

# EVALUATION OF STRESS TOLERANT ORPHAN LEGUMES (STOL) FOR DRYLAND FARMING SYSTEMS ACROSS SUB-SAHARAN AFRICA AND INDIA

ICAR-NBPGR, New Delhi



*"Agricultural crop improvement for the relief of poverty, with a focus on legumes."*



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ICAR collaborative programme :

*"Evaluation of Stress Tolerant Orphan Legumes (STOL) for use in dryland farming systems across sub-Saharan Africa and India - Promoting India-Africa Framework for Strategic Cooperation"*

in partnership with the Kirkhouse Trust (KT) registered in Scotland with its administrative office at Oxfordshire, UK.

The Project MoU was signed on 17 May 2018

*Project Duration : May 2018-April 2023*

Extended for two years: May 2023-May 2025



Under this an agreement between KT and ICAR, **and ten African countries (Burkina Faso, Ghana, Kenya, Mali, Namibia, Niger, Nigeria, Senegal, Tanzania and Uganda)** was signed to collaborate on activities, namely to:

1. Identify promising varieties of each STOL species;
2. Multiply and exchange seed to partners for evaluation;
3. Carry out farmer field trials of the best performing varieties and crops.;
4. Capacity building of scientists, extension workers and farmers in the management of target crops; and
5. Strengthen and establish local seed systems.
6. Initially, Project would run for 5 years with cash funding support from KT while the partners will provide in-kind support.

India included moth bean, mung bean, horsegram , dolichos, Indian cowpea and pigeonpea;

Whereas African partners agreed to share 50 varieties of African cowpea , bambara groundnut , tepary bean and marama bean



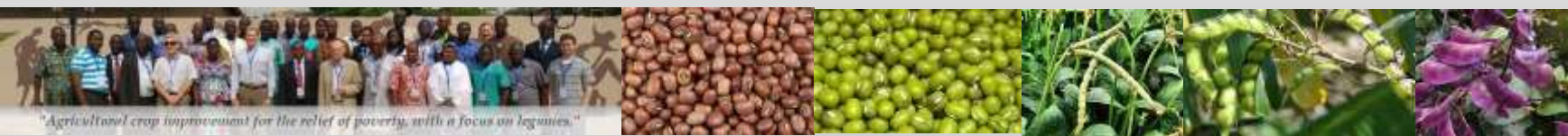
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- Project inception meeting - Abuja, Nigeria on 1 November 2018.
- **50 accessions** each of **mothbean, mungbean, horsegram** and **dolichos** and 11 accessions of **cowpea** were identified by Indian partners and seed was multiplied for exchange.
- All export of germplasm was done following guidelines of the DARE approved Material Transfer Agreement ( DARE approved Bilateral MTA).
- African partners also identified promising accessions of cowpea (44 accessions) and bambara groundnut (41 accessions)
- Seeds sent by six countries (Burkina Faso, Ghana, Mali, Niger, Nigeria, Uganda, Namibia and Tanzania). This germplasm was grown under plant quarantine, before their performance tested out under field condition in Western Rajasthan.



# Import

Crop	No.	Country
Cowpea	4	Ghana
	5	Mali
	14	Niger
	10	Uganda
	10	Ghana
Bambara groundnut	12	Nigeria
	10	Mali
	16	Niger
	6	Tanzania
	8	Uganda
Tepary bean	6	Nigeria
	17	USA
	10	Burkina Faso
Marama bean	19	Namibia



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# Bambara groundnut

Originally from West Africa, a nutrient-dense crop is also complete food due to its balanced macronutrient composition.

- Grows well in semi-arid climate and kharif season
- An important PGR (drought-tolerant trait) remains underutilized
- Its introduction and establishment will result in making this crop available as a new source for quality plant proteins, especially in climate change-ready agriculture where other protein-rich crops may not perform well



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## New Introduction- Marama bean (*Tylosema esculentum*)

*Promising accs. for drought tolerant, high nutritional value (high protein content) and diverse accessions were introduced from Namibia*

One acc. in 2020 and 18 accs. in August 2023

Evaluated in partnership with Agriculture University, Jodhpur



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## Export (Six stress tolerant legume crops)

Crop	No.	Countries (9)
Dolichos	50	Burkina Faso, Ghana, Kenya, Mali, Namibia, Niger, Nigeria, Tanzania, Uganda
Mungbean	50	
Horsegram	50	
Cowpea	9	
Pigeonpea	2	
Mothbean	50	
6 CROPS	(211 sample to each country) Total 1899 samples	

<b>Dolichos</b>	<b>5 accs. each (Total 45 samples)</b>	<b>Burkina Faso, Ghana, Kenya, Mali, Namibia, Niger, Nigeria, Senegal, Uganda</b>
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Burkina Faso



Ghana



Mali



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## Status of Export under the Project (2023-25)

Crop	No.	Country
Moth bean #	13x 4 (52)	Senegal
Mungbean*	13 x5 (65)	Senegal
Mothbean	4 x 5 (20)	Burkina Faso
Mungbean	5 X 5 (25)	Burkina Faso
Cowpea	45	Namibia

### \*Mungbean varieties

MH421,  
 MH1142 (MH2-14),  
 Virat (IPM2-14),  
 GM 7(Ganga),  
 GM 4 (GAM 5)

