Committee (CCC):** All primary research and extension partners in CIALCA are represented in the CCC. The CCC acts like an advisory body to the lead institutes and meets at least once a year. It checks whether the execution of CIALCA is in line with its initial objectives and strategies. The CCC provides strategic advice on partnerships and approaches (e.g. on the integration between partners and regions), but leaves the actual activity planning to the general and specific planning meetings. The chair of the CCC alternates between the primary committee members on an annual basis.
- **Interactions with partners:** During CIALCA-I, various international NGOs have been interacting or will start to interact with CIALCA across the regions (e.g., Catholic Relief Services, Bureau Diocésaine de Développement, WorldVision). Although international NGOs usually plan their strategy at the national level, there is some cross-fertilization between the regions with the same NGO.
- **Knowledge Resource Centre:** The KRC that will be established during CIALCA-II will be based in Bujumbura but will serve all the regions. The communication specialist who

will lead the KRC will assist in streamlining contacts with partners and clients across the regions.

## **STUDENTS**

- **PhD project that operate across regions:** During CIALCA-I, at least 4 PhD projects operated across 2 or more regions/countries. MSc students usually support PhD research, but focus on activities within a specific region. During CIALCA-II, new PhD projects are going to start using a similar approach.

## **ADMINISTRATIVE**

- **Administrative procedures:** During CIALCA-I, a set of administrative procedures were agreed upon that were implemented in all regions through local offices. These include procedures on accounting, vehicle use, staff engagement, travel support, capital purchases, etc. During CIALCA-II, the administrative capacity of the various offices will be further strengthened by tighter integration of these procedures in those of the international center.
- **Reporting and accounting process:** During CIALCA-II, the technical and financial reporting guidelines will be streamlined between all regions and the three projects. This streamlining will happen at the level of format, content, and timing of the reporting.

# Annex 1 - Launching Meeting Programme

## Tuesday 28 October

### *SESSION I – OPENING – Chairman: Prof Walangululu*

09:00 - Welcome DG ISABU and introduction of participants (15 min)

09:15 - Welcome Attaché Belgian Embassy in Burundi (15 min)

09:30 - Welcome DG IRAZ (15 min)

09:45 - Welcome Minister of Agriculture and opening of the meeting (15 min)

### **10:00 - Tea break**

### *SESSION II – PROGRESS WITH CHARACTERIZATION*

10:30 - Program outline – Bernard (15 min)

10:45 - Short introduction to the CIALCA projects – Piet, Guy, Bernard (10 min each)

11:15 - Presentation PRA activities – Bernard (20 min)

11:35 - Presentation baseline characterization – Emily (20 min)

11:55 - Presentation final legume characterization – Pieter (20 min)

12:15 - Presentation final banana characterization – Piet (20 min)

### **12:35 - Lunch**

### *SESSION III – PROGRESS WITH LEGUME ACTIVITIES*

14:00 - Progress with activities in Rwanda – Ngoga, Aimable (15 min, 10 min discussion)

14:25 - Progress with activities in South-Kivu – Jean-Marie, Kasereka (15 min, 10 min discussion)

14:50 - Progress with activities in Bas-Congo – Lodi, Willy (15 min, 10 min discussion)

15:15 - Progress with process research activities – Pieter (15 min, 10 min discussion)

### **15:40 - Tea break**

16:00 - Progress with seed multiplication activities – Jean-Claude (15 min, 10 min discussion)

16:25 - Progress with market-related activities – Eliud (15 min, 10 min discussion)

16:50 - Progress with nutrition activities – Martha (15 min, 10 min discussion)

17:15 - Scaling up and partner involvement – Bernard (10 min, 10 min discussion)

17:35 - CIALCA-I, the NGO perspective – Sylvain (15 min, 10 min discussion)

## Wednesday 29 October

### *SESSION IV – PROGRESS WITH BANANA ACTIVITIES*

08:30 - Introduction

08:50 - Germplasm trials (Guy)

09:15 - Macro-propagation (Jim)

09:30 - Extension activities (Jean-Prosper / Roger)

10:00 - On-farm trials (Soil fertility management and XW) (Charles/Jules)

### **10:30 - Tea break**

11:00 -

- BBTV (Célestin/Jean-Pierre) (10 min)
- Germplasm collection and characterization (Dowiya/Guy) (10 min)
- Fruit peel disease (Walangululu) (5 min)
- AMF x nematode x plant performance (Joyce/Sveta/Edouard/Bernard) (10 min)
- Xanthomonas Wilt (Uwera/Charles/Mary/Guy) (10 min)
- Nutrient cycling (Syldie) (10 min)
- Soil physics (Tony/Piet) (5 min)
- Plant density (Telesphore/Niels/Guy) (10 min)
- Plantain x altitude (Sikyolo/Guy) (5 min)
- Banana-coffee (Anaclet) (5 min)
- UCL banana work (Delvaux/Delstanche/Freyman/Piet) (10 min)
- KUL banana work (Swennen/Placide/Guy) (10 min)

### **12:40 - Lunch**

- 14:05 - Conflict x agriculture (Paul/Emily/Piet)
- 14:10 - Perceptions of banana chain actors (Julie/Piet)
- 14:15 - Economics and Post-Harvest (Emily/Immaculate)
- 14:30 - Human nutrition (Beatrice)

### *SESSION V – IDENTIFICATION OF CIALCA-I PRODUCTS*

- 14:40 - Working groups per country: Identification of promising CIALCA-I products

### **15:40 - Tea break**

- 16:10 - Feedback from working groups per country

### **EVENING – Reception**

#### **Thursday 30 October**

### *SESSION VI – CIALCA-II PLANNING*

- 08:30 - Presentation CIALCA-II proposal
- 09:00 - Discussion on CIALCA-II proposal

### **10:15 - Tea break**

- 10:45 - Working groups on vision, communication, and scaling up
- 12:00 - Feedback from working groups

### **12:30 - Lunch**

- 14:00 - Working groups on science issues and potential PhD/MSc projects
- 15:00 - Feedback from working groups

### **15:30 - Tea break**

- 16:00 - Working groups on farming systems: integration of bananas and legumes
- 17:00 - Feedback from working groups

## **Friday 31 October**

### *SESSION VII – IMPLEMENTATION AND PRACTICAL RRANGEMENTS*

08:30 - Feedback from the CCC meeting – *Prof Walangululu*

09:00 - Discussion on CCC issues, including reporting, training needs assessment

09:30 - Regional planning meetings

### **10:30 - Tea break**

11:00 - Any other business

### *SESSION VIII – CLOSURE*

12:00 - Closure

## Annex 2 - List of Participants

Nr	Name	Institution	Country
1	Theodomir RISHIRUMUHIRWA	AGROBIOTEC	Burundi
2	KATHELYNE CRAENEN	Ambabel	Burundi
3	Katrien Meersman	Ambabel	DRC - Kinshasa
4	PICQ Claudine	Bioversity	France
5	Charles Staver	Bioversity	France
6	Blomme Guy	Bioversity	Uganda
7	Beatrice Ekesa-Onyango	Bioversity	Uganda
8	Eldad KARAMURA	Bioversity	Uganda
9	KATUNGA MUSALE	CIALCA	DRC - Bukavu
10	KANYARUGURU J.Prospere	CIALCA	Burundi
11	NKURUNZIZA Aline	CIALCA	Burundi
12	SANGINGA Jean Marie	CIALCA	DRC
13	Julie LUNZHIRWA	CIALCA	DRC - Kinshasa
14	Jean Claude Rubyogo	CIAT	Malawi
15	ELIUD BIRACHI	CIAT	Kigali/Rwanda
16	Martha Nyagaya	CIAT	Uganda
17	Kasereka Valery	CIAT/CIALCA	DRC - Bukavu
18	PIETER PYPERS	CIAT-TSBF	TSBF/Nairobi
19	Apollinaire MASUMBUKO	CNTA-INERA	Burundi
20	Pegase BANYANKIYE	CRS	Burundi
21	Stephen Walsh	CRS	Kenya
22	Dr Jean Pierre BUSOGORO	Gembloux	Belgique
23	FACHEUX Charly	ICRAF	Cameroun
24	NZOHABONAYO Zacharie	IFDC	Burundi
25	Piet Van Asten	IITA	Uganda
26	Jim Lorenzen	IITA	Uganda
27	Emily OUMA	IITA-CIALCA	Burundi
28	MBIKAYI NKONKO	INERA	Kinshasa
29	BIMPONDA MANITU WILLY	INERA/CIALCA	DRC - Bas Congo
30	LODI LAMA	INERA/CIALCA	DRC - Kinshasa
31	Jules NTAMWIRA	INERA/CIALCA	DRC - Bukavu
32	RUSUKU Gerard	IRAZ	Burundi
33	SENGELE Ndani	IRAZ	Burundi
34	SABIMBONA Bonaventure	IRAZ	Burundi
35	Amb.NTIHABOSE Salvator	ISABU	Burundi
36	Syldie BIZIMANA	ISABU	Burundi
37	NDAYIRAGIJE Pascal	ISABU	Burundi
38	NIYONGERE Celestin	ISABU	Burundi
39	Anaclet NIBASUMBA	ISABU	Burundi
40	GAHIGI Aimable	ISAR	Rwanda
41	Nabahungu N.Leon	ISAR	Rwanda
42	NGOGA Tenge Ghislain	ISAR	Rwanda

43	HABONIMANA Patricie	Journaliste Minagri	Burundi
44	Giovani Forgione	Phytolab	Burundi
45	Sylvain MAPATANO	Plateforme DIOBASS	DRC - Bukavu
46	Charles MUREKEZI	RADA	Rwanda/Kigali
47	Bernard Vanlauwe	TSBF	Nairobi
48	Jean Walangululu MASAMBA	UCB	DRC - Bukavu
49	NDUNGO VIGHERI	UCG	DRC
50	Leopold MUMBERE	VECO	DRC

# Annex 3 - Report of the CIALCA Consultative Committee meeting

## Participation

P Ndayiragije, ISABU  
G Rusuku, IRAZ  
L Nabahungu, ISAR  
J Walangululu, UCB  
N Vigheri, UCG  
N Mbikayi, JP Lodi Lama, INERA  
S Mapatano, Diobass  
D Katunga, JP Kanyaruguru, CIALCA  
P Van Asten, IITA  
G Blomme, Bioversity  
B Vanlauwe, TSBF-CIAT

## Agenda

### 1. Welcome and introduction

### 2. Review of the minutes of the last meeting

#### 2.1. Minutes of the last meeting

Minutes were reviewed and adopted with no additional comments. We need to add Prof Mbikayi to the mailing list.

