



**FEED THE FUTURE**

The U.S. Government's Global Hunger & Food Security Initiative

# High-Quality Seed Production by Smallholder Farmer Groups

A Global Case Study

*Photo credit: CRS Niger*



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The U.S. Government's Global Hunger & Food Security Initiative

# FEED THE FUTURE GLOBAL SUPPORTING SEED SYSTEMS FOR DEVELOPMENT – S34D

February 17, 2022

## Collaborative Partners



# Acknowledgment

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Contributions from national partners and co-authors HQ Tin, L Amadou, N Toure, C Nkhoma, S Alonzo, J Aijuka, C Opiyo, and S Bragdon are greatly appreciated. Special thanks to T Slind for support with geospatial analyses.

# High-Quality Seed Production by Smallholder Farmer Groups

*A Global Case Study*

**Dissemination Webinar – February 17<sup>th</sup>, 2022**

**Bhramar Dey (CRS, S34D); Bert Visser (ON, SD=HS)**

*Study Authors: B Dey, B Visser, HQ Tin, L Amadou, N Toure, C Nkhoma, S Alonzo, J Aijuka, C Opiyo, S Bragdon*

# Study Objectives

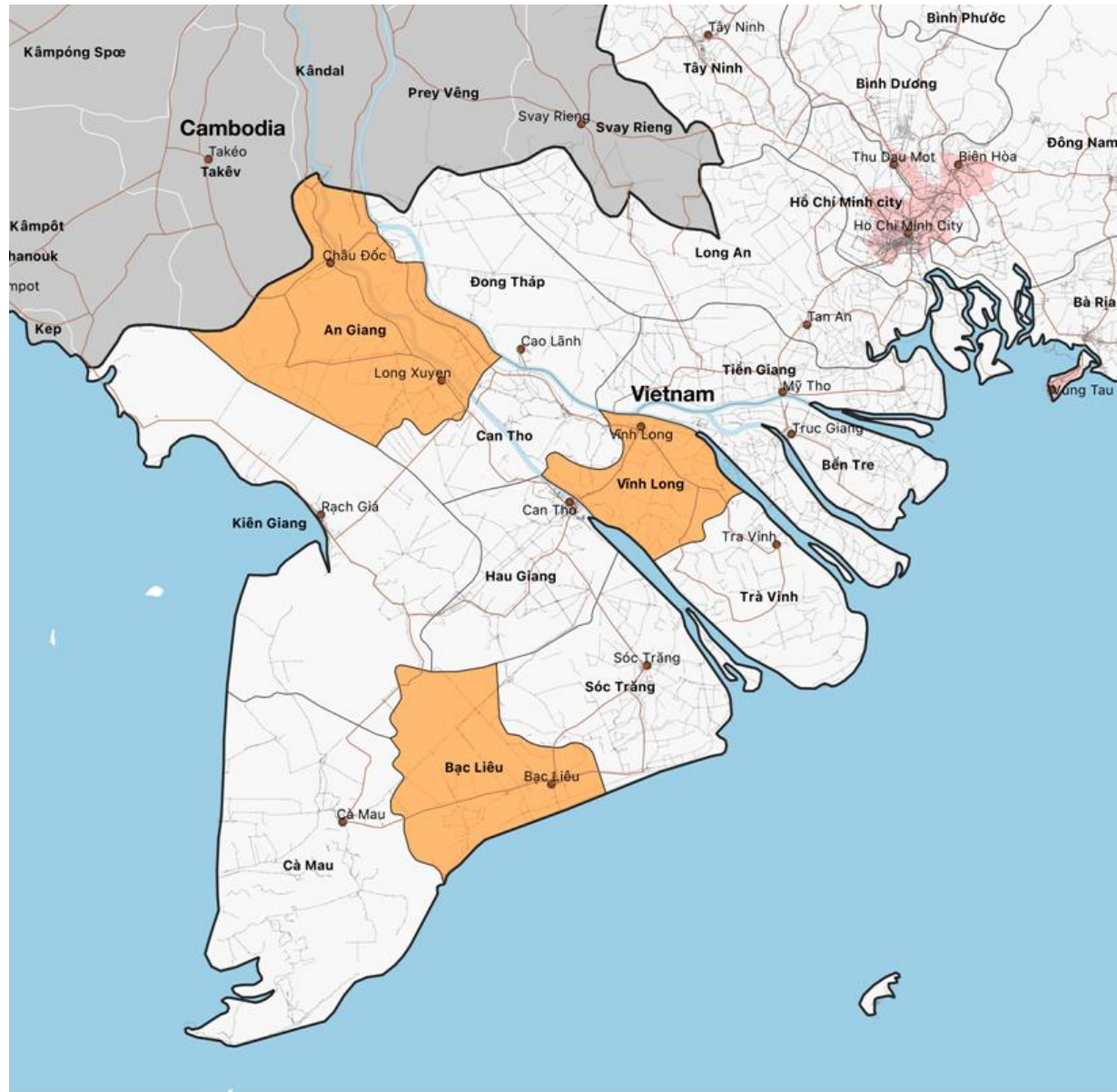
- Explore the operational structures, approaches, social networks, policy and legal systems, and the agro-ecosystems within which seed producer groups and seed clubs exist and function
- Assess their operational strengths and weaknesses, discern commonalities and divergences across seed producer groups / enterprises, countries and crop types
- Provide learnings and recommendations for farmer seed producers, development organizations, donor partners, implementing partners, and national policy/decision-makers, to incorporate into farmer seed production and marketing efforts on-the-ground

# Study Sample

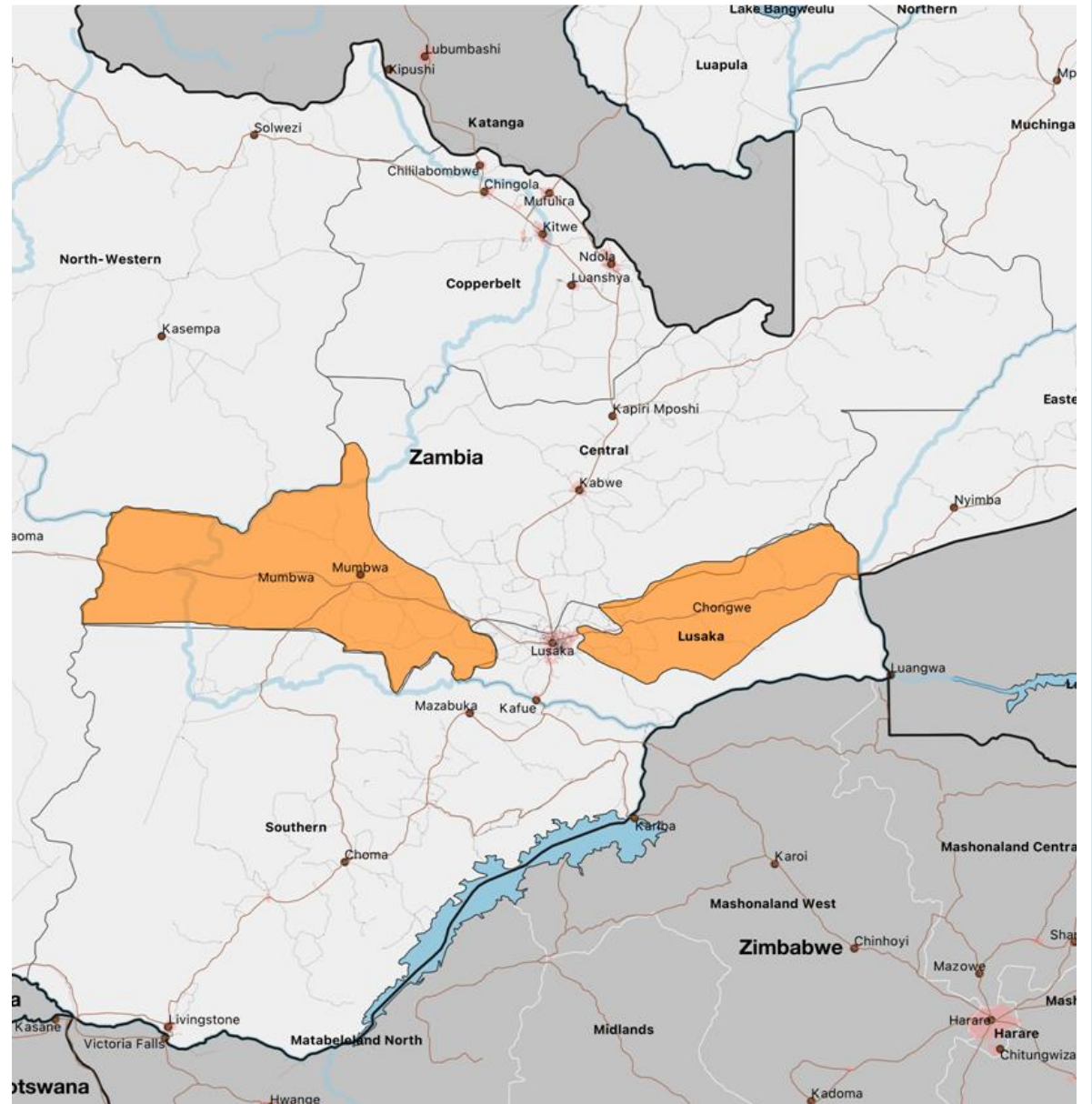
COUNTRY	NATIONAL PARTNER	# OF SEED PRODUCER GROUPS	# OF FGS	CROPS
VIETNAM	CanTho University, Mekong Delta Development Research Institute	5	5	Rice
UGANDA	Participatory Ecological Land Use Management (PELUM)	4	4	Groundnut, Sorghum, Sweet Potato
ZAMBIA	Community Technology Development Trust (CTDT)	4	4	Cowpea, Soybean, Maize, Groundnut, Common bean
NIGER	Catholic Relief Services	4	8	Cowpea, Pearl millet
GUATEMALA	Asociación de Organizaciones de los Cuchamatanes (ASOCUCH)	4	4	Common bean, Potato

