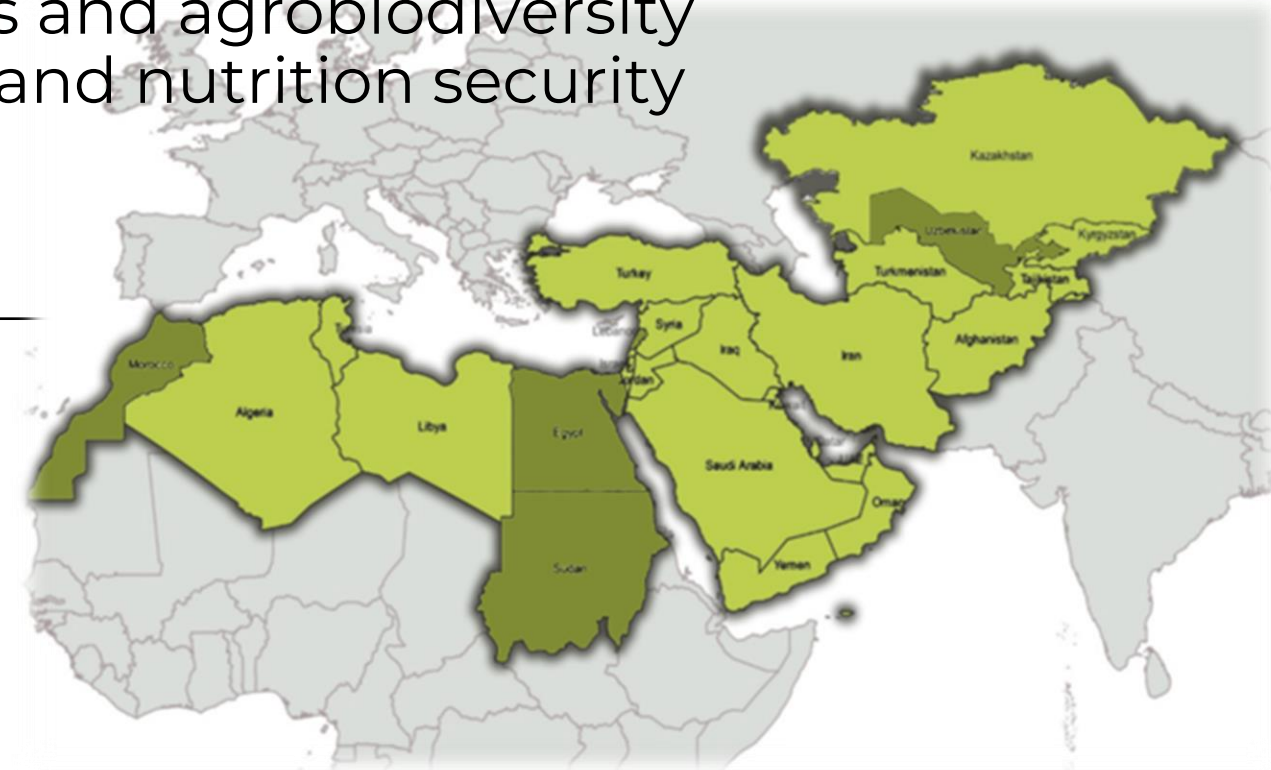


From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA)

WP2: Genetic innovation, seed systems and agrobiodiversity conservation for climate resilient food and nutrition security
Stakeholder Meeting – Uzbekistan September 14th, 2022

WP Members:

- Lead: Z. Bishaw (ICARDA)
- Co-Lead: J. Andrade-Piedra (CIP)
- Members:
 - ICARDA: M. Sanchez-Garcia, A. Amri, YA Yigezu, AA Niane
 - IFPR: Kibrom Abay
 - ABC: M. Turdieva



Task 1: Participatory validation of genetic innovations



- Target Product Profile
 - Identify variety to replace
 - Identify strengths (traits to keep) and weaknesses (traits to improve) in cultivar to replace
 - Identify benchmark to compare (no need to be the cultivar to replace)