#### 2.2. CIALCA offices

##### BUKAVU

- Secretary has been engaged for the Bukavu office.
- Role of CIALCA facilitator: reporting follow up, accounting for funds received, facilitation with partners (eg, meetings, advertisement of CIALCA), political authorities, harmonization of activities, representation of CIALCA for regional events,
- Linkages with provincial authorities are good and have been reinforced.
- Other duties for the facilitation during CIALCA-II:

##### KINSHASA

- Only CIAT works in Kinshasa. We should explore potential linkages with ICRAF and CIP before formally engaging them in CIALCA.

##### KIGALI

- TORs as for Bukavu; facilitation was implemented very efficiently.

##### BURUNDI

- The Burundi office reports to Bioversity.
- The CIALCA office will be located in Bujumbura for reasons of accessibility, networking with partners, communication, etc.

##### OTHER SITES

- North Kivu: no need for a full CIALCA office; the current representation is sufficient.
- Discuss with IITA and Bioversity if they can support a CIALCA office in North-Kivu.
- Explore the possibility to hire an office at UCG for CIALCA.

### **2.3. CCC membership**

- Terms of Reference developed in December 2006:
- Ensure that project direction does not deviate too much from the overall objectives from the outset.
- Update project objectives to keep them consistent with the evolution of the context of various countries (analysing opportunities and threats on a regular basis in the environment in which the project is working).
- Facilitate possible institutional and/or administrative problems to which teams may be confronted to on the field.
- Decide together with the administrative offices from various projects (CIAT, IITA, and Bioversity) on the main options and issues related to the management of projects.
- CCC is comprised of the managers of the aforementioned project partners.
- CCC will meet at least once a year to assess activity progress against planning. If possible, these meetings should be held on the sidelines of the Annual Planning Meeting.
- Add development partners from all countries:
- Rwanda: add a representative of RADA.
- Burundi: add a representative of CRS.
- Start discussing with the Extension Services of Burundi and evaluate their membership during the next CCC meeting; Jean Prosper will start discussing with this partner.
- Need to have a way for partners at the site level to interact.

### **2.4. Election of chairperson for 2009**

- After voting and discussions, the following order for chairmanship was agreed upon in Butare in June 2007:  
2007: UCB (Prof Walangululu), 2008: ISABU, 2009: ISAR, 2010: INERA, 2011: IRAZ.

### **2.5. International conference**

- Organize in the context of a potential 3rd phase.
- Committee to report back by Email to the CCC by January 2009: CIAT, IITA, Bioversity, IRAZ.

## **3. Presentation of the CIALCA-II proposal**

Two other projects have also been approved by DGDC and DGDC has advised them strongly to work together with CIALCA where this makes sense. The inclusion of new projects: The projects are lead by ICRAF and CIP: **ICRAF**: Project: 'Increasing small-scale farmer benefits from agroforestry tree products in West and Central Africa – AFTP4A'. The project will work in the following sites:

- Democratic Republic of Congo: Kasangulu, Mbanza Ngungu (Bas-Congo), Tshopo District (Province Orientale)

**CIP**: Project: 'Enhancing the nutrient-rich Yam Bean to improve the food quality and availability and sustainability of farming systems in Central- and West Africa – Yambean, Central & West Africa'. The project will work in the following sites:

- D.R. Congo in A) the Province Bas-Congo (with the INERA station in Mvuazi) in the Western part of D.R. Congo, and B) the Province South-Kivu (with the INERA station Mulungu) in the Eastern part of D.R. Congo which borders Rwanda, Burundi, and Tanzania. At both locations field evaluations and processing studies will take place.
- Rwanda in the Southern Province of Rwanda (with the ISAR station in Rubona) at the Kinazi pilot site. Field evaluations and processing studies will take place at this location.

- Burundi in the Province Muramvya (with the ISABU research station Gisozi) in Central Burundi. Field evaluations and processing studies will take place at this location.

#### **4. Important issues in relation to CIALCA-II**

##### **4.1. Knowledge Resource Centre (KRC)**

- The KRC will be housed by the CIALCA office in Bujumbura.
- Roles: Collect information about CIALCA-related activities in the region, repackage information to specific stakeholders, identify proper information dissemination channels, etc.
- The KRC should accompany the dissemination activities to be achieved by CIALCA.
- Linkages with IRAZ need to be explored since IRAZ has a mandate for information dissemination.

##### **4.2. Technical and financial reporting**

- MoU with partners will continue to be signed by individual institutes since CIALCA is not a legal entity.
- Funds for shared activities should be sent as a single transfer to partner institutes; distribution of funds to specific projects should be done at the CIALCA level.
- Technical and financial reporting: A draft format was proposed to use for technical and financial reporting, to be submitted twice per year (Annex 1).

##### **4.3. Principles for MSc and PhD identification; partner training needs assessment**

- Principles for degree-related training:
  - Priority themes following CIALCA priorities
  - Candidates presented by a partner institute
  - Quality of the candidate
  - Aim at some level of equilibrium where applicable (regions, genre, etc)
- Group training events:
  - Prioritize training events based on specific needs

##### **4.4. Partnerships for scaling up**

- We need to ensure that we modify partnerships to ensure that we reach the number of households we have promised to reach.

##### **4.5. New ICRAF and CIP-lead projects (see section 3 above)**

- We'll inform the new projects and start engaging with them. We'll then formalize relationships as this is required.

#### **5. Any other business**

##### **5.1. Budgets for partners**

- It is important that partners have a global idea on the total funds available per partner for a specific year. These will be estimates since final funding is based on agreement on specific activities.

#### **6. Wrap up and closure**

## Annex 4 - List of CIALCA-I products

### Product 1

<p><b>Product name :</b> Improved leguminous crop varieties (haricot nain, haricot volubile, soja, arachide et niébé)</p>
<p><b>Product description:</b> High performance varieties, characterized by high yield potential, high resistance to pest, diseases and biophysical pressure (droughts, heavy rains and poor soil fertility). Further, the varieties have been selected by farmers themselves according to their own criteria which include market variety preference (size and colour of grains), the taste etc. Several bean varieties are fortified <i>i.e.</i> characterized by high iron and zinc levels and therefore good for health. The list further includes promiscuous varieties with high biomass, which benefits soil fertility. For each region, species and varieties adapted and appreciated by users have been selected. Some varieties are more specific to a certain region while others are more flexible and adapt to several regions.</p>
<p><b>Customers :</b> Farmers, NGOs, seed producers, state seed systems</p>
<p><b>Essential components:</b></p> <ul style="list-style-type: none"> <li>• Clean and good quality seed, well selected and preserved</li> <li>• Varietal maps with information on various varieties</li> <li>• Regions maps showing the adaptability of each variety (to be developed)</li> </ul>
<p><b>Optional components:</b> Information on variety management in order to maximize their yield (aligned planting, use of organic inputs and mineral fertilizers, pest and disease control, cleaning...)</p>
<p><b>Potential Modifications:</b> Adapting management to the conditions of each environment (spacing, use of inputs...)</p>
<p><b>Inputs/materials required:</b></p> <ul style="list-style-type: none"> <li>• Good quality seeds: the product itself is an input;</li> <li>• Poor soil fertility (see varietal maps)</li> </ul>
<p><b>Region where the product is applicable:</b> Some varieties are more specific to certain regions than they are to others (South Kivu, Bas Congo, South-Eastern and North-Eastern parts of Rwanda) or even to some sites in a given region, while other varieties are rather flexible and adapt to several regions (see region maps showing the adaptability of each variety –to be developed)</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>• Climate variability (droughts, heavy rains...)</li> <li>• Seed mis-preservation (good storage conditions that protect the seed against heat, humidity and rodents are necessary)</li> </ul>
<p><b>Appropriate Mode(s) of dissemination:</b></p> <ul style="list-style-type: none"> <li>• Link the farmers who are producing the seeds with development partners;</li> <li>• Vertical and horizontal dissemination: involving farmers associations in the selection and multiplication of varieties, training of associations trainers in seed multiplication, exhibition of varieties during farm days to make these varieties known to development partners;</li> <li>• Introduction in the formal system and acceptance, then dissemination through state seed services</li> </ul>
<p><b>Other information :</b> Need to translate the technical sheets into local languages</p>

