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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 2 of the Provisional Agenda

Seventeenth Regular Session

Rome, 18–22 February 2019

SUBMISSIONS BY MEMBERS ON THE CONTRIBUTION OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE TO THE FOUR PILLARS OF FOOD SECURITY AND TO THE ACHIEVEMENT OF RELEVANT SUSTAINABLE DEVELOPMENT GOALS

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I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its last session, considered options for raising awareness of the role of genetic resources for food security and nutrition.[1] In this context, it requested FAO to prepare a study addressing the contribution of genetic resources for food and agriculture to the four pillars of food security and to the achievement of relevant Sustainable Development Goals (SDGs), and to reflect the outcomes of the study in *The State of the World's Biodiversity for Food and Agriculture*. The Commission requested FAO to invite Members and observers to provide inputs to the Secretariat by 31 March 2017.[2]

2. This document compiles submissions received by the Secretariat in response to Circulate State Letter C/CBD-7 issued by FAO on 22 May 2017, for information of the Commission. The submissions are presented in alphabetical order and in the language in which they were received.

II. SUBMISSIONS

i. Canada

This note is in response to the decision of the Commission to invite Members and observers to provide inputs to the Secretariat on a study by FAO addressing the contribution of genetic resources for food and agriculture (GRFA) to the four pillars of food security and to the achievement of relevant Sustainable Development Goals, by 31 March 2017. The deadline for input was extended by the Bureau of the Commission to 31 July 2017.

Canada would like to see this study placed firmly in the context of implementation of the Sustainable Development Goals, in particular Goal 2: "End hunger, achieve food security and improved nutrition and promote sustainable agriculture".

Within SDG Goal 2, Target 2.5 is particularly relevant:

> By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to the fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed.

International agreements relevant to Canada with respect to access to genetic resources and benefit-sharing are principally the UN Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

Canada agrees that countries should raise awareness of the important role of the conservation and sustainable use of GRFA for food security and nutrition. The Government of Canada is consulting Canadians to help determine the scope and direction of a new food policy. GRFA, and the links among science, health and food security more generally, are taken into account in our analysis as we develop the new food policy.

Utilization of GRFA can contribute significantly to address food security and malnutrition issues. On 16 January 2015, a **Special Event on Food Security and Genetic Diversity** held at FAO Headquarters demonstrated that access to and the sustainable use of GRFA (plant, animal, forest, and aquatic) are relevant to all four pillars of food security (availability, access, utilization, and stability).

However, little attention was given during the **2015 Special Event** to the importance of genetic resources in adapting agricultural production to climate change. This is in contrast to the **FAO's Climate-Smart Agriculture Sourcebook (2013)**, which highlighted the importance of GRFA in coping with climate change.

As a follow-up to the **2015 Special Event**, the Commission requested its Secretary to identify options for specific activities in raising awareness of the importance of genetic resources for food security.

[1] CGRFA-16/17/Report Rev.1, paragraph 19.
[2] CGRFA-16/17/Report Rev.1, paragraph 21.

These were presented to the Commission's 16th Session held on 30 January – 3 February 2017, in Working Document **CGRFA-16/17/5**.

As Canada stated during the 16th Session, we believe that quantitative assessment of the benefits of investing in GRFA (or costs of not doing so) in support of the four pillars would enrich the study.

We have a few comments with reference to document **CGRFA-16/17/5.**

It might be relevant for the forthcoming study to make more reference to the program of work on agricultural biodiversity of the UN CBD. While collaboration on technical guidelines was noted at the 13th Convention of the Parties held in December 2016, other aspects, such as the CBD's initiatives on biodiversity for food and nutrition, soil biodiversity, and pollinators, may be of relevance too.

Role of biotechnology: the study should make more reference to the value of biotechnology in addressing issues related to climate change such as drought and salinity, and nutrient deficiency, than was presented in document **CGRFA-16/17/5**. The value of biotechnology, from low- to high-tech approaches, was recognized and discussed during the **2016 FAO International Symposium on the Role of Agricultural Biotechnologies in Sustainable Food Systems and Nutrition**, which is to be followed by regional consultations on the same subject in fall 2017 and 2018. FAO's increased attention to agriculture biotechnologies is now considered one of the areas of emphasis for FAO's work in the next biennium (2018-19). As such, it would be important for the Commission to include the use of biotechnology in raising awareness about genetic resources for food security and nutrition.

