COMMITTEE ON COMMODITY PROBLEMS

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EXAMINATION OF THE TECHNICAL FEASIBILITY OF ANALYZING AND MONITORING THE ECONOMIC SIGNIFICANCE OF BANANA VARIETIES OTHER THAN CAVENDISH – OUTLINE OF A STRATEGY[1]

I.   INTRODUCTION

1.   At its last session, the Intergovernmental Group (IGG) on Bananas and Tropical Fruits recognized the need to broaden the coverage of the monitoring and analysis of banana markets to include varieties other than Cavendish. Subsequently, the Commodities for Livelihoods programme of Bioversity International was requested to examine the technical feasibility of analyzing and monitoring the economic significance of banana varieties other than Cavendish.

II.   BACKGROUND

2.   With an annual global production of around 125 million tonnes, bananas are the 8th most important food crop in the world, and the 4th most important in the least developed countries (FAOSTAT 2010[2]).

3.   Only about 15 percent of this global production enters the world market, with an estimated value of more than USD 5 billion per year (Arias et al. 2003). The bulk of global

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[1] Paper prepared by Bioversity International, in collaboration with the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) and the International Institute of Tropical Agriculture (IITA).

[2] See document CCP:BA/TF 11/CRS 7 for detailed list of references.

banana production from smallholder farmers who grow the crop in relatively small plots or backyard gardens for home consumption and local markets.

4.   Global banana trade relies almost exclusively on Cavendish varieties. Production systems for local consumption and trade are much more diverse, relying on a range of different varieties.

5.   Of particular importance are the East African Highland Bananas (EAHB) that account for approximately 17percent of the banana types grown worldwide. They are a staple starchy food for around 20 million people in Africa (Edmeades et al. 2006a) and an important source of income. There are around 120 EAHB varieties in Uganda alone that are not found anywhere else in the world.

6.   The plantains form another important group and make up about 15percent of banana types grown worldwide (Lescot 2010). They are a major staple food in Africa, Latin America, the Caribbean and India. Plantains are especially important in the humid lowlands of West and Central Africa, where over a hundred different varieties are grown.

7.   Southeast Asia is the centre of origin of the banana, and it is in this region that we find the greatest diversity of the crop (Perrier et al. 2009). Numerous cultivars are being grown for many different purposes: fruits are not only consumed raw, but also processed in many ways and at all stages of ripening and development, leading to products with increased shelf life, such as flour, chips and beverages. In India and other Asian countries, the plant is grown for its leaves (for plates or firewood) or fiber extracted from the pseudostem (for ropes and fishing nets). The flowers and terminal bud, and to a lesser extent the pseudostem, are eaten cooked or raw. These different varieties can also play an important nutritional role. For instance, while Cavendish varieties hardly contain any pro-vitamin A carotenoids (pVACs), levels of pVACs in some orange banana cultivars have been found to approach those found in the best-performing sweet potato and carrot varieties (Davey et al. 2009).

III.   PROBLEM STATEMENT

8.   Access to reliable data on crop production and marketing is vital for effective planning in research and economic development. Despite their indisputable importance to food security and poverty alleviation, there are hardly any statistics on the production, trade and consumption of these "other" banana varieties (which for the purpose of this work include Cavendish varieties that are not produced for export).

9.   Systematic collection of reliable statistics is challenging because bananas are often grown in mixed cropping systems with annual food crops, perennial mixed plantings, backyard gardens or bush fallows, along roadways and on waste lands, and consumed in the home or traded through informal local market systems. The existence of many synonymous names for the same or different varieties adds to the challenge.

10.   The FAO statistics (http://faostat.fao.org) distinguish between "banana" and "plantain" but it is not always clear what these two terms cover. For instance, are the starchy ABB cooking bananas classified with the (also starchy) plantains, or are they classified with the (mostly sweet) bananas? In the FAO database, we can notice that for Rwanda and Burundi, where basically the same types of banana are grown, production in Burundi is registered under "banana" while production in Rwanda is classified under "plantain". Still according to the FAO data, Uganda is the largest producer of "plantain", but in reality 99percent of this production is in fact EAHB varieties, that are different from plantain. These two groupings of "banana" and "plantain", besides being ambiguous, certainly fail to unveil the vast diversity of the crop.

IV.   OBJECTIVE OF THE STRATEGY

11.   The objective of the strategy that is outlined below is to establish a collaborative system that will allow the collection and compilation of reliable banana statistics, broken down by meaningful

categories of the diversity of the crop (genome groups, subgroups, varieties), that can be regularly updated and will be easily accessible to users.

