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The International Treaty
ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE

**Views, Experiences and Best Practices as an example of possible options for
the national implementation of Article 9 of the International Treaty**

Note by the Secretary

At its [second meeting](#) of the Ad hoc Technical Expert Group on Farmers' Rights (AHTEG), the Expert Group agreed on a revised version of the [template](#) for collecting information on examples of national measures, best practices and lessons learned from the realization of Farmers' Rights

This document presents the updated information on best practices and measures of implementing Article 9 of the International Treaty submitted by Uganda on 18 May 2021.

The submission is presented in the form and language in which it was received.



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FOR FOOD AND AGRICULTURE

Template for submission of

Measures, Best Practices and Lessons Learned from the Realization of Farmers' Rights as set out in Article 9 of the International Treaty

Basic information

- Title of measure/practice

Strengthening Seed Delivery System for Dryland Cereals and Legumes in Drought-prone Areas of Uganda

Also code named "The Cluster Granary Seed (CGS) Project"

- Date of submission

Initially submitted on 12th July 2019, and submitted a revised copy on 18th May 2021.

- Name(s) of country/countries in which the measure/practice is taking place

Uganda

- Responsible institution/organization (name, address, website (if applicable), e-mail address, telephone number(s) and contact person)

National Semi-Arid Resources Research Institute (NaSARRI).

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- Type of institution/organization (categories)

The National Semi Arid Resources Research Institute (NaSARRI), a Public Agricultural Research Institute, under, the National Agricultural Research Organisation (NARO) – A Government Institution.

- Collaborating/supporting institutions/organizations/actors, if applicable (name, address, website (if applicable), e-mail address, telephone number(s))

1. National Plant Genetic Resource Centre, <http://www.pgrcuganda.go.ug>, Entebbe Uganda
2. World Vision Uganda
3. IITA,



**Food and Agriculture
Organization of the
United Nations**



The International Treaty
**ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

4. ICRISAT, www.icrisat.org
5. CIAT, www.ciat.cgiar.org
6. District Local Governments of Serere, Kumi, Amuria and Kitgum districts in Uganda

Description of the examples

Mandatory information:¹

- Short summary to be put in the inventory (max. 200 words) including:
 - Implementing entity and partners
 - Start year
 - Objective(s)
 - Summary of core components
 - Key outcomes
 - Lessons learned (if applicable)

Project implemented in Amuria, Kumi and Kitgum districts of Uganda, led by the National Semi-Arid Resources Research Institute of NARO, in partnership with World Vision Uganda, the National Plant Genetic Resource Centre and farmer groups. Started 2016 with the goal to contribute to enhancing food security and climate-change adaptation in drought-prone areas by strengthening seed systems of target crops, including sorghum, finger-millet, pearl-millet, cowpea, pigeon-pea, and groundnut. Specific objectives were (1) assemble the diverse local and improved genetic resources of target crops; (2) establish an effective and sustainable seed delivery model for increasing access to quality seeds and (3) build the capacity of farming communities to produce and conserve such seed. Over 300 local and improved genetic resources of the target crops were assembled and characterized through farmer-led demonstrations, and variety selection. Thirty farmer groups are now producing and conserving quality seeds for their communities. A ‘cluster granary’ seed delivery model was developed and operationalized by 30 farmer groups. Overall, 600 farmers have directly benefited; indirectly, over 1500 households have benefited through seed sharing, training sessions, voluntary visits to demonstration sites, National Agricultural shows, World Food Day Celebrations, ‘Plant Clinics’, close interaction with scientists, and participating in other agriculture-related events.

(200 words)

- Brief history (including starting year), as appropriate

Intervention began over 5 years ago to address challenges faced by resource-poor smallholder farmers in drought-prone areas of Uganda. Farmers mostly cultivate indigenous seed for sorghum, pearl and finger millets, cowpea, groundnuts, and pigeonpea for food security and income. The productivity of these crops was very low due to unreliable access to quality seed and less adapted varieties driven by ineffective seed delivery systems (MAAIF, 2010). Also, effects of drought, floods, pests, and decreasing soil fertility worsened the challenges. Specifically, a seed system designed to easily avail quality and affordable seed to resource poor farmers was non-existent, though, very limited sharing

¹ This mandatory information is required in order for the measure/practice to be included in the Inventory.



and exchange of seed occurred within communities. No crop genetic and seed conservation efforts existed at the time in these communities. Thus, the need to develop a seed delivery model that would ease access to quality seed by the resource poor farmers in the country was important. Empowering farming communities with skills and knowledge to produce and conserve seed adaptable to effects of climate change strengthened their sustainable use. A deliberate effort to conserve diverse and adaptable genetic materials by involving farming communities, the National Public Agricultural Research Institutes, and other Seed Banks would strengthen the seed delivery system.