### Product 2

<p><b>Name of product:</b> Maize-leguminous rotation</p>
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<p><b>Product description:</b> Leguminous crops are planted during B season while maize is planted after/during A season. A small dose of DAP (100kg/ha) is applied to the two crops in soils lacking phosphorous. With this system, it is possible to produce about 2 to 3 tons of leguminous during B season and 3 to 5 tons of maize during A season while reducing the use of urea (100 kg/ha of urea for maize farming).</p>
<p><b>Customers :</b> Farmers, development agents, private stakeholders (e.g. maize flour mill)</p>
<p><b>Essential components:</b></p> <ul style="list-style-type: none"> <li>• Improved maize variety (e.g. ZM 607).</li> <li>• Improved leguminous variety with high biomass production, preferably that of soyabean (e.g. SB24) or that of yam bean (e.g. AND10).</li> <li>• Information brochure on technology for producers and development agents</li> </ul>
<p><b>Optional components:</b> Adding organic and/or phosphorous inputs in the leguminous and urea in maize depending on the need of the soil. Aligned planiting facilitates a strategic and efficient use of fertilizers.</p>
<p><b>Potential Modifications:</b></p> <ul style="list-style-type: none"> <li>• Different types of leguminous depending on the production objectives and agro-ecological conditions;</li> <li>• Associate maize with cassava in A season with a wide enough spacing that would allow the planting of leguminous in B season.</li> <li>• Reduce/increase the doses of fertilizes depending on farmers' purchasing power</li> </ul>
<p><b>Inputs/materials required:</b> -Maize and leguminous seeds -Mineral fertilizers : DAP and urea</p>
<p><b>Region where the product is applicable:</b> The technology has a wide applicability and may be applied in the eastern province of Rwanda, South Kivu, North Kivu and Bas Congo</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>• Space competition with sorghum (sorghum is more preferred by farmers in Rwanda during B season)</li> <li>• Poor fixation of leguminous such as beans weak side effects;</li> <li>• Poor growth of leguminous and maize in the event of weak rainfall level;</li> <li>• Incorrect application of fertilizers and crop burning</li> </ul>
<p><b>Appropriate Mode(s) of dissemination:</b></p> <ul style="list-style-type: none"> <li>• Demonstration farms;</li> <li>• Information brochures on technology for producers, maize processing units and development agents;</li> <li>• Seed systems;</li> <li>• Inputs market (chemical fertilizers) and crop products (sojabean and maize)</li> <li>• Training on the use of sojabean and mixing sojabean with maize</li> </ul>

### Product 3

<p><b>Name of product:</b> Integration of leguminous crops in cassava cropping systems</p>
<p><b>Product description:</b> Cassava is planted with a spacing of 2 m x 0.5 m and 4 rows of leguminous crops are planted at the same time. During the second season, it is possible to associate a second leguminous crop with cassava (2 two rows between cassava rows). With this system, it is possible to produce about 2 – 3 tons/ha of leguminous crops per year without reducing cassava productivity.</p>
<p><b>Essential components:</b></p> <ul style="list-style-type: none"> <li>• CMD resistant improved cassava variety;</li> <li>• Improved leguminous variety;</li> </ul>

<ul style="list-style-type: none"> <li>Information brochure on technology for producers and development agents.</li> </ul>
<b>Optional components:</b> Adding organic and/or mineral inputs depending on the needs of the soil.
<b>Potential Modifications:</b> Reducing cassava density may increase leguminous crops productivity but with reduced productivity for cassava.
<b>Inputs/materials required:</b> <ul style="list-style-type: none"> <li>Cassava cuttings;</li> <li>Leguminous seeds;</li> <li>Organic and mineral fertilizers (optional)</li> </ul>
<b>Region where the product is applicable:</b> <ul style="list-style-type: none"> <li>Mountainous South-Kivu</li> <li>Bas-Congo (Cataractes and Lukaya)</li> </ul>
<b>Potential risks:</b> <ul style="list-style-type: none"> <li>Minimal growth in acid soil or poor phosphorous soils without use of nutrients;</li> <li>Weak growth of leguminous crops if the spacing is not adhered to;</li> <li>Choking of cassava in fertile soils by leguminous crops if they are planted with a high density (especially the sojabean and the cowpea);</li> <li>Competition and difficult growth of leguminous in the second season.</li> </ul>
<b>Appropriate Mode(s) of dissemination:</b> <ul style="list-style-type: none"> <li>Demonstration farms;</li> <li>Information brochures on technology for producers and development agents, famers associations and development NGOs;</li> <li>Seed systems</li> <li>Training on the use of soja</li> <li>Training on the use of and application modes for organic and inorganic fertilizers</li> <li>Management modes and methods for crop associations</li> </ul>

## Product 4

<b>Name of product :</b> ADA Approach : Evaluation of technologies at the household level
<b>Product description:</b> An approach to assess a technology enabling households participating to experiment and learn the benefits of the technology and, thus, to facilitate an effective dissemination of the technology. Households receive packages containing planting materials (improved varieties), inputs, an explanatory brochure, and a farm booklet. Local agents (facilitators or animators) attend training and explain to the participating household how to set up small scale trials. These trials consist mainly in 3 to 4 small demonstration farms showing the benefits of the various components of the technology as compared to the practice in use. Households themselves set up and manage the trials, always with the support of a local agent. A brochure explains the technology in a concise and simple manner and shows how to set up the trial. Households collect data in the field booklets, which enables them to better understand and assess the technology and eventually adapt or adopt it.
<b>Essential components:</b> <ul style="list-style-type: none"> <li>Packages comprising of improved varieties planting materials, inputs, explanatory brochures and farm booklet;</li> <li>Support by local agents for the training and follow up of trials.</li> </ul>
<b>Optional components:</b> <ul style="list-style-type: none"> <li>Promoting the technology through organising exchange visits (between farming associations) and farm days (with the attendance of the media, state institutions and development stakeholders...) including field visits;</li> <li>Technical visits to assess the the setting up of packages (in order to better interpret the data collected) and the modifications done by the households (so as to adapt the technology to local</li> </ul>

<p>demands).</p> <ul style="list-style-type: none"> <li>• Awarding of certificates to participants;</li> <li>• Assessing the adaptation and adoption (during the next season).</li> </ul>
<p><b>Potential Modifications:</b></p> <ul style="list-style-type: none"> <li>• Number of households involved: we recommend at least 10 packages per site;</li> <li>• Level of follow up and data collection: an in-depth follow up permits to understand the efficiency of the technology; a basic follow-up only contains yields measures and the evaluation</li> </ul>
<p><b>Inputs/materials required:</b> Improved varieties and inputs for the composition packages</p>
<p><b>Region where the product is applicable:</b> Wide applicability methodology in regions where development agents are working and where farmers (preferably) are organised in associations (to enable a quick dissemination).</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>• It is imperative to have a distribution and training body to ensure that the trials are properly and timely set up;</li> <li>• It is imperative to have an active commitment for the support and follow up of trials to ensure that the technology is demonstrated and applied properly;</li> <li>• It is imperative to have a clear understanding with the households, preferably in the form of small contracts (distribution of packages for filling out the farm booklets) to ensure data collection.</li> </ul>
<p><b>Appropriate Mode(s) of dissemination:</b> N/A (The product is <i>per se</i> a method of dissemination)</p>
<p><b>Targeted customers :</b> Development and research organisation</p>

## Product 5

<p><b>Name of product :</b> New banana varieties</p>
<p><b>Product description:</b> Improved banana varieties with tolerance/resistance to diseases, rodents, and such abiotic constraints as poor soil fertility and droughts. The varieties originate from different sites:</p> <ol style="list-style-type: none"> <li>1. The FHIA hybrid variety comes from Honduras. There are dessert varieties, cooking varieties, beer varieties and plantains. These varieties are resistant to Fusariosis race-1. In general, these varieties also show a resistance/tolerance to Sigatoka (Cercosporiosis). These varieties are not genetically linked to the high altitude bananas.</li> <li>2. The IITA/NARO hybrid varieties from Uganda. These varieties are ancestors to the high altitude bananas. There are cooking and beer varieties. They are more tolerant and resistant to Sigatoka and nematodes.</li> </ol>
<p><b>Essential components:</b> Banana plants</p>
<p><b>Optional components:</b> Brochures on the characteristics of these varieties</p>
<p><b>Modification potentielle:</b> No – but new varieties are approved on a regular basis</p>
<p><b>Inputs/materials required:</b> Banana plants from <i>in vitro</i> laboratories or from macro-propagators</p>
<p><b>Region where the product is applicable:</b> These varieties that are performing across all regions.</p>
<p><b>Potential risks:</b></p> <ol style="list-style-type: none"> <li>1. The introduction of disease when using non clean planting materials</li> </ol>
<p><b>Appropriate Mode(s) of dissemination:</b></p> <ol style="list-style-type: none"> <li>1. It is preferable to put in place evaluation and demonstration farms for introduced varieties;</li> <li>2. The start-up materials must be clean – <i>in vitro</i> plants are preferred;</li> </ol>

<p>3. The introduction of macro-propagators will enable famers to multiply materials from demonstration/evaluation farms;</p> <p>4. Vulgarisation organisation (state or NGO) may assist with steps 1-3</p>
<p><b>Targeted customers :</b> Research and development organisations Farmers</p>

## Product 6

<p><b>Name of product:</b> Xanthomonas Wilt control options package</p>
<p><b>Product description:</b></p> <ol style="list-style-type: none"> <li>1. Early de-budding (immediately after the formation of the last hand) to prevent insect vector transmission;</li> <li>2. Cut off a single flower-infected plant (in a healthy mat) at the base of the pseudostem;</li> <li>3. De-leafing and de-suckering should be temporarily halted in plots with diseased plants;</li> <li>4. Regular uprooting of diseased mats in fields with few diseased plants;</li> <li>5. Uproot all plants/mats in fields with a high percentage of diseased plants and subsequent replanting with bananas after 6 months;</li> <li>6. Des-infection of contaminated garden tools;</li> </ol>
<p><b>Customers:</b> Extension staff, NGO staff, farmer associations, farmers</p>
<p><b>Essential components:</b></p> <ul style="list-style-type: none"> <li>• Forked wooden stick to de-bud;</li> <li>• Garden tools;</li> <li>• Fire to des-infect garden tools;</li> </ul>
<p><b>Optional components:</b> Chemical desinfectant to desinfect garden tools (e.g. by using Jik)</p>
<p><b>Potential Modifications:</b> None identified</p>
<p><b>Inputs/materials required:</b> Forked wooden stick, garden tools, fire wood</p>
<p><b>Region where the product is applicable:</b> The entire East African Highland region</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>• Late de-budding could lead to insect vector transmission – de-budding needs to be done immediately after the last hand has formed</li> <li>• Tools used to remove sick plants can infect clean plants if not properly disinfected</li> </ul>
<p><b>Appropriate Mode(s) of dissemination:</b> Demo-plots Leaflets and posters for development agents, extension staff and farmers Radio, TV, website Training of trainers</p>

