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## Co-creation of Agroecological Practices Combinations in Agroecology Living Labs

Diego Cerrudo<sup>a,1</sup>, Mehreteab Tesfai<sup>b</sup>, Hycenth Tim Ndah<sup>c</sup>, Ruphine Batumike<sup>d</sup>, Precillia Ijang  
Tata Ngome<sup>e</sup>, Jules Ntamwira<sup>f</sup>, Vicky Ruganzu<sup>g</sup>, Innocent Kirayi Nsengimana<sup>h</sup>, Marie-Chantal  
Niyuhire<sup>i</sup>, Isaac Balume<sup>j</sup>, Wivine Munyahali<sup>k</sup>

<sup>a</sup> CIRAD, UPR-AIDA, France

<sup>b</sup> Norwegian Institute of Bioeconomy Research, Division of Environment and Natural Resources, Dept. of Soil and  
Land use, Norway

<sup>c</sup> University of Hohenheim, Dept. of Communication and Advisory Services in Rural Areas, Germany

<sup>d</sup> IITA, Research and Adaptation Team, DR Congo

<sup>e</sup> National Institute of Agricultural Research Development (IRAD), Cameroon

<sup>f</sup> INERA, Banana Research Program, DR Congo

<sup>g</sup> Rwanda Agriculture and Animal Resources Development Board (RAB), Rwanda

<sup>h</sup> APDIK, DR Congo

<sup>i</sup> ISABU, Land Management and Agroecology, Burundi

<sup>j</sup> ETH Zurich, Sustainable Agroecosystems, Switzerland

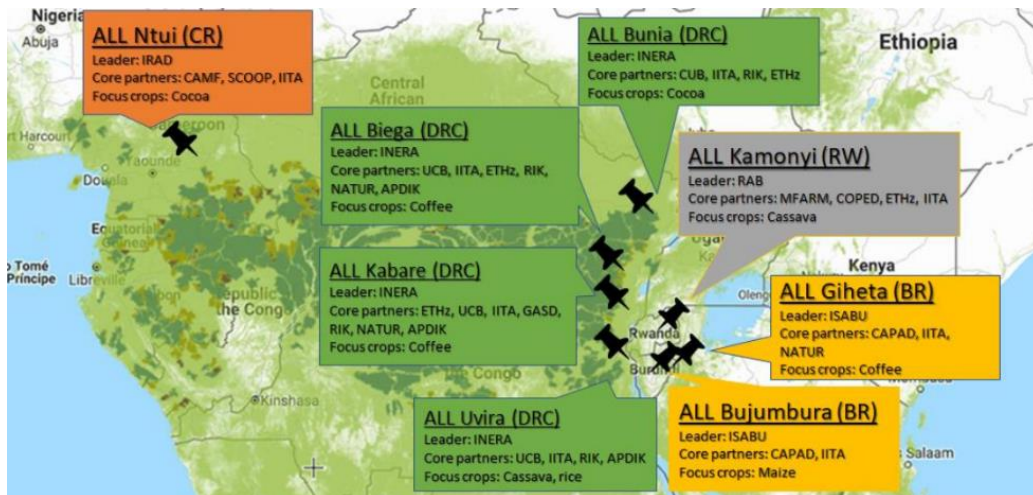
<sup>k</sup> Catholic University of Bukavu, Fac. of Agronomy, DR Congo