Country	India	Key traits			
Benchmark Products Selected For Comparison		Trait Category	Trait Name	Trait Measurement Units	Minimum Threshold or Range
	Vmorales	Yield	Grain yield	t/ha	10% above check
	Taffa	Abiotic Tolerance	Drought tolerance	t/ha	10% above check
	Taffa	Agronomic Traits	Earliness	Days to heading	10% less than local check
	Taffa	Agronomic Traits	Lodging tolerance	Score 1 (Resistant) - 100 (Completely lodged 90°)	40 or less
	DWRB137	Fodder/Forage Traits	Straw yield	Dry straw yield in t/ha	10% above check
	DWRB137	Biotic Resistances	Powdery mildew and Net Blotch	Scale 1-9 for PM and 1-9 NB	PM <6; NB ≤6
	Rihane-03	Abiotic Tolerance	Salinity tolerance	t/ha	10% above check
	RD2552	Fodder/Forage Traits	Forage production	t/ha	10% above check
	DWRB137	Yield	Grain yield	t/ha	10% above check
	Rihane-03	Fodder/Forage Traits	Forage production	t/ha	10% above check
	VMorales	Fodder/Forage Traits	Straw quality	Crude protein (%)	>4.5%

Section #6: Competitive Product Profile: Key Traits.

Key trait strengths and weaknesses of important competitive products within the Market Segment.

Competitive Product	Year of Release	Average Yield. Tonnes/ Ha	Average Cost of Seed. \$/Kg	Average Planting Rate/ Ha.	Estimated Market Share (%)	Trait <u>strength</u> of the competitive product and trait score for each key trait based on advanced stage yield trial data. (Please use the Standard Crop Trait Name and Measurement Units)						Trait <u>weakness</u> of the competitive product and trait score for each key trait based on advanced stage yield trial data. (Please use the Standard Crop Trait Name and Measurement Units)					
						Trait #1		Trait #2		Trait #3		Trait #1		Trait #2		Trait #3	
						Trait Name	Score or Range	Trait Name	Score or Range	Trait Name	Score or Range	Trait Name	Score or Range	Trait Name	Score or Range	Trait Name	Score or Range
DWRB137, RD2751, RD2552, RD20235 and RD2715	Latest 2019	4.99	0.35	100Kg	40	Lodging resistance	Resistant	Resistance to leaf blight and rusts	Leaf blight=46 Rust=0-10R	Straw yield	6t/ha	High forage production	14.5t/ha	High regeneration capacity	3.5t/ha		