## Produit 7

<p><b>Name of product:</b> Macro propagation of bananas</p>
<p><b>Product description:</b> La macro-propagation is a technology aimed at producing fifteen plants from one banana plant. The best technique consists in (i) choosing health plants, (ii) cleaning the plant (paring, boiling water), (iii) destroying the meristem (apex), (iv) gradually remove the smaller plants when they have 2-3 leaves, and (v) cause to grow and harden small plants in a sterile soil in humid room.</p>
<p><b>Customers :</b></p>

<ul style="list-style-type: none"> <li>- Farmes</li> <li>- Development agents</li> </ul>
<b>Essential components:</b> <ul style="list-style-type: none"> <li>- Clean plants</li> <li>- Cleaning with boiling water and for sterilising the soil</li> <li>- Charcoal/woods</li> <li>- Humid room</li> </ul>
<b>Optional components:</b> <ul style="list-style-type: none"> <li>- Use of cytokin</li> </ul>
<b>Potential Modifications:</b> <ul style="list-style-type: none"> <li>- Using <i>in vitro</i> plants to ensure that the start-up materials are clean</li> </ul>
<b>Inputs/materials required:</b> <ul style="list-style-type: none"> <li>- Barrel, cooking woods for boiling water cleaning</li> <li>- Plastic and wood to build a humid room</li> </ul>
<b>Region where the product is applicable:</b> <ul style="list-style-type: none"> <li>- Great Lakes region</li> <li>- Cameroon</li> </ul>
<b>Potential risks:</b> <ul style="list-style-type: none"> <li>- Multiplication of sick materials</li> </ul>
<b>Appropriate Mode(s) of dissemination:</b> <ul style="list-style-type: none"> <li>- Demonstration propagation units</li> <li>- Information brochure on the technology for producers and development agents</li> <li>- Training</li> </ul>
<b>Other information :</b>

## Product 8

<b>Name of product :</b> Detection and eradication of the Banana Bunchy Top Virus (BBTV)
<b>Product description:</b> Analysis: This is a sampling, preservation and transport system for vegetal material with a view to molecular analyses aimed at detecting infections by various pathogens. For viruses in general and BBTV in particular, analysis protocols are easy to implement and do not necessitate the use of antibodies or nucleic acids purification. Eradication: This is the set of performing procedures for the elimination of viral infections necessitating various treatments such as thermotherapy, chemotherapy, and cryotherapy and meristem culture. Regenerated materials must be monitored by sensitive detection techniques before being submitted to large-scale multiplication which can be undertaken only when the absence of viral infections has been proven.
<b>Customers :</b> Analysis : Organisations tasked with providing phyto-sanitary analyses at country level Eradication : Laboratories striving to achieve the cleaning of vegetal materials in the region
<b>Essential components:</b> Analysis : (1) Technical competences, (2) Availability of molecular analysis equipment (PCR), (3) Ease of procurement of consumables Eradication: (1) <i>In vitro</i> culture laboratories, (2) Analysis capacities for vegetal materials, (3) Thermotherapy rooms, (4) Technical competences (trained staff), (5) vectors control.
<b>Optional components:</b> (1) Availability of reference materials (positive and negative tests).
<b>Potential Modifications:</b> Minor modifications of protocols depending on equipment available and treated varieties
<b>Inputs/materials required:</b> Analysis : (1) Consumables, (2) Capacity building (scientific and technical high level staff) Eradication : <i>In vitro</i> culture consumables, antiviral molecules
<b>Region where the product is applicable:</b>

All zones where banana is cultivated
<b>Potential risks:</b> Analysis: Performance level (sensitiveness, specificity, repetitiveness) – it will be necessary to organise a ring test amongst the various laboratories involved in the use of the technology. Treatment: Risk of reinfection of the cleaned materials and weak sensitization of farmers.
<b>Appropriate Mode(s) of dissemination:</b> Training (cabacity building), local purchase of equipment and consumables.
<b>Other information :</b> The analysis system is adapted for various pathogen species.

## Product 9

<b>Name of product :</b> Clean planting material
<b>Product description:</b> Banana production is often limited by a number of pests and diseases. Large yield losses occur when planting material is already infected with pests and diseases. Clean planting material often yield substantially higher yields, then using traditional suckers. There are two approaches to obtain (more) clean planting material, each with their own procedures and risks involved: <ol style="list-style-type: none"> <li>1. <i>Tissue culture plants:</i> in the laboratory, meristematic tissue is being dissected and put on media to obtain hundreds or even thousands of plants from only a few mother plants. Normally the meristematic tissue will be tested for disease presence. Infected material can either be discarded or sometimes cleaned (e.g. possible for viruses like BBTv). The young plantlets will be put on rooting medium and later transferred into weaning bags filled with sterile soil. At planting, this material should still be free from pest and diseases, unless the plants got infected during the weaning or hardening stage.</li> <li>2. <i>Boiling water treatment:</i> most farmers in East Africa will still use suckers as planting material. The roots and corm surface are infected with nematodes and weevils. These pests can largely be removed by paring the corm (i.e. peeling the corm surface and removing the roots). Hereafter, the corms can be dipped in boiling water for 20-30 seconds (depending on size). This will eliminate any nematodes or weevil eggs or larvae that may have remained at the corm surface.</li> </ol>
<b>Customers :</b> <i>Boiling water:</i> farmers and farmer organisations, particularly in low altitude (<1300m) zones <i>Tissue culture:</i> commercial farmers close to urban markets, NGOs wishing to provide 'seeds'
<b>Essential components:</b> <i>Tissue culture</i> <ul style="list-style-type: none"> <li>- Indexed mother plants / disease-free meristem</li> <li>- Growth and rooting medium, sterilizing equipment for tools and soil</li> <li>- Laboratory infrastructure (laminar flows, septic rooms)</li> <li>- Weaning sheds / nurseries</li> </ul> <i>Boiling water</i> <ul style="list-style-type: none"> <li>- Vigorous suckers, apparently free of any diseases</li> <li>- Knife/machetes</li> <li>- Pot or drum</li> <li>- Fire wood and water</li> </ul>
<b>Optional components:</b> Establish clean mother gardens and add macro-propagation unit to further multiply clean material.
<b>Modifications potentielles:</b> Include rapid tools and systems to verify the presence of pest and disease in planting material
<b>Inputs/materials required:</b> <i>Tissue culture :</i> Chemical products for tissue culture lab – cleaning starting material <i>Boiling water:</i> Healthy vigorous suckers, wood, water, and a drum/pot to boil water
<b>Region where the product is applicable:</b> Entire region, although mostly applicable in low areas (<1300m) where pest and disease pressure is

often particularly high.
<b>Potential risks:</b> <i>Tissue Culture:</i> Risk of multiplying diseased material in the tissue culture lab. Current tissue culture labs are heavily dependent on NGOs as their clients – risk is that NGOs will stop buying and that farmers have not yet adopted the technique <i>Boiling water:</i> Boiling the suckers too long will kill the plant
<b>Appropriate Mode(s) of dissemination:</b> Demonstrations of technologies through extension partners. Demonstration nurseries.
<b>Other information:</b> Strong need for local disease identification capacity.

## Product 10

<b>Name of product:</b> Banana zero-tillage mulch systems
<b>Product description:</b> Improved soil management through combination of zero-tillage practices with application of (self-) mulch. Bananas and some of their intercrops (e.g. coffee in Uganda) have very shallow rooting systems. At the onset of the wet season, when the plant starts to recover from the dry season, the farmer often tills his banana field to allow intercropping (e.g. with beans) and removal of weeds. This practice is very detrimental to the banana root systems. In some areas in Southwest Uganda, farmers practice banana-bean intercropping without soil tillage and with proper management of banana self-mulch and when possible with application of external (grass) mulch. This practice will (i) improve banana plant performance, (ii) will still allow good bean yields, while (iii) minimizing erosion at the onset of the wet season.
<b>Essential components:</b> - Hoe will be needed for superficial weeding at the onset of the wet season
<b>Optional components:</b> - Application of external mulch will further suppress weeds and increase nutrient inputs. - Herbicide (glyphosate) may be effective for removals of weeds like couch grass.
<b>Modifications potentielles:</b> - The banana plant density will affect the light penetration to the soil surface, thereby greatly affecting the performance of weeds and intercrops - To further encourage erosion control, farmers may decide to install contour bunds, where possible reinforced with forage/mulch producing crops
<b>Inputs/materials required:</b> - Hoe - Mulch.
<b>Region where the product is applicable:</b> The entire banana producing area in the EA Highlands
<b>Potential risks:</b> - Insufficient mulching and weeding may lead to larger weed pressure than in till systems, thereby reducing yields - Use of herbicides has to be done judiciously. Excessive application may damage crops and the environment
<b>Appropriate Mode(s) of dissemination:</b> - Farmer field schools / demonstration plots, in collaboration with farmer organisations and NGO/extension partners\ - Development and distribution of training materials

