



Adding value to bananas: the results of a study and workshop on the contribution of *Musa* processing businesses to rural development

Progress report to the Rockefeller
Foundation



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1. Project data

1.1	Project title	CFC/FISGB/O9FT Expanding market opportunities and adding value to <i>Musa</i>	
1.2	Project executing agency	International Plant Genetic Resources Institute – International Network for the Improvement of Banana and Plantain	
1.3	Project supervising agency	IGG BA/TF	
1.4	Starting/completion dates	June 2004 - June 2006	
1.5	Project financing	CFC Grant:	\$ 89 595
		Co-financing contributions:	\$ 63 000
		Rockefeller Foundation:	\$ 50 000
		US AID:	\$ 5 000
		Counterpart contributions:	\$ 66 000
1.6	Participating countries	Costa Rica, Nicaragua, Cameroon, Nigeria, Tanzania, Malawi, Philippines, India, Malaysia	

2. Executive summary

Period covered: June 2004 – June 2006

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In 2004 the Common Fund for Commodities (CFC) and Rockefeller Foundation financed IPGRI/INIBAP to provide a global platform for the development of production technologies and marketing strategies for banana-based products. This platform aims to respond to such problems as post harvest losses, seasonal gluts resulting from new more productive cultivars, dependence on a single cultivar, loss of biodiversity and banana perishability. INIBAP, working through its four regional networks (BARNESA for Eastern and Southern Africa, MUSACO for West and Central Africa, MUSALAC for Latin America and the Caribbean, and BAPNET for Asia and the Pacific) identified two countries in each network to carry out a country-based study looking at types of *Musa* processing businesses, their business support environment and their contribution to rural development. In a workshop held in the Philippines in October 2006, the country teams presented their results for analysis. Over forty participants concluded that processing has potential to contribute to rural development and to the reduction in poverty, but in the countries in the study, there is a need for systematic and sustained investment in the business services environment and in the management capacity of potential small business operators. Over forty participants identified key initiatives for INIBAP and its networks to address the possibility of increasing the contribution of *Musa* processing to rural development.

Results have been presented and discussed in the regional *Musa* networks in Asia and Latin America. An expert meeting was convened in Mexico among food technologists with experience in *Musa* processing to develop a manual on the basics of *Musa* processing for micro and small scale businesses. The draft manual will be reviewed with small processing business operators in early 2007 in Cameroon. The results will also be discussed in the regional networks in Africa in 2006 and 2007. INIBAP has also begun to develop a web site with the results of the case studies and the workshop.

3. Technical report

3.1 Country studies and global workshop

In 2003 IPGRI/INIBAP presented a proposal to CFC to provide a global platform for the development of production technologies and marketing strategies for banana-based products. This platform responds to such problems as post harvest losses, seasonal gluts resulting from new more productive cultivars, dependence on a single cultivar, loss of biodiversity and banana perishability. The proposal was approved for funding in April 2004. Between the presentation of the proposal and its approval, INIBAP, the Technical Centre for Agriculture and Rural Cooperation (CTA) and other partners organized a workshop in Africa to analyze the potential for adding value to bananas and plantains (see INIBAP report to CTA on Seminar on “Assessing the opportunities for developing and diversifying markets for bananas and banana-based products in Sub-Saharan Africa”, Kampala, Uganda 2-5 February 2004). INIBAP also collaborated with Rockefeller Foundation in the organization of a seminar and trade fair in Kenya in April 2004. Based on the experience in these two workshops which focused on successful businesses, INIBAP developed an implementation strategy for the CFC funded - global workshop

based on country studies of *Musa* processing businesses and their business support environment (Appendix 1). This was designed to strengthen linkages between the production research and development sector and the processing research and development sector during the execution of the study and to take advantage of the value of the regional banana networks as a forum for prioritizing a research and development agenda, as research partners and as a channel for delivering important technologies and approaches. At the same time IPGRI/INIBAP also contacted other sources of financial support to complement the CFC funding. Rockefeller Foundation based in Nairobi agreed to join the effort and support from the United States Agency for International Development (USAID) was used to finance country studies in Tanzania and Cameroon.

In mid 2004 a preliminary survey form was drawn up and distributed to national country coordinators prior to their annual regional meetings (Appendix 2). Following the questions in the survey, country representatives compiled their existing impressions of the types of *Musa* products found in the country and the support sector. In the case of Latin America, each country had already undertaken a similar survey developed by regional specialists (see CD from MUSALAC meeting 2004). During 2004 the four regional networks discussed the challenges of adding value to *Musa* through processing, reviewed the proposal for a global workshop and analyzed the merits of completing the country studies in the different countries that participate in the networks. In Latin America, all countries presented an overview of the *Musa* processing sector, but in the other regions only a few of the countries compiled the information. Based on these regional meetings, two countries per region were selected to participate in the initiative – completion of a country-based survey and participation in a global workshop.

In late 2004 and early 2005 INIBAP staff worked with *Centro Agronomico Tropical de Investigacion y Ensenanza* (CATIE) professionals from the Centre for the Competitiveness of Eco-businesses to develop the method for the country-based study of small *Musa* processing businesses and their business support environment. A draft method was tested out in Costa Rica to yield the version which was to be used with collaborators. The method built on the preliminary survey. The national *Musa* representative from the production sector led the study by forming a group of 3-5 specialists from production, food processing and enterprise promotion. This group first proposed a typology of *Musa* processing businesses based on type of product, technology employed, type of client and size. They also sketched out the types of technical and business services which were available to the different categories of *Musa* processing firms. With this first draft view of the sector, they then conducted visits and interviews with 2-3 businesses representing both processing businesses and services. After each visit, the team also analyzed the contribution of the business to rural development based on a livelihoods framework. With this field data, the study team then looked at linkages among entities in the sector and also identified mechanisms which contributed to better information and service flow in the sector. Those interviewed as well as key organizational leaders were invited to a final workshop to review the results, make suggestions and to identify follow-up actions. The gaps between micro and small business needs and available services were highlighted and the contribution of existing *Musa* processing businesses to rural development was identified. These results were prepared as a final report and Powerpoint presentation for the global workshop.

