Appendix V

PROJECT DOCUMENT

PROPOSAL FOR NEW WORK ON A CODEX STANDARD FOR YAM (*Dioscorea* spp.)

(Prepared by Costa Rica)

1. Purpose and scope of the standard

- The objective of the work is to develop a global standard that establishes the basic quality requirements for yam, to assure consumers of a safe, quality product.
- The standard would apply to the different commercial varieties and/or types of *Dioscorea rotundata* and *Dioscorea cayenensis* (yellow yam), (*Dioscorea alata* L.), to be supplied fresh to the consumer after preparation and packaging.

2. Relevance and timeliness

Yam (*Dioscorea* spp.) is a tuber that is consumed all over the world and mainly sold fresh. As large volumes are exported, maintaining the final quality is important. It is sensitive to physiological and physical damage, bruising, and cold conditions, all of which have a negative effect on the tuber. In some cases, the product is not of the size required for the market.

Yam originates from Southeast Asia and Melanesia, distributed by humankind to other regions such as the Americas, Africa, Madagascar, the rest of Asia, and Australia. Yields can reach up to 23 tonnes per hectare, depending on the species and variety (Lebot 2009). It is a staple in the African countries, as the African continent accounts for more than 90% of global production. According to FAOSTAT (2016), the largest producer is Nigeria, with 35 618 420 tonnes, followed by Ghana, with 7 074 574 tonnes. The main varieties are *Dioscora rotundata* and *Dioscorea cayenensis* (yellow yam).

Across the globe, yam is known by many different names, including: ñame común, ñame grande, ñame asiático, ñame de agua, ñame alado, yam, greater yam, winged yam, water yam, purple or white yam, Guyana arrowroot, ten-months yam, tabena, batatilla, iñame, ñangate, ñame de mina, napi, cará branco, cará cultivado, cará de Angola, ingame blanche, igname St. Martín, ubi, ube, and shenshu.

High volumes of fresh yam are sold worldwide. In 2015, total sales were worth approximately USD 151.3 million. The main exporting countries were Ghana, Costa Rica, and Jamaica (estimates by CCI, based on COMTRADE statistics). Brazil has increased its exports to a maximum of 317 tonnes last year, mostly to the European Union, as European countries buy between 80 and 100% of its production. Panama currently produces 17 200 tonnes. In recent years, Jamaica, Colombia, Dominican Republic and Nicaragua have also started exporting yam (CNP, 2014, IICA, 2015). Jamaica produces up to 10 000 tonnes per year; Colombia produces 315 000 tonnes, which it exports to the United States and Puerto Rico and other Caribbean islands.

In Costa Rica, yam is grown in the Huetar Caribe and Huetar Norte regions; the material planted is *Dioscorea alata* L. It is produced mainly for export, with small volumes being kept for the domestic market. Exports go mainly to North America, the Caribbean and the European Union, although large volumes are also sent to other countries in Central America. The total volume ranges between 16 500 and 18 000 tonnes per year, representing up to USD 13.5 million in 2015 (Procomer, 2016).

Given the level of yam production worldwide, standards are needed to regulate quality and establish a benchmark for marketing the vegetable for producing and exporting countries. Furthermore, the elaboration of a Codex standard for yam will help protect consumer health and promote fair trade practices, in accordance with the international agreements currently in place.

For the reasons described above, several members of Codex expressed the importance of establishing requirements to ensure that supplies of the product meet quality and safety requirements, since the export volumes of Costa Rica, the Caribbean countries, South America, and Africa are significant. That would facilitate international trade for exporting and consuming countries.

3. Main aspects to be covered

This proposal for new work applies to tubers of the commercial types or varieties of *Dioscorea* spp., to be supplied fresh to the consumer after preparation and packaging:

- Establish the minimum requirements for tubers
- Specify the provisions concerning sizing.
- Define the provisions concerning quality and size tolerances.

- Establish provisions concerning presentation.
- Determine marking or labelling pursuant to the guidelines established by Codex Alimentarius.
- Add the guidelines established by Codex Alimentarius with regard to contaminants that affect the product.
- Refer to the guidelines of Codex Alimentarius with regard to hygiene requirements.