**Study Methodology:** Focus Groups Discussions (FGD) were held with each of the groups using a structured survey instrument to collect the qualitative information. At least ten members from each group were chosen randomly to collect the financial and production data (per Ha level). The data collection efforts were undertaken by partners following approved Covid protocols.

# Vietnam

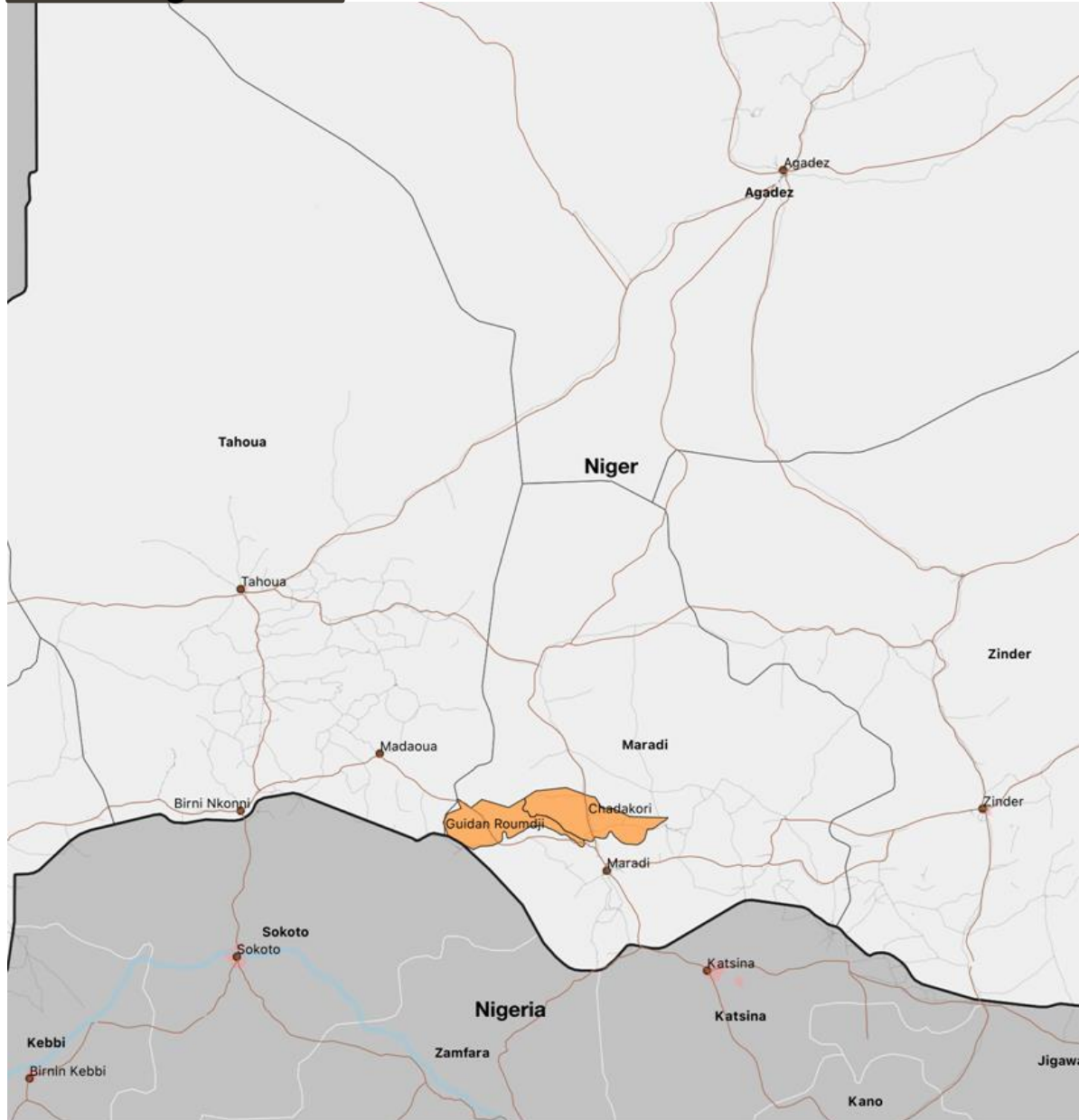


# Zambia

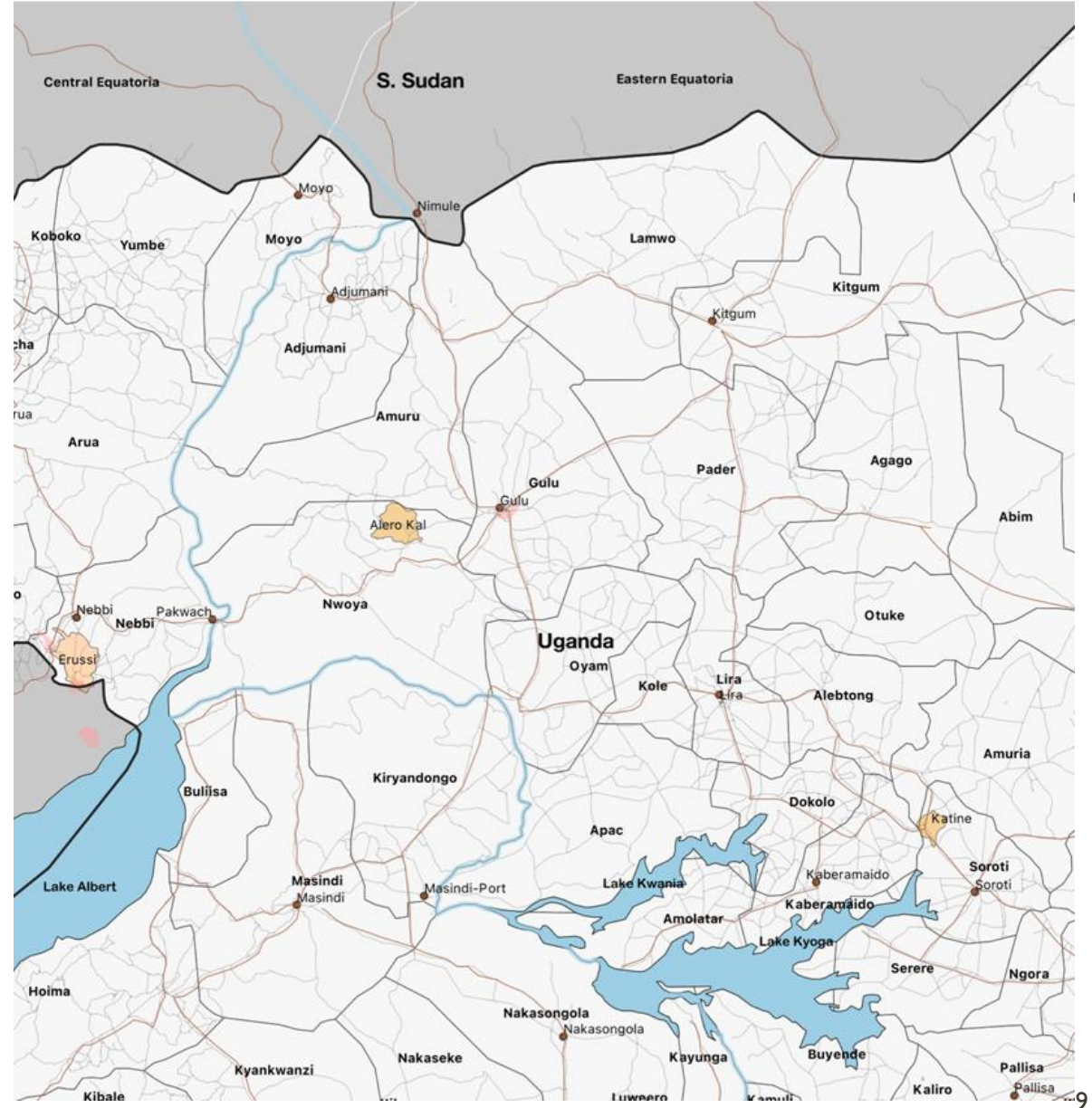




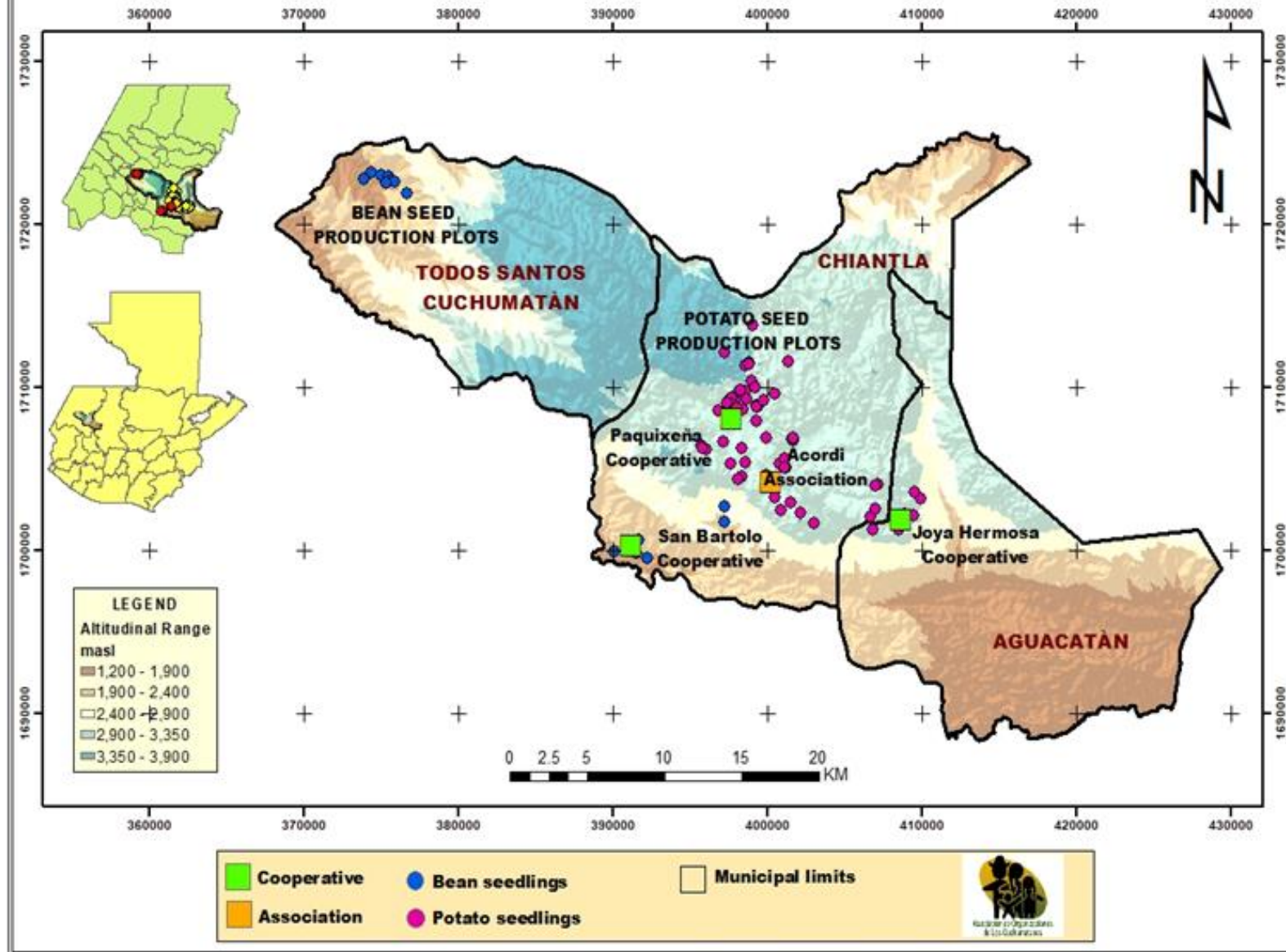
# Niger



# Uganda



# LOCATION OF THE SURVEYED SITES IN THE HUEHUETENANGO, GUATEMALA



# Seed Producer Group Profiles, Markets, and Costs

## Vietnam

Group	Established	Members	Market access	Transboundary trade
Ta Ben	2001	30	Vicinity to local market, good road to infrastructure	No
Trung Hiep	2003	8		No
Vinh Trach	2004	15		Yes
Binh My	2004	8		Yes
Vinh Qui	2002	40		Yes

## Zambia

Group	Market access	Transboundary trade	Members	Established	Crops
Tiwine Womens Seed growers Cooperative	Close to market with good road network	No	50	2014	Maize, beans, groundnuts, soya beans
Chiyota Seed Growers Association	Road is very bad. Far from markets as they take the produce to Lusaka	Yes	25	2013	Soya beans, groundnuts
Mumbwa Seed Growers Association	The purchasing seed companies (Afriseed and Kamano seed company) collect on site	No	31	2001	Maize, beans, cowpea, soya beans
Mweete Seed Growers Association	They only sale to the seed company that supports them	No	21	2019	Cowpea

## Uganda

Seed Group Name	Location	Any transboundary trade?	Members	Established
Loyo Kwo	Alero sub county Headquartet, Nwoya District Headquarter.	Yes, across other districts such as Gulu, and Kitgum	17	2009
Labongo Lworo	Alero Subounty headquarter, Nwoya District Headquarter.	No, not yet but their intention is to reach markets outside their district	26	2015
OJOFACOS	Katine Subcounty Headquarter, Soroti District	No, all sales are done within the community due to overwhelming local demand	314	2016
Mic PaRwoth	Erussi Sub County Headquarter, Nebbi District	No, all sales are done within the community due to overwhelming local demand by a community school	12	2016

