

# Developing Improved Vegetable Varieties in Sri Lanka and Looking into Seed Systems to Enhance Farmer Access to High-quality Seeds of Successful Varieties

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Research and development to  
realize the potential of  
vegetables for healthier lives  
and more resilient livelihoods



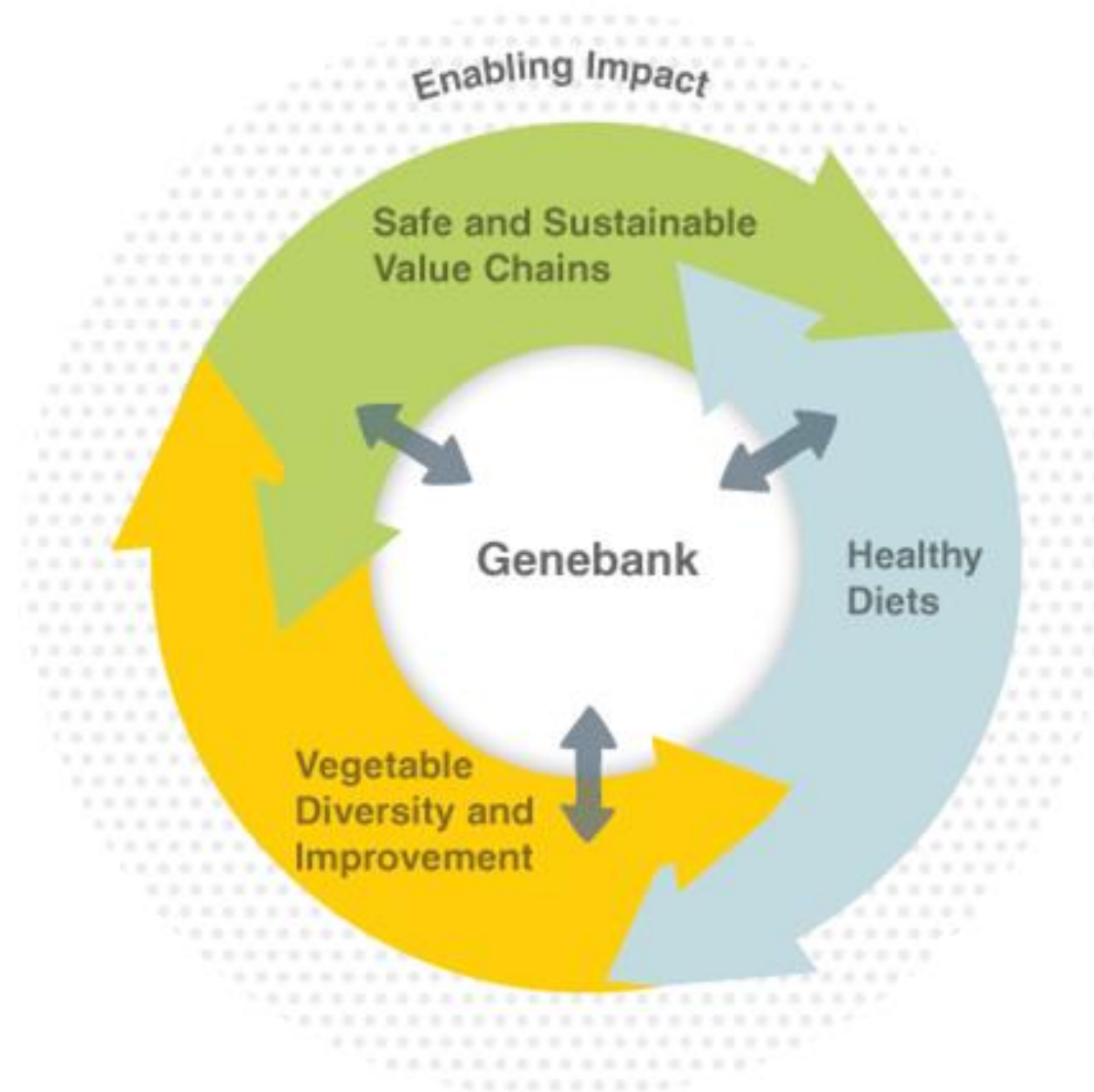
Vegetable  
Diversity



Trait Diversity



High Performance  
Vegetables





# WP2 - Biodiversity and Genetic Improvement

Year-round supply of affordable vegetables

- Increase vegetable intake
- Vegetables are affordable & accessible
- Vegetables are a source of income along the value chain