In April 2005 the INIBAP offices in Montpellier, France, and West and Central Africa worked with collaborators from Cameroon and Nigeria to begin the country studies in that region. These studies were completed during May-August.

During May and June letters of agreement were signed with partners in seven countries to carry out the study following the methods guide. From June through September India, Malawi and Malaysia completed the study using the methods guide and local expertise. In July the INIBAP project leader visited Nicaragua and Philippines to reinforce the study team. In September the project coordinator visited Tanzania to share experiences from other country studies with the team in the Kagera District of Tanzania. The multi-disciplinary country teams completed the study during the weeks and months following the visit from the INIBAP coordinator.

A local organizing committee in the Philippines composed of PCCARD (Philippine Council for Agriculture, Forestry and Natural Resources Research and Development), DA-BAR (Department of Agriculture - Bureau of Agricultural Research), Cavite State University and INIBAP-Asia and Pacific organized the workshop and a techno-fair. The workshop was held from 10-13 October in Southwood Park, Philippines, outside of Manila with 50 participants (Appendix 3). Two to three delegates from each country team participated (21 persons). Resource people in food technology and enterprise promotion were also invited to contribute to the analysis (9 persons). Food technologists came from Brazil, South Africa, France (Centre de coopération internationale en recherche agronomique pour le développement) and Italy (Food and Agriculture Organisation). Business experts came from Uganda (International Institute for Tropical Agriculture - IITA, FoodNet), Costa Rica (CECOECO), IPGRI-Malaysia and Tanzania (private consultant). Representatives from the four INIBAP regional offices and the main office in Montpellier, France, also participated in the workshop (6 persons). Additional representatives from the host committee organizations also participated (14 persons).

The first three days of the workshop were dedicated to presentations, working groups and conclusions (Appendix 4). All countries had completed a study following a common method and had prepared a Powerpoint presentation. Working groups were formed by specialization of the participants, by region and across regions to analyze the results of the workshop from different perspectives (see pages 45-55 in the Appendix 5). On the fourth day Cavite State University organized an enterprise fair on banana processing. This fair included a symposium and displays from state universities around the Philippines, selected local banana processing businesses and input businesses and government offices. The country participants from around the world also displayed their *Musa* products. Representatives of 12 country members of BAPNET, the Banana Network of Asia and the Pacific, participated in the symposium and fair. They held their annual meeting during the three days following the fair, during which time they also reviewed the results of the workshop and discussed follow-up actions in their region. Each participant received a CD with the nine country studies and workshop presentations, a CD with presentations from symposium at the techno fair and a report prepared by the local organizing committee (Appendix 5).

3.3 Results and conclusions of the workshop

This summary of the workshop results and conclusions first presents information about the *Musa* processing businesses, their products, technology used and clients. Each type of

processing business is then characterized by the type of services which it employs for daily operations and long term competitiveness. The service environment itself is then characterized in terms of its capacity to support businesses to resolve problems and to identify and take advantage of new market opportunities. The section ends with a discussion of the potential for adding value through processing to contribute to rural development and the proposed follow-up initiatives by INIBAP and other lead organizations.

3.2.1 Importance and diversity of *Musa* processing

The percentage of *Musa* produced which is converted into processed products for resale varies with the type of cultivars (Table 1).

Table 1: How much *Musa* is produced and processed in the nine countries in the study?

		Total area in <i>Musa</i>	Volume produced	% sold fresh nationally	% sold processed nationally	% exported fresh	% exported processed
Nigeria	Dessert Banana	68 000	701 000	98,5%	1,5%	-	-
	Cooking banana	34 000	362 000	35%	65%	-	-
	Plantain	161 000	1 224 000	85%	13%	1,5%	0,5%
Cameroon	Dessert Banana	65 000	630 000	55	5	38	2
	Cooking banana	??	150 000	??	??	-	-
	Plantain	200 000	1 200 000	75	15	10	1
Malawi	Dessert Banana	180 000	900 000	90	5	5	-
	Cooking banana	40 000	120 000	25	75	-	-
	Plantain	15 000	30 000	80	20	-	-
Tanzania	Dessert Banana	12 000	60 000	99	1	-	-
	Brewing banana	15 000	75 000	0	100	-	-
	Cooking banana	120 000	600 000	98	2	-	-
	Plantain	3 000	15 000	5	95	-	-
India	Dessert Banana	421 400	14 952 000	96	0,1	0,1	0,8
	Cooking banana	34 300	1 008 000	60	40	-	-
	Plantain	34 300	840 000	45	53	1,2	0,8
Malaysia	Dessert Banana	27 000	150 000	69	1	30	-
	Cooking banana	??	210 000	??	??	-	-
	Plantain	4 000	20 000	50	50	-	-
Philippines	Dessert Banana	198 000	4 432 000	??	??	??	??
	Cooking banana	155 000	1 604 000	??	??	??	??
	Plantain	??	1 000				
Nicaragua	Dessert Banana	24 000	??	90	1	9	-
	Cooking banana	36 090	??	98	2	-	-
	Plantain	18 000	??	80	1	15	1
Costa Rica	Dessert Banana	45 000	2 035 000	10	1	75	15
	Cooking banana	300	650	100	-	-	-
	Plantain	11 000	75 000	35	10	43	12
Total for all countries	Dessert Banana	??	??	??	??	??	??
	Cooking banana	??	??	??	??	??	??
	Plantain	??	??	??	??	??	??

Only about 5% of the total production of dessert bananas is processed in the nine countries in the study. Costa Rica and India account for quite a large share of this total through the processing of reject bananas from Cavendish plantations into banana puree and juice. AAA-type bananas are also processed on a small scale for juice, beer, flour, dried bananas and as an ingredient in different snack foods which are made fresh on the street each day.

The percentage of plantains processed for sale is about 24%. The largest volume of this is in India, Cameroon and Nigeria which are the three countries in the study producing the most plantains. The most common products are plantain chips, sweets and roasted plantain as a street food.

For cooking bananas between 30 and 40% of the production is sold processed as beer, alcohol, chips, catsup and street foods. The major portion of this total is processed in Philippines where millions of school children and youth buy a bananacue every day as an after school snack.

