



Food and Agriculture
Organization of the
United Nations



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 the International Centre for Agricultural Research in the Dry Areas (ICARDA) on 23 July 2019.

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

Basic information

Title of measure/practice

Mungbean for more productive crop rotations in Tajikistan

Date of submission

July 23, 2019

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

Tajikistan

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

ICARDA

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Type of institution/organization (categories)

Treaty-based international organization; international research centre part of the CGIAR.

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

Dehkan-Farm Association named after "A. Gafurov",

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Mandatory information

Brief summary for the inventory

The Collaborative Research Project on Sustainable Soil Management to Enhance Agricultural Productivity in Central Asia (Phase II) started in 2018. It is carried out by the International Center for Agricultural Research in the Dry Areas (ICARDA) together with the International Food Policy Research Institute (IFPRI) and the Eurasian Center for Food Security, funded by the Russian Government. The objective is to introduce mungbean cultivation as a new practice to smallholder farmers in the Sughd region of Tajikistan to enhance soil fertility in current cotton-wheat-cotton or wheat-fallow crop rotations, as well as to generate additional income. Core component is the introduction of short-duration, heat- and drought-tolerant mungbean; 600 kg of elite seeds were provided by ICARDA. Farmers saved seed for their own use from their harvest and either shared or sold part of it to other farmers for sowing in 2019. This farmer-to-farmer

seed exchange and sale is expected to ensure broader impact in following years. Further project activities include building a network of on-farm demonstration sites and capacity development for farmers and seed-producers. The key to including an additional crop in the crop rotation lies in the smallholders' access to improved early-maturing wheat and mungbean varieties.

Brief history

In June 2018, soon after the harvest of the winter wheat crop, ICARDA began working with a group of local farmers in Sughd province of Tajikistan to pilot new early-maturing varieties of winter wheat and of mungbean. Including mungbean in the existing wheat-cotton crop rotation would both increase cropping intensity by 50 to 100 percent, leading to higher incomes, and improve soil health through nitrogen fixation, thus reducing the cost of fertilizer application.

Crop rotation	Yr1 (Nov – June)	Yr 1 (July to Oct)	Yr2 (Nov – Feb)	Yr 2 (March-Oct)	Cropping intensity
Wheat-Cotton	Wheat	Fallow	Fallow over winter	Cotton	2 crops in 2 years (100%)
Wheat-Mungbean-Cotton	Wheat	Mungbean	Fallow over winter	Cotton	3 crops in two years (150%)

Crop rotation	Yr1 (Nov – June)	Yr 1 (July to Oct)	Cropping intensity
Wheat-Wheat	Wheat	Fallow	1 crops in 1 year (100%)
Wheat-Mungbean	Wheat	Mungbean	2 crops in 1 year (200%)

Core components

Farmers within the research site primarily follow cotton-wheat-cotton in two-year rotations or wheat-fallow in an annual rotation of crops. Both wheat and cotton crops are demanding on soil nutrients, leaving soil impoverished. Inclusion of short-duration, heat and drought tolerant short-duration mungbean does not only bring additional income from otherwise fallow fields, it also improves soil health by fixing atmospheric nitrogen into the soil. Within the framework of the project, mungbean cultivation was introduced as an SLM practice for the smallholder farmers.

Description of the context

Traditionally, the winter wheat farmers in Central Asia have been leaving fields fallow following the wheat harvest in June-July. Cultivation of local old, long-duration (120 -150 days) mungbean varieties after wheat harvest was delaying wheat planting in fall. The key to include an additional rotation crop during summer lay in identifying early-maturing wheat and early-maturing mungbean varieties. While early-maturing wheat varieties had become available to farmers through international collaboration with ICARDA and CIMMYT, the farmers in the research site were either not aware of these varieties or did not have access to seed. ICARDA made available the seed of the early-maturing wheat varieties through project. The second issue was unavailability of early-maturing mungbean varieties. Early maturing (75 to 105 day) mungbean varieties were made available in Central Asia through international collaboration of the World Vegetable Center (WorldVeg). ICARDA, in collaboration with WorldVeg, had promoted the adoption and seed multiplication of early-maturing mungbean varieties in its CRP-Dryland project in Central Asia.