## Product 11

<b>Name of product:</b> Banana-coffee association
<b>Product description:</b> The banana-coffee association is a farming system more developed in Uganda enabling to (i) associate coffee plants and banana plants in the same farm, (ii) recycle the biomass produced, mostly by the banana, in the same to improve/maintain soil fertility. This system makes it

possible to maintain almost the same level of productivity of coffee as in non-associated farming as well as that of the banana. For the Arabica plant, the best combination is 2 coffee plants for 1 banana plant.
<b>Essential components:</b> <ul style="list-style-type: none"> <li>- Improved banana and coffee varieties;</li> <li>- Adhere to the coffee plant banana plant ratio.</li> </ul>
<b>Optional components:</b> <ul style="list-style-type: none"> <li>- Planting density dependent upon ecology;</li> <li>- Determination of deficiencies in mineral elements and fertilization;</li> <li>- Competition for water –adaptation of densities depending on the hydric tree;</li> <li>- Canopee management and competition for light</li> </ul>
<b>Potential Modifications:</b> <ul style="list-style-type: none"> <li>- A high density of both crops will reduce their productivity and may lead to disease proliferation</li> </ul>
<b>Inputs/materials required:</b> <ul style="list-style-type: none"> <li>- Banana plants;</li> <li>- Coffee plants;</li> <li>- Use of nutrients –e.g. fertilisers, will be necessary in a very intensive system</li> </ul>
<b>Region where the product is applicable:</b> In area where arabica coffee is grown (South Kivu, North Kivu, Rwanda, Burundi)
<b>Potential risks:</b> The policy on coffee farming –difficulty in convincing the disseminating agents, as the banana-coffee association is not currently envisaged. It was even forbidden in the past.
<b>Appropriate Mode(s) of dissemination:</b> <ul style="list-style-type: none"> <li>- Trial at station level;</li> <li>- Demonstration from farmers' farms where the association is already implemented;</li> <li>- Information brochure on the technology for producers and development agents.</li> </ul>

## Product 12

<b>Name of product:</b> Improving nutrition by promoting soybean products
<b>Product Description :</b> An approach for promotion of different soybean products based on training-of-trainers, promotion materials such as recipe books, brochures with key nutrition messages, a training manual, and demonstration gardens to show best agronomic practice for soybean cultivation. Folders, guides and books are all translated into local languages. Soybean is very beneficial for human health: it is rich in protein, vitamins, minerals and immunity-boosting substances.
<b>Essential components:</b> <ul style="list-style-type: none"> <li>● CIALCA Technical guide 01: A training manual that contains information on basic nutrition and hygiene required in the proper handling, preparation and storage of food components, and explains the importance of dietary diversification, processing, preparation and utilization of soybean products. The guide also includes a sample questionnaire for conducting soybean acceptability studies and identifying soybean products for dissemination, a soybean commodity fact sheet hand-out and selected soybean recipes (e.g., soymilk, tofu, okara,...).</li> <li>● Recipe books with detailed instructions for preparing soybean products (for trainers).</li> <li>● Handouts with recipes for different soybean products based on acceptability studies conducted in the specific region (for trainees).</li> <li>● Brochure on best agronomic practices for soybean cultivation</li> <li>● Demonstration gardens at local centres (preferably nutritional or health centres), managed by the local centres to teach visitors about soybean.</li> <li>● Trainers, who are representatives from nutritional or health centres, community and health workers, and farmer groups. These trainers train visitors, neighbours, colleagues,... Trainees then become trainers themselves to stimulate widespread knowledge on soybean processing and nutrition.</li> </ul>

<p><b>Optional components:</b> The soybean promotion package can be linked to promotion packages on other crops and practices, for example bio-fortified beans, orange-fleshed sweet potatoes, fruits and preparation of vegetables etc. See also product 18.</p>
<p><b>Potential modifications:</b></p> <ul style="list-style-type: none"> <li>• Soybean products are chosen based on acceptability studies and availability of local ingredients. Recipes are then adapted based on local preferences. Feedback from trainers is used to adapt recipe leaflets.</li> <li>• Involvement of NGO partners working with nutritional centres for scaling up.</li> </ul>
<p><b>Inputs / materials required:</b></p> <ul style="list-style-type: none"> <li>• Improved soybean varieties and good-quality seed.</li> <li>• Other local ingredients listed in the recipes</li> <li>• Cooking materials and other equipment for training purposes.</li> <li>• Manuals, leaflets and other promotional materials translated into local language.</li> </ul>
<p><b>Region where will the product is applicable:</b> The approach is adapted to soybean-cultivating areas with presence of potential health partners.</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>• Trainees may not engage in training themselves without motivation. A local compensation system is required for durability.</li> <li>• Training on soybean utilisation must be accompanied by training on agronomic practices for soybean cultivation and proper seed conservation.</li> <li>• Soybean products often have short shelf lives.</li> </ul>
<p><b>Appropriate Mode(s) of dissemination:</b> Integrated approach involving key health partners for training-of-trainers, locally managed demonstration gardens and dissemination of promotion materials (manuals, leaflets,...).</p>

## Product 13

<p><b>Product name:</b> Integrated seeds systems approach</p>
<p><b>Product description:</b> An approach for legume seed production, supply and marketing, accompanied by training to improves skills of local producers and seed quality, promotion to increase information and knowledge about seed, and a monitoring and evaluation system. A multi-partner and multi-channel (mostly informal) seed system approach allows accelerated accessibility to quality seeds of improved varieties in sustainable and equitable manner.</p>
<p><b>Essential components:</b></p> <ul style="list-style-type: none"> <li>• Improved varieties</li> <li>• Availability of breeder/foundation seed</li> <li>• Seed producers (producing acceptable high-quality seed in an informal system and certified quality seed in a formal system)</li> <li>• Training to enhance skills and knowledge of seed producers and other supply chain actors, preferably by an experienced and trained development partner / ONG</li> <li>• Training and promotion manuals, including varietal cards indicating appropriate management and adaptation of new varieties.</li> <li>• Linkages between farmers and output markets or private sector seed producers</li> </ul>
<p><b>Optional components:</b></p> <ul style="list-style-type: none"> <li>• Seed quality control by official bodies</li> <li>• Use of fertilizer inputs fertilizers and pesticides (according to soil fertility and disease/pest constraints)</li> </ul>
<p><b>Potential modifications:</b></p> <ul style="list-style-type: none"> <li>• Seed production can be done following a centralized system (at a farmer association or cooperative level, on a larger communal land area) or a decentralized system (where individual</li> </ul>

<p>farmers produce seed in their own, often smaller plots and centralize their production at the association or cooperative level for marketing their seed).</p> <ul style="list-style-type: none"> <li>Seed production can be done following a formal system (centralized with quality control and certification done by an official body and commonly producing seed for a wide area), or following an informal system (without external quality control and commonly producing seed for local clients).</li> </ul>
<p><b>Inputs required:</b></p> <ul style="list-style-type: none"> <li>Improved varieties</li> <li>Good quality starter seed (breeder and foundation)</li> <li>Organic inputs or fertilizer and pesticides according to soil fertility and disease/pest constraints</li> </ul>
<p><b>Region where will the product is applicable:</b> The approach is applicable in all legume-producing areas.</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>Use of poor quality seeds, poor storage,...</li> <li>Lack of organizational and technical capacity for producing and marketing seed, and as a result production of insufficient quantities to achieve widespread dissemination of new varieties.</li> </ul>
<p><b>Appropriate dissemination modes:</b></p> <ul style="list-style-type: none"> <li>Local or commercial seed production by individuals or farmer groups</li> <li>Promotion materials (leaflets, varietal cards,...)</li> <li>Media channels (radio and television), demonstration plots, field days, linkages with partners</li> </ul>

## Product 14

<p><b>Name of product :</b> Development of a business plan for small-scale farmers</p>
<p><b>Product description :</b> An approach to assist farmers associations (or synergies of associations) to build their business plan development capacities for a business (production or farming) which is deemed more productive. A market committee shall be former and shall use a brochure about ten-page long to conduct a market survey then identify the profitable business and submit to the general assembly. In the course of the preparatory training, the criteria developed beforehand shall be taught to the market committee members.</p>
<p><b>Essential components :</b></p> <ul style="list-style-type: none"> <li>Identity and coherence of the association;</li> <li>Commercialisation plan;</li> <li>Operations plan;</li> <li>Organisational plan;</li> <li>Finance plan;</li> <li>Training support and follow-up visits; with participative evaluations</li> </ul>
<p><b>Optional components :</b> Funding sources in the case of sought credits, refund procedures</p>
<p><b>Potential Modifications :</b> To be adapted to the requirements of backers and changes occurring in the business environment</p>
<p><b>Inputs/materials required :</b></p>
<p><b>Region where the product is applicable :</b> There has to be access to the market. The product is applicable across all regions with crop producers and traders.</p>
<p><b>Potential risks :</b></p> <ul style="list-style-type: none"> <li>The plan should be developed well before the start of the farming season. There may be delay in the plan development.</li> <li>There have to be a well coherent group and minimal organisation;</li> <li>Associations may need support in terms of inputs or investment credits to start the business;</li> </ul>

<ul style="list-style-type: none"> <li>• Unpredicted changes in the natural and business environment</li> </ul>
<b>Appropriate Mode(s) of dissemination :</b> <ul style="list-style-type: none"> <li>• Support in terms of training at the beginning of each season and initial supervision (preferably by a development organisation, NGO...);</li> <li>• Continuous monitoring and evaluation.</li> </ul>
<b>Other informations :</b> It is important to define a support strategy for associations. The latter spend entire days developing business plans in which expectations for support are voiced and to which it is necessary to respond.

## Product 15

<b>Name of product :</b> Strengthening of farmer association for collective marketing of agricultural products
<b>Product description:</b>
<b>Essential components:</b> <ul style="list-style-type: none"> <li>• Characterisation variables and associations tendency to accept to collect data using an evaluation sheet;</li> <li>• Illustrated sheets with technical prescription translated into local languages and support guide for associations follow-up</li> </ul>
<b>Optional components:</b> New date not planned in the evolution of associations
<b>Potential Modifications:</b> Develop and print the document so that even a new association will be able to follow the demarche.
<b>Inputs/materials required:</b> <ul style="list-style-type: none"> <li>• Summary document on associations data;</li> <li>• Supporting meetings for the outlining of the guide to associations and other partners</li> </ul>
<b>Region where the product is applicable:</b> South Kivu and North Kivu in DRC
<b>Potential risks:</b> The existence of a guide to support associations should not inhibit their innovating capacities. The guide is template on the situation in the course CIALCA's three years. It should be flexible and modifiable.
<b>Appropriate Mode(s) of dissemination:</b> Distribute it to associations and partners
<b>Other information :</b> The guide needs to be finalised to be given the form of a document.

