RESEARCH SUMMARY

Impact assessment of agricultural extension and input subsidies – baseline data for Eastern DRC

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Promoting legume crops for African smallholders

Promoting sustainable agriculture in Sub-Sahara Africa is an important objective for many governments, donors and (inter)national organisations. Agricultural extension services have recently regained popularity to facilitate learning and experience with (new) agricultural practises that aim to increase yields and ultimately raise farmers' income. Yet evidence on the effectiveness of extension services is scarce, with mixed results. Success seems to depend on the area and crops under study. In addition, cultural practises, social norms and the presence of formal markets are likely to play a role in take-up. Specifically, limited or no access to credit is believed to be a major barrier for smallholder farmers to experiment and take-up new practises or buy improved inputs. Researchers from the Netherlands and DR Congo have partnered with local non-governmental organisations to implement and evaluate a set of interventions that aim to increase farmer take-up of legume crops in Eastern DR Congo. The interventions are undertaken as part of the multi-country N2Africa programme (www.n2africa.org).

Partners

This project brings together:

- Research partners: International Institute for Tropical Agriculture (IITA), International Center for Tropical Agriculture (CIAT), Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA), Catholic University of Bukavu, Wageningen University and UNU-MERIT
- Implementing organisations: PAD, DIOBASS, WOMEN for WOMEN, SARCAF, IPLCI & CDC/Kiringye

Extension services and subsidized inputs for legume crops in DRC

Grain legumes (e.g. common bean, soybean, groundnut) are important staple crops for the majority of poor households (HH) in Eastern DRC, providing the (often) main source of protein, in the absence of affordable dairy, fish or meat products. Yet current yields comprise only a fraction of their potential due to poor soil fertility management and other stressors; including insufficient knowledge and limited access to new inputs and crop growing techniques.

Research objectives

1. Assessment of HH needs for improving agricultural yields in Eastern DRC
2. Impact evaluation of agricultural extension services on knowledge, attitudes and adoption of new inputs for grain legumes
3. Assess the impact of subsidized inputs on knowledge, attitudes and adoption of these inputs relative to receiving extension services only

Baseline data collection

We worked with 905 households in 93 villages located along one of three 'axes' (northern, western and southern) in the province of North Kivu, Eastern DRC. The sample of 93 villages was drawn from a sampling frame (list) comprising of villages that are located along the northern, western and southern axes and satisfied the following criteria: (i) located in area where at least one of the partners had contacts; (ii) accessible by motorized vehicles and (iii) had not been part of any prior N2 Africa intervention.

We hired 37 local enumerators from Bukavu to conduct the surveys. Recruitment of local enumerators was done in close consultation with the Catholic University of Bukavu (UCB). Staff from the six partner NGOs accompanied enumerators in the field to obtain permission for conducting research and to explain the purpose of the research to the village authorities. We collected relevant household and community level baseline data through surveys, community meetings and economic experiments between March and June 2013.

Promoting legume crops for African smallholders

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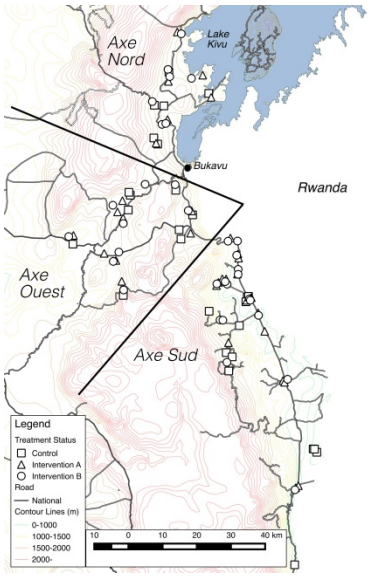

Figure 1: research locations

Socio-economic characteristics

***Table 1* HHs & villages in baseline survey by axe**

Axe	Villages	HH
North	20	153
West	26	227
South	53	525

The number of villages (HH) in the South was about twice the number of villages (HH) sampled along each of the Northern and Western axes.