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

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 ¹	Also relevant ²
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		
2	Financial contributions to support farmers conservation and sustainable use of PGRFA such as contributions to benefit-sharing funds		
3	Approaches to encourage income-generating activities to support farmers' conservation and sustainable use of PGRFA		
4	Catalogues, registries and other forms of documentation of PGRFA and protection of traditional knowledge		
5	In-situ/on-farm conservation and management of PGRFA, such as social and cultural measures, community biodiversity management and conservation sites		

¹ Please select only one category that is most relevant, under which the measure will be listed.

² 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 ³ , 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		
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.		
11	Other measures / practices		

Objective(s)

Introduction of mungbean cultivation as a new practice in the fields of smallholder farmers in Sughd region of Tajikistan

Target group(s) and numbers of involved and affected farmers⁴

A group of 31 farmers (11 women and 20 men) participated in the wheat-based rotation with inclusion of mungbean as a rotation crop. Within the framework of the project, ICARDA provided 600 kg of Mungbean elite seeds to plant 30 ha of mungbean by using 20 kg/ha seed rate.

Location(s) and geographical outreach

On-farm field activities were undertaken in the Sughd region of Tajikistan, but it has relevance for whole country in Tajikistan and its neighbouring countries in Central Asia.

Resources used for implementation of the measure/practice

600 kg Improved seed of a short-duration mungbean variety

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

The participant farmers saved the seed for following year planting, and either shared or sold to other farmers for planting in 2019. This farmer to farmer seed exchange and sale is expected to have a broader impact in following years.

³ Including seed houses.

⁴ Any classification, e.g. of the types of farmer addressed, may be country-specific.

Please describe the achievements of the measure/ practice so far (including quantification)

Using 600 kg seed the farmers produced 18.5 tons mungbean. Mungbean yield among farmers ranged from 0.4 to 0.8 t/ha with an average yield of 0.62 t/ha. At the prevalent selling price of USD 0.75/ha, farmers were able to earn USD 300 to USD 600/ha. The maximum cost involved in production of mungbean in the research site was USD 150/ha. Thus, the farmers were able to earn approximately between USD 150 to USD 450/ha as net profit. In a short period of 75 days these profit levels are substantial considering the 9-month duration of the wheat crop. Additional benefits came from improvement in soil health due to an increase in nutrient contents of the soil, as a result of mungbean production.

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

Academy of Agricultural Sciences of Tajikistan

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

No

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

The mere availability of early-maturing wheat and mungbean varieties alone is not going to make this innovative crop rotation practice sustainable on a larger scale. Establishment of a network of on-farm demonstration sites and the capacity-building of the farmers and seed-producers for production of quality seed is crucial for the expansion and sustainability of adoption of wheat-mungbean crop rotation by smallholders.

Lessons learned

There are a few elements that must be considered in undertaking wheat-mungbean crop rotation.

Institutions – an arrangement should be made either with public or with farmers’ organizations about seed production of both early maturing varieties of wheat and mungbean. This was a critical issue for the initiation of the project.

Capacity building – Since mungbean is not a widely-grown crop, and more so the farmers don’t have technical know-how of seed production of mungbean, a planned capacity-building component should be included for the package and practice of crop and seed production of both wheat and mungbean, in particular for mungbean.

Policy – Local governmental agencies should be made aware of the intervention in order to link the pilot work into the main-frame of land-use planning.

Marketing – Even though marketing is not a problem at pilot level of the project, market outlets for mungbean should be created in advance for large scale cultivation of mungbean by the farmers.

Further information

Link to further information about the measure/practice

- Mavlyanova R, and Sharma RC. 2015. Producing high quality mungbean seeds. Workshop Report. ICARDA, Tashkent, Uzbekistan. <http://www.cac-program.org/files/6f59f8d0abe1470efda99793a991c938.pdf>
- Mavlyanova R. and Sharma RC. 2015. High quality seed production of wheat and mungbean in Kuva, Fergana. Report. ICARDA, Tashkent. <http://www.cac-program.org/files/ec9f7aca08a1460f0debbbab0399c61c.pdf>
- Amanov S, Sharma RC, Akramkhanov A, and Nurbekov A. 2018. Wheat-mungbean crop rotation improves soil health and increases income on small farms in Uzbekistan. https://drive.google.com/drive/folders/19_tu4xRSh_QXAKN4QG_8F4-rSI_W-KbK