4. Assessment against the *Criteria for the Establishment of Work Priorities*

General criterion

Developing an international standard for yam would be useful for all the nations involved, be they producing, exporting, or consuming countries. The quality of the product should comply with global commercial and marketing practices, in order to take into account the needs of consumers worldwide, as well as the minimum food safety requirements.

Developing an international standard for yam would be especially useful for developing countries, as they are the principal producers, exporters, and consumers of the vegetable. The quality of the product should comply with global marketing practices in order to take into account the needs of consumers across the globe, as well as the minimum food safety requirements, to protect consumer health and guarantee fair practices in food trade. To that end, the criteria for the elaboration of a regional standard for *Dioscorea* spp. are presented below.

In Costa Rica, the tariff code for *Dioscorea* spp. is 070601060110 (chapter 07, heading 14, subheading 301019), which corresponds to bulbs, onions, tubers, tuberous roots, buds and rhizomes.

Criteria applicable to the product

a. Volume of production and consumption in various countries, and volume and trade between countries

In general, yam is marketed as a fresh product, in cardboard boxes with a net weight of approximately 18 kg or 23 kg.

Global production has increased. While in 2011, FAO reported that it was 50 million tonnes, in 2013, FAOSTAT estimated that the figure for 20 countries in Africa, Asia, the Caribbean, and South America was close to 68 million tonnes. The biggest volumes were produced by countries such as Nigeria, Ghana, Ivory Coast, Ethiopia and Benin, with volumes ranging from 45 to 1.4 million tonnes. Another ten countries produced between 0.6 and 0.2 million tonnes.

According to FAO, the countries producing volumes of less than 0.20 million tonnes included Japan, Jamaica, Venezuela, Burkina Faso, Costa Rica, Panama, Dominican Republic, and Nicaragua.

In Costa Rica, production over the last three years has averaged 15,376 tonnes (Figure 1), with nearly all of it being exported to countries such as the US, Puerto Rico, other Caribbean islands, and some European Union countries (Table 1).

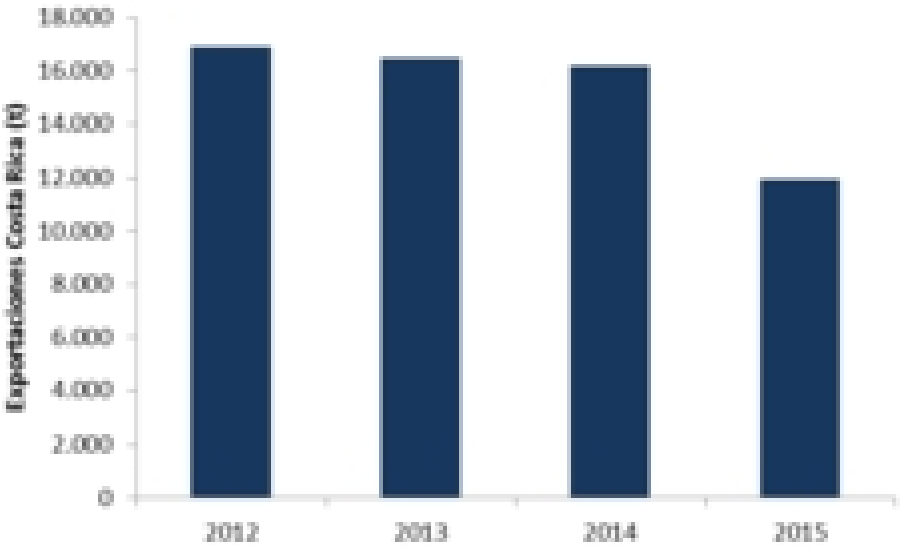

Figure 1. Volumes of exports of yam produced in Costa Rica 2012 y 2015 (Procomer 2016).

Table 1. Volume of yam sold by Costa Rica to the main purchasing countries (2012-2015).

	Volume (tons)			
Region	**2012**	**2013**	**2014**	**2015**
North America	14.123,3	12.869,9	13.055,0	9.466,9
South America	23,1	34,1	13,0	14,4
Central América				42,9
Asia				
Caribe	2.572,2	3.040,4	2.650,1	2.284,6
European Union	179,5	504,2	461,9	134,6
Rest of Europe				15,2
Total	**16.898,2**	**16.448,6**	**16.180,0**	**11.958,6**

(Source: Procomer (2016).