These statistics on processing are often only tentative estimates which need further refinement.

3.2.2 Types of *Musa* processing businesses and their products

Each country categorized the *Musa* processing businesses by technology, size of the business, type of product produced and clients. These different categories correspond to more or less five different types of processing businesses (Table 2).

There were two types of micro businesses which represent from hundreds to thousands in those countries indicated in Table 2. The smallest business prepares and sells a single product in the street each day and was found in the four countries of Africa and the Philippines. The micro business based at home or in a small workshop represents a slightly larger scale of operations for such products as chips, banana beer, banana-based alcohol and banana fibre handicrafts. This type of micro-business is found in the great majority of the countries in the study.

The next category represents small to medium businesses. They produce a single product or a wider range of products which are identified with a label, contact information and licenses. These are the businesses which are legally registered and appear in national statistics. Chips are the most common product, but businesses also produce jams, relish, alcohol, wine and dried bananas. This type of business is much less numerous than the micro-enterprises. Per country the number ranges from a few to 50 businesses.

A special category was designated for businesses set up by NGOs which often produce special or new products for the local market, although some also export small quantities. They produced such products as banana fibre paper, dried bananas, wine and banana-flavoured yogurt. In Costa Rica growers' associations have also been financed to set up processing plants to export pre-processed plantain foods. Such businesses often receive some financial report, so it is less clear if they are financially independent.

Table 2: *Musa* products by country according to five types of processing businesses

Type of business	Products/countries	Strengths	Weaknesses
Micro-enterprises: single product prepared and sold on the street (100's to 1000's in each country)	Philippines – bananacue	Simple, low cost technology Labour intensive Quality control by consumer Daily cost accounting Low sale price	Difficult hygiene on street (dust, mud, lack of clean water) Precarious finances Minimal shelf life Not licensed or regulated Raw material supply
	Cameroon – banana fritters, roasted plantain		
	Nigeria – dodo ikere, roasted plantain		
	Tanzania – balagala, roasted plantain		
	Malawi – banana pancakes, muffins, snack foods		
Micro-enterprises: single product prepared at home for sale on street or from home (100's to 1000's in each country)	India – chips, sweets, handicrafts, fibres	Simple, low cost technology Labour intensive Daily price accounting Low sale price	Labour efficiency Minimal shelf life Not licensed or regulated Raw material price and supply
	Nicaragua – chips, sweets, baked ripe plantain, chocolate covered ripe banana, vinegar		
	Costa Rica – chips		
	Nigeria – chips, beer		
	Tanzania – beer, brandy		
	Malawi – banana pancakes, muffins, snack foods		
	Cameroon – chips		
Small to medium enterprises: mixed snack or food production with company label and license (few to 50 per country)	Chips – Nigeria, Malaysia, India, Costa Rica, Nicaragua, Philippines, Cameroon	Traditional products for popular taste Diverse product mix for efficient use of installations and labour Licensed and regulated which permits expansion to legal markets Technology, packaging can be upgraded Strategic business management	Need for more specialized services External financing needed for expansion Dependent on public services Vulnerable to cheap imported substitutes or changing tastes
	Banana relish, juice, jam, figs, sweets – India		
	Flour – Nigeria, Cameroon		
	Banana catsup – Philippines		
	Alcohol – Cameroon		
Micro and small enterprises promoted by NGOs (few to 10 per country)	Figs – Cameroon, Tanzania, Nicaragua, Costa Rica	Access to training on management Access to technical training Access to financing New products for new markets	Uncertain financial sustainability Services for business not always available locally Market potential potentially limited Small volume
	Wine – Malawi, Tanzania		
	Paper products and handicrafts – Nicaragua, Tanzania, Malawi		
	Pre-frozen foods for export – Costa Rica		
	Yogurt – Nicaragua		
Medium to large businesses with modern processing technology (few per country)	Frozen pre-cooked foods – Costa Rica	Business strategy and management Volume production for cost reduction Access to international technology and packaging	Raw material price and supply High cost product not accessible to low income classes
	Dairy products – Cameroon, Costa Rica, Nicaragua, India, Malaysia, Malawi		
	Puree – Costa Rica, India, Philippines		
	Chips – Costa Rica, Nicaragua, India		
	Flour – Nigeria		
	Wine – Tanzania		

Large businesses with modern technology for using banana in their products were found in all countries, although only in very small numbers for the production of banana-flavoured milk products, wine, puree and juice, chips and pre-prepared frozen products.

The country with the highest percentage of processing is Costa Rica which exports a diversity of processed *Musa* products. Countries such as Tanzania, Malawi and Philippines have significant added value through local processing by micro enterprises. In Tanzania rural households obtain added value through the preparation of banana juice, beer and distilled alcohol. In the Philippines value is added by micro businesses in urban areas.

3.2.3 Services employed by different *Musa* processing businesses

Each category of *Musa* processing businesses makes use of quite different services (Table 3). The micro businesses use very rudimentary processing and packing equipment based on traditional technology. They use no business planning services, accounting or market studies.

The small to medium businesses represent a wide diversity of conditions. There are small traditional processing businesses using limited services, but there are also businesses set up with market studies, plant and equipment design and other business development services. The processing businesses set by NGOs are usually small. Usually the women's groups or community associations involved receive training, technical assistance and market development support.

The large enterprises often use imported equipment and packaging, bring in international consultants to design production and marketing strategies and have a specialized management and production work force. These businesses generally follow the legal licensing procedures for food, worker and environmental certification.

3.2.4 Mechanisms/linkages in business support environment to reach small and micro businesses

From the previous section it is clear that existing micro-businesses use only rudimentary services. For *Musa* processing businesses to become more numerous, significant and dynamic, especially for the benefit of rural communities, an active and accessible business services environment is key. In this section the results from the country-based studies are used to provide insight into the quality and availability of services for small and micro businesses. In essence the question posed is: In which business support environment would a marginal household, a women's cooperative or a community association find it easier to set up or expand a processing business beyond the common micro-enterprises? To make this evaluation requires examining the range and quality of services, their availability to more marginal sectors and the mechanisms and linkages among the different types of services that contribute to more integrated rather than piecemeal and uncoupled support. The reports presented by each country were quite uneven in their coverage of this point. Table 4 is therefore quite tentative and preliminary in its results.