Resiliency of agricultural systems: it would be appropriate to mention the importance of reducing the potential risk of land degradation on biodiversity and genetic resources, through sustainable management of agricultural investment, as in document **16/17/5, para. 18** and as emphasized in the Commission's **Special Event "The contribution of biodiversity for food and agriculture to resilience"** held at FAO on 28 January 2017.

Development of communication strategies: Canada is supportive of the development of communication strategies in raising awareness of GRFA, as presented in document **16/17/5, paras. 32 and 33**. Active citizen engagement efforts or public participation in biodiversity can help strengthen the impact level of the described communication strategies. The mode of message delivery is crucial, and communication strategies under development need to tailor their plans to specific groups of their target audience.

Improving the knowledge base: regarding the collection of information to improve our knowledge base, as presented in document **16/17/5, para. 34**, it is important to emphasize the need to study gaps in understanding about how *ex situ* conservation of genetic resources (including wild relatives) is improving food security, particularly with regard to complementarity between genebanks, breeders, and on-farm participants.

Nutrition education and market development: document **16/17/5, paras. 36-41** encourages the introduction of GRFA into the school system at an earlier age and recognizes the importance of branding 'greater variation' as a means of promoting product value, thus increasing consumer demand for the conservation of biodiversity. Canada is supportive of studying the integration of GRFA into national food security and nutrition policies. Awareness raising and targeted policy dialogue are key means to achieve this objective. However, the study would be advised to keep in mind that some countries, like Canada, already have food security and nutrition policies that include the sustainable use of GRFA, and may not have additional resources to further integrate this element into its policies. Canada also wishes to emphasize that any study of market development and access to markets and services, or legal and economic incentives, must be done in the context of consistency with international obligations.

Document **16/17/5, paragraph 42 (iv)** requested FAO to report on a regular basis on relevant awareness-raising activities of FAO. Canada agrees that the study should include this request. Canada also recommends an assessment of the impact of FAO's awareness-raising activities. What results are achieved through FAO's efforts, for example, in assisting countries to integrate GRFA into their food security and nutrition policies?

BACKGROUND:

There is evidence of a positive impact of diversification of species at the genetic level (intraspecific diversity, genetic diversity) on food security, as it can provide benefits for improved productivity, nutritious foods, and risk management. The number of plant and animal species cultivated for food and agriculture is limited, and there is a trend towards a declining range of genetic diversity in farmed animals and plants. Of note, there are also non-cultivated plants that are used for food. Sustainable use of GRFA can improve the diversification of food production and the access by individuals to appropriate nutritious foods, including the uptake and metabolism of micronutrients. Diversified agro-ecosystems can be more resilient to stresses, therefore improving the stability of access to adequate food at all times. For instance, diversity enhances drought tolerance and resilience to pests and pathogens and is also useful in extending growing seasons and in buffering against harvest failure of one species.

During the 15th Session of the Commission in January 2015, Biodiversity and Nutrition were addressed **(CGRFA-15/15/6)**. Raising awareness of biodiversity for nutrition was also included in the *Voluntary guidelines for mainstreaming biodiversity into policies, programmes and national and regional plans of action on nutrition* **(CGRFA-15/15 Report, Appendix C)** endorsed by the Commission. This was linked with enhancing security and nutrition, and associated with this was the need to increase awareness. The suggested examples of raising awareness of biodiversity for nutrition included:

(1) supporting national awareness campaigns, the organization of initiatives, and workshops;

(2) promoting teaching of biodiversity for food and agriculture in nutrition education;

(3) disseminating research results within scientific communities; and

(4) organizing special events related to biodiversity for food and agriculture.

These voluntary guidelines were also presented during the 13th Conference of the Parties to the Convention on Biological Diversity, in which Canada has been a Party since 1993.