- Core components of the measure/practice (max 200 words)

Understanding farming community knowledge and perception

A baseline study was conducted using household interviews targeting 300 households and 3 focus group discussions. Information on farmer perceptions, local knowledge, attitudes towards climate change, practices mitigating effects of climate change, using diverse adaptable plant genetic resources, rights, practices and traditions pertaining access to quality seed were all obtained, through participatory variety selection and demonstration gardens.

Germplasm collection and characterization

Diverse genetic resources of target crops were collected from local markets and farmers' fields with prior informed consent, in selected semi-arid agro-ecological zones. Some germplasm were obtained from research institutes and CGIAR centres guided by Standard Material Transfer Agreements. Passport data were according to the descriptors developed by IBPGR/FAO. Germplasm characterization and evaluation conducted on-station, and later shared promising germplasm with participating farmers.

Establishment of community seed delivery model

A Cluster Granary Seed Delivery model was developed and adopted. Farmers were mobilized into solidarity groups of 10 households to form small clusters (SCs), and 10 SCs forming large clusters in each of the 3 districts, structures through which they would easily share or access quality and affordable seed.

Capacity building for quality seed production

Farmers were trained on quality seed production and conservation through farmer-led method-results demonstrations gardens at project sites. Farmers were also empowered to select crop germplasm of their choice through participatory variety selection approach. Trainers of trainers were also trained in quality seed production, postharvest handling, safe use and handling of pesticides, record and book keeping. Community seed granaries (stores) were constructed to facilitate seed conservation.

- Description of the context and the history of the measure/practice is taking place (political, legal and economic framework conditions for the measure/practice) (max 200 words)

According to UBOS (2010) in Uganda National Seed Policy 2014, over 80% of the country's 5 million households are dependent on agriculture. Households are segmented as commercial farmers (5%), semi-commercial farmers (27%), and smallholder farmers (68%) where women play a significant role. The latter category dominates the sector with an average land holding size of 1.1ha practicing low input / output farming systems. Though Uganda achieved economic growth averaging



about 6% per annum in the past two decades, the agricultural sector was declining because most growth achieved was attributed to increase in cultivated area and not improved resource productivity. There was minimal use of external inputs like improved seed, fertilisers estimated at 1kg/ha/year (MAAIF DSIP-FIP, 2012) compared to 35 and 13kg/ha/year in Kenya and Tanzania, respectively, limiting transformation of current agriculture into commercial agriculture. Only 13% of planted area is planted with seed from seed companies dominated by maize seed (25%). Implying, the seed sub-sector was still under developed and majority of the farmers accessed seed through an informal system that needed strengthening. This was further confounded by the limited efforts towards resilience adaptation as a result of the rapid effects of climate change.

- To which provision(s) of Article 9 of the International Treaty does this measure relate

- Art. 9.1 ×
- Art. 9.2a ×
- Art. 9.2b ×
- Art. 9.2c ×
- Art. 9.3 ×

Other information, if applicable

- Please indicate which category of the Inventory is most relevant for the proposed measure, and which other categories are also relevant (if any):

No.	Category	Most relevant ²	Also relevant ³
1	Recognition of local and indigenous communities', farmers' contributions to conservation and sustainable use of PGRFA, such as awards and recognition of custodian/guardian farmers		X
2	Financial contributions to support farmers conservation and sustainable use of PGRFA such as contributions to benefit-sharing funds		X
3	Approaches to encourage income-generating activities to support farmers' conservation and sustainable use of PGRFA	X	
4	Catalogues, registries and other forms of documentation of PGRFA and protection of traditional knowledge		X
5	In-situ/on-farm conservation and management of PGRFA, such as social and cultural measures, community biodiversity management and conservation sites	X	

² Please select only one category that is most relevant, under which the measure will be listed.

³ Please select one or several categories that may also be relevant (if applicable).



6	Facilitation of farmers' access to a diversity of PGRFA through community seed banks ⁴ , seed networks and other measures improving farmers' choices of a wider diversity of PGRFA.	X	
7	Participatory approaches to research on PGRFA, including characterization and evaluation, participatory plant breeding and variety selection	X	
8	Farmers' participation in decision-making at local, national and sub-regional, regional and international levels		X
9	Training, capacity development and public awareness creation	X	
10	Legal measures for the implementation of Farmers' Rights, such as legislative measures related to PGRFA.		X
11	Other measures / practices		X

- In case you selected 'other measures', would you like to suggest a description of this measure, e.g. as a possible new category?