A ranking of the regions/countries studied by the availability and quality of services indicates that in Costa Rica equipment, packaging and technical and business assistance

Table 3: Services employed by five categories of processing business

Type of service providers	Type of processing business				
	Micro: single product prepared and sold on the street	Micro: single product prepared at home for sale on street or from home	Small to medium: mixed snack or food production with company label and license	Micro and small: promoted by NGOs	Medium to large: modern processing technology
Technical Assistance on processing	--	--	Public food technologists, equipment and input sales	Public food technologists, foreign consultants	Contracted internationally or in-house
Simple packaging	Recycled paper, polyethylene bags, leaves, serving stick	New paper or polyethylene bags, recycled bottles, bring your own container	New packaging – polyethylene or polypropylene, plastic container, bottles	Like small business	--
Advanced packaging	--	No	Paper labels or printed bags, laminated or aluminium bags	Like micro and small business	Sealed for food safety with minimal handling, product branding
Raw materials / simple ingredients	Local markets	Local markets	Bulk purchases, contracts with growers and traders	Local markets	Bulk purchases, collection network, grower contracts
Specialized ingredients	--	--	Spices, preservatives, flavourings	Specially sourced by business advisors	Imported directly
Hand equipment	Minimal kitchen utensils	Utensils for larger batches	Similar to micro, but higher quality and larger	Like micro and small business	Specialized or efficiency and food safety
Small scale equipment	--	Large pans, sieves, closed containers, stoves	Dryers, stoves, large pans, worker safety equipment	Like micro and small business	Imported directly, worker safety equipment
Industrial equipment importers	--	Plastic bags, sealers	Cookers, sterilizers, dryers, scales, package sealers	--	Specialized product lines custom designed
Business services	--	--	Accounting, investment plans	Training courses	Specialized departments in house
Professional education in processing	--	--	University food technology	University food technology	University food technology
Practical training in processing	On job, from family	On job, from family, on job in another business	On-job, occasional government service	Training on new products	In house
Credit	--	--	Government credit or friends	Training and technical assistance free	Commercial credit or parent company
Environment standards	--	--	Water, wastes, noise	--	Water, noise, wastes
Food safety standards	--	--	On site inspections, health certificates	--	On site inspections, health certificates, in house labs
Labour safety standards	--	--	Worker safety	--	Worker safety

Table 4: Quality and accessibility of business support environment for the promotion and expansion of processing businesses among rural communities in nine countries studied

Country (region covered in study)	Availability of inputs, equipment and technical and business assistance (rank= 1 low availability; 9 highest availability)	Services which facilitate establishment or upgrade of micro and small businesses among rural /programmes for rural development	Percent of rural population with potential access to services
Nigeria (area Lagos/Ibadan)	4	Small/Medium Enterprise Development Agency Women in Food Processing (NGO) National Horticultural Research Institute (NIHORT) Universities (Abeokuta, Ibadan, Ile-Ife)	< 5%
Cameroon (area Yaounde-Douala)	3	Few NGOs Centre Africain de Recherches sur Bananiers et Plantains (CARBAP) Small scale dryer workshops	< 5%
Malawi (southern region)	2	DEMAT (Development Malawian Enterprises Trust) MIRTDC (Malawi Industrial Research and Technology Development Centre)	< 5%
Tanzania (Kagera District)	1	Few NGOs in food processing Agricultural Research and Development Institute (ARDI)	< 5%
India (Tamil Nadu state and surroundings)	8	DRIP – District Rural Industries Project NAMT – State government rural agro-industry initiative Banana Product Cluster Project Ministry of Food Processing National Banana Research and Development Centre	5 – 15%
Malaysia	7	Malaysian Agricultural Research and Development Institute (MARDI)	5 – 15%
Philippines (Southern Tagalog Region)	6	Provincial Science and Technology Office Department of Science and Technology – Provincial Centre Technical Education/Training Development Authority National Research Centers in Food, Nutrition, Industrial Development and Packaging Universities (Cavite, Los Baños) Credit services	5 – 15%
Nicaragua (West, Center, South)	5	Small/Medium Business Institute Few NGOs in food processing University (Leon)	< 5%
Costa Rica (whole country)	9	National Training Institute Technical high school food technology training Agricultural Reconversion Program National Council on Production Center of Food Technology Input sales representatives are food technologists	15 – 30%

are dynamic services which target export and middle income national markets. On the other extreme is the Kagera District of Tanzania which is distant from any large city and has very limited services for processing businesses. The business support environment in Africa was generally more limited than in Asia or Latin America.

All the regions/countries studied have begun to focus programmes on the added value as a component of rural development, but there is substantial difference in the extent of these programmes. Costa Rica has numerous initiatives to link production to processing and to generate added value for grower association. These include training services in agro-industry for workers, young entrepreneurs and farmer associations and credit for

cooperative processing. India and Philippines also have diverse programmes to allow rural communities to generate added value. In Africa NGOs are playing a leading role in adding value for poverty reduction and the public sector also has incipient initiatives. However, areas remote from large cities receive much less attention.

The low estimated percentage of the population with potential access to service providers adding value through processing indicates the difficulty for marginal families or communities to process for added value. Only a very small percentage of the population in Africa has potential access. This situation is better in Asia, but even so the percentage remains relatively low. Costa Rica has achieved a higher degree of accessibility based on good infrastructure, small size and multiple programmes dedicated to capacity development.

3.2.5 Processing as a solution to production and market problems

Adding value through processing is often seen as a solution to diverse aspects of rural development, especially among production specialists, planners and politicians. This study offers some preliminary results on several of these points (Table 5).