Furthermore, Bioversity International is developing an 'Agro-biodiversity Index' that may guide interventions and investments for sustainable and nutritious food systems, and enable progress toward the commitments to the Sustainable Development Goals and the Convention on Biological Diversity Aichi Targets **(Bioversity International, 2016)**. The CBD stated that the creation of an 'Agro-biodiversity Index' can help raise awareness about the linkages between biodiversity, healthy nutrition, and sustainable food production. Raising awareness through education and capacity building activities can also strengthen the acceptability of genetic resources and food biodiversity.

Document **16/17/5, paragraph 42 (i)** provided to the 16th Session of the Commission invited countries to raise awareness of the important role of the conservation and sustainable use of GRFA for food security and nutrition. Canada recognizes the importance of raising awareness of the importance of genetic resources in food and agriculture. Internationally, we support developing country partners in this objective through initiatives such as:

- Consultative Group on International Agricultural Research (CGIAR): Canada contributed CAD 10 million over the last fiscal year to the CGIAR, which is implementing a long term program for managing and sustaining crop collections. They work in close collaboration with the Global Crop Diversity Trust to conserve the diversity of plant genetic resources in CGIAR-held collections and to make this diversity available to breeders and researchers in a manner that meets high international scientific standards and is cost efficient, secure, reliable and sustainable over the long-term.
- Global Crop Diversity Trust (GCDT): Canada provided CAD 10 million for initial operational resources between 2003 and 2013 to establish the Crop Trust and to leverage funds from other donors.
- Pan-Africa Bean Research Alliance (PABRA): Canada contributed CAD 15 million (2009 – 2015) to the PABRA, which works towards supporting improved nutrition, health, gender equality and

food security in several African countries through the development and dissemination of bean varieties that are resistant to drought, disease and pests. Since 1996, PABRA has released over 550 new bean varieties.

- USC "Seeds of Survival" – Global Affairs Canada contributed CAD 14.9 million (2015-2020) to scale up USC Canada's "Seeds of Survival" program in Central America and Africa. The program works with smallholder farmers (women, men and youth) in Africa, Central America, Asia and Canada, to strengthen their knowledge and their food and seed systems through participatory plant breeding, community seed banks and agro-ecological practices. This project reached an estimated 293 communities and over 44,000 beneficiaries, improving their food security and climate resilience, with particularly strong results in Ethiopia.

During the 16th Session of the Commission, FAO presented a draft Report on the State of the World's Biodiversity for Food and Agriculture **(CGRFA-16/17/Inf.10)**. The draft Report demonstrates that 600 out of 2400 wild food species are at risk, which can put this important pool of genetic resources for food security in jeopardy.

SUGGESTED REFERENCES:

Climate-Smart Agriculture Sourcebook, FAO, 2013
http://www.fao.org/docrep/018/i3325e/i3325e.pdf

Special Event on Food Security and Genetic Diversity, 2015 http://www.fao.org/nr/cgrfa/events/en/

Mr Jomo Kwame Sundaram, Assistant Director-General, Coordinator for Economic and Social Development, FAO: "The current status of genetic diversity and biodiversity considerations in the Sustainable Development Goals" (Speaking points) - **Special Event on Food Security and Genetic Diversity, 16 January 2015**

CGRFA-15/15 Report, Appendix C, 2015: Voluntary guidelines for mainstreaming biodiversity into policies, programmes and national and regional plans of action on nutrition

FAO, International Symposium, 2016: Proceedings of the FAO International Symposium on the Role of Agricultural Biotechnologies in Sustainable Food Systems and Nutrition
http://www.fao.org/documents/card/en/c/66e9a36c-19b2-407a-83c9-5b767e233417/

Bioversity International, 2016: Mainstreaming Agrobiodiversity in Sustainable Food Systems: Scientific Foundations for an Agrobiodiversity Index. Rome, Italy.