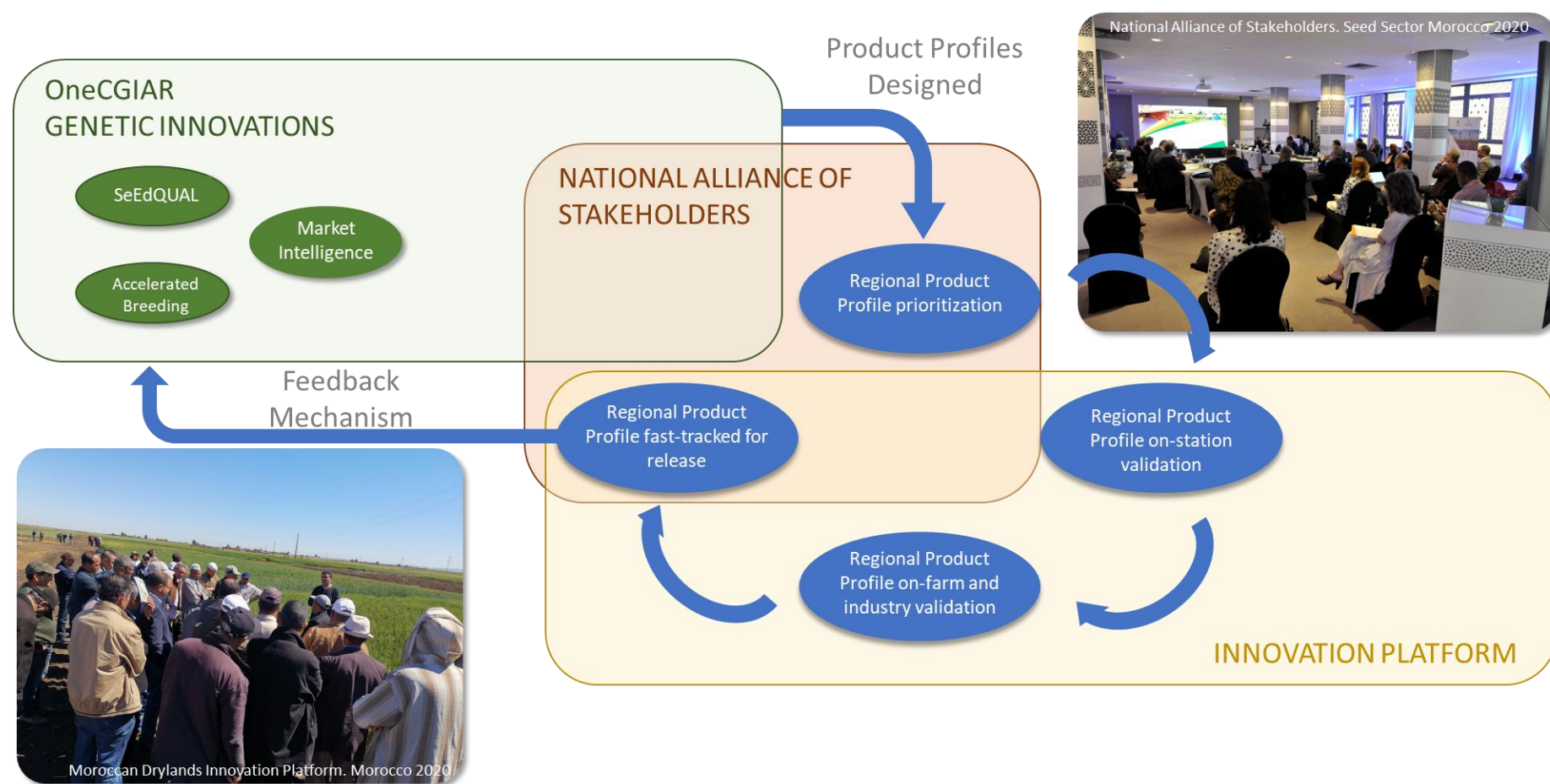
Task 1: Participatory validation of genetic innovations

Multi-stakeholder integrative approach to promote adoption and fast-track release of Best Global Genetic Innovations

Challenge:

New varieties take too long to be released and often don't answer the needs of farmers, industry and consumers

- Informed prioritization of Product Profiles
- Participatory validation of market segment relevant traits at Innovation Platform
- Integration of the needs and preferences of all actors in the value chain, with a gender perspective
- Accelerate the release of best bet genetic innovations



Task 1: Participatory validation of genetic innovations



Multi-stakeholder integrative approach to promote adoption and fast-track release of Best Global Genetic Innovations

O 2.01 Product Profiles for CWANA prioritized.

O 2.02 Performance of advanced lines during on-station assessment published.

O 2.03 Performance of and gender trait preferences for advanced lines during on- and off-farm participatory assessment published.

O 2.04 Farmers exposed to climate-smart varieties.

O 2.05 Full description of selected advanced lines recommended for country release/registration produced.

O 2.06 Germplasm of the selected advanced lines available for NARS release/ registration process.

Task 1: Participatory validation of genetic innovations



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Qarshi Agroecology

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Task 1: Participatory validation of genetic innovations



Multi-stakeholder integrative approach to promote adoption and fast-track release of Best Global Genetic Innovations

O 2.01 Product Profiles for CWANA prioritized.