Table 5: Gains expected from processing *Musa* for added value

Proposed gains from adding value	Tentative observations – nine country studies
Processing is solution to reduce loss and absorb seasonal gluts	Low processing capacity Few products for storage Processors complain about seasonal lack of raw material and high prices
Processing will pay better price	Processing pays market price or less When price increases, processors suspend activity Farmer processing was uncommon
Large untapped markets	Local mass markets are for low cost, known products Limited, but growing, disposable income in middle class Some export markets available with appropriate scale of operations
Processing business contributes to poverty reduction	Important for marginal households as survival strategy Few micro businesses grow to small/medium Few processing businesses among rural households New skills and resources to access information and services Service providers difficult to access for poor households

First, processing is often proposed to reduce post-harvest losses, to absorb seasonal production gluts and to use low quality production. The nine country studies show that processing capacity is limited and therefore currently not set up to absorb large seasonal overproduction. Short term increases in amount of production which is processed is not likely. Many of the products based on banana and plantain are perishable or are produced for short-term consumption. This means that they cannot easily be stored for later use. From the point of view of the processors, the more limiting problem is the lack of raw material and high prices in certain seasons of the year. During periods of scarcity processing businesses are idle. The only case of the use of overproduction is the processing of reject bananas from export plantations.

Second, processing is often proposed as an opportunity for higher prices for farmers. The studies showed that processing businesses pay the market price or lower. When plantain or banana prices increase too much, processors suspend their processing lines. They indicated that they cannot easily pass short term price fluctuations onto the consumers of their products. In addition, very few cases were found of farmers who processed bananas

or plantains to capture added value. Costa Rica had a few farmer associations which operated processing factories. In Malaysia one of the chip factories interviewed also had plantain plantations. In Tanzania banana juice, beer and alcohol production is based in rural communities.

Third, processed products are seen to have a large potential market. The country studies showed that, at the current time, many of the processed foods are consumed by local mass markets for their low cost and easy availability. This market does not appear to have much potential for expansion. There is growing middle class market with increasing disposable income for pre-processed foods and innovative snack foods, but in most of the nine countries this growth is still limited. In most countries local contacts spoke of requests for processed products for export, but the volumes and the quality requested were usually beyond the production capacity for raw materials and beyond the managerial capacity and the service capacity of most of the countries. Exporters lost interest when they understood that reliable export volumes were not available.

3.2.6 *Musa* processing to reduce rural poverty

Based on the current limited capacity of processing to resolve production and market problems, the contribution of processing to poverty reduction can also be addressed (Table 5).

The thousands of micro-enterprises which process banana and plantain are extremely important to marginal households as a livelihood strategy for survival. However, very few of these businesses grow from micro to small businesses. They are quite skilled in operating with minimal resources and they know their markets quite well, but they do not have the skills and access to service providers to develop new products or markets. In some cases they may prefer to not grow to avoid the inspection and supervision that is required to become a legal small business, a situation mentioned in Nicaragua and India. They may be increasingly subject to inspection and licensing which threaten their survival. In Costa Rica, for example, street food enterprises were legislated out of existence.

Only a very few of the businesses profiled in the nine countries were owned by banana and plantain producers which means that the value which is added does not often go to rural communities. The Kagera District in Tanzania was the exception where thousands of household businesses produce banana juice, beer and alcohol. However, sanitary regulations and competition from beer and rum may reduce the number of these businesses in future years.

Finally, the study teams felt that the business owners and operators in most cases needed additional skills and resources to access services and information which would allow them to resolve problems in their processing and marketing and to identify and take advantage of opportunities for new products or markets. This problem is aggravated by the fact that most service providers are not easily accessible to poor, marginal or rural households.

In summary, processing has potential to contribute to rural development and to the reduction in poverty, but in the countries in the study, there is a need for systematic and sustained investment in the business services environment and in the management capacity of potential small business operators. The strategies of Costa Rica and India to promote added value in rural communities indicate that progress is possible.

3.2.7 What can INIBAP contribute to this situation?

During the third day of the workshop, after all the case studies had been presented and invited resource persons had also presented selected themes of interest, three work groups were formed to analyze the results of the studies. These groups – food technology, production, business development – were asked to identify issues across all the studies which could be addressed by an initiative from INIBAP. Seven issues were identified (Table 6) and will be reviewed briefly here.

The processing technology group concluded that access to good information on quality control and efficiency in processing was more of a problem than the lack of information, especially about technology for micro and small businesses. The group proposed that INIBAP bring together experienced *Musa* processing technologists to compile a manual on the basics of *Musa* processing oriented for use in projects to promote small processing businesses. This effort to consolidate existing technology would also provide a basis to consolidate an updated research agenda.

The production group identified three issues. First, while *Musa* germplasm has been characterized with botanical descriptors, much less information is available on the fruit and pulp characteristics of even the common cultivars of dessert bananas, cooking bananas and plantains. They suggested that INIBAP organize collaborators to identify descriptors of fruit and pulp, compile information by cultivar on fruit and pulp characteristics and identify cultivars with disease and pest tolerance to substitute for cultivars with similar fruit or pulp with disease susceptibility. Second, they suggested that production systems be developed based on the needs of processing rather than expecting processing to be designed around production problems. However, they indicated that small scale technology be developed to use reject bananas which are currently processed primarily with advanced and large scale technology. Their final issue was the loss of *Musa* biodiversity due to market specialization. They proposed that INIBAP and partners develop strategies for cultivar mixtures which can be marketed based on their biodiversity.

The enterprise group expressed concern for the lack of attention to business aspects of processing and called for greater partnerships among production, processing and business in the development of rural processing businesses. They also indicated that a data base documenting the experience of projects which promoted processing businesses for rural development would be a useful learning resource to illustrate how different approaches can be taken to promoting and strengthening *Musa* processing businesses under different conditions. They also identified a need for improved methods targeting micro and small businesses and farmer associations who have more rudimentary training needs than addressed in conventional business training courses.