## Introduction

African agriculture and food systems have great potential for enhancing food and nutritional security in and beyond Africa while driving inclusive and sustainable rural development. However, to tap this potential, we must address some of the major environmental and socio-economic challenges faced by smallholder farmers and other stakeholders. One alternative solution is agroecology, which offers an answer to this call (Titonnel et al, 2022). Evidence in Africa shows that agroecology can increase productivity and build resilience to economic, socio-ecological, and climate shocks (AFSA, 2016). However, an incremental and transformational agroecological transition involves simultaneous technological and institutional changes, accompanied by an increased capacity for problem-solving from farmers to adapt the combination of practices to the local context (De Tourdonnet 2018). Such a challenge calls for an innovation strategy that includes farmers and other actors in the agri-food system, improving relevance and legitimacy while maintaining the credibility of science (Lacombe et al., 2018). It is becoming widely accepted that agricultural innovations respond better to local challenges of farming systems using participatory approaches. In response to this, the project CANALLS is set to drive agroecological transitions in the humid tropics of Central and Eastern Africa (CEA) via multi-actor transdisciplinary Agroecology Living Labs (ALLs). Central to agroecology and to the ALLs is co-creation, through active engagement of diverse stakeholders. In this paper, we 1) describe the co-creation framework developed and implemented within the CANALLS project, 2) outline the methodology employed, and 3) present initial results from the application of the co-creation process in one of the four ALLs within the Central and Eastern African region (Figure 1).

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<sup>1</sup> Corresponding author Email: [diego.cerrudo@cirad.fr](mailto:diego.cerrudo@cirad.fr)



**Figure 1:** CANALLS's agroecology living labs

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## Methodology

In CANALLS, co-creation focuses on co-designing combinations of agroecological practices (AEPs) to address the key challenges encountered by farmers and other stakeholders in the value chain. The framework of co-creation was designed based on a literature review and lessons learned from previous projects using Living Labs or similar platforms for agricultural development (e.g., Reboot in East Africa and AgriLink Living Labs in Europe). Key considerations of our design include:

- The co-creation process requires mid- to long-term efforts from different stakeholders in different forms and levels. It is important that the energy and commitment of the stakeholders are proportionally matched with the benefits they get, and that their expectations for results match the reality (Pound and Posthumus, 2016).
- The capacity of the facilitator and the support he or she receives are key factors for determining the results of the co-creation process (Bellec et al., 2012).
- Failing to create a process that can be maintained once CANALLS ends would limit the realization of the scaling-up potential of AEPs (Lacombe et al., 2018)
- The initial co-creation design must be flexible enough to be improved over time and respond to changes in the experimentation objectives.

The co-creation process was designed in a participatory way with CANALLS partners and follows a structured 4-step cycle: 1) identification and comprehension of challenges; 2) mapping, prototyping, and prioritizing AEPs; 3) evaluation of AEP combinations in real-life settings; and 4) assessment of outcomes and formulation of scaling strategies and/or plans for subsequent co-creation (Figure 2).

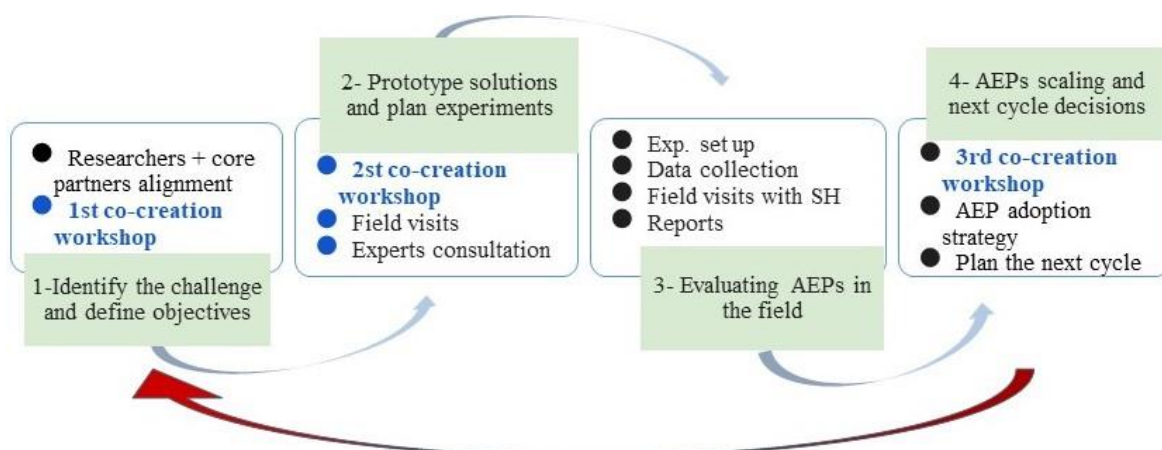


Figure 2: CANALLS AEP Co-creation Conceptual Framework.