Crops	Center	Country	Agro-ecologies	Basic traits	Added-value traits	1st priority	2nd priority	3rd priority
Bread wheat	IWWIP	Uzbekistan	Red grain, Cold tolerant, Irrigated	Gluten Strength, Red grain, Yellow rust resistance, Early vigor, lodging tolerance	Cold drought, heat tolerance TKW, Hectolitre weight, biofortification. Leaf ruats and septoria	Cold tolerance	Drought and heat tolerance	Grain size and biofortified
			Red/white grain, Cold tolerant, low irrigation/rainfed	Gluten Strength, Cold tolerance, Yellow rust resistance, Early vigor, lodging tolerance, crown root, nematodes and septoria	Cold drought, heat tolerance TKW, Hectolitre weight, biofortification. Leaf rust and septoria	Cold tolerance	Drought and heat tolerance	Grain size and biofortified
Barley	ICARDA	Uzbekistan	Feed barley for Arid and Semi-Arid	Drought tolerance, Cold tolerance, Biomass production, Earliness	Feed quality, Yellow rust	protein content (grains)	protein content and low ADL (straw)	Yellow rust
			Malt and Fodder barley	Grain size, lodging tolerance, yellow rust resistant	Aphids, Malting quality,	Malting quality (KO, FAN, B-glucan,...)	Earliness	Aphid resistance
Potato	CIP	Uzbekistan	Subtropical lowland	Marketable tuber yield	Late blight resistance, Potato virus Y resistance, Total tuber yield under Heat condition	Tuber cooking quality	Tuber dormancy period/Storability	Tuber dry matter content
Sweetpotato	CIP	Uzbekistan	Subtropical lowland	Orange fleshed, 90 days harvest for low (<28%) and high dry matter (>28%), dual purpose use (foliage to animal feed)	Storage root yield under drought prone and heat condition	>35t/ha storage roots and >35t/ha foliage for animals (direct feed, hay, silage, pellets)	Salinity tolerance/storability and perishability tolerance under transport conditions	

Task 1: Participatory validation of genetic innovations



Multi-stakeholder integrative approach to promote adoption and fast-track release of Best Global Genetic Innovations

O 2.01 Product Profiles for CWANA prioritized.

Additional options:

Crops	Countries	Agro-ecologies	Most grown Varieties	Basic traits	Added-value traits	1st priority	2nd priority	3rd priority
Chickpea	Uzbekistan							
Lentil	Uzbekistan							

Task 1: Participatory validation of genetic innovations



Multi-stakeholder integrative approach to promote adoption and fast-track release of Best Global Genetic Innovations

- Target Product Profile validation trials at Innovation Platform
 - Confirm if current candidates (10-20) meet TPP requirements

Bread Wheat	ICARDA/C IMMYT	Egypt	Heat stress, Yield potential	Heat stress tolerance: 15% better than the benchmark (Misir 1))	Resistance to rusts: 50% better than the benchmark (Sids-15)	Medium/tall plant height: 3% taller than the benchmark (Sids-15)
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- Involve value chain stakeholders in validation (on-farm (year 2) and on-station stakeholder preference days
- Identify gender-specific preference traits and include them in selection
- Assess trade-offs and synergies with other Innovations at IP level => integrated innovation package development