## Product 16

<b>Product name:</b> Improving nutrition by promoting an improved and diversified food basket
<b>Description of product:</b> An approach for promotion of improved, diversified and nutritious foods based on training-of-trainers, promotion materials such as recipe books, brochures with key nutrition messages, a training manual, and demonstration gardens with crops important for nutrition (banana, orange-fleshed sweet potatoes, beans and amaranths). The crops are selected based on their importance to the community and need to supply a full food basket (carbohydrates, proteins, vitamins and minerals). High nutrient content can increase the nutritive value of diets. This approach facilitates adoption of new food products with high nutrient contents and so improves the nutritive value of household diets. All folders, guides and books are all translated into local languages.
<b>Essential components:</b> <ul style="list-style-type: none"> <li>• CIALCA Technical guide 02: A training manual that contains information on basic nutrition and hygiene required in the proper handling, preparation and storage of food components, and explains the importance of dietary diversification, processing, preparation and utilization of</li> </ul>

<p>bananas, beans, amaranths and sweet potato products. Selected recipes using locally available ingredients are included in the guide. The importance of demonstration gardens and diversification of home gardens is highlighted and practical guidelines for establishing demo gardens are elaborated in the guide.</p> <ul style="list-style-type: none"> <li>• Recipe books with detailed instructions for preparing new recipes based on banana, beans, amaranths and sweet potatoes (for trainers).</li> <li>• Handouts with new recipes (for trainees).</li> <li>• Demonstration gardens at local centres (preferably nutritional or health centres), managed by community resource persons who use the produce for nutrition education and demonstration at the centres, and distribution for establishment of additional gardens in other sites.</li> <li>• Trainers, who are representatives from nutritional or health centres, community and health workers, and farmer groups. These trainers train visitors, neighbours, colleagues,... Trainees then become trainers themselves to stimulate widespread knowledge on processing and preparation of nutritious foods.</li> </ul>
<p><b>Optional components:</b> This promotion package can be linked to the soybean promotion package. See also product 14.</p>
<p><b>Potential modifications:</b></p> <ul style="list-style-type: none"> <li>• Other vegetables and fruits can be introduced in the gardens and recipes are adapted based on local preferences. Feedback from trainers is used to adapt recipe leaflets.</li> <li>• Apart from community health workers, NGO partners can be involved for scaling-up.</li> </ul>
<p><b>Inputs required:</b></p> <ul style="list-style-type: none"> <li>• Good-quality seeds and planting materials of improved varieties to grow the different crops.</li> <li>• Other local ingredients listed in the recipes.</li> <li>• Cooking materials and other equipment for training purposes.</li> <li>• Manuals, leaflets and other promotional materials translated into local language.</li> </ul>
<p><b>Region where will the product is applicable:</b> The approach is adapted to all areas with presence of potential health partners.</p>
<p><b>Potential risks:</b></p> <ul style="list-style-type: none"> <li>• Trainees may not engage in training themselves without motivation. A local compensation system is required for durability.</li> </ul>
<p><b>Appropriate mode(s) of dissemination:</b> Integrated approach involving key health partners for training-of-trainers, locally managed demonstration gardens and dissemination of promotion materials (manuals, leaflets).</p>

## Annex 5 - Dissemination strategies.

PRODUCTS	WHAT PRIORITY ACTIVITIES FOR CIALCA II	POSSIBLE STRATEGIES
LEGUMINOUS	<ol style="list-style-type: none"> <li>1. Dissemination of performing technologies</li> <li>2. Training of trainers to facilitate dissemination</li> </ol>	<ul style="list-style-type: none"> <li>- Organised sale of seeds by associations</li> <li>- Liaison with development institutions and micro-finance, technical schools</li> <li>- Production of information and dissemination materials</li> <li>-Development of monitoring and evaluation sheets</li> <li>- Generalisation of small seed packages</li> <li>- Develop shared training schools</li> <li>- Find other partners for dissemination (NGOs...)</li> <li>- Involve state stakeholders where possible or link activities with existing public projects.</li> </ul>
BANANA	<ol style="list-style-type: none"> <li>1. Training of trainers in germplasm management</li> <li>2. Setting up of more propagators in action sites</li> </ol>	<ul style="list-style-type: none"> <li>-Farms day ;</li> <li>-School farms;</li> <li>-Development of information and sensitisation tools on diseases</li> <li>-Cleaning and indexing of plants</li> <li>-Development of monitoring and evaluation sheets</li> <li>-Creation of multipliers networks</li> </ul>
NUTRITION, MARKET,	<ol style="list-style-type: none"> <li>1. Promotion of already developed recipes</li> <li>2. Linking farmers to better markets</li> <li>3. Reinforcing producers organisations/associations</li> </ol>	<ul style="list-style-type: none"> <li>-Develop guidelines, brochures, leaflets.... on promoted products</li> <li>--Use of media (radio, TV) to disseminate information on nutrition;</li> <li>-Demonstration farms;</li> <li>-Support associations with their business plan to enable them to generate income;</li> <li>-Support quality control;</li> <li>-Facilitate links with sellers of inputs and materials;</li> <li>-Support structuring; and</li> <li>-Facilitate the collective sale of products.</li> </ul>

## Annex 6 - What would be needed in terms of research in CIALCA-II?

Research topic/ products (Banana)	Major research questions	Rating for research investments (1 very poor – 10 very good)					Does it stimulate linkages within CIALCA?
		Does it address CIALCA priorities?	Envi-saged benefit?	Chances for adoption?	Does CIALCA have the resources?	External support required?	
Environment/ germplasm interactions	(1) Varietal adaptation (2) Quality of fruits/high nutrition value varieties (3) New IMTP varieties	10	6	8	10	8	Yes
Macropropa- gation	(1) adaptability (2) phytosanitary linked risks evaluation (3) risk of activating BSV integrated integrated sequences through macropropagation (4) varietal behaviour/economic analysis, (5) macropropagation technology.	10	8	8	9	9	Yes
Collection and characterisa- tion of new varieties		10	5	5	9	5	Yes
Soil fertility management	(1) soil fertility and deficiency mapping, (2) fertilisers compounds (chemical, organic)	10	9	7	9	8	Yes
Banan/legume associations	(1) varieties, (2) canopee management, (3) density management	10	8	10	9	9	Yes
Banana/coffee associations	(1) varieties, (2) canopee management, (3) density management (4) coffee quality, (5) economic profitability, (6) coffee health status	8	9	7	9	9	Yes
Endophytes	(1) on nematodes, (2) on the BBTv and other viruses, (3) weevil	10	7	5	8	8	Yes

Mycorrhiza	(1) effects on growth and resistance in the farms of farmers	8	4	2	9	7	Yes
BBTV	(1) elimination of the vector during sanitation / BBTV eradication (2) BBTV ring test, (3) reinfection rate/pace	10	8	8	9	6	Yes
Fusariosis	(1) collection/ identification of races, (2) varietal resistance	8	6	8	6	8	Yes
Research topic/ products (legume crops)	Major research questions	Rating for research investments (1 very poor – 10 very good)					Does it stimulate linkages within CIALCA?
		Does it address CIALCA priorities?	Envisaged benefit?	Chances for adoption?	Does CIALCA have the capacity?	External support required?	
Cowbean, groundnut, pigeon pea	- Potential of being accepted (sociological/economic studies) for pigeon pea? - Issue of disease and pests for cowbean, ground pea and cajan beans?	10	NI : 3 AR : 6 PC : 2	NI : 5 AR : 8 PC : 2	NI : 8 AR : 7 PC : 8	no	No,except if there is a possibility of integrating in banana or in market/ nutrition aspects
Maize-legume associations	- Contribution of the leguminous in the association system? - Economic study (cost/benefits)? - Other spacings depending on the preferences of farmers? - Effect of altitude/rainfall and climate variability on the production in association?	10	6	6	8	No	Very limited
Erosion control systems	- Efficiency of hedges and anti-erosion species, costs/benefits - Evaluations of socio-economic constraints (vulgarisation – transfer to the farming environment) - Evaluate other regions/ countries	8	8	2-7 (varies depending on areas)	8	ICR AF	Moderate (erosion control in banana systems, mulch source, supervisors e.g. penisetum)

Use of fertilisers	<ul style="list-style-type: none"> <li>- Determine the appropriate doses, types and management depending on the soil conditions, taking into account policies;</li> <li>- <i>Ex ante</i> feasibility/productivity study;</li> <li>- Trade-off/use of fertilisers at the level of the farms</li> </ul>	10	9	7	10	Link with other initiatives	Very high
Techniques for rain water collection	<ul style="list-style-type: none"> <li>- Cost/benefits analysis</li> <li>- Risks analysis (on-station at Bugesera), evaluation during B season in Bas-Congo, and climate studies (</li> </ul>	5	5	3	8	no	Very limited
Use of Rhizobium	<ul style="list-style-type: none"> <li>- Identification and isolation of effective tissue</li> <li>- Efficiency and productivity of the use of rhizobium inoculant</li> </ul>	8	7	6	10	Link with other	Very limited
Integrated seed systems	<ul style="list-style-type: none"> <li>- Constraints, methods and stakeholders to achieve a wide dissemination?</li> <li>- Post-harvest and conservation/seed quality</li> <li>- Conservation of germplasm</li> </ul>	8	10	8	10	PABRA, state services	Link with macro-propagation initiatives
Banana-grain legume associations	<ul style="list-style-type: none"> <li>- Spacings/light/competition (nutrients and water flows)</li> <li>- Tillage or not?</li> <li>- Physiological studies</li> <li>- Economic study</li> <li>- Pathosystems aspects</li> </ul>	10	8	8	10	no	Very high
Cassava-grain legume associations	<ul style="list-style-type: none"> <li>- Continue with cost/benefit</li> <li>- Understanding nutrient cycles</li> <li>- Seasonal effects (A vs B)</li> <li>- Adaptation to other regions</li> </ul>	10	8	8	10	no	Limited
Adapted and preferred soybean and bean varieties	<ul style="list-style-type: none"> <li>- Post-harvest and conservation</li> <li>- Rhizobium tissue</li> <li>- Evaluation of soybean and beans varieties in Burundi</li> </ul>						