Special Event on the Contribution of Biodiversity for Food and Agriculture to Resilience, 2017
http://www.fao.org/nr/cgrfa/events/en/

CGRFA-16/17/5: Options to raise awareness of the role of genetic resources for food security and nutrition

CGRFA-16/17/Inf.10: State of the World's Biodiversity for Food and Agriculture (Draft)

Sustainable Development Goals http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Sustainable Development Knowledge Platform: https://sustainabledevelopment.un.org/?menu=1300

ii. Ecuador

In order to ensure the reporting and monitoring of the Sustainable Development Goals - SDGs at country level; the National Institute of Statistics and Census (INEC), together with the National Secretariat for Planning and Development (SENPLADES) and the Ministries, have been working since February 2015 on the implementation of the Agenda 2030, generating commitments with each of the entities of the public sector that are responsible for the continuous reporting on indicators.

The Statistics and Censuses Council (CONEC) accepted a working tool proposed by INEC, which consists of Special Statistical Commissions and the creation of Thematic Tables as spaces in which public sector entities, based on their responsibilities and powers, will intervene in the construction

process of indicators and improvement of the statistical supply available to monitor the SDGs. The SDG indicators, based on their relevance, feasibility and availability were classified as follows:

- Type A: When all the necessary information for the calculation of the indicator is available;
- Type B: When certain information is available for the calculation of the indicator and it is necessary to make improvements in the source of information for its reporting. There is a sub-classification for Type B indicators: i) Short-term B (improvements to be implemented take one year) and, ii) Long-term B (improvements to be implemented will take more than one year);
- Type C: When no information is available for the calculation.

It is necessary to mention that the category of the indicator may change according to the information that is available.

In this respect, the National Agricultural Research Institute (INIAP), together with the Ministry of Agriculture, Livestock and Fisheries (MAGAP), presented the work done in the Thematic Table on Agriculture, Livestock and Fisheries, regarding the information availability report for estimating indicator: 2.4.1 Proportion of agricultural area under productive and sustainable agriculture. The indicator considers three aspects: economic, social and environmental, with views to quantify the agricultural area in which productive and sustainable agriculture is practiced; in compliance with the METADATA provided by the UN.

The availability components of the report were presented afterwards:

Calculation formula and description of variables:

$$UIQ < Piq \ \& \neq APestQ$$

$$B(1-i) = \begin{matrix} UAS/RUS \\ P \times \bar{p} \times Mcp \end{matrix} \geq IPR$$

$$\sum SUP(n-1) = 1$$

Variable	Label	Source	Description
UAS	Current Land Use (Uso Actual del Suelo)	MAGAP	The current agricultural area corresponding to the agricultural category of the soil recommendations or skills file is determined. Proper use.
RUS	Recommendations of Land Use (Soil suitability) (Recomendaciones de Uso del Suelo (Aptitud del suelo))	MAGAP	
UIQ	Use of Chemical Inputs, only for those who did not apply chemical pesticides (Utilización de Insumos Químicos, solo para los que no aplicaron pesticidas químicos)	INEC/ESPAC	The volume of chemical inputs applied per hectare will be measured for all registered crops for each producer.
Piq	Parameter of application of chemical inputs (Parámetro de aplicación de Insumos químicos)	MAGAP-INIAP	Indicator of technical application by types / groups of crops.
APestQ	Area in which no chemical pesticides were applied (Área en la que no se aplicó Pesticidas Químicos)	INEC	Identification of the area that was not applied chemical pesticides, which will be submitted to the analysis for the indicator.
B(1-i)	Average annual income (producer) (Ingreso promedio anual (productor))	INEC	Total income earned by a producer in a year.
P	Production	INEC/ESPAC	Total production per product obtained by the producer in one

			year.
$\bar{p}$	Average price per product	MAGAP	Average annual sales price - producer
Mcp	Producer's marketing margin (Margen de comercialización del productor)	MAGAP	Marketing margin per product in one year
IPR	Annual average rural income (Ingreso Promedio Rural anual)	INEC/ENEMDU	
∑SUP(1-n)	Summation of sustainable production area (Sumatoria de la superficie productiva sostenible)	INEC	Summation of the surface that fulfilled the established parameters to be characterized as sustainable productive