V.   WHAT CAN BE BUILT ON?

12.   A wealth of information exists in many countries; surveys have shown that farmers have in general a very good knowledge of the different varieties grown and their importance. The difficulty is however that this local knowledge is often only available in local journals or reports or not captured in any written form at all. Tapping into this valuable knowledge is not easy but can be facilitated by working through existing networks, such as the regional banana R4D networks[3] and the global ProMusa[4] network, coordinated by Bioversity.

13.   CIRAD has for the last 20 years been collecting banana production statistics, broken down in four categories (Lescot 2000, 2004, 2006, 2008, 2010):

1) Plantains (AAB)   cooking bananas

2) EAHB + ABB group + other cooking bananas

3) Cavendish (AAA)   dessert bananas

4) Gros Michel + other dessert bananas

14.   CIRAD also collects export and import data, broken down by Cavendish varieties and plantains, and dessert bananas and plantains, respectively. The work is the effort of a small team of 1-2 people at CIRAD. They consult a wide range of documents for their compilations, including the FAO statistics, national statistics, country reports, publications, etc., further supplemented by their own expert knowledge of banana production in certain countries and regions. The statistics are published every two years in Fruitrop[5]. They are Open Access, with the exception of the most recent edition.

15.   The International Institute for Tropical Agriculture (IITA) has recently proposed an electronic tool to capture spatial data on banana production and their characteristics. This tool arose from work initiated at the Banana International Conference in Mombasa, Kenya in 2008, where Bioversity with support from IITA organized a mapping exercise, during which banana experts were asked to mark the main banana-growing areas on a map of their country. On a short questionnaire, additional characteristics about the respective areas were recorded (e.g. main cultivar type, production technology and presence of pests and diseases). All data were entered into a Geographic Information System (GIS) and published on the internet as the Banana Open Access Platform[6] (BOAP). This online mapping tool allows local experts to add, update and validate banana production data.

16.   The ProMusa network is currently setting up an online collaborative banana knowledge compendium. Country factsheets are created, that provide – amongst other things – information about important varieties grown and traded in the country.

VI.   ELEMENTS OF STRATEGY

17.   The strategy that is proposed seeks to connect the above-mentioned efforts and to build a collaborative framework that collects and updates banana statistics:

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[3] MUSALAC in Latin America and the Caribbean, BAPNET in Asia and the Pacific, BARNESA in eastern and southern Africa and the Innovation Platform for Plantains in West and Central Africa.

[4] www.promusa.org

[5] http://passionfruit.cirad.fr/index.php/percent28htmlpercent29/fruitrop/fruitrop.html

[6] http://banana.mappr.info

1. A desk study literature review:
    a) A comprehensive list of banana varieties and groups that are of (national or regional) importance in terms of food security and income will be compiled.
    b) A list of articles, databases and other resources will be compiled, as well as important resource persons identified, for the top five most important varieties/groups per region.
    c) For each of these groups, their economic and food security role (production, consumption, and local, regional and international trade) will be worked out in detail.
    d) For each of these groups, key production and marketing constraints, and their growth potential, will be identified.
    e) Current initiatives to spatially quantify global banana production (FAO, CIRAD, IITA and IFPRI) will be compared.

2. Making the information available in different formats:
    a) The results of the desk study will be summarized in the online country factsheets, housed on the ProMusa website.
    b) A workshop will be organized in collaboration with FAO Statistics Division to discuss the design of a banana-specific database, building on the CIRAD and the BOAP databases, that will be able to capture the data compiled during the desk study, broken down by meaningful groups of banana diversity. All statistics will be published in an open access report that will be freely available online.
    c) The database will be linked to a mapping tool to visually present the information and make it available online. The tool will include a module that allows making overlays with other maps (e.g. existing socio-economic data, climatic data, pests and disease data, production data of other crops, etc.).

3. Systematic updating of the information:
    a) The knowledge compendium is built with wiki software, allowing people to validate and update the information in a collaborative way (cfr. Wikipedia). The database and mapping tool will also be built with a user interface that will allow people to update the data.
    b) The ProMusa network, the FAO Statistics Division and the regional R4D networks will play an important role in making sure that the country information and data are reliable and regularly updated.