### Preliminary Results

Co-creation activities were implemented in three months by organizing two workshops per ALL across 4 case study countries (i.e., Ntui in Cameroon, Kamonyi in Rwanda, Bujumbura in Burundi, and Uvira, Biega, and Kabare in Democratic Republic of Congo). A wide range of stakeholder groups and other invited stakeholders participated actively in the workshops that included members in each ALL (Figure 3). Co-creation workshops resulted in the identification of key challenges (Step 1) and the prototyping and prioritization of AEPs to overcome those challenges (Step 2). The selected AEPs included the use of biopesticides to control insects and diseases, the use of alternative nutrient sources to improve soil fertility, erosion control techniques, and the improvement of shade management in agroforestry systems. Once the AEPs were mapped, project partners together with ALLs’ stakeholders conducted field visits and meetings to co-design farmer-led experiments (Table 1). The design of field experiments was defined for the six ALLs and are now at different stages of implementation (Step 3).

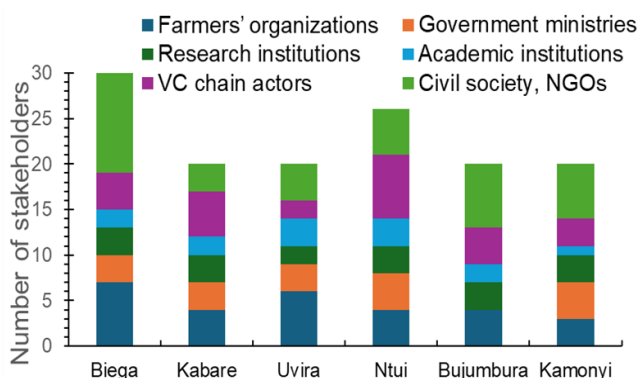


Figure 3: Stakeholder groups represented in each ALL of CANALLS project.

ALL	Focus Crop	Main Challenges	Combinations of AEP to evaluate
Ntui	Cocoa	Pests Low soil fertility Shade management	Biopesticides Foliar fert. Improved shade management
Kamonyi	Cassava	Soil erosion Low soil fertility	Anti-erosion practices Combination of org. and inorg. fert. Intercrops
Bujumbura	Maize-bean intercrop	Pests Low soil fertility	Biopesticides Combination of org. fert.

<b>Biega</b>	Coffee	Low soil fertility Old variety Pests	Biopesticides Anti-erosion practices Organic fertilizers Cover crops
<b>Kabare</b>	Coffee	Pests Poor crop management Aging of coffee trees	
<b>Uvira</b>	Rice and cassava	Pests Low soil fertility Drought	Biopesticides Combination of org. and inorg fert.

**Table 1:** Description of challenges and AEPs to be evaluated in each ALL.

## Conclusions and Outlook

After ALLs inception, we only transited the 2 initial steps of the first cycle of co-creation. From these initial steps, we learned that in general, stakeholders showed high interest in agroecology, demonstrated by high and diverse attendance to the workshops and active participation in the activities. Moreover, trials are being implemented in 6 ALLs. In general, the bottom-up approach of the ALLs led to the discussion and prototyping of new, relevant ideas and concepts to evaluate in the field which are expected to bring useful information to farmers and other stakeholders. Although we describe a general co-creation framework, each ALL is unique and therefore the co-creation process and the design, implementation, and evaluation of AEPs must be adapted accordingly. In general, the challenges identified will require several cycles of co-creation to reach scalable results making it evident that the ALLs need to be sustained beyond CANALLs duration to reach meaningful impact. In addition, the co-creation process is resource-demanding and should fit specific conditions; e.g., strong commitment from key partners and stakeholders. Results from a full cycle of co-creation (or two cycles by the end of the project) will allow us to assess the functionality of ALLs as a methodology for the co-creation of AEPs, and to identify contextual indicators and key aspects that could be used in the design of ALLs in the CEA region.

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