## Niger

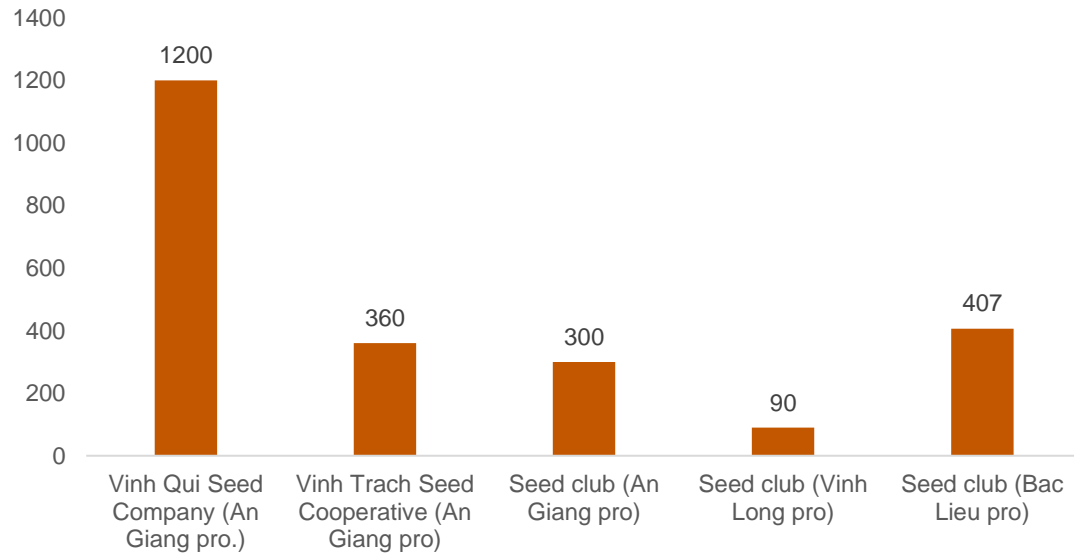
Group	Region	Department	Commune	Location	Crop	Transboundary trade	Members	Established
Boukassa Noma	Maradi	Guidan Roudji	Chadakori	Kouroungoussaou	Millet	Yes	56	1998
Yada Iri	Maradi	Guidan Roudji	Chadakori	Chadakori	Millet, Cowpea	No	80	1998
Cigaban Matta	Maradi	Guidan Roudji	Chadakori	Chadakori	Millet	No	33	1998
Himma	Maradi	Dakoro	Sabon Machi	Sabon Machi	Millet, Cowpea	Yes	44	1999

## Guatemala

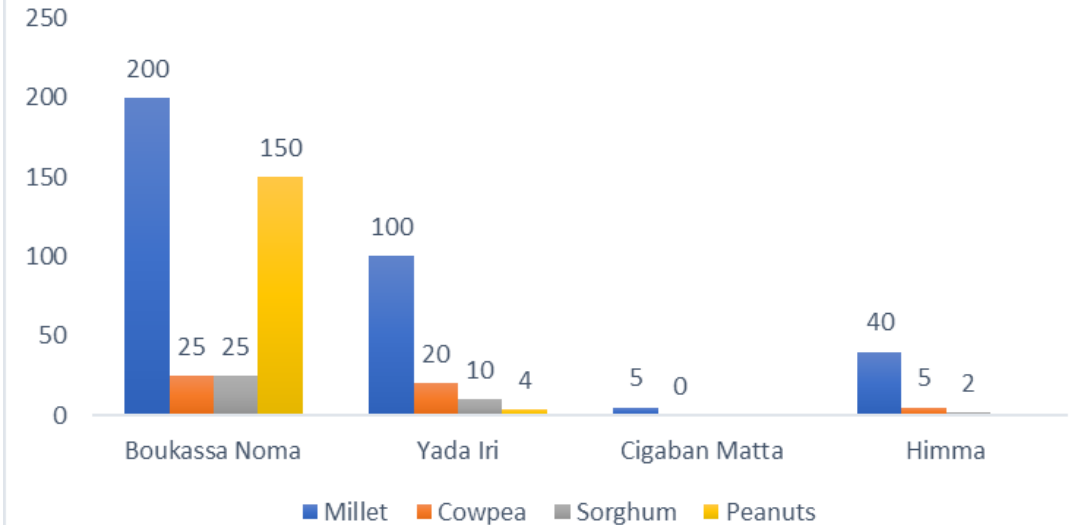
Group	Region	District	Location	Crops	Members	Established
San Martin Cuchumatan	Huehuetenango	Aguacatan	Climentoro	Beans	13	1974
PAQUIX	Huehuetenango	Chiantla	Paquix	Potatoes	50	1998
ACORDI	Huehuetenango	Chiantla	Capellania	Potatoes	29	1998
SAN BARTOLO	Huehuetenango	Chiantla	Regadillos	Beans	55	2016

# Average annual seed production (MT)

## Vietnam Seed Production (MT)



## Niger Seed Production (MT) By Groups



## Zambia

Group	Crops	Seed Produced (MT)
Tiwine Womens Seed growers Cooperative	Maize, beans, groundnuts, soya beans	86
Chiyota Seed Growers Association	Soya beans, groundnuts	12
Mumbwa Seed Growers Association	Maize, beans, cowpea, soya beans	32
Mweete Seed Growers Association	Cowpea	32

## Guatemala

Groups	Crops	Seed Produced (MT)
San Martin Cuchumatan	Bean	3
Paquix	Potatoes	240
Acordi		
San Bartolo		

# Group composition – gender and youth



Country	Gender inclusivity	Youth presence	Membership
Vietnam	Negligible	Negligible	↑
Zambia	Moderate	Moderate	↑
Uganda	High	High	↑
Niger	Very High	Very High	↑
Guatemala	Very High	Moderate	↑

	Negligible
	Moderate
	High
	Very High
↑	Positively increasing



## Market shares - trend

- For Guatemala, the share in local market increased from 0-5% to up to 20% over ten years, but provincial markets' capture increased to more than 20% share over the same period.
- The same pattern was observed for Vietnam seed clubs (which could be due to the Seed Ordinance 2008), the total share in rice seed provision of the 400+ seed clubs in the Mekong Delta in Vietnam adding up to 30% of the total volume.
- In general, the share in local markets across all countries ranges from 20% to more than 50%, and from 5% to 20% maximum in provincial and national markets.




# Groups respond to variety demand in the market

Countries	Crop seed varieties that increased in market share	Crop seed varieties that decreased in market share
<b>Vietnam</b>	Varieties such as <i>Dai Thom 8</i> and <i>OM18</i> were cited as “in-demand” by all the clubs.	Varieties (such as – OM4900, IR50404 etc.) have been stopped due to low eating quality and blast disease susceptibility.
<b>Zambia</b>	Demand for groundnuts increased; <i>lutembwe</i> variety of cowpea increased in demand	Demand for maize decreased; <i>lubebe</i> variety of cowpea decreased in demand due to susceptibility to weevils
<b>Uganda</b>	Groundnut (varieties – serenut 11, serenut 2, serenut8) and sweet potatoes (due to its vitamin content)	NABE 15 and 17 in beans have reduced in demand due to low yields
<b>Niger</b>	For both cowpea and millet, varieties that have high yields, shorter duration growth and resistance to pests and diseases are preferred by customers in the market. Cowpea variety IT90 has seen a tremendous increase in market demand due to nutrition aspects and short production cycle.	Variety K VX is less resistant and low yielding and thus demand for that decreased over the years. Groups stopped production of IT98 because if not harvested on time then the seeds spill to the ground and deteriorate.
<b>Guatemala</b>	Demand for ICTA Frit and Tollocan varieties has grown because of their high yield; Bean varieties with the most demand are ICTA Hunapú (high yields, well adapted), ICTA Hunapú precoz and ICTA super Chiva	Potato variety Loman has decreased in demand due to high susceptibility of diseases and low yields; Some bean varieties are no longer demanded because of lower yields (examples – ICTA Super Chiva, ICTA Altense).