*10,000 farmers adopt improved climate-resilient vegetable cultivars*



# WP2 - Biodiversity and Genetic Improvement

*Collect, conserve and use vegetable biodiversity*



**Vegetable Biodiversity**

*Breed improved vegetable varieties*



**Crop Improvement**

*Release improved varieties and bring them to farmers*



**Seed Systems**



# Biodiversity

## Collect and conserve vegetable landraces

(Benin, Tanzania, Sri Lanka)

- 2,465 accessions collected
- Okra, pepper, tomato, traditional vegetables (*Vernonia amygdalina*, *Corchorus olitorius*, *Ocimum gratissimum*)

## Characterize biodiverse germplasm

- Disease resistance
- Abiotic stress tolerance
- Farmer- and consumer-preference

## Create awareness of the importance of biodiversity conservation





# Genetic Improvement

## Global and traditional vegetables

Target Product Profiles



Multi-disease resistant, high-yielding,  
nutritious breeding lines



Adaptation Trials  
Farmer- assisted  
selection



## DUS Trial Variety Release





# Trait Development – Sri Lanka

Number of Lines	Evaluation	25 Total lines
Period of evaluation	Evaluation 1: October 2023 to March 2024	12 lines
	Evaluation 2: May 2024 to October 2024	13 lines
Data recording	As per IPGRI descriptor	

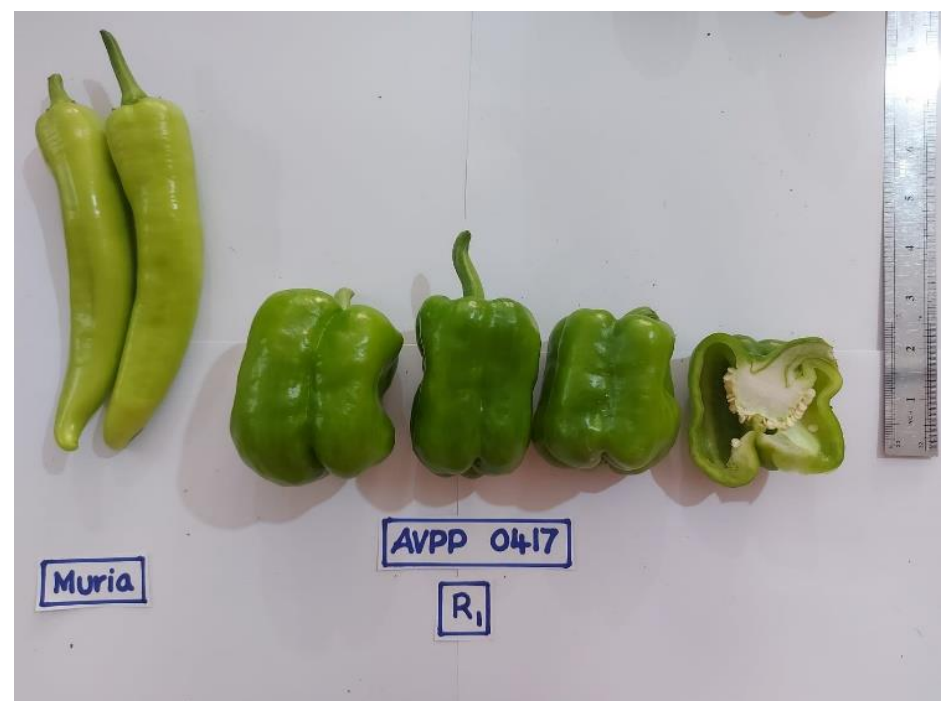
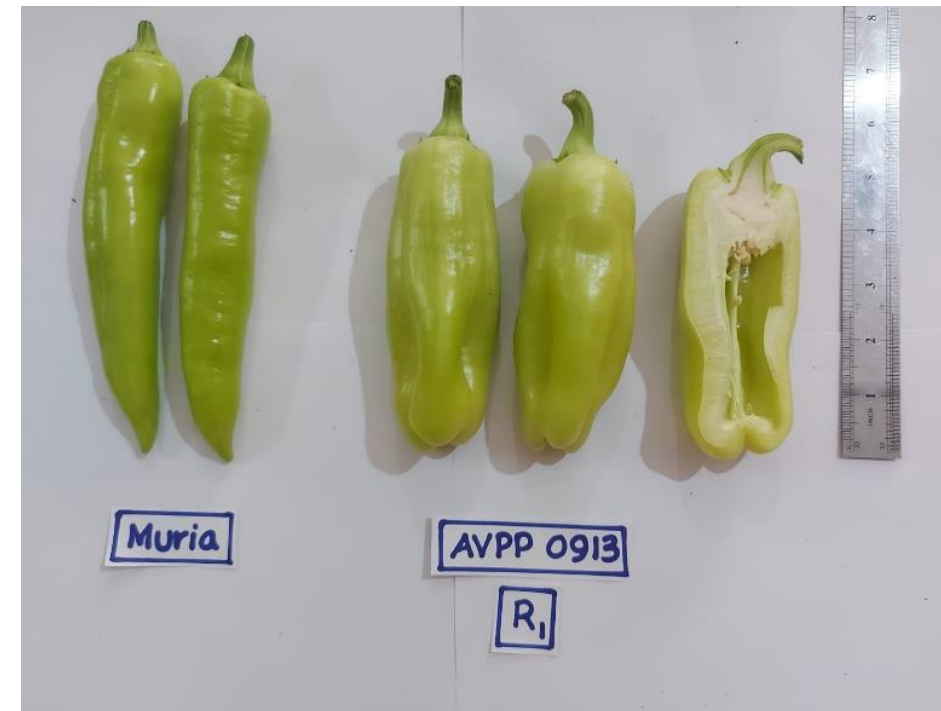
Line No	Average Per fruit wt (g)	Yield per plant (kg)	DI% to <i>Ralstonia solanacearum</i> Biovar III
AVTO 2129	30.0	1.05	10 (R)
AVTO 2317	94.6	3.31	10 (R)
AVTO 2003	46.2	1.38	15 (MR)
AVTO 2319	74.8	2.24	15(MR)
AVTO 2127	36.0	0.90	20 (MR)