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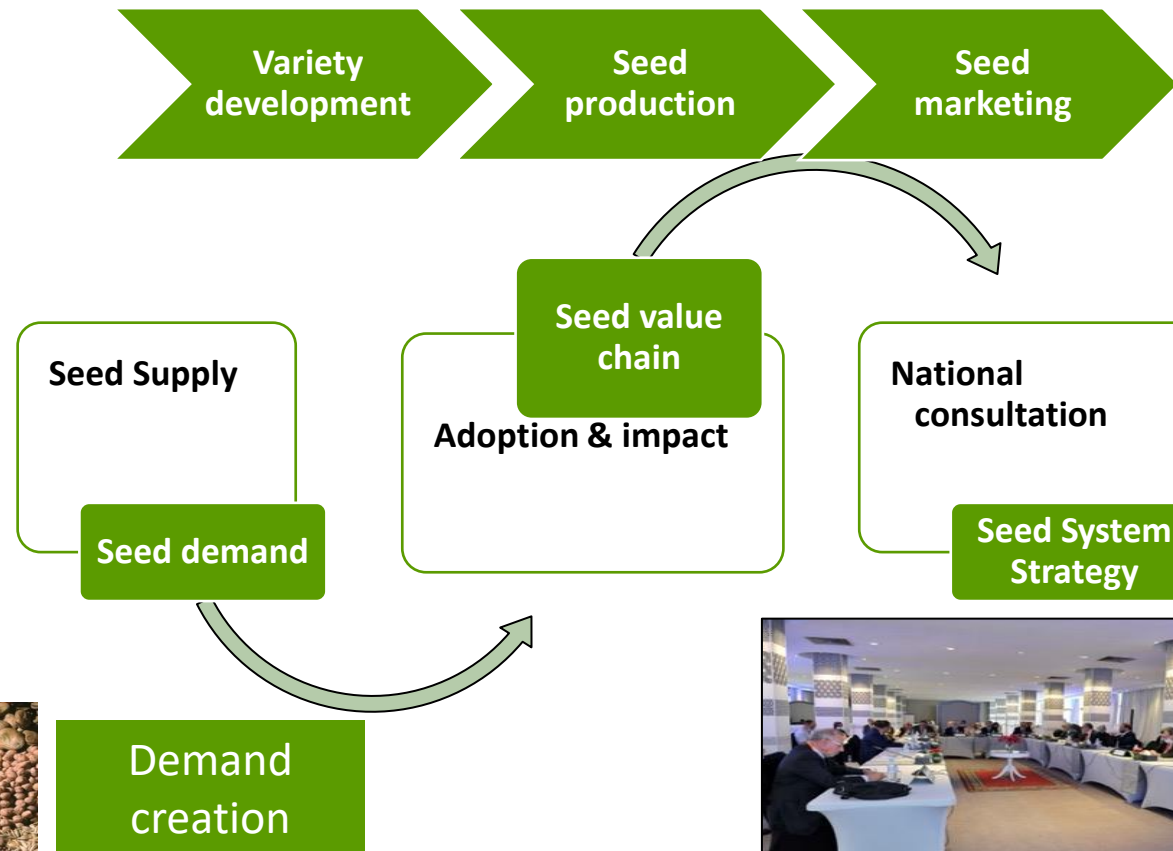
Task 2: Inclusive seed systems for delivery of genetic innovations

Context specific seed sector development considering diversity in agroecology, farming systems, crops, farmers, etc

Challenges:

Low varietal/seed replacement rates limited farmers' access and benefits from new genetic innovations

- Awareness and demand creation for commercialization of new genetic innovations
- Sustainable EGS production models
- Analysis of seed value chain, adoption and impacts to identify systemic constraints and seek solutions
- Technical and economic feasibility of alternative seed systems for less commercial crops



Cognizant of complexity and diversity of CWANA:

- Recognize/value the roles of formal, intermediate & informal sectors and cherishes diversity of pathways where seed of different crops is produced, marketed/ exchanged, and used by farmers
- Value chain approach from variety development and release to seed production, commercialization and farmers' seed use promoting entrepreneurship

Informal seed production and delivery systems for landraces strengthened

Task 2: Inclusive seed systems for delivery of genetic innovations

Context specific seed sector development considering diversity in agroecology, farming systems, crops, farmers, etc