Research topic/ products (Markets and Nutrition)	Major research questions	Rating for research investments (1 very poor – 10 very good)					Does it stimulate linkages within CIALCA?
		Does it address CIALCA priorities?	Envisaged benefit?	Chances for adoption?	Does CIALCA have the resources?	External support required?	
1. Impact of market access on integrated soil management	To what extent does market access impact on profitability? Do farmers who make profits from their farm enterprises reinvest in natural resource improvement?	10	Sustainable resource management	High chance	Yes	Yes	Yes
2. Impact of past harvest products on food security status of households	What is the nutrient composition of the post harvest products? What is the contribution and acceptability of post harvest products to the dietary intake of households? What is the nutrition status of the households?	10	Improved health and nutrition status	High chance	yes	Health partners, Government	Yes
3. Determinants of adoption and dissemination of improved technology and economic livelihoods	What are the adoption rates of improved technologies? What are the determinants of technology adoption Are there linkages between adoption of improved technology and improvement in livelihoods? What forms of collective action are found among the farm households? How does collective action contribute to adoption of technology How does collective action contribute to the economic livelihoods? What are the information types, users, channels and strategies that impact on adoption?	10	Technology uptake Improved incomes	High chance	yes	Yes	Yes
4. Evaluation	What are the key technology	10	high	yes	Yes	yes	yes

of user preferences for technology traits	traits that are preferred by users? How do preferred user traits compare with the developed product traits?						
5. Application of HACCP technique to assess potential hazards and health risks along the supply and marketing chain of post harvest products	What are the possible hazards that could be a threat to human health along the production and marketing stages of post harvest products? What are critical control points of the identified hazards? (evaluate the technologies for processing banana products; Evaluate the efficiency of processing (and processes) and packaging wine from bananas	10	high	yes	Yes/ no	yes	yes
6. Market structure, conduct and performance and dynamics in the banana subsector	Who are the market participants? What are the institutions and coordination mechanisms? What are the efficiency levels of the markets? What are the main dynamics in the banana subsector?	10	High	Yes	Yes	yes	Yes
7. Is there a trade-off between market participation and food security	What is the level of market participation among the farm households? What determines the level of market participation? What are the farmer perceptions/expectations or motives of decision to participate in the market? What is the food security status of the market participating households vis a vis non market participating households? What is the nutrition status of market participating households vis a vis non-participating households?	10	high	Yes	Yes?	yes	yes

## Annex 7 - Feedback from the participants on fostering stronger integration in CIALCA-II

<b>1. Integration in CIALCA I</b>	
	Common activities: baseline characterization studies
	Integration through meetings and partnerships
	CCC meetings
	A joint office per country
	Joint planning meetings + joint sites and partners offices (Baseline + PRA) + same trials + CCC
	Common planning
	Working in synergy Research / organizations / Banana NGOs
	Evaluation of projects by Jos Kalders "All projects are presented as one"
	Burundi: assembly and targeting of local partners - research topics which reflects the member countries' sites
	Collaborating with same NARS
	Joint office, integration of local NGOs
	No much integration other than sharing office space, vehicles and some staff
	Production systems, markets, nutrition only for one purpose: to improve the livelihoods of rural populations
	Activities / studies: PRA, Baseline
	Baseline survey, offices
	Baseline and PRA
	Technology transfer activities
	Improvement of banana-bean systems in the District Lake by minimum labour under mulching and seeding in a regional frame
	Association bananas leguminous
	A common tool : the web site
	Characterization activities were planned, implemented and analysed as CIALCA
	The CIALCA is a very promising regional cooperation between Rwanda, Burundi and the DRC with Belgium as the donor. The CIALCA should be a starting point for a new cooperation with the support of Belgium. The results of CIALCA can be used to sensitize decision-makers of our 3 countries of the need to resume cooperation. In this approach, Belgium can be very beneficial.
<b>2. Better integration</b>	
	Partnership + uniform characterization
	Common approach to disseminate CIALCA products as CIALCA
	Giving priority to technology transfer to farmers
	Communications, KRC
	Bananas and beans integration: tests for the 3 projects
	Planning by themes for CIALCA II. e.g. during this meeting in work groups
	Interdisciplinary research (germplasm, IPM, fertilization, post harvest, markets, extension, etc..) For all CIALCA crops
	Integration on seed system/ dissemination of germplasm for all the crops
	Integration of all potential stakeholders with consideration of beneficiaries in the planning
	Working at the household level rather than plot
	Also depart from the perspective of end consumers and / or orientate research on the important link of the chain values

Training : capacity building ; dissemination : by extension
Joint capacity building and training / Joint country planning meetings / Joint multidisciplinary research teams-themes / Joint monitoring and evaluation
Research - capacity building -technology transfer - dissemination at users level
Design the agriculture we are supporting as a whole and not bananas then leguminous, then cassava. It is a whole package. It should come as a team and not individual projects. Harmonize activities calendar.
Involve the interests of farmers
Similar work done in different sites and information exchange
Establish a database on available technologies
Put all countries on the same page in terms of acquisition of existing technology package or is available within the countries covered by CIALCA
Make our work plans as a group especially monitoring of activities to minimize on resources and enhance integration.
Multidisciplinary research on the same site (eg fertilization of an association banana / leguminous) / track approach that integrates the production and market on the same product.
Facilitate exchanges between producers in different CIALCA sites
Organization of similar activities in different CIALCA countries to reach more regional conclusions
Organize regular dialogues between the actors working on same themes
Identify all the different partners for technologies dissemination
More interaction in the choice of research topics
Co-supervision of students by 3 institutes on cross-cutting research subjects
<b>3. Banana / beans</b>
Organic material, food security, soil conservation, communication
Demonstrate to farmers that the system produces a lot more with demos / activities in fields
Banana Bean Integration
Develop research themes of association for a better flow of nutrients in both cultures
Study nutritional value / develop recipes combining banana- beans, soybeans – groundnuts, cowpeas.
Identification of constraints and choice of options
The joint activities are carried out jointly
Involve specialists in each culture to work together
Factsheet on nutrition integrating bananas and legumes , recipes
Germplasm - fertility - density - nutrition - market - extension
Develop recipes that incorporate both bananas and leguminous / collective development of technical guides on bananas and legumes
Integrating by training farmers in using a mixed fertilizer to reach high yields of good seeds to be disseminated though the region under the CIALCA
Common MSc/PhD
Indigenous knowledge and views of integration beans-bananas
In the banana-leguminous associations, using a single worker paid by the projects concerned
Research on banana vegetable association fertilization
Enhance team work
Charts/flyers about varieties and production methods
Students learn on specific ways to improve productivity in banana in association

	Field work, training and booklets
	Use vegetables in banana fields fertilization coverage
	Carry out experiment together / seed system/macro propagation with some farms
<b>4. Farm level integration</b>	
	Common PhD on trade off analysis; Involvement of NUANCES
	Integrating agriculture, forestry and animal husbandry through soil conservation, diversification of germplasm, the use of manure and seed technology (use of the varieties tested and adapted to achieve food security and surplus for market)
	Farmers Training in the model schools fields, teach to farmers how to calculate the costs and benefits of operating so that they could select the technology the most profitable.
	Joint research through MSc, PhD (where to put fertilizer in the farming systems ; joint field demonstration
	Farm integration of technology : growing Bananas and legumes in association and evaluate impact on food security, resources allocation end income ; enterprise combination and relative impacts
	Farm integration of technologies to achieve food security, resources conservation and income; cropping system: banana + climbing beans
	Search germplasm adapted to the association banana vegetables by integrating soil improvement and technologies for the conservation and improvement of soil to improve nutrition and providing higher incomes in an integrated system for farmers
	Integration of agro-forestry and livestock for each farm
	Training of farmers ; exchange visits, involve local agronomists
	All activities on the banana and beans from the plantation to the market
	Trade off analysis
	Researcher who will study the relationship between income and reinvestment must examine the effects of various crops (bananas, legumes and other)
	Develop soil conservation methods in bananas vegetables systems, and methods of harvest.
	Demonstrating the benefits of technology to the farmer to allow him to take advantage of this innovations
	Participatory trials, training
	Team of 3 students (agronomist, economist and modeller) to investigate most profitable use of inputs (with special emphasis on fertilizers) at farm level (different crops/field)
	Working with test group of vulnerable people by integrating best practices, good seeds, agro forestry
	Target the farmers/end users that are in the same organization/domain of recommendation
<b>5. Markets</b>	
	Test and adapt a variety which can get a good return as end product (participatory variety selection). Multiply and disseminate through the region by using a participatory approach; select the best and appropriate technology to be used in the post-harvest process (conditioning, bagging and marketing.
	Market studies, information on markets
	Survey in consumption centers on consumer preferences for bananas and leguminous, integrate the results in germplasm, processing, macro propagation
	Common planning between people leading market activities
	May promote the gain and minimize food. There is a lack of storage and media methods for not selling its product
	Not to establish differences between groups or cooperatives depending on the product. A group can sell several products. Training in capacity building of producers is the same;