Information sources:

- Area with permanent crops
- Area with transitional crops
- Area with natural grass
- Area with cultivated grass
- Recommendations for land use
- Procurement prices
- Producer's marketing margin (Production costs or Intermediation Index)
- Average annual rural income
- Production

In addition, the National Assembly, at its 467th meeting on 20 July 2017, committed itself to review a Draft Resolution for complying with the SDGs. From then onwards, the SDGs became cross-cutting issues regarding the National Assembly's work at the Commissions and Parliamentary Groups. This compliance is also strongly related to genetic resources, and in particular to plant genetic resources through the Organic Law on Agro-biodiverisity, Seeds and Sustainable Agricultural Promotion, under the Official Register Supplement No.10, which came into force on 8 June 2017.

More specifically to genetic resources, and in line with the follow-up process to the Second Global Plan of Action and SDGs target 2.5, which states that "by 2020 maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed ", Ecuador has submitted accession data from the INIAP's germplasm bank to the WIEWS system.

iii. Germany

Submission of German inputs for the study on the role of genetic resources for food and agriculture for food security

Regarding your request to submit input for the study on the role of genetic resources for food and agriculture for food security Germany would like to bring the following projects to your attention, which are funded by Germany with a total of 5 Mio EUR (4,996,146 EUR).

"Genome wide studies to improve drought stress tolerance of Ethiopian barley and durum wheat varieties" (2813FS01)

Project duration: 01.01.2014 - 31.12.2017

Countries: Ethiopia

German funding: 444,573 Euro

Summary

The project aims at identifying drought tolerant durum wheat and barley genotypes from Ethiopian landrace collections and the identification of genomic regions or genes involved in drought stress response in barley and durum wheat using genome wide association genetics studies. Based on these results easy to handle molecular markers will be developed for combining positive alleles for drought stress which will be used to introgress drought stress tolerance in adapted Ethiopian barley and durum wheat cultivars.

250 barley and 250 wheat (T. durum) genotypes will be selected by the Ethiopian partner and genotyped using the 90k iSelect chip of wheat and the 9k iSelect chip of barley as well as SSRs. The 250 wheat and barley genotypes will be phenotyped in Ethiopia and in growth chamber experiments in Germany. Based on these genotypic and respective phenotypic data genome wide association studies will be conducted and respective SNP markers will be converted to easy to handle PCR-based markers.

Contribution to the four pillars of food security*: Availability and stability*

Contribution to the SDG: *Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture; Goal 13. Take urgent action to combat climate change and its impacts*; Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*

"Building the basis for implementing the Save and Grow approach- regional strategies on sustainable and climate-resilient intensification of cropping systems" (GCP/INT/259/GER)

Project duration: 01.05.16 – 30.04.19

Countries: Sambia, Sri Lanka

German funding: 2 221 000 Euro

Summary

Meeting food needs and economic growth for a growing global population in the face of natural resources constraints and climate change is a major challenge. On the one hand climate change adversely impacts rural communities dependent on agriculture. On the other hand, poor access to/use of resources further increases vulnerability of the rural poor to climate change impacts.

The project will focus on two Regions of major interest to the Food and Agriculture Organization of the United Nations (FAO): Southern Africa with Zambia and South Asia with Sri Lanka as the focal Country. The project will assist the Member Countries of FAO in responding to the priority identified in their National Development Plans, Country Programming Frameworks, and United Nations Development Assistance Frameworks of: (1) ensuring sustainable natural resource use for agricultural productivity growth, (2) successfully linking smallholder/emerging farmers to markets, and (3) increasing rural income.