- Gender considerations to enable ladies to be in charge of seed production, conservation and diversity in households and other levels, since they are always food producers in the rural settings of Uganda.
- Farmers aware of the availability of the Genetically Modified genetic resources (if approved for use) in crop production, their likely effects, and dangers likely to arise from their use.

- Objective(s)

The overall objective is to contribute to enhanced food security and adaption to climate change in drought-prone areas of Uganda through developing a seed delivery model that will improve access to quality seed, and empower farming communities to produce and conserve seed adaptable to adverse conditions.

Specific objectives;

- Assemble the diverse local and improved genetic resources of the target crops
- Establish an effective and sustainable seed delivery model for increasing access to quality seeds, and,
- Build the capacity of farming communities to produce and conserve quality seed.

- Target group(s) and numbers of involved and affected farmers⁵

- Smallholder farmers in the target areas trained (1,466): Women (614) and Youth (200)
- Field extension officers (3): Women (1) and Youth (3)
- Scientists (9): Women (2) and Youth (0)

⁴ Including seed houses.

⁵ Any classification, e.g. of the types of farmer addressed, may be country-specific.



Food and Agriculture
Organization of the
United Nations



The International Treaty
ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE

d) Input suppliers (3): Seed companies (4), stockists (6), etc.

- Location(s) and geographical outreach

The project was implemented in three districts covering three agro-ecological zones; Amuria (Usuk sandy farm grasslands), Kitgum (Northern grass-farm-bush transition) and Kumi (Eastern Lake Kyoga basin) (Wortmann and Eledu, 1999).

- Resources used for implementation of the measure/practice

- a) Funds (EU through the ITPGRFA)
- b) Plant genetic materials: collections from farmers, released crop varieties from Government, introductions from other research institutes/CGIARs and breeding lines from the Research station.
- c) Land: NaSARRI land, Farmer's land and land offered by the Local Government Authorities in target districts
- d) Agro-inputs: Procured through the Cluster Granary Seed Project funded by the EU.
- e) Labour provided by participating farmers
- f) Technical knowledge provided by different experts in agriculture, research Scientists and Engineers.
- g) Vehicles: Contribution from the Research Institute (NaSARRI-NARO).
- h) Laboratories and other infrastructure: Contribution from the Research Institute (NaSARRI-NARO).

- How has the measure/practice affected the conservation and sustainable use of plant genetic resources for food and agriculture?

The practice has introduced a diversity of plant genetic resources into communities, especially improved varieties into the target communities, it has eased community access to quality seeds, has provided alternatives for conservation of genetic materials ie. National Gene Banks, Research *In Situ* seed Conservation, and Community Seed Banks. Thus, access to quality seed by the rural poor farmers was made easy. Increased crop production and productivity of the target crops was achieved, and resulted into the overall agricultural sector growth, ensuring food security and nutrition for better livelihoods.

- Please describe the achievements of the measure/ practice so far (including quantification) (max 200 words)

Information on farmer's perceptions, local knowledge and attitudes towards climate change, practices mitigating effects of climate change, use of plant genetic resources, farmer's rights, practices related to access to quality seed, was obtained from a baseline study. 1,137 germplasm was assembled and characterised; 110 cowpea accessions characterized for growth habit, drought tolerance, maturity, and yield; 120 sorghum, 25 pearl millet, and 20 finger millet accessions characterized for maturity, pest resistance, and yield; 738 pigeonpea accessions characterized for growth habit, flower / pod colour, yield, and maturity; and 124 groundnuts accessions characterized for maturity period, oil content, pest



**Food and Agriculture
Organization of the
United Nations**



The International Treaty
**ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

resistance, and confectionery. 154 accessions conserved with NPGRC, Entebbe. 90 Drought tolerant and 65 early maturing genotypes were identified for adaptation. 725 farmers (F 338: M 387) were mobilised into 30 groups, each having 10 households as a small cluster and 10 small clusters form a large cluster. These constitute a Cluster Granary Seed Delivery model operationalized in communities. Land for construction of 18 seed granaries was identified and secured. A total of 1,466 farmers (614 F: 1,044 M) trained on quality seed production and conservation, using 153 demonstration gardens. In total, farmers were given foundation seed amounting to 3,366.65Kgs, for multiplication.

- Other national level instruments that are linked to the measure/practice.