### #Mothbean varieties

RMO 435,  
 RMO 257,  
 RMO 25,  
 RMO 2251



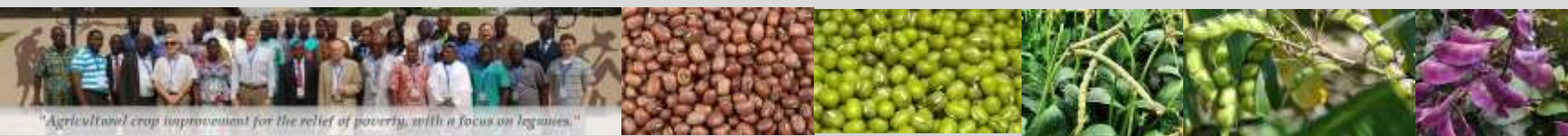
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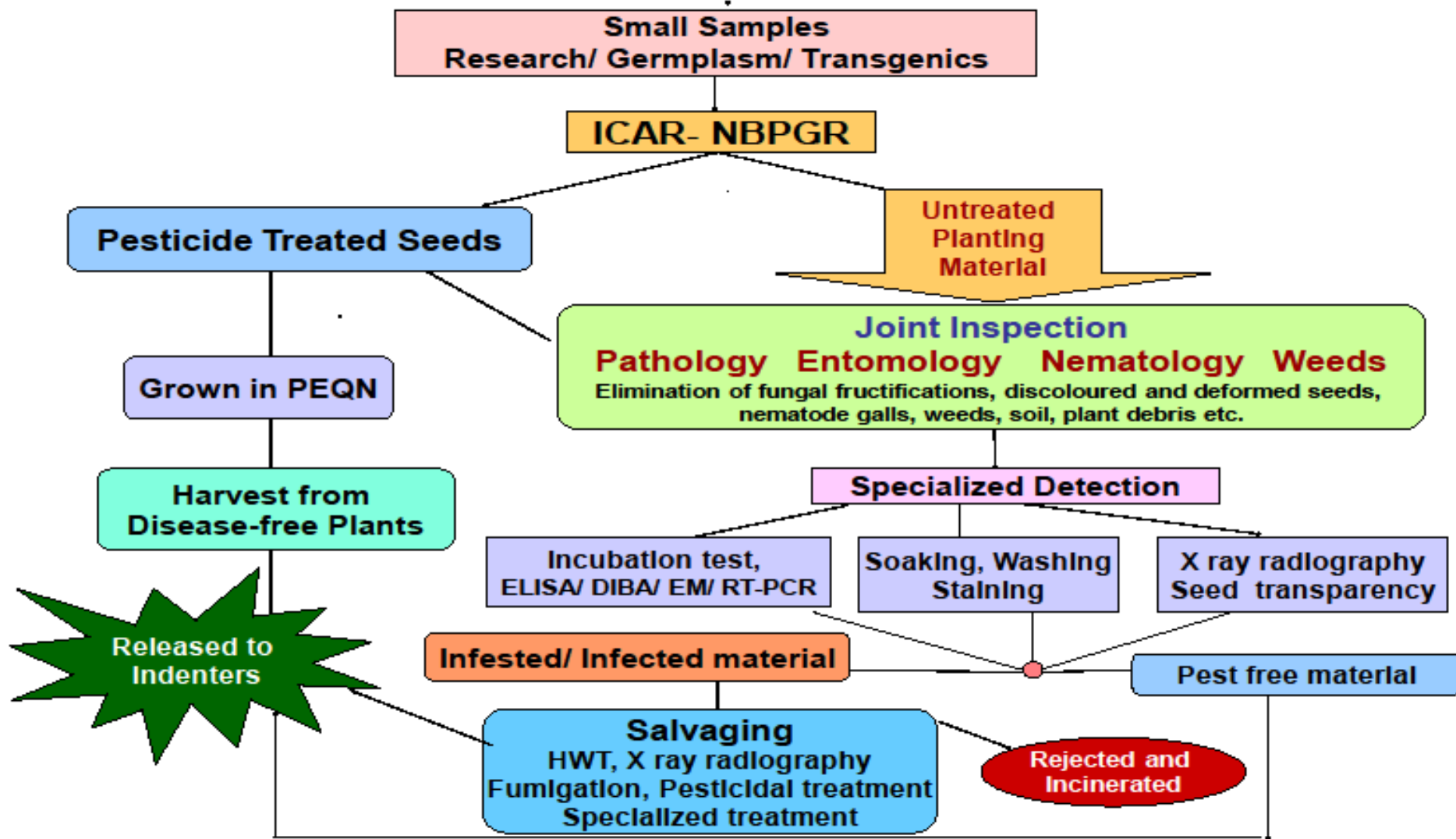
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- Most of the varieties of mung bean and moth bean performed well and were preferred by many African farmers
- Most of the late maturing varieties of horse gram were rated as good source of green fodder.
- Many Dolichos varieties did not flower, being photoperiod sensitive



# Quarantine Processing of Imported Seed/ Planting Material



## Publications:

Tripathi K, Pamarthi R K Semwal, D P Tyagi V, Brahmi P, & Pandey A (2023). Efforts for the Revival of *Vigna subterranea* (L.) Verdc. (Bambara groundnut) through Germplasm Introduction in India. *Indian J. Plant Genet. Res.*, 36(01), 116–121.

Parameswari B, Bhaskar Bajar, Karthikaiselvi, N Sivaraj, P Pranusha, P Brahmi, S K Mangrauthia, L Saravanan, C Chalam and K Anitha. Interception of *Bean common mosaic virus* in bambara groundnut accessions imported from Ghana through RT-PCR (2022) . *Indian J. Plant Prot.* 50 (2&3): 80-85.





**Thank You**



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