	Line No
1	AVTO 1914
2	AVTO 2006
3	AVTO 2008
4	AVTO 2027
5	AVTO 2129



# Capsicum evaluation at RARDC Bandarawela



- These lines have been selected out of 11 pepper lines based on yield, fruit shape and color
- To utilize in future breeding programs after multi location testing



# Variety Development

## Distinct – Uniform – Stable

2 seasons and key locations

	Registration
<b>Benin</b> (35 varieties):	11 tomato 7 chilli 4 habanero 4 okra 9 amaranth
<i>accomplished</i>	
<b>Tanzania</b> (20 varieties)	6 tomato 5 chilli 5 sweet pepper 4 habanero
<i>ongoing</i>	
<b>Sri Lanka</b> (1 hybrid)	1 chili hybrid
<i>accomplished</i>	

Informal / formal  
seed system

Formal seed  
system





# Variety Development – Sri Lanka



## Adaptation trails

WorldVeg lines, F1 hybrids, local checks

Low-country:

- Wet zone
- Dry zone (2 sites)



## Field day

Farmer- appraisal of selected materials



## Cultivar selection for registration and



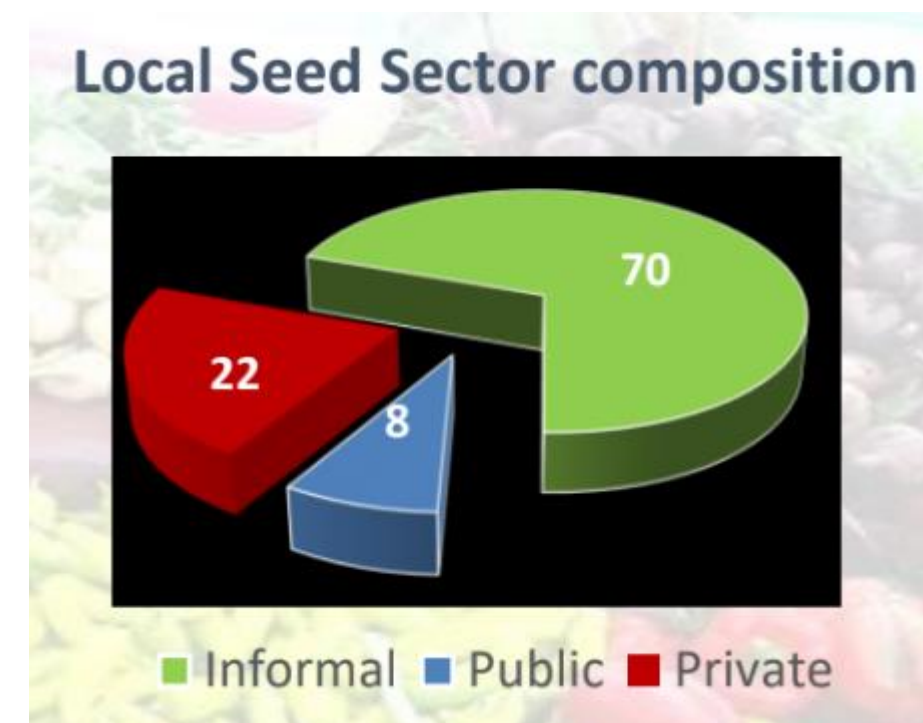
## Bulk seed production





# Seed Systems – how do improved varieties reach farmers?

- Seed is available when farmers need it
- Choice of varieties adapted to environment, production system and market requirements
- Seed quality
- Counterfeit seed
- Access to breeder seed
- Seed policies



- *Own saved seed*
- *Seed exchange among farmers*
- *Farmer seed bank*
- *Seed production cooperative*
- *Seed companies*



# Seed Systems – Benin



## Seed Systems Roadmap

### Research and vegetable varietal improvement

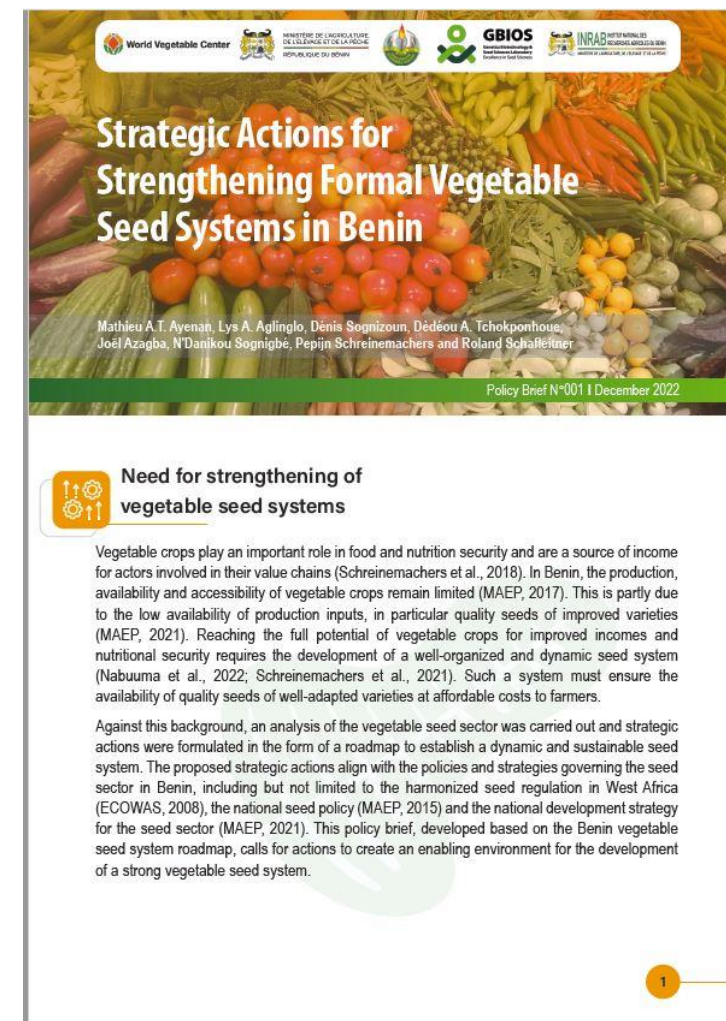
- Strengthen vegetable research and breeding capacity
- Support public private partnerships in variety development, testing, registration and scaling

### Pre-basic and basic seed

- Forecast seed requirement to plan of early-generation seed production
- Decentralize early-generation seed production
- Strengthen the capacity of the public and private seed sector

### Seed Sector regulation and governance

- Funding mechanism for Natl Plant Seed Committee and seed certification
- Attract foreign investment (conducive environment for variety registration, UPOV, ease of business) to develop Benin into a vegetable seed hub for ECOWAS
- Advocate to expand the number of vegetable crops included in the regional catalog
- Define and agree on a pest lists to ease safe seed movement between countries



### Variety registration

- Streamline variety release and registration
- Online platform to update the national variety catalog

### Seed quality assurance

- Train more seed inspectors in vegetable seed certification
- Establish more seed quality testing laboratories
- Introduce Quality Declared Seed (QDS), minimum quality standards and truth-in-labeling as alternative seed certification for vegetables
- Allow commercial seed production of ATV using alternative quality assurance mechanisms

### Seed marketing

- Locally produced certified seed through seed fairs, demonstration trials, seed kits...
- Implement anti-fraud measures to counter the distribution of fake seed.