Contribution to the four pillars of food security: *Availability, access, utilization and stability*

Contribution to the SDG: *Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture; Goal 12. Ensure sustainable consumption and production patterns. Goal 13. Take urgent action to combat climate change and its impacts*;*

"Ich liebe Fisch"

"Improving Community Health-Nutrition linkages through Solar Energy based Fish and Crop integrated Value Chains" (2813FSNU09 and 2813FSNU10)

Project duration: 01.03.2016-30.09.2019

Country: Malawi

German funding: 1,152,253 EUR

Summary

The project focuses on research and linking of several aspects along the value chain of sustainable aquaculture of *Oreochromis karongae*, a favored and high quality source of protein for human nutrition. In the context of these measures, an innovative linkage of fish and crop production in integrated aquatic systems (classical integrated agriculture-aquaculture systems, IAA and aquaponics) will allow enhanced productivity and thus an optimized nutritional and socio-economic status of smallholder farmers in rural areas of Malawi adopting these techniques.

The approach of this project is manifold, such as to (a) enhance the production of the endemic fish species *O. karongae* by breeding and hybridization, (b) establish a specialized solar powered hatchery and optimize rearing protocols, in order to improve the supply of fingerlings for ongrowing farms, (c) use an IAA (aquaponics) system approach to integrate nutrient fluxes between animal and crop production, (d) implement training courses for local communities and smallholder farmers, thus ensuring capacity development and (e) monitor the changes in health status and food habits of local families and especially children and elderly after implementation of the IAA system to ensure a benefit for the whole community and (f) facilitate establishment of a community agriculture-nutrition-health linkage innovation platform and networking with relevant institutions to safeguard sustainability beyond the project life cycle.

Contribution to the four pillars of food security*: Availability, access, utilization and stability*

Contribution to the SDG: *Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture; Goal 12. Ensure sustainable consumption and production patterns (12.8.a); Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development; Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*

"Enhancing local food security and nutrition through promoting the use of Baobab (Adansonia digitata L.) in rural communities in Eastern Africa" (acronym:BAOFOOD; 2813FSNU07 and 2813FSNU08)

Project duration: 01.03.2016 – 28.02.2019

Country: Eastern Africa

German funding: 1,178,320 €

Summary

The project aims at (1) identifying and mapping baobab populations and recording the full range of morphological diversity and population vitality, identifying most valuable populations for conservation and propagation, and developing techniques for sustainable tree management and protocols for vegetative propagation of baobab; (2) analyzing nutrients and bioactive compounds of baobab raw products along different environmental gradients, reviewing of local uses and processing technologies of baobab in different regions, nutrient analyses of processed baobab products and development of nutrient maintaining processing technologies and new products, as well as analysing the impact of supply chain organisation on nutrient and physical properties of baobab products; (3) assessing the nutritional status and role of baobab in daily diets, assessing the effect of baobab diet on nutritional and health status of school children, and describing the impact of commercial baobab utilisation on nutritional and health status; (4) assessing consumer preferences, current market demand and analysing market chains; (5) initiating the formation of community organisations for sustainable baobab management, developing an area-specific extension approach and initiating its implementation, and establishing a fully operational processing unit and supplying products to target groups; and (6) informing relevant stakeholders about sustainable baobab management and its role in improved nutrition, and the results and technologies developed by the project.

Contribution to the four pillars of food security: *Availability, access, utilization and stability*

Contribution to the SDG: *Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture; Goal 12. Ensure sustainable consumption and production patterns (12.8.a); Goal 13. Take urgent action to combat climate change and its impacts*; Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*

iv. India

The Role of Genetic Resources for Food and Agriculture for Food Security:

Protection of Plant Varieties and Farmers' Rights Authority identified 22 agro-biodiversity hot spots in India which have the maximum diversity of genetic resources for food and agriculture which is equally recognized by National Biodiversity Authority. Some of these hot spots are secondary centre of origin or diversity of important crop species like Rice at Jeypore (Koraput hotspot region) and included among the 3 (three) Globally Important Agricultural Heritage System (GIAHS by FAO) in India.

The Authority identified the tribal populations engaged in the sustainable farming practices and conservation of endangered landraces in Jeypore area and awarded them with Plant Genome Saviour Community Awards during 2009-10. Several such community groups and individual farmers received such awards for their excellent work towards agro-biodiversity management and conservations till date.