By 2015, the main exporting countries were Ghana, which occupied 25.9% of exports, the United States (16.2%), Costa Rica (13.8%) and Jamaica (10.5%), with export volumes between 10,000 and 26,000 metric tons (CCI calculations based on COMTRADE statistics).

Table 2 shows that in American countries have carried out transactions for amounts up to 25.39 million, which constituted 16.8% of the value of global transactions in 2015 and the total transactions made by America and the Caribbean, were the 43.7%.

In the specific case of Brazil, it is reported that exports of this tuber as fresh produce, between 2012 and 2015, generated approximately $ 2 million with the European Union as the main destination. Other countries such as Colombia, report up to 314,991 tonnes production in 2013, however, as shown in Table 1, the value of exports is relatively low, compared to Jamaica, United States and Costa Rica.

Table 2. Value of global exports of yam made by American and the Caribbean in the period between 2012 and 2015 countries.

	Exports (thousands of dollars)			
Countries	**2012**	**2013**	**2014**	**2015**
Jamaica	0	0	22.115	25.393
United States of America	11.246	13.954	22.182	20.699
Costa Rica	15.959	18.222	17.017	15.466
Colombia	23	489	1.050	2.659
República Dominicana	177	282	418	326
Dominica	0	0	56	63
St. Vincent and the Grenadines	0	0	0	51
Panamá	99	332	225	47
Nicaragua	23	9	18	17
Canadá	0	0	28	0
Santa Lucía			1	

Source: ITC calculations based on COMTRADE statistics

b. Diversification of national legislations and resultant or potential impediments to international trade

The elaboration of this global standard is being carried out in consonance with the legitimate objectives of the World Trade Organization and the statutes of the Codex Alimentarius Commission, which include protecting consumers' health and ensuring fair practices in the food trade.

There are currently no known impediments to the elaboration of this standard, given the volume of trade in this tuber. This work would provide a specific, recognized standard to strengthen international trade in a product that originates from Africa and Asia, and currently is produced in a number of regions of the world.

Although it has been traditionally used as a food product, yam has great potential in the pharmaceutical industry. In addition, importing countries require the application of good practices in all plant products supplied to them by third countries.

Since no international standard for yam exists and no other organization has undertaken work on the subject, the establishment of a Codex standard is considered necessary and opportune, in order to integrate the criteria into a single internationally acceptable standard.

In this way, the possible barriers to trade will be reduced, and a complete legal framework will be put in place that stipulates the minimum acceptable global standards for yam.

c. International or regional market potential

Table 3 lists Costa Rica's exports of *Dioscorea* spp. to the main countries that purchased its production between 2012 and 2014. The most important were the US, Puerto Rico, Martinique, and Guadeloupe, with the first two purchasing more than 6000 tonnes each, according to data from Procomer (2015).

Table 3. Volume exported to the principal markets for Costa Rican yam between 2012 and 2015.

	Volumen (toneladas)			
País	**2012**	**2013**	**2014**	**2015**
Estados Unidos	7.374,4	6.521,2	6.695,8	4.989,8
Puerto Rico	6.424,3	6.086,8	6.140,5	4.288,1
Martinica	1.059,5	1.767,2	1.334,0	1.289,4
Guadalupe	1.462,8	1.246,8	1.294,4	995,2
Canadá	324,6	261,9	218,6	189,1
Total	**16.645,5**	**15.883,8**	**15.683,5**	**11.751,5**

d. Amenability of commodity to standardization

The standard basically addresses the aspects related to the quality, size, safety, and labeling of *Dioscorea* spp, so that consumers can be certain about the characteristics of the product they purchase.