You are invited to the Workshop on

# Seeds for Sustainability

## Rethinking Sri Lanka's Vegetable Seed System



**December 03, 2024**  
**From 8.15 a.m. to 4.45 p.m.**

**At the Earls' Regent Hotel, Kandy**



World Vegetable Center



International Water  
Management Institute



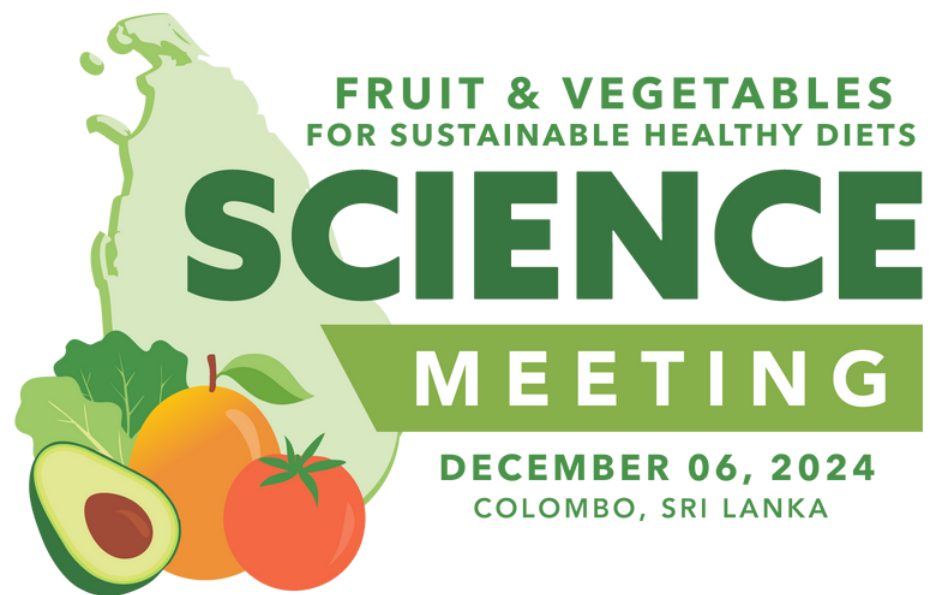


# Seed Systems Sri Lanka



	Constraint	Recommendation
Research	<ul style="list-style-type: none"> <li>• No breeders on the job marker</li> <li>• Lack of prioritization</li> <li>• No MEL</li> </ul>	<ul style="list-style-type: none"> <li>• Investment in human capacity</li> <li>• Better coordination bw public and private sectors</li> </ul>
Regulation	<ul style="list-style-type: none"> <li>• Outdated regulation</li> <li>• Insufficient IP protection</li> <li>• Lengthy variety release</li> </ul>	<ul style="list-style-type: none"> <li>• Update to international standards (Seed act, Plant protection)</li> <li>• Seed quality assurance for imported varieties</li> </ul>
Extension	<ul style="list-style-type: none"> <li>• Lack of involvement</li> <li>• Demotivation</li> </ul>	<ul style="list-style-type: none"> <li>• Revive the system of before 2000</li> </ul>
Seed multiplication	<ul style="list-style-type: none"> <li>• Poor purity maintenance</li> <li>• Affected by weather</li> <li>• Basic seed not available in time</li> </ul>	<ul style="list-style-type: none"> <li>• PPPs to plan, coordinate and multiply</li> </ul>
Distribution and retail	<ul style="list-style-type: none"> <li>• Poor storage</li> <li>• Smuggled seed</li> </ul>	<ul style="list-style-type: none"> <li>• Online seed market</li> <li>• PPP</li> <li>• Cold storage infrastructure</li> </ul>
Import	<ul style="list-style-type: none"> <li>• Non-technical barriers</li> <li>• Violations of regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Liberalize policies</li> <li>• Timely testing</li> </ul>





# Thank You



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