Table 6: Conclusions based on 9 country studies: Initiatives for the work plan of INIBAP and the regional networks 12 Oct 2005

Issue	Proposed Initiative
Processing technology	
Information for quality improvement and on diverse <i>Musa</i> products has been generated by organizations and individuals around the world, but is not easily accessible to service providers to micro and small processing businesses	Prepare manual on the basics of <i>Musa</i> processing in simple language usable by service providers and small scale <i>Musa</i> processing businesses on the critical quality issues by unit operation for the different types of processing (drying, frying, cooking, fermentation/distillation, juicing, baking, freezing) taking

	<p>into account also the role of cultivars and maturity state. Type of technology, equipment and size efficiency is also relevant;</p> <p>Identify gaps in understanding of quality (microbiological, physical-chemical, sensorial, technological, nutritional and health) based on compilation of manual;</p>
Production	
<p>Many cultivars have been collected and characterized based on botanical and agronomic characteristics, but much less is known about their characteristics for processing. This limits possibilities for cultivar substitution and new product development.</p>	<p>Develop protocol for characterization of post harvest and processing qualities of cultivars;</p> <p>Promote analysis of post harvest and processing qualities for posting on web page (MGIS);</p> <p>Organize preparation of a compendium of cultivars grouped by their substitutability for processing as well as their performance characteristics and pest and disease tolerance;</p> <p>Develop IMTP initiative on processing types to fill gaps identified in compendium;</p>
<p>Processing has been proposed as a strategy to reduce post harvest losses and seasonal gluts.</p>	<p>Redesign production systems based on the needs of processors rather than trying to design processing to address the current production problems;</p> <p>Develop small scale processing for use of reject fruits;</p>
<p>Biodiversity of <i>Musa</i> is being lost as production becomes more market-oriented.</p>	<p>Develop and document strategies to add value to cultivar mixtures which are marketed for their contribution to biodiversity</p>
Business strengthening	
<p>Production and food technology research and development is focused primarily on technical issues and is not often market or enterprise oriented.</p>	<p>Promote review of planning procedures by research and development organizations to identify opportunities to incorporate market or enterprise perspectives;</p> <p>Incorporate market and enterprise perspectives to orient actions in future multi-country projects;</p>
<p><i>Musa</i> processing businesses represent quite different combinations of capital, management skills, technological level and type of market which call for different approaches to promotion and strengthening.</p>	<p>Promote the documentation of projects oriented to promoting and scaling up <i>Musa</i> processing businesses based on a simple typology of business types and develop a data base as a learning resource to organizations preparing new projects on <i>Musa</i> processing;</p>
<p>The total volume of <i>Musa</i> processed is low. However, micro <i>Musa</i> processing businesses provide income opportunities to significant numbers of low income households which present a precarious situation for quality improvement and business expansion.</p>	<p>Identify partners with methods experience on small farmer market studies, business feasibility and planning, participatory technology development, service provider capacity building, business to business collaboration for the development of multi-country projects oriented to rural development through value adding for farmer associations and micro and small processors.</p>

3.3 Actions and Plans for follow up and the promotion of findings

In October 2006 the study teams presented the results of the studies to the meeting of BAPNET, the regional banana and plantain network for Asia and the Pacific.

In January 2006 a proposal was presented to CTA to publish the results of the study as an illustrated methods guide and to create an electronic information resource centre on the INIBAP web site.

In March 2006 the INIBAP coordinator presented the results of the study at CATIE in Costa Rica which had been a partner in the methods development. In May 2006 the results were presented and discussed at the annual meeting of the Latin American and Caribbean banana and plantain network meeting.

In May food technologists working with Musa from Brazil, Costa Rica and France were convened in Mexico to develop a manual on the basics of processing bananas and plantains for micro and small businesses. Funding from Rockefeller was used for this meeting. The remainder of Rockefeller Foundation funds will be used for another workshop planned for Africa to test the manual with small processing business operators in Cameroon in early 2007. Additional funding will be obtained for this meeting.

INIBAP has planned the following activities to promote the discussion and use of the results of the country studies and global workshop:

- Overview article analyzing results of nine case studies to be submitted to *InfoMusa*. This overview will also provide an introduction to an internet-based resource center.
- Learning resource center on the INIBAP web site based primarily on the methods and results presented in the case studies and country reports:

The following information products will be prepared and made available through the web site. They will also be distributed as hard copy through regional networks and in INIBAP-initiated development projects:

- Improved version of the methods guide for the study of *Musa* processing businesses and their business support environment with illustrations from case studies (electronic formats in English, French and Spanish; printed versions in English and French depending on funding);
- Compendium of country reports (electronic formats - original language);
- Compendium of 15 processing businesses illustrating different products and technologies (electronic format in English, French and Spanish);
- Web links to business development resources (CIAT Rural Enterprises Institute, CATIE CECOECO, CDE);
- Data base on projects which promote processing enterprises for rural development.
- Funds from the Rockefeller Foundation grant will be used to fund participants of the study teams from Cameroon and Nigeria to report back to the regional network which will meet Kinshasa in September 2006. The discussion of results from the studies in East Africa in the annual BARNESA meeting has been planned for 2007, since ASARECA has indicated that BARNESA will not meet in 2006.
- Follow-up to INIBAP initiatives proposed in Philippines workshop:
 - Working group of food technologists has begun to prepare a manual on the basics of *Musa* processing to be tested with small *Musa* processing businesses in Africa in 2007 (proposed for financing with balance from Rockefeller Foundation grant) ;
 - Working group of food technologists have begun identification of descriptors of fruit and pulp quality with standardized procedures for measurement to be reviewed and published electronically by early 2007;
 - Study proposal in preparation for potential of tourist hotels and cruise ships as market for *Musa* biodiversity in Central America;

- Phase II proposal to CFC for *Musa* evaluation and dissemination incorporates *Musa* processing and business promotion.