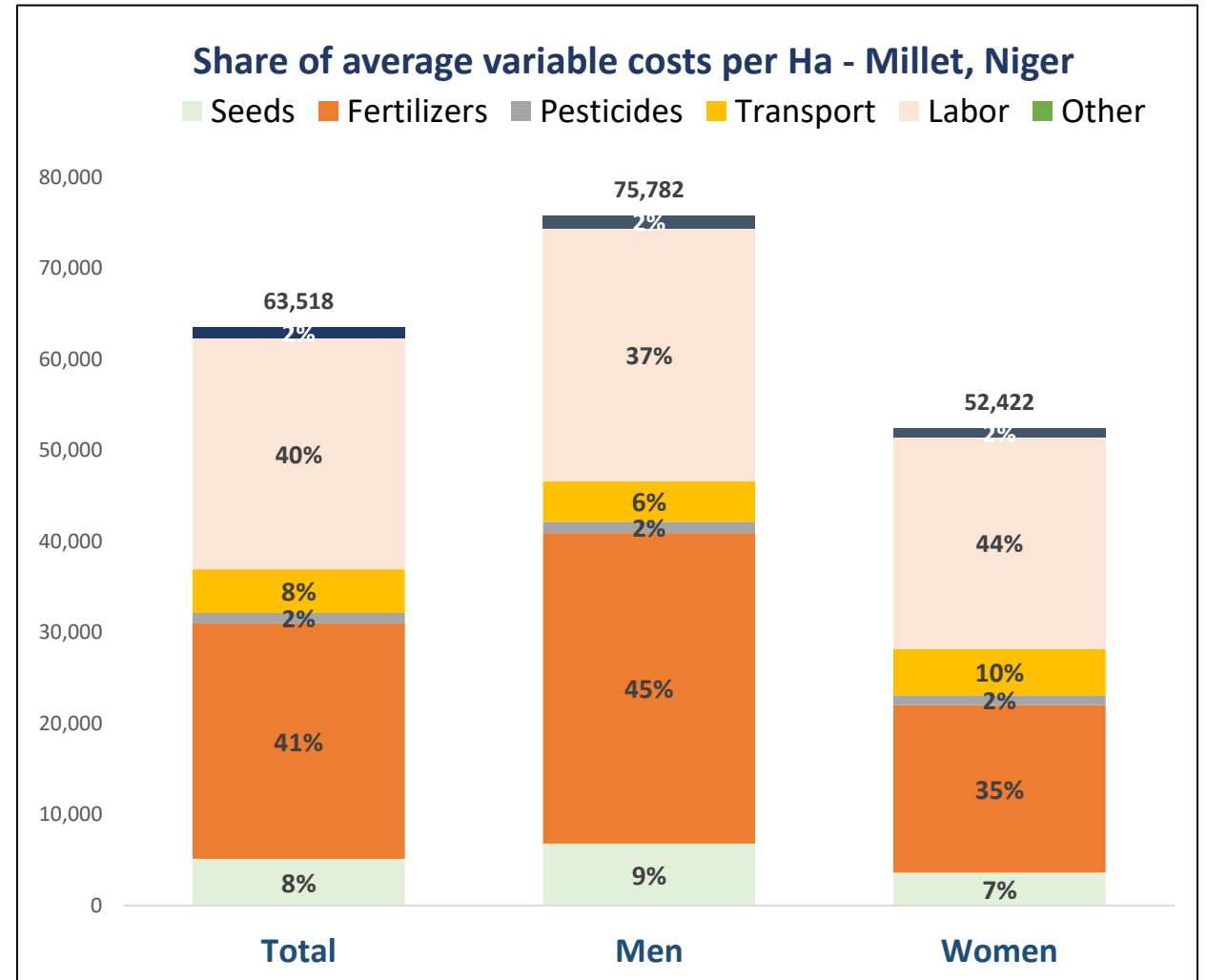
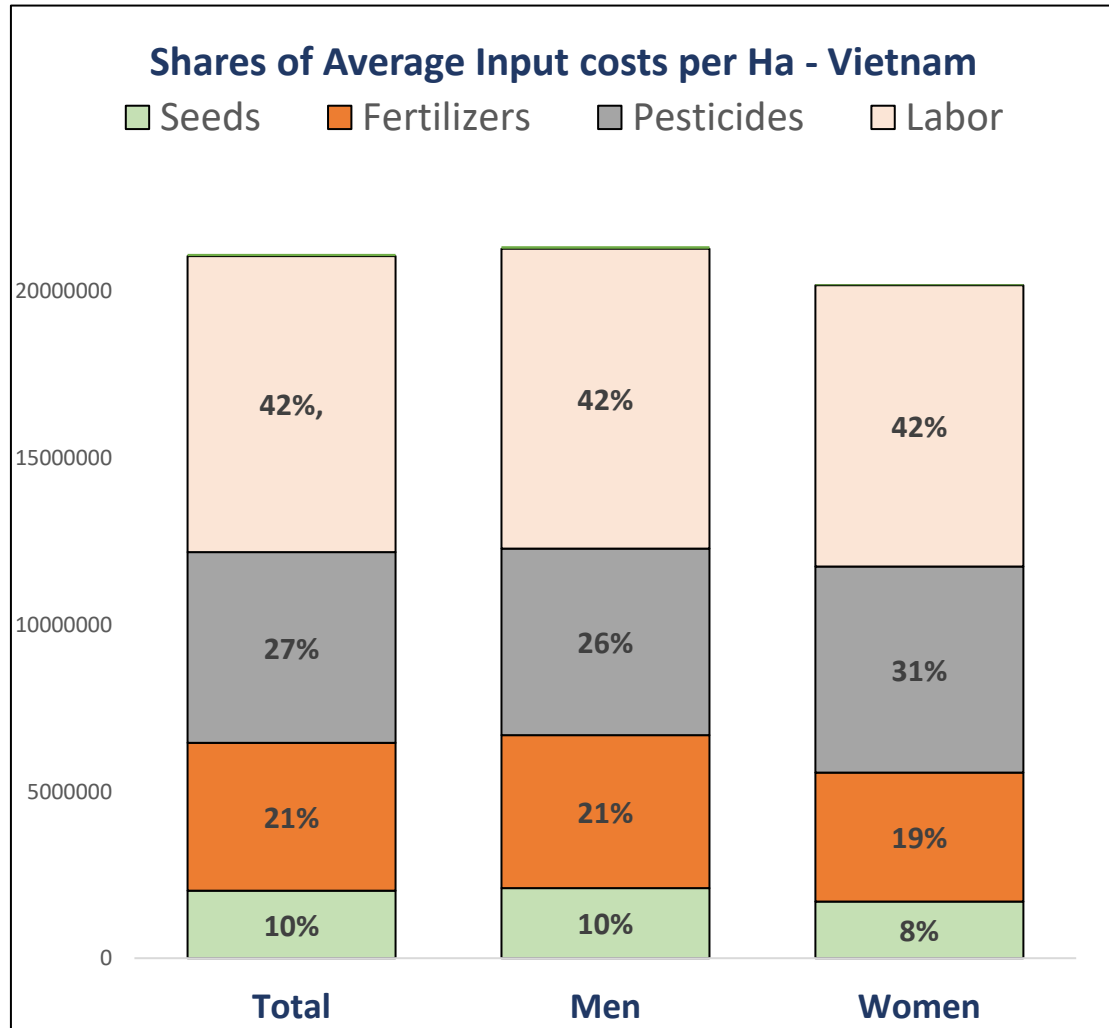
# Key Takeaways

- Groups are located in various agro-ecologies and produce different crop varieties
- Most groups have been established many years ago
- Growing membership over the years
- Expanding market shares for many groups
- Producing various seed volumes of various standards: certified, QDS, producer-assured
- Seed production in some crops is dominated by men, while in other women are central
- Almost all groups regard their efforts as sustainable

Seed attributes	Customers' preferences
Resistant to pests & diseases	Very High
Adapted to climate change	High
High yield	Moderate
Good palatability and cooking time	Moderate