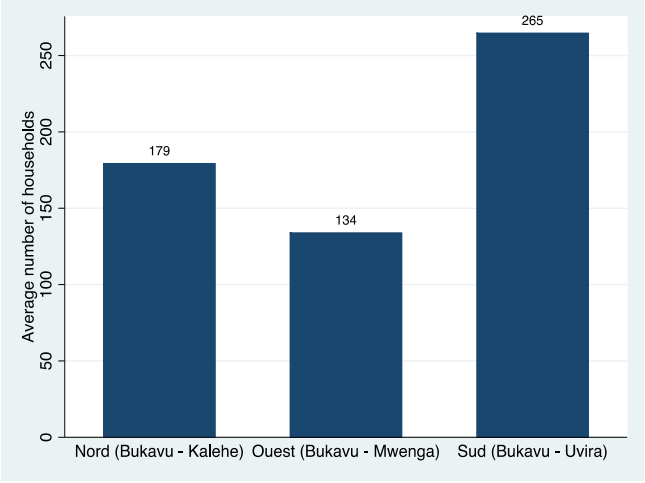

***Figure 2:* Average number of HH per village**

Household size is similar across the axes. Average household size is 7 persons with the majority being headed by a male member.

***Table 2* Household size and gender**

Axe	Household size		Male HH head	
	Mean	Std. Dev.	Mean	Std. Dev.
North	7.12	2.98	88.5	0.32
West	6.56	2.73	93.2	0.25
South	6.39	2.58	86.4	0.34
Total	6.56	2.70	88.5	0.32

Literacy rates are fairly similar across the three axes, yet differ considerably across family heads and their spouses (65 versus 42 percent). As most heads are male this suggests some gender bias.

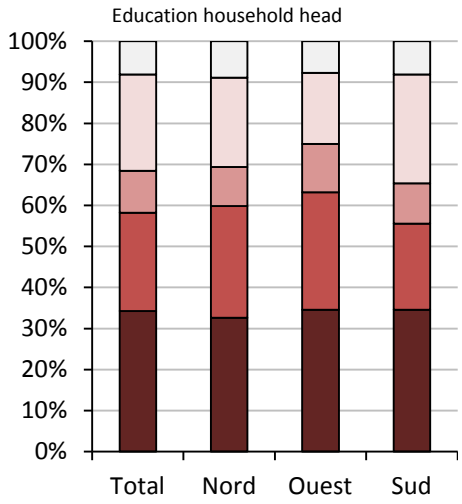

***Figure 3a* Educational attainment HH head**

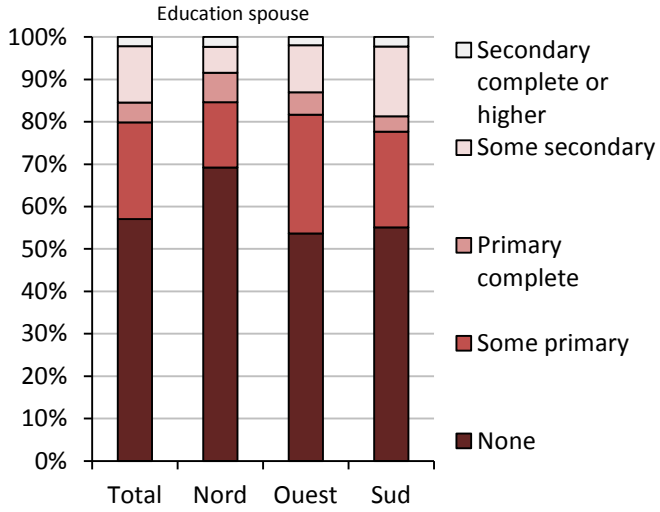

***Figure 3b* Educational attainment spouse**

Educational attainment of household heads and their spouses demonstrate a similar pattern with

little difference across the axes but considerable gender differences.

The majority of our respondents are farmers. The proportion of farmers is highest in the South. Some 16 percent in the North also work in wage labour; this percentage is much lower in the West and South.

Table 3 **Occupational choice HH head**

	Total	North	West	South
Farmer	77.80	67.57	72.07	83.14
Wage labourer	7.62	16.22	6.76	5.56
Petty trading	3.70	4.05	4.50	3.26
Mining	1.35	-	4.50	0.38
Unemployed	2.35	4.05	2.70	1.72
Student/"other"	7.17	8.11	9.46	5.94
Total	100%	100%	100%	100%

Questions related to food insecurity were adopted from the Food Insecurity Access Scale[1]. Respondents were asked after the intensity of nine types of food insecurity situations. These were combined into a single index (where higher scores indicate higher food insecurity).

Table 4 **Food insecurity index**

Food Insecurity Index	Obs	Mean	Std. Dev.	Min	Max
North	152	15.4	7.1	0	27
West	226	16.7	6.0	0	27
South	525	14.5	6.6	0	27
Total	903	15.2	6.6	0	27

The average household's food insecurity index is 15.2, indicating that the average household experiences seven to eight types of food insecurity three to ten times per month. Households in the West axe have the highest level of food insecurity, but the regional differences are small.