Appendix 1: Work plan and budget for workshop and INIBAP-facilitated support platform to Add value to the banana - Presented to CFC and co-funders 3 December 2004

Although only one banana, the Cavendish type, dominates global trade, several hundred *Musa* varieties are cultivated in the tropics for local and urban markets and home consumption. Many of these bananas are consumed fresh. Small food-processing enterprises also produce and market a wide range of banana-based products (see table). New food products based on bananas are being developed. On another front, banana breeders have had recent success in developing more productive and disease resistant cultivars. INIBAP and its partners have been testing new cultivars from FHIA, CARBAP, and IITA in over 20 countries throughout the tropics. These cultivars are not exact replicates of traditional cultivars in terms of texture and taste, but could serve as raw material for innovative banana products. In conjunction with improved management techniques, these cultivars and additional cultivars under development with improved eating qualities represent a potential that production exceed local demand, especially during peak harvest periods. Converting perishable *Musa* fruits from higher yielding cultivars into banana-based products with longer shelf life and developing banana-based products which are more convenient and appealing to the growing urban markets with growing disposable income are potential pathways to generate value from these new technologies and improve the well-being of rural communities. For INIBAP and its partners this means linking germplasm collection, evaluation, and improvement which has been their traditional focus with farm-to-market channels, banana processing technologies and enterprise strengthening, new areas for the regional *Musa* networks and national *Musa* sectors.

INIBAP has received financing from the Common Fund for Commodities (CFC) to document technologies currently used in innovative banana processing enterprises and to promote them through a global workshop. This workshop has been scheduled for mid to late 2005 for the Philippines. INIBAP is organizing funding to broaden the study and the workshop to develop a support platform for better banana-product enterprises. INIBAP is linking dispersed expertise and knowledge and public and private sector experience among a relevant group of stakeholders which will serve as a support platform for initiatives for more dynamic banana-product enterprises. The themes to be covered by the platform include banana processing technology, technical and business aspects of enterprise development, alternative project approaches to enterprise development, and support system linkages to increase enterprise success.

Expected outputs:

Member countries in INIBAP-facilitated networks with broadened focus on processing enterprises for rural well being:

Learning resources on *Musa* processing enterprises strengthening:

- Validated method for technical and business analysis of small scale *Musa*- processing enterprise with 20 case studies to exemplify processing technology and enterprise issues;
- Inventory of projects for promoting and strengthening *Musa*-processing enterprises;

- Method to analyze local/national support system for *Musa*-processing enterprise start-up with 8 country studies to exemplify differences in enterprise support systems in different countries;

Priorities, recommendations, themes for new projects, follow-up actions for *Musa* processing enterprise platform identified by workshop participants;

Activity	Date	CFC budget	Co-funding		
			INIBAP	CTA	Other
Presentation of value-added business strategies for <i>Musa</i> in 4 regional networks (40 countries)	Completed June–Nov 2004		\$20,000 trips/time \$40,000 meetings		
Method development for banana processing enterprise study, profile of business support environment and documentation of project promoting processing business	January 2005	\$3,000	\$6,000	\$3,850	
Case studies Latin America – 6 enterprises, 2 business support environment, 2 projects	February	\$8,000	\$5,000	\$5,000	
Case studies East/Southern Africa – 6 enterprises, 2 business support environment, 2 projects	April	\$8,000	\$5,000	\$5,000	
Case studies Asia – 6 enterprises, 2 business support environment, 2 projects	May	\$8,000	\$5,000	\$5,000	
Case studies West/Central Africa – 6 enterprises, 2 business support environment, 2 projects	June	\$8,000	\$5,000	\$5,000	
Workshop in Philippines	Tentative late July	\$3,595	\$28,000	\$15,000	\$8,000
24 participants		\$48,000			
16 participants				\$32,000	
6 participants					\$12,000
Enterprise fair		\$3,000			\$2,000
Preparation of CD	During workshop				\$2,000
Manual/case studies on the promotion of <i>Musa</i> product enterprises (English, French, Spanish)	August–Oct 2005		\$12,000		\$41,000
Presentation workshop results in regional networks	August–Nov 2005		\$20,000 travel/time	\$12,000	\$12,000
Distribution manual/case studies in regional networks	Nov 2005–Nov 2006		\$40,000 regional meetings		

Appendix 2: How can we add more value to bananas and plantains – a preliminary survey

Since the early 1990's scientists have produced about a dozen new banana and plantain cultivars which are resistant to certain pests and diseases and can produce double or triple the yield of the

local cultivars. In the next 10-20 years scientists will breed many more cultivars with high production capability. Will more bananas and plantains mean more money and greater well being for farm households and rural communities?

In developing countries 55% of the economic value of the agricultural sector derives from post-production activities, while in more developed economies over 80% of the value of agriculture is from post-production. The message is clear. More income and greater well being from more bananas and plantains is more likely to come from post-production activities. Frequently, however, post-production is controlled by urban-based businesses and traders.

How can the increasing value of bananas and plantains that comes from processing and marketing benefit rural households and communities? Two elements are important:

- *Competitive small and medium rural enterprises for processing and marketing;*
- *A dynamic information and services support system which supports innovation and competitiveness among rural enterprises.*

Imagine yourself with a few crops fields and needing more income! How about processing your bananas for sale! Your challenge is to take this initial idea, develop it, test it, and then begin production for sale. But you need additional information - what to produce, for what buyers, techniques for processing, how to package it, who will sell it, who are the competitors, how to finance the costs. With your small-scale enterprise your challenge is to organize information, knowledge, materials, and labour to create something with additional value. From an initial idea, you need to study, plan, and test to develop a prototype for small scale production which may grow or fail. Once you are established, a neighbour might improve on your idea and take your customers. Or a new product appears from another region or country which is more interesting to buyers. To defend the value you have created, you need to produce more efficiently or you need an improved product or maybe an improved package. You may need to improve your business management skills – better cost accounting, better market information.

To set up a small business, create value, and stay competitive, a farm or village household must draw on information and services from other sources. Ideas for products, technical information on how to process bananas for juice, figs, flour, chips, mats, packaging materials, equipment for processing, financing for expanded facilities, distributors to new markets, business management skills. We can refer to this web as the information and services support system. In some localities such information and services are not readily available. In other regions useful information and services can be acquired more easily.

The preliminary questionnaire on the following pages is designed to help us analyze the challenges of promoting small rural processing enterprises and strengthening the support system which together lead to more value from banana and plantain and greater rural well being. Three areas are addressed: *Musa* products sold, technical processing services, enterprise skill support.

Preliminary questionnaire: Small banana and plantain-processing businesses and their support system of information and services

1. What banana and plantain-based products are sold:

1.a. Fill in table describing banana and plantain-based products produced and sold by formal sector (legally registered businesses). Visit supermarkets and smaller shops in city, town, village. List banana and plantain-based products found. Compare number and quality of banana and plantain-based products to other similar foods from other raw materials. Note whether they are produced nationally or imported.