	Very High
	High
	Moderate

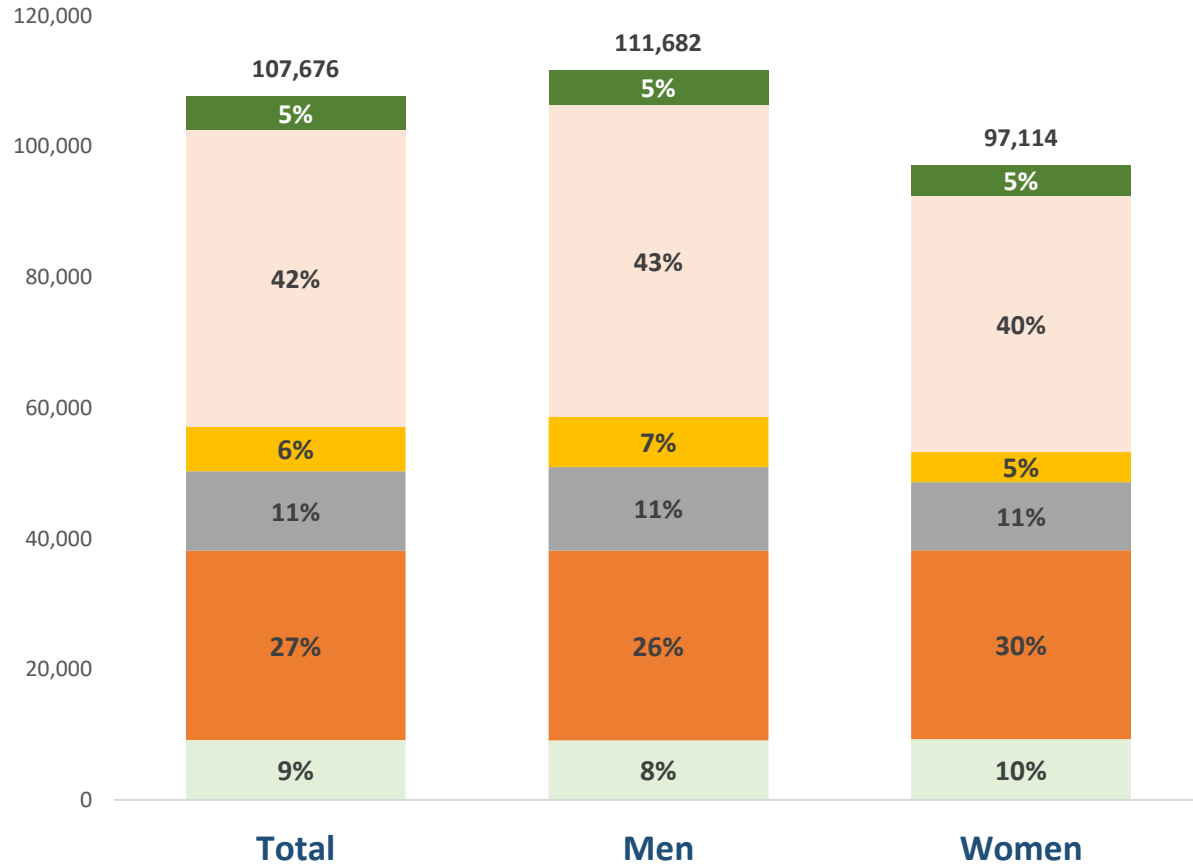
# Average shares of total variable costs



# Average shares of total variable costs (cont.d)

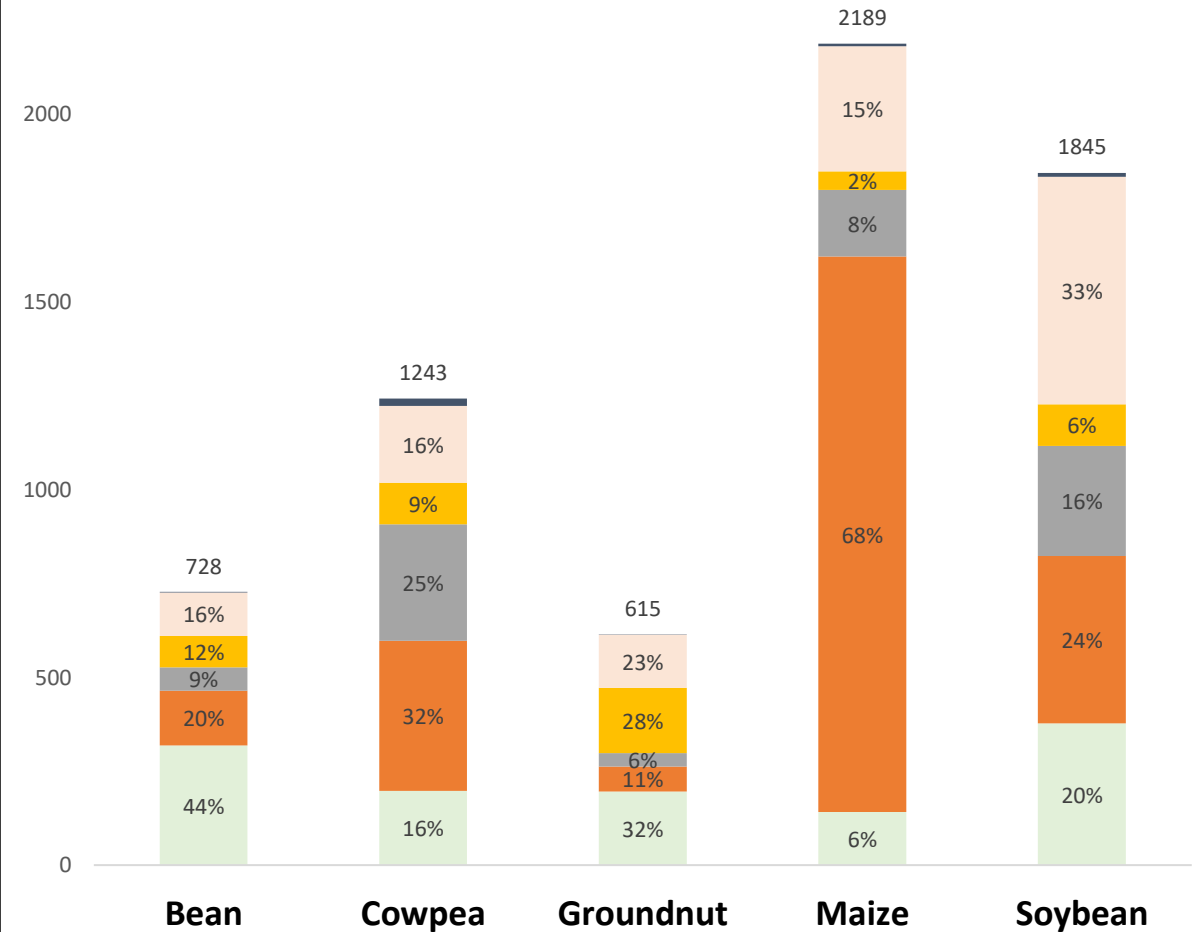
## Share of average variable costs per Ha - Cowpea, Niger

Seeds Fertilizers Pesticides



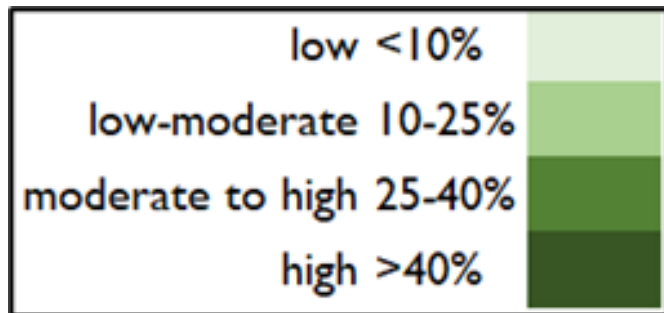
## Share of average variable costs per Ha - Zambia