It would be interesting to note that one community "Tamil Nadu Hill Banana Growers' federation" an awardee in 2010-11, helped in bringing back in cultivation of two landraces, e.g. Virupaksh and Sirumalai Hill banana that were endangered due to Bunchy top disease and help local communities at Dindigul district to conserve these varieties and use for religious purposes.

The Authority conducts training cum awareness programme on a mission mode to generate awareness among the farmers/ community groups identifying several topics, viz. food security, public research and extension programmes, education policies and market and value chain development, with the aim of arriving at policies that support food security, adequate nutrition and the conservation and sustainable use of GRFA.

Due to developed high yielding, drought & flood tolerance, and insect & disease resistance varieties through the conserved plant genetic resources, the food grain production has been estimated 272 million tonnes in 2016-17 in the country. Other than food grain, the production of oil seeds is estimated to 33.6 million tonnes in 2016-17 and sugarcane production is estimated 309 million tonnes in 2016-17 in the country.

In addition, livestock products are the major source to ensure food and nutritional security to millions of people. India is the largest producer of milk in the world and this production has reached to 155.5 million tons during 2015-16 with per capita per day milk availability of 337 gram. The egg production in India has reached to 82.93 billion eggs with per capita per annum availability of 66 eggs during 2015-16. The meat production in India has reached to 7.00 million tons during 2015-16. The wool production of the country has been recorded as 43.6 million kg during 2015-16. Besides, about more than 48.5 million cattle and buffalo are also provided draft power to Indian agriculture and rural transport.

i. Norway

The role of genetic resources for food and agriculture for food security.

The Commission considered options for raising awareness of the role genetic resources for food security and nutrition. In this context, it requested FAO to prepare a study addressing the contribution of genetic resources for food and agriculture to the four pillars of food security and to the achievement of relevant Sustainable Development Goals (SDGs), and to reflect the outcomes of the study in *The State of the World's Biodiversity for Food and Agriculture*. The Commission requested FAO to invite Members and observers to provide inputs to the Secretariat. On this background, Norway hereby submit some inputs.

Norway believes that well documented contributions of GRFA to food security and the achievements of the SDGs would be valuable contributions towards increased political and financial priority of the management of GRFA. In recognition of the comprehensive topic and that there are many relevant issues, Norway suggests that the study also address the questions mentioned below. Norway also recommends that the study includes concreate examples to illustrate the different contributions of GRFA to food security.

Nutrition

What is the current state of knowledge in regard to the nutritional value of farmers' varieties and traditional animal breeds (meat, milk, egg) compared to uniform varieties and commercial breeds?

Forest genetic resources

According to the Summary of the International Conference on Forests for Food Security and Nutrition in 2013, "[t]he genetic diversity in natural forests offers huge potential for the discovery, development and improvement of new sources of food and medicines, among others."1 What is the current state of knowledge in regard to forest genetic diversity's contribution to food security?

Aquagenetic resources

It is important to highlight the essential role of fish and marine resources for global food security. With the rapid technological development, aquatic genetic resources for food and agriculture will probably be of increasing importance in the future, both within aquaculture and other specific practices.

Resilience

What is the current state of knowledge in regard to different capacity of farmers' varieties to adapt to various climate conditions and to provide stable yields despite instable conditions compared to uniform varieties? What are the different experiences in the use of traditional animal breeds when it comes to use of grazing areas that is less suitable for other agricultural production? E.g. goats' and cows' abilities to utilise grass and other roughages in order to produce nutrition meat; and their different climbing capacities to utilise marginal land in mountains/hilly areas etc.

Contribution to SDGs

The study should focus on the contribution of GRFA particularly to SDG 2 "Zero hunger". Target 2.5 addresses genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, and access and benefit sharing. The study should therefore document the importance of access to genetic resources for improving crops and animals as well as provide examples of benefit sharing and its contribution to food security. The study should also touch upon the role of assocated traditional knowledge in management of genetic resources. Does the different ways of conserving plant and animal genetic resources (in situ, on farm, ex situ, the degree of interlinkages between the different conservation facilities) have an impact on the degree of the importance of the genetic resources to food security?