VII.   CASE STUDY

18.   To illustrate the potential of the proposed strategy, a case study[7] was prepared on the economic significance of banana varieties other than Cavendish in Uganda. Dr Deborah Karamura, a specialist in the diversity of EAHB working for Bioversity-Uganda, compiled a report on the diversity of bananas in Uganda. The results from the report were compared with the data available in the FAO, the CIRAD database, national statistics and the spatial information in the Banana Open Access Platform. The outcomes of the study were combined with other banana-related information for Uganda to build a country factsheet for Uganda.

A.   SUMMARY OF THE FINDINGS

19.   Uganda is the second largest producer of banana and has one of the highest per capita consumption rates in the world. Depending on the cultivar, bananas are consumed as a staple food or transformed into beverages or a diversity of confectionaries. Banana is a staple to an estimated 10 million Ugandans, with 66 percent of the country's urban population depending on it. The

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[7] See document CCP:BA/TF 11/CRS 6.

population's growth rate of 3percent suggests significant increases in future demand for bananas, especially in urban areas.

20.   The most extensively grown type of banana belongs to the subgroup known as the East African highland bananas (EAHB) (Karamura et al. 1999), which were domesticated in the region (Table 1). The crop is grown by about 75percent of the farmers and ensures income throughout the year, provides feeds for animals and plays a key role as a food import substitute.

21.   "Sukali Ndiizi" and "Bogoya" represent the main dessert and commercial bananas. They are both widely grown in all banana growing areas, although on a small scale. Plantains are also grown on a small scale. Their proportion in farmers' banana fields are estimated at 2 percent (Gold et al. 1999). Unlike the EAHB, which lose value at ripening, plantains can still be roasted, steamed or used for juice production at the over-ripe stage.

Table 1. Most widely cultivated types of bananas and their use in Uganda.

Genome group	Type	Use
AAA	EAHB - Matooke	Cooking
	EAHB - Mbidde	Beer
	Introduced varieties (e.g. Bogoya)	Dessert
AAB	Plantain	Roasting
	Sukali Ndiizi	Dessert
ABB, AB	Introduced varieties	Beer
AABB, AAAA, AAAB	Hybrids	Multipurpose

22.   For all varieties grown in Uganda, the key production constraints are soil fertility, pests (weevils and nematodes) and diseases (Fusarium wilt, black Sigatoka, and Xanthomonas wilt). The availability of chemicals is limited in many rural areas and out of reach to most small-scale producers, making banana production largely organic.

23.   Addressing soil fertility, as well as pests and diseases are essential to ensure long-term production. Production challenges are very similar across the region where there is an inability to meet the demand for quality and quantity due to diseases. There is also limited access to clean seed material and limited transboundary exchange of information and technologies. Increasingly, however, banana is becoming more and more prioritized as an important and viable crop for investment both at the national and regional levels. But while regional markets are very promising, they are largely unsearched.

24.   The first priority should be to guarantee sustainable banana production systems and increase the efficiency of the banana marketing chain from rural production areas to urban consumption zones, which is hampered by poor infrastructure in most rural areas. The banana marketing system is also very complex with long value chains of actors from farmers to consumers.

25.   Cross-border trade in the region has gone on for many decades but the volumes traded have remained low. The main products traded are Matooke (green-cooking/ beer bananas); dessert bananas (Gros Michel, Sukali Ndiizi); plantains; banana beverages (juice, beer/wine, gins) and fibre products. The export of dessert bananas (mainly Bogoya and Sukali Ndiizi) regionally and internationally is mainly constrained by the poor quality of the fruit due to difficulties in controlling ripening, poor handling and unattractive appearance on ripening.

26.   Capturing regional market opportunities, such as the ones developing in Rwanda and Kenya will require changes in the way bananas are produced and marketed. Forming marketing groups or co-operatives is one way of combining and coordinating selling of required volumes. Another option would be for exporters to develop contractual arrangements with large farmers who possess the resources necessary to produce sufficient volumes, the management skills for

contractual negotiation and production planning and have incentives to maintain long-term contractual relationships. Investment in research on Sukali Ndiizi is also needed to control ripening and develop methods to improve skin colouration characteristics if the barriers to export are to be overcome.

VIII. REFLECTION ON BUDGET REQUIREMENTS

27.   Outlined below are some of the elements that will need financial support. More detailed estimates will be provided at the IGG session in May.

28.   The first phase will require, amongst others, support for a desk study for 15-20 of the most important banana-producing countries, travel of experts to selected countries for data gathering and interviews, an expert workshop to discuss the set-up of a global database system, and the development/improvement of a database system and mapping tool. The developed system will then need to be validated and improved. The maintenance of the system will require investment in systematic data inputting and updating.