Fertilizers Pesticides Transport Labor Other



# Comparison of shares of variable costs across crops and countries

Average share of total variable costs	Vietnam	Niger		Zambia					Guatemala	
	Rice	Millet	Cowpea	Bean	Cowpea	Groundnut	Maize	Soybean	Bean	Potatoes
<i>Seeds</i>										
<i>Fertilizers</i>										
<i>Pesticides</i>										
<i>Transport</i>	N/A									
<i>Labor</i>										
<i>Other</i>										



# Seed Producer Group Activities and Processes

# Group Activities

- Sub-groups and their functions
- Inspection and certification
- Capacity building and training
- Price-setting and selling
- Packaging and labelling
- Marketing
- Roles of external stakeholders



## Sub-group Functions

- Every group in the study sample has one or more sub-groups to oversee seed production, internal quality control, and/or marketing operations
- Some groups voluntarily engaged a third party to inspect seed production, e.g., Vietnam
- Seed groups producing certified seed and/or QDS were inspected by national regulatory agencies (examples: SCCI in Zambia)
- Market intelligence was obtained through visits to local markets, informal exchanges with other producer groups, radio messages from both local and national governments, and advice from other external stakeholders
- Most groups produce seed of one or two varieties at household level and three to four varieties at the group level

# Inspection and certification

- Not all groups aim for formal seed certification
- All groups undertake internal peer-review field inspections
- Some groups also involve outsiders (e.g., community seed bank committee in Uganda)
- Common criteria for seed quality: physical purity, genetic purity, germination rate, seed health (absence of pests and diseases)
- Vietnam: most seed produced for varieties under plant variety protection, informally inspected by public sector regional seed centers
- Zambia: QDS produced, certified by SCCI
- Guatemala: potatoes are certified by government agency MAGA (field monitoring internally organized)
- Uganda: seed produced under QDS conditions but no formal inspection

# Capacity building & training

- Every group in the study sample received formal and/or informal trainings
- Trainings range from a few hours to several weeks across multiple agricultural seasons
- Trainings are provided by various stakeholders, including NARS, local extension agents, private seed companies, development partners, and NGOs
- Usually, trainings are provided free of cost
- Learning and exchange visits are also reported, e.g., in Niger

# Support provided by external stakeholders

Stakeholders who provided support	Vietnam					Zambia					Uganda					Niger					Guatemala								
<i>Local and provincial Government</i>	■	■	■			■	■	■		■	■	■	■	■		■		■		■	■	■	■					■	
<i>NARS</i>			■	■	■		■		■					■						■			■					■	■
<i>Extension agencies</i>					■				■						■							■							
<i>Seed certification agencies</i>				■				■		■				■							■						■		
<i>Development partners</i>			■		■	■		■							■	■		■				■	■			■		■	■
<i>Private sector</i>		■	■			■	■		■				■						■	■		■			■	■		■	

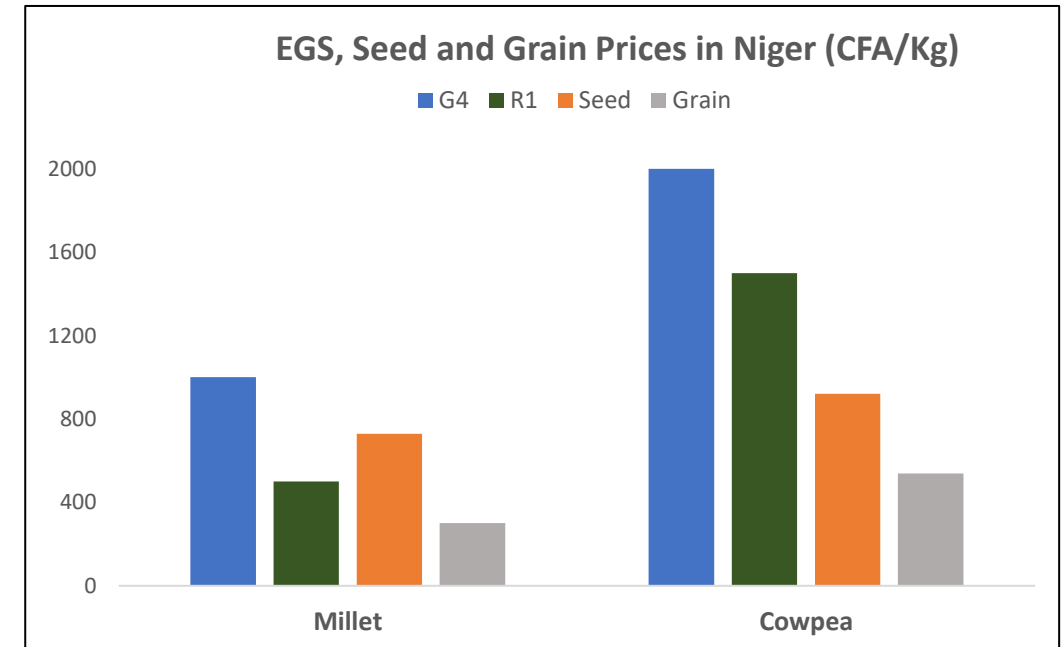
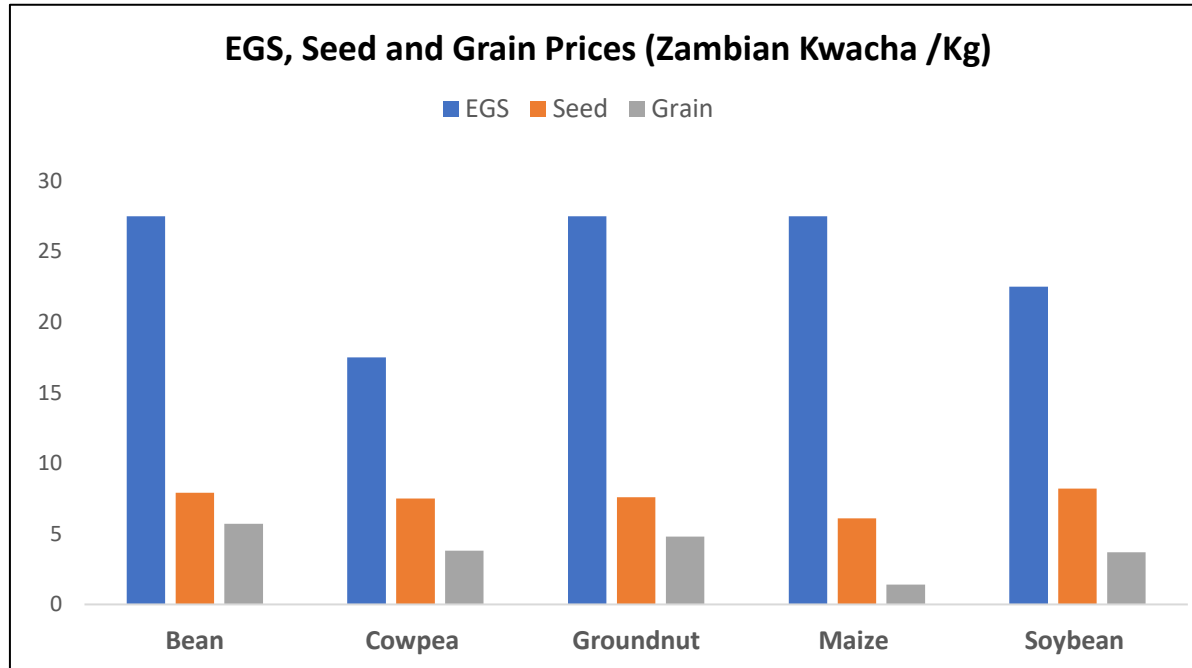
**Legend:**

- Processing equipment
- Seed Storage
- Purchase of seed produced
- Access to EGS
- Field inspection
- Field days
- Trainings
- Access to inputs