Same market committee for different products
Input market: joint studies to access the fertilizer ; 'point' research on how farmers can best organized themselves to go to the market
Market intelligency, explore both national, regional and niche markets
Development of producers' cooperatives to sell better
Analysis of the potential demand for the several products of banana and leguminous
Link farmers to markets ; Meet traders and consumers needs
Research on the banana sector oriented, low-cost production (value / cost)
Expand the network of farmers organizations for a market-oriented production (national and international)
Common strategy integrating development of business plan + training of NGO partners + strengthening of farmer groups
Products identification requested by the market, training, integration of private sector
Use of selected and tested varieties of legumes
Carry out a complete value chain analysis and market opportunity identification (PMR) to link production to profitable markets for bananas and legumes ; evaluate profitability of enterprise combinations
Identification of consumer requirements
Considering technologies that go in line with consumers
Synergies to increase production, market research and make the production sustainable (sustainability)
Production-market chain continuum ; study market chain in the satellite sites
<b>6. Models for scaling out</b>
Involve extension agents at local level in all activities. In this way, promising technologies will be disseminated as widely understood even at the local level (bottom)
Integrate learning from everyone (involved) in the CIALCA SMEs
Development of stakeholders' networks by site as platforms
Lobby and influence policy makers
A joint specialist at KRC ; make NGOs responsible for coordinating dissemination efforts per region/country
Common technology-training-information-receiving / common extension workers
ToT workshops; production of community friendly IEC material; facilitation of trainees to reach community members
Doing farmers field schools, producers training around these fields installed in producers' farms
Field schools, media, farmers associations
Develop a good partnership with active actors ; avail the new technology; awareness: TV, radio, publications, field days
Critically evaluate the role and performances of partners (NARS, NGOs) to focus the impact of the technologies ; evaluate capacity requirement of partners ; evaluate the producer organizations (training needs, capacities strengthening, ) ; identify farmers that can be used as role/opinion players and integrate them in the capacity building activities (within the farmers organizations)
Organize farm-extension – researchers networks
Study if the seed dissemination chain and all players
Common NGO partners ; centralized production of dissemination materials; promote CIALCA I products as one basket
Strengthening integration among research, extension, local governments and farmers networks

	Training of para-agronomists in the satellite sites sorted among the farmers leaders
	FFS; involve extension services
	Use of media and integration of private sector
	Same tools for extension; go through the same partner sites for all products and not increase the partners based on products
	Engage some partners; integrate seed system/macro-propagation; Joint planning
	Common integration with partners across all projects (satellite partners)
	Set extra expatriate or responsible...????
	<b>7. Knowledge resource centre</b>
	Organizing and strengthening a regional documentation centre and regional information which centralizes the information in the three countries
	Active collaboration with IRAZ
	Bioversity+CIAT+IITA in a joined KRC
	Different packaging of knowledge, targeting different stakeholders (e.g. policy makers, researchers, farmers, NGOs and extensionists...)
	Collection of agricultural information and technologies + data processing + make them accessible in terms of beneficiaries. Universities - NGOs - Farmers
	Gather all the products, resources, manuals and post them on the same web site
	Production of IEC materials that are community friendly ; Harmonizing all the material produced so that they pass on the same message
	Organize regional meetings ; facilitate exchange and communication ; website ; Monitoring and evaluation ; regular evaluation of milestones ; conference at the end of CIALCA II
	Make available all the tools at the farmers level
	Make available the results already obtained on the site, a database of raw data for subsequent use, train people on the use of this Knowledge Resource Centre
	Avail data base ; involve policy makers (adverts of CIALCA activities on TV, radio, etc.) ; link CIALCA with other scientific organizations
	A database on the various information to enable publications and tools for information dissemination, a regional organisation is required
	Collaborations with media centres and other publishing information centres; with NARS
	Strengthen the exchange of experiences between research institutes and universities of these three countries
	Promoting research result mechanisms in the region (regional newspaper). Indeed, it is not clear which technologies are available in Burundi, DRC and Rwanda.
	Creation of a CIALCA newspaper
	Common database, copies of the articles are on line on the same web site, same channels of distribution for all projects
	Site specific information centers linked to farmer local organizations, NGOs, local governments; Integrating site specific information centres to create regional, national linked information centres ; evaluate best strategies for collection and dissemination of the information
	Advertise now! Tasks on M & E and communication
	KRC as proposed in proposal with tasks on communication + M & E +s dissemination pathways
	<b>8. Monitoring, evaluation and impact assessment</b>
	Integration and collaboration with stakeholders
	Monitoring sheets designed together, all project meetings are the same, reports are available for everyone, a monitoring and evaluation personne paid for all projects
	Joint planning review of both banana and beans ; share planning documents

	Common annual evaluation including all the partners site (including farmers' organizations)
	Planning meetings at regional level ; reporting ; develop comprehensive tools od M&E and impact
	An adequate control system to be implemented. Refine the assessment tools, monitoring tools, organize meetings to determine what went wrong for improvement.
	Under IRAZ's responsibilities
	Common indicator sheets for CIALCA; field visit by a joint team (CIALCA) for evaluation, impact assessment: production increase, reduction of disease due to malnutrition, farmer's income increase
	Organize field visit and get feedback from beneficiaries
	Develop a common tools for all regions
	Participatory M&E; create factual site as a basis for evaluation
	Develop an evaluation sheet that can be used by each CIALCA researcher (common form); streamline assessment
	Standardize sheets for collecting data according to the necessary different kind of data.
	To have an effective evaluation system involving beneficiaries and implementers for the project planned activities
	Get expertise through KRC ; get factual M&E system that is not resulting in too many extra meetings
	KRC to led M & E ; Impact assessment organize as common activity like baseline
	Developing a common evaluation tool that can be used within CIALCA; collective monitoring to avoid waste of resources i.e. time + money
	Organize restitution meetings in the sites with farmers
	Joint identification of milestones, outputs, outcomes, that should be monitored (Benchmark) : classify the outcomes as immediate (monitor regularly), intermediate (assess impact) ultimate (assess impact); compare actual performances to Benchmark

**All below reports are available in PDF format from the CIALCA website [www.cialca.org](http://www.cialca.org):**

### **Progress Reports**

**Progress Report 1:** CIALCA (2006) Technical Progress Report September 2005 – October 2006.

**Progress Report 2:** CIALCA (2007) Summary Progress Report September 2005 – April 2007.

**Progress Report 3:** CIALCA (2007) Technical Progress Report November 2006 – December 2007.

### **Technical Reports**

**Technical Report 1:** Farrow et al (2006). Characterization of Mandate Areas for the Consortium for Improved Agricultural Livelihoods in Central Africa (CIALCA).

**Technical Report 2:** Musa sector strategic plan for Burundi

**Technical Report 3:** Musa sector strategic plan for DR Congo

**Technical Report 4:** Musa sector strategic plan for Rwanda

**Technical Report 5:** Musa sector strategic plan for Central Africa

**Technical Report 6:** Rishirumuhirwa (2006), The role and management of bananas in Burundian farming systems

**Technical Report 7:** Sanginga et al (2007). Participatory Rural Appraisals of the livelihood status of farmers in the CIALCA mandate zones of DR Congo, Rwanda, and Burundi.

**Technical Report 8:** Pypers et al (2007). Participatory evaluation and characterization of improved legume germplasm at the CIALCA action sites in DR Congo and Rwanda.

**Technical Report 9:** Jagwe et al (2008). Banana Marketing in Rwanda, Burundi and South Kivu

### **Thesis Reports**

**Thesis Report 1:** Geoffrey Germeau (2006). Identification des contraintes en culture bananière traditionnelle dans trois régions du Rwanda par enquête diagnostique. Université Catholique de Louvain (UCL)

**Thesis Report 2:** Anaclet Nibasumba (2007). Garniture cationique des sols et des racines dans des systèmes de culture bananière du Burundi et du Rwanda

**Thesis Report 3:** Paul Cox (2008). The land as casualty, soil, cattle, and the future in South Kivu, RDC. University College London – Department of Anthropology.

**Thesis Report 4:** Julie Van Damme (2008). Analyse systémique des contraintes en culture bananière au Rwanda. Université Catholique de Louvain (UCL).

**Thesis Report 5:** Ellen Vandamme (2008). Nutrient deficiencies in soils of Walungu, South-Kivu, Democratic Republic of Congo (K U Leuven).



**International Institute of Tropical Agriculture (IITA), Uganda**



**Bioversity International, Uganda**



**Tropical Soil Biology and Fertility Institute of the International Centre for Tropical Agriculture (TSBF-CIAT), Kenya**



**Institut de Recherche Agronomique et Zootechnique (IRAZ), Burundi**



**Institut des Sciences Agronomiques du Burundi (ISABU), Burundi**



**Institut des Sciences Agronomiques du Rwanda (ISAR), Rwanda**



**Institut National des Etudes et de la Recherche Agricole (INERA), DR-Congo**



**Université National de Rwanda (NUR), Rwanda**



**Université du Burundi (UNB), Burundi**



**Université de Kinshasa (UNIKIN), DR Congo**



**Université Catholique de Bukavu (UCB), DR Congo**



**Université Catholique du Graben (UCG), DR Congo**



**Katholieke Universiteit Leuven (K U Leuven),  
Université Catholique de Louvain-la-Neuve (UCL), Belgium**



**Faculté Universitaire des Sciences Agronomiques de Gembloux, Belgium**



**Rwanda Agricultural Development Authority (RADA), Rwanda**



**Plateforme DIOBASS, DR-Congo**



**VECO Congo, DR Congo**



**Service d'Accompagnement et de Renforcement des Capacités  
d'Auto promotion de la Femme (SARCAF), DR Congo**



**Programme d'Appui au Développement Durable (PAD), DR Congo**



**Bureau Diocesane de Developpement, DR Congo**



**Association pour la Promotion du Développement Endogène des Communauté  
de base (APRODEC), DR Congo**



**Rwanda Rural Rehabilitation Initiative (RWARRI), Rwanda**



**Rwandese Health Environment Project Initiative INITIATIVE (RHEPI), Rwanda**



**Rwanda Development Organisation (RDO), Rwanda**



**Catholic Relief Services, Burundi**



**WorldVision, Rwanda**

N.B. CIALCA partnerships permanently expand, so the list above is not exhaustive. It only reflects partners who have a direct agreement with CIALCA-CGIAR institutes at the time of release of this report.