Given the special characteristics of the product, the parameters for the various commercial types or varieties also need to be established, to make it possible to differentiate yam from other products with similar names.

e. Coverage of the main consumer protection and trade issues by existing or proposed general standards

The new work will improve the protection of the consumer and facilitate trade in yam by establishing an internationally recognized quality standard.

f. Number of commodities that would need separate standards including whether raw, semi-processed or processed

As mentioned under the previous point, there is no Codex standard for this crop. *Dioscorea* spp. is a product that is supplied fresh to the consumer, without processing, and the only practices to which it is subject are related to postharvest management (preparation and packaging).

g. Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental body or bodies

There is no general product standard for yam. However, standards have been developed by Colombia and for Africa. The relevant existing standards, which could be taken into account while a Codex Standard for yam is developed, are:

- NORMA TÉCNICA COLOMBIANA - NTC 1269
- DRAFT AFRICAN STANDARD CD-ARS 825

5. Relevance to the strategic objectives of Codex

The elaboration of the proposed standard is based on the following strategic objectives:

The elaboration of a Codex Standard for yam is proposed pursuant to the strategic goal of countries promoting the maximum application of Codex Standards in their domestic legislation, and facilitating international trade. This proposal dovetails with Strategic Goal 1 - Establish international food standards that address current and emerging food issues, and the corresponding objectives of the 2014-2019 Strategic Plan. The proposal is based on scientific considerations and designed to help establish the minimum quality requirements for fresh yam, with a view to protecting the health of the consumer and achieving equitable practices in the food trade.

6. Information on relation between the proposed and other existing Codex documents

The proposal concerning the preparation of a Codex Standard for yam forms part of the Terms of Reference of the Codex Committee on Fresh Fruits and Vegetables.

7. Identification of any requirement for and availability of expert scientific advice

In elaborating the draft Codex standard, the information generated by each national expert, as well as other experts in the rest of the region, will be used as a reference.

8. Identification of any need for technical input for a standard from external bodies, so it can be scheduled

Colombia's standard will be taken into account in developing the yam standard, including the experience available in other importing/exporting countries that participate in the standardization of this product in the CCFFV.

9. Proposed timeline for new work

It is expected that the development of this standard to be conducted in three CCFFV meetings or less, depending on the agreement reached by CCFFV.

10. General information concerning *Dioscorea* spp.

Origin and geographical distribution:

- Area of origin of *Dioscorea alata*: Southeast Asia and Melanesia.
- Secondary distribution: Different species of *Dioscorea* have been introduced into the Americas, Africa, Madagascar, South and East Asia, Australia, and Melanesia.
- Long-distance migration/aided by human beings. It is grown commercially, in family kitchen gardens, and also grows wild.

Identification and description (Rodríguez 2000; Lebot 2009; Arnau et al. 2010; CABI 2015):

- ***Habit and life cycle***: Herbaceous perennial; climbing, twining vine.
- ***Size***: Can reach 10-15 meters in length.
- ***Stem***: Quadrangular, with membranous, irregular, winged projections.
- ***Leaves***: Vary greatly in size; heart-shaped; phyllotaxis - opposite.
- ***Flowers****:* Female flowers are in approximately 30 cm long spicules; male flowers grow in small panicles. Most cultivars are sterile. When produced, most flowers are male.
- ***Tubers****:* They weigh an average of 3-5 kg per plant, with many different shapes. The color of the pulp can be white, yellow, or purple.

Habitat

- Grows in tropical regions. Growth can be severely restricted by temperatures below 20°C, with optimal growth occurring at 25-30°C. Requires optimal precipitation of approximately 1150 mm during the crop cycle. Therefore, it is considered a crop with optimal development in climates designated as tropical rainforest, tropical monsoon and tropical savannah.
- Requires deep, loose, fertile, and well drained soils; and plowing followed by double raking and hilling, to encourage growth of the tubers.

Uses

- Yam is usually consumed fresh. After being peeled, cut into segments and cooked in hot water, it is eaten with other vegetables and sauces. It is also consumed as yam paste. It may also be roasted or fried.
- Forms of consumption by region: specify forms of consumption in the countries to which it is exported and in other countries, for example, in Africa and Asia.

Nutritional value

- According to data from the Agricultural Research Service of the United States Department of Agriculture, yam is high in carbohydrates, minerals (calcium, iron, magnesium, phosphorus, potassium, sodium, zinc), vitamins (thiamine, riboflavin, niacin, B6, B12, A), and fiber.