# Market channels and setting the seed price

- Price is set in two alternative ways:
  - By contracts with institutional buyers before the onset of production
  - By examining actual production costs and competitor prices in local markets, and setting the local market price at the end of the production season
- Local market prices would typically be proposed by the marketing subgroup and agreed with the group leaders
- Seed is sold in local markets (rice in Vietnam), and to seed companies (Afriseed in Zambia, cowpea in Niger), NGOs and international organizations (WFP buying pearl millet in Niger), and government agencies (Vietnam)

# Seed and Grain Prices



## Guatemala

Crops	Seed Price /Kg	Grain price /kg (Sowing)
	<i>(Guatemalan Quetzal)</i>	
Beans	25	10
Potatoes	5.1	3.3

## Seed-Grain Price Ratio

Countries	Bean	Cowpea	Groundnut	Millet	Maize	Soybean	Potatoes	Rice
Niger		1.7		2.4				
Zambia	1.4	2.0	1.6		4.4	2.2		
Guatemala	2.5						1.5	
Vietnam								1.2

# Comparing Gross Profits (per Ha)

	Vietnam	Niger		Zambia					Guatemala	
	Rice	Millet	Cowpea	Bean	Cowpea	Groundnut	Maize	Soybean	Bean	Potatoes
<b>Average Variable Costs (USD) /Ha</b>	2,625	269	456	134	229	113	403	340	6,160	11,668
<b>Average Yield Kg/ Ha</b>	8792.5	751.0	618.3	508.4	469.3	751.8	1838.2	1040.6	2116.0	42118.0
<b>Average Selling Price (USD)per Kg</b>	0.92	3.09	3.90	1.46	1.38	1.41	1.13	1.51	5.40	1.08
<b>Average Revenue (USD) per Ha</b>	8,049	2,319	2,413	742	647	1,057	2,075	1,570	11,425	45,484
<b>Gross Profit (USD) per Ha</b>	5,425	2,050	1,957	608	418	944	1,671	1,230	5,266	33,816
<i>Sample size</i>	58	40	40	8	21	12	18	17	19	20

Adjusted for PPP (2020 USD)

<https://data.worldbank.org/indicator/PA.NUS.PRVT.PP>

## Assumptions and caveats

- The figures assume market equilibrium
- Post-harvest loss, share of produce consumed, share of seed produced saved and or exchanged for free, are not considered
- Data is adjusted for outliers and oddities
- Profit is based on recovery of only variable costs, fixed costs (such as land, capital, storage etc.) are not included

## Break even points to recover all variable costs (%share of seed produced to be sold)

	Rice	Bean	Maize	Soybean	Groundnut	Millet	Cowpea	Potatoes
Vietnam	28-33%							
Niger						11-12%	20-21%	
Zambia		18%	19%	22%	11%		35%	
Guatemala								



# Packaging & Labelling

- In case of seed marketed locally, packaging and labelling was cited as one of the key challenges by majority of the groups sampled
- Labelling is important as it shows the identity of the producer or producer group (*producer-assured*), builds trust; knowing the identity and expected quality plays a major role in local markets
- In Vietnam only unprotected varieties get labelled, but protected varieties not
- Seeds are packaged in small to large volumes, up to 40 kg (Vietnam) and 50 kg (Zambia)
- Typically, labels contain information on names of seed producer groups, crop variety, weight, expected yield, year of production
- Many producer groups are not aware of formal labelling requirements, nor of potential advantages of proper labelling
- Many groups were unable to arrange for labelling due to lack of labelling material and equipment (such as sewing machines). The implied cost of packaging seeds further adds to this constraint



# Self-reported strengths and weaknesses

Operational Areas	Enablers	Challenges
<b><i>Seed production</i></b>	<p>Support from and recognition by local and regional governments and agencies</p> <p>Positive price effects of group registration and consumer recognition</p>	<p>Limited access to and high costs of EGS and other inputs</p> <p>Distance to external support services</p> <p>Lengthy producer registration processes</p> <p>Pest and disease infestation problems</p>
<b><i>Monitoring and inspection</i></b>	<p>Well qualified peer farmers available in the producer groups</p> <p>Government agencies provide advice and prepare for formal inspection</p>	<p>Dependence on local government; Lack of timely access to and high costs of inspection for the purpose of certification</p>
<b><i>Marketing and distribution</i></b>	<p>Ready market intelligence (popularity of specific varieties, average price levels)</p>	<p>Little knowledge on seed law provisions</p> <p>Transportation challenges to reach nearby markets</p> <p>Meeting fluctuating market demand</p>
<b><i>Scaling up of production</i></b>	<p>Motivated membership; High technical acumen</p> <p>Social cohesion and trust; customer confidence</p>	<p>Lacking farm equipment; lacking processing equipment; lacking storage facilities</p>

## Key Takeaways (1/2)

- Regardless whether formal seed inspection for the purpose of certification is occurring or not, seed producer groups are able to deliver high-quality seed, increasingly using producer labels to confirm seed quality
- All groups have established bodies and procedures arranging for peer field monitoring and inspection of the standing crop and the harvested seed, as well as for processing and marketing activities
- All groups show self-confidence, and exhibit a strong group feeling, and almost all perceive their efforts to be economically sustainable
- Many groups have experienced an expanding market share, particularly in local markets
- Proximity between producers and consumers / buyers is an advantage, since this allows for trust building, social cohesion, brand/group loyalty
- Actors involved in the formal seed system assisted almost all groups (in all countries and for all crops) with access to early-generation seed
- Access to EGS of varieties demanded by markets, and issues with packaging/labelling were cited as major challenges by all groups visited in this study

## Key Takeaways (2/2)

- The advantages of proper packaging and labelling of the produced seed need further attention of both the seed producer groups and external stakeholders
- Improved market transparency and highlighting the importance of seed quality may help the diffusion of new and popular existing varieties
- Seed producer and consumer preferences should have implications for government agencies and research institutes focusing on EGS supply, as well as for international and national breeding institutes in setting product profiles of new varieties
- National and international agencies should pay attention to the roles and needs of local and regional governments and strengthen their capacities, since these stakeholders are best positioned to support a well-functioning local seed supply
- There is no single successful model. Much of success depends on national policy and government support, agro-ecosystem conditions, and market demand for high-quality seed at affordable prices of specific crops

# Recommendations

- Establishing sustainable markets for EGS, cited by almost all groups as a major challenge
- Responding to major changes in varietal preferences (adjusted to climate change, proper yields, good palatability), and the need for clean seeds free of pests and diseases
- Linking farmer seed producer groups with upstream stakeholders (NARS, seed companies, breeding institutes)
- Generating greater market transparency for farmer seed producers and local customers
- Creating more awareness on comparative advantages of proper packaging and labelling
- Policy & advocacy : assessing and understanding current hindrances and barriers to the full functioning of farmer seed producer groups (group registration, capacity support, seed production and marketing requirements) and legal recognition of and capacity support for farmer seed producer groups

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Grazie

Thank  
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Gracias

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# Speaker Bios



**Dr. Bhramar Dey** (Senior Technical Advisor, S34D CRS) brings a unique blend of project design, management, and analytical skills focusing on country-led interventions in data, policy, monitoring and evaluation, and agricultural input systems. She has over 18 years of experience in data and regulatory reform analyses, and designing, managing large client and stakeholder-oriented projects. Prior to joining CRS, Dr. Dey worked at the Bill and Melinda Gates Foundation (BMGF) - Agriculture initiative. Born and raised in India, Bhramar holds a Ph.D. in Applied Economics from Clark University.



**Dr. Bert Visser** was born in the Netherlands in 1951. He obtained a MSC in Molecular Sciences from Wageningen University and a PhD in medical virology from Utrecht University. From 1982 he worked for the National Agricultural Research System DLO in the Netherlands and for the Ministry of Foreign Affairs. From 1997 until 2016 he was the director of the Centre for Genetic Resources, the Netherlands, part of Wageningen University and Research. After his retirement from Wageningen he joined Oxfam Novib as the scientific advisor to the Sowing Diversity – Harvesting Security programme focusing on smallholder agrobiodiversity and food and nutrition security.



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