Organisations such as Bioversity International a CGIAR, and the Integrated Seed Sector Development (ISSD), a local seed business organisation supported rural farmers to produce, access, and afford quality seed. Also, the project farmers participated in genetic resource exposure events such as the National Agricultural trade Shows, World Food Days, Plant clinics etc, for purposes of visibility and knowledge sharing.

- Are you aware of any other international agreements or programs that are relevant for this measure/practice?

Yes. NaSARRI, partnered with a Kirkhouse Trust funded project ICAR-NBPGR to promote production of Stress Tolerant Orphan Legume crops to mitigate effects of climate change for improved food security and livelihoods of the rural poor. A bilateral Materials Transfer Agreement (MTA) was signed to facilitate sharing of these genetic materials as they are not included in the ITPGRFA *Annexure 1*.

- Other issues you wish to address, that have not yet been covered, to describe the measure/practice

The practice needs scaling up, out, and in, for greater impact. Demand for quality seed in the neighbouring farming communities outside the project area was high wanting to participate as direct beneficiaries.

Lessons learned

Describe lessons learned which may be relevant for others who wish to do the same or similar measures/practices (max 250 words).

- 1) Capacity of farmers to produce in diversity and conservation of quality seed was appreciated and built. Farmers realised the importance of multiplying seed and its deliberate conservation for future use.
- 2) Planting seasons vary within agro-ecological zones, but can as well be dictated by the indigenous tradition of the natives who by their ways believe and decide to grow crops once in a year. Apparently, farmers have appreciated the possibility of having to grow some crops such as the early maturing sorghum twice in a year if such seed is availed. This has been observed from project beneficiaries in Kitgum and Amuria districts.



**Food and Agriculture
Organization of the
United Nations**



The International Treaty
**ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

- 3) Improved crop varieties were more productive compared to most of the unimproved local crop varieties as observed by farmers from the method-results demonstration gardens, as well as their personal fields.
 - 4) The project changed farmer's mind-set of previously expecting free hand-outs from charity organisations and now, have embarked on producing quality seed, and deliberately saving it for own future use in times of shortage / scarcity.
 - 5) Capacity building through training of farmers improved their knowledge and skills. This was important in sharing knowledge and skills and was greatly appreciated; particularly the practice of planting small grain crops such as sorghum and millets in rows compared to broadcasting eased their effort in production. Demonstration results of row planting excited them because it made field operations such as weeding, spraying and harvesting easy, and gave relatively higher yields.
- What challenges encountered along the way (if applicable) (max 200 words)
 1. Erratic weather patterns were experienced by farmers eg, prolonged drought, less moisture etc, which affected planning and execution of some activities as well as affected the quality of germplasm collected for on station evaluation.
 2. The construction of the community seed granaries and handing them over to the users took un-necessarily long to the effect that the project lifetime expired before the ultimate beneficiaries got and utilised them to operationalize the Cluster Granary Seed Delivery model.
 3. The project ended before training them how to manage their community seed granaries.
 4. Disbursement of funds could at times delay to facilitate ease of implementation of activities and affected the timing of our work-plan.
 5. Limited means of transport at the Institute as well as project sites affected project operations.
 6. Frequent tractor break downs at the Institute affected timely field operations.
 7. Remuneration to project staff - Site Coordinators was relatively low, and morale to work was low.
 - What would you consider conditions for success, if others should seek to carry out such a measure or organize such an activity? (max 100 words)
 1. Engaging farmers right from the start and ensuring that they are involved in decision making whenever there is a need to engage them (participatory approaches)
 2. Working together with local government authorities to get their support
 3. Partnerships with local non-government organisations, Government Ministries (Agriculture, Works, environment, gender etc) eases work.
 4. Capacity building of farmers and other stakeholders in project implementation was important
 5. Timely availability of resources such as funding during implementation
 6. Food and Agriculture (FAO) to always expedite the implementation of some activities such as engaging the contractors on time to construct structures that the users would utilise while the project still runs, to avoid incomplete work.



Food and Agriculture
Organization of the
United Nations



The International Treaty
ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE

Further information

- Link(s) to further information about the measure/practice .
 1. National Plant Genetic Resource Centre, <http://www.pgrcuganda.go.ug>, Entebbe Uganda
 2. World Vision Uganda, wvi.org/uganda
 3. IITA,
 4. ICRISAT, www.icrisat.org
 5. CIAT, www.ciat.cgair.org
 6. Kirkhouse trust, www.kirkhoustrust.org
 7. Wortmann C.S and C.A Eledu (1999). Uganda's Agroecological Zones. A guide for Planners and Policy Makers. CIAT.