Table 4 **Asset ownership**

	Total	North	West	South
Machette	86.4%	84.3%	88.1%	86.3%
Hoe	97.1%	98.0%	96.9%	97.0%
Bicycle	15.5%	4.6%	1.3%	24.8%
Radio	44.6%	47.1%	47.1%	42.9%
Mobile phone	41.3%	41.8%	40.1%	41.7%
Pan	97.5%	99.3%	97.4%	97.0%
Bed	62.9%	69.3%	69.2%	58.3%
Mattress	42.1%	40.5%	42.7%	42.3%
Canoe	1.2%	3.3%	0.4%	1.0%
Bed net	1.9%	3.3%	0.4%	2.1%
Television	1.9%	5.2%	0.0%	1.7%
Motorcycle	3.1%	5.9%	1.8%	2.9%
# of assets	5.0	5.0	4.9	5.0

The type and number of assets owned is remarkably similar across the three axes, except for the more durable assets including canoe, television and motorcycle; these items are hardly present in households in the West and South (generally below 3 percent) while households in the North are (somewhat) more likely to have them (3-5 percent on average).

Table 5 **Credit, outstanding loans, and savings**

Axe	Obs	Taken credit	Lent money	Has bank account or other form of savings
North	153	37.2%	20.9%	7.2%
West	227	37.0%	19.4%	6.2%
South	525	41.1%	19.2%	7.4%
Total	905	39.5%	19.6%	7.1%

Note: Credit taken during the past 12 months

Credit is mostly obtained from family and friends and is used for food purchases (33%) social causes (35%) or education (10%), with only 6.4% used for purchasing agricultural inputs.

[1] See Coates, Jennifer, Anne Swindale and Paula Bilinsky. Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3). Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development, August 2007.

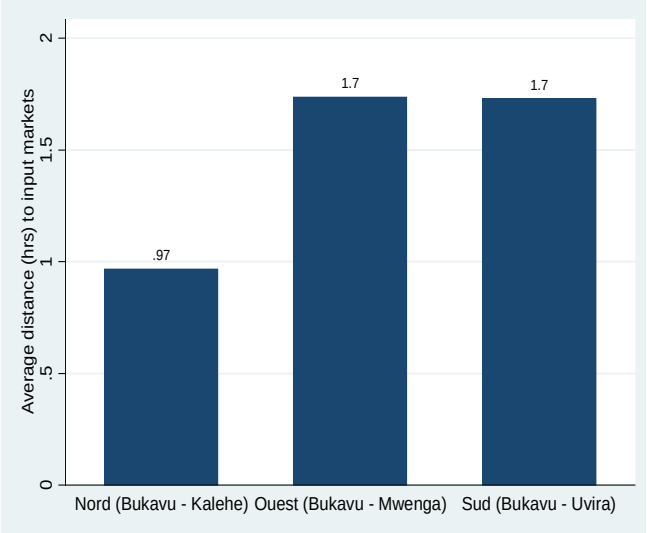

Figure 4: **Distance to market**

Table 6 **Community events**

Any NGO project last 5 years	81%
Episodes of too much rain last year	76%
Episodes of too late rain last year	60%
Episodes of human epidemic last year	44%
Episodes of livestock epidemic last year	81%
Episodes of plant epidemic last year	89%

NGOs are active in the region, demonstrated by the high percentage of villages that have had an NGO project in the last five years (table 6). Many villages suffer from adverse shocks, ranging from negative climatic events to disease epidemics of plants, animals or human beings.

Assessing the impact of agricultural extension and input subsidies

This policy brief provides a descriptive analysis of the baseline data collected for a study on the impact of agricultural extension services and subsidized inputs in Eastern DR Congo. The data presented here demonstrate that this part of DRC is poor, food insecure and has a high incidence of adverse shocks. Most socio-economic characteristics are relatively similar across the three different axes, despite substantial variation in geophysical (and hence land use) characteristics.

The provision of agricultural extension services and subsidized inputs of commercial fertilizer, inoculant[2] and improved seeds aim to mitigate the impacts of shocks and improve the well-being of households through increased agricultural yields. (Local) partners have implemented the agricultural trainings and coordinated the subsidy scheme. The researchers will assess the impact of the interventions by comparing communities that received both agricultural extension and subsidized inputs to communities that only received extension services or no intervention at all (comparison group) using base- and end-line data.[3]

[2] Inoculant refers to a commercially available product. Grain legumes are coated (inoculated) with bacteria that fix nitrogen gas from the air into a form usable by plants. The nitrogen fixation thereby contributes to the production of high-protein legumes, increases yields and improves soil fertility.

[3] A detailed description of the research design and outcme indicators is presented in a companion policy brief.