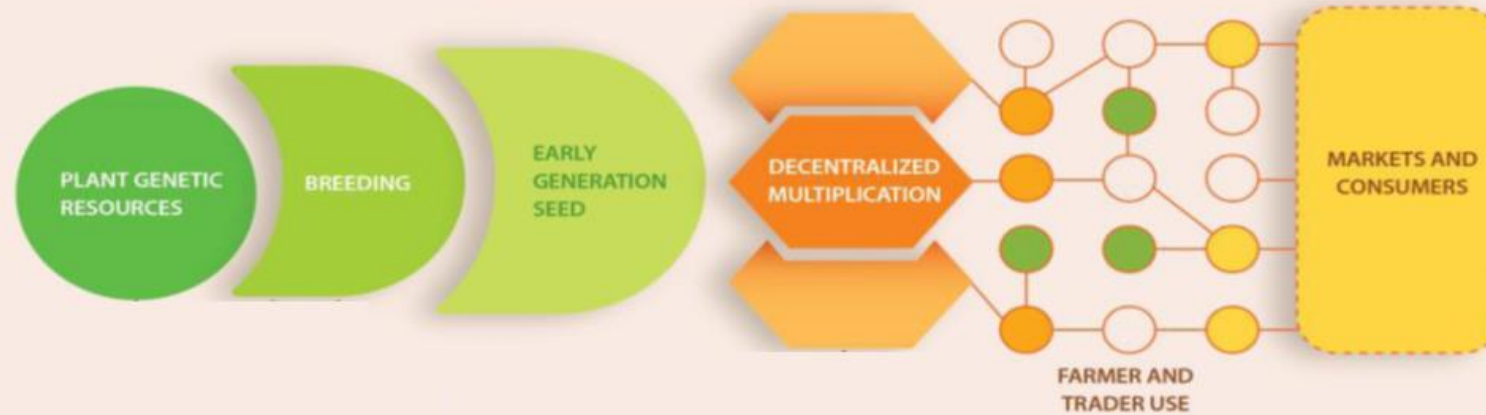


Based on priority crops from Task 1:

1. Identify recently released (2020-22) varieties or near release (2023) who can meet the TPP selected for market segments
2. Demonstrate in large plots (minimum of 100 m²) using full production packages
3. Organize field days for stakeholders to create awareness and demand
4. Collect production costs and partial rate of return analysis
5. Prepare plans for production early generation seed (licensing, etc.)

Participatory process for local seed business for less commercial crops – POTATO [AND SWEETPOTATO]

Seed value chain



- Who are the specific stakeholders of a seed system?
- What variety and seed characteristics do farmers appreciate and why?
- How is a new variety spreading from farmer to farmer?
- Where do farmers get seed when they do not use their own?
- What type of quality assurance is cost effective to increase access, availability, and quality of planting material?

Participatory process for local seed business for less commercial crops – POTATO [AND SWEETPOTATO]



Replicable,
open-source,
and backed by science.



- ✓ Description sheet
- ✓ User guide
- ✓ Peer-reviewed publication
- ✓ Technical support available

<https://tools4seedsystems.org/>

Multi-stakeholder framework



Stakeholder	Availability/ supply	Accessibility			Quality	
		Delivery channel features	Affordability/ profitability issues	Info to create awareness & demand	Variety (incl. biodiversity)	Health, genetic purity, physiological age, & physical quality ¹
Policy makers						
National research						
International research						
Traders (local markets)						
Specialized seed producers						
Farmer organizations						
NGOs & national extension						
Private food sector						
Seed users						

Based on the seed security framework by [Remington et al. 2002](#) and the seed system security assessment ([Sperling 2008](#); [McGuire and Sperling 2016](#))

Multi-stakeholder framework - Documentation

<https://tools4seedsystems.org/tools/multi-stakeholder-framework/>



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Multi-stakeholder framework - Process

1. **Purpose:** Identify stakeholders, coordination breakdowns, bottlenecks.
Rapid assessment of seed availability, access, and quality
2. **Steps**
 - a) Context analysis and literature review
 - b) Identify stakeholders
 - c) Define key questions
 - d) Field visits, focus group discussions, interviews
 - e) Stakeholder workshop
3. **Time:** 2 to 3 months
4. **Number of people:** 1-3 people to collect and analyze information.
5. **Equipment:** internet, vehicle, location and stationery for workshops and focus group discussions
6. **Expertise:** biophysical and social science, including gender expertise

Selection of 1-2 potato [and sweetpotato] varieties for local seed business



POTATO:

- Local variety 1:
- Local variety 2:

SWEETPOTATO:

- Local variety 1:
- Local variety 2:

TO BE DEFINED AS PART OF THE PREVIOUS EXERCISE: MULTI-STAKEHOLDER FRAMEWORK



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THANK YOU!