Type of banana or plantain product	Cultivar used	National and local labels	Imported brands	Frequency compared to other similar food products	Quality of packaging compared to other products

Indicate the prepared food items from the formal sector in which banana and plantain are a minor ingredient?

1.b. Indicate the abundant banana and plantain products produced and sold by informal sector (small scale and local – on streets, roadside stands, bus stops, sold by children)

Type of banana or plantain product	Cultivar used	Frequency compared to other similar food products	Quality of packaging and presentation compared to other products

Indicate the prepared food items from the informal sector in which banana and plantain are a minor ingredient?

2. Quick inventory of the support sectors for technical processing aspects of banana or plantain product businesses:

2.a. Indicate the sources of information/technical expertise/training courses on banana or plantain processing techniques for small-scale businesses:

- list universities/research centres with food science programs (% work on banana/plantain):

- private companies, consultants which provide technical expertise on processing (% work on bananas or plantain):

2.b. Indicate private sector sources of processing equipment and packaging material for small-scale start-up enterprises. Are other sources used by medium and large scale businesses? Are materials and equipment fabricated nationally or locally? (Perhaps a colleague in the food science department might have information to answer this question. Or a visit to a nearby small business.)

2.c. Indicate trade fairs or associations of small food processing businesses. What are their activities? How many members do they have?

2.d. What are information sources available to small businesses on local / national / international markets for banana and plantain products? How easy is it to access? Is it up-to-date?

3. Sectors related to small business set up and operations:

3.a Indicate government programs and offices which promote small scale processing enterprises. What services do they offer?

Indicate universities, private centres, and NGOs which have programs or support for small-scale processing businesses.

Indicate any special projects to promote small-scale processing enterprises with banana/plantain or other similar crops. Indicate also donor, possible contacts.

3.b. Indicate sources of credit for small-scale processing enterprises, including government programs, banks, local organizations, cooperatives, and informal sector. Have there been any studies about credit availability?

3.c. Indicate government agencies or offices which monitor and regulate small-scale processing businesses: worker safety, food safety, environmental regulations, product registration:

4. Are there studies or statistics which are useful in knowing more about size and nature of the banana and plantain product business?

What is the contribution of the banana and plantain processing sector to the gross national product and the gross agricultural product?

Appendix 3: Directory of participants

1st Global Banana Uses Enterprise Workshop

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Appendix 4: Programme Workshop and Enterprise Fair

Musa processing businesses and their support environment

Potential contributions to rural development and biodiversity through value adding

10-13 October 2005 - Southwood Park, Manila, Philippines

Expected products from workshop:

1. Country studies presented and analyzed to identify critical factors in the promotion of *Musa* processing businesses and in the strengthening of the corresponding business support environment which contribute more effectively to rural development and *Musa* biodiversity;
2. Identification of project mechanisms for more effective *Musa* processing business establishment for rural development;
3. Proposal for preparation of manual on *Musa* processing technology developed by food technologists;
4. Priorities, recommendations, themes for new projects, follow-up actions for *Musa* processing enterprise platform identified by workshop participants;
5. Strategy for feedback of results to regional *Musa* networks;

10 October, Monday

Time	Activity	Who
8:30 – 9:30	Inauguration –	Secretary of Science and Technology Estrella F. Alabastro
	Welcome -	Dr. Patricio S. Faylon Executive Director PCARRD-DOST
	Introductions – who are we	
9:30-10:15	Presentation: <i>Musa</i> processing businesses and their business support environment	Charles Staver IPGRI-INIBAP
	Break	
10:45 – 12:00	Country study Philippines	Study team – PCCARD/University of Philippines Los Baños
	Support Services for SMEs in the Philippines	Jerry Clavesillas, Assistant Director, Bureau of Small and Medium Enterprise Development-Department of Trade and Industry
12:00 – 1:00	Country study India	Study team – India Banana Research Center, Tamil Nadu Agricultural University
1:00 – 2:15	Lunch	
2:15 – 2:45	Cultivars, nutritional quality and consumer preferences	Max Reynes CIRAD
2:45 – 3:45	Country study Malaysia	Study team – Malaysian Agricultural Research and Development Institute
	Break	
4:15 – 5:15	Country study Costa Rica (translation from Spanish)	Study team – University of Costa Rica CITA, Ministry of Agriculture
7:00 – 9:30	Welcome dinner	

11 October, Tuesday

Time	Activity	Who; what do we need
8:30 – 9:00	Review of first day action	John Jagwe – Food Net IITA
	FAO and PH Action strategies to strengthen processing business	Francois Mazaud - FAO Agricultural and Food Engineering Technology Service
9:00-10:00	Country study Nicaragua (translation Spanish)	Study team – UNAN Leon
	Break	
10:30 – 11:30	Country study Nigeria	Study team – NIHORT
11:30 – 12:30	Country study Cameroon	Study team – CARBAP, Agro PME, Ministry of Agriculture
12:30 – 1:00	Methods for market studies – a coconut example	Menno Keizer IPGRI coconuts for poverty reduction
1:00 – 2:30	Lunch	
2:30 - 3:00	Electronic resources and marketing for small <i>Musa</i> processing businesses	Jason Donovan CATIE Center for the Competitiveness of Eco-Businesses
3:00 – 4:00	Country study Malawi	Study team – Ministry of Agriculture, University of Malawi, Malawi Export Promotion Council, Ministry of Trade and Private Sector Development
	Break	
4:30 – 5:30	Country study Tanzania	Study team – Agricultural Research and Development Institute - Maruku
6:30	Bus to shopping center and dinner	

12 October, Wednesday

Date	Activity	Who; what do we need
8:00 – 8:30	Review of work from day two	Martha Stambuli
9:00-10:30	Issues and Initiatives from the country studies for INIBAP to make added value of <i>Musa</i> biodiversity more useful to rural development	Working groups by specialization – food technologists, enterprise specialists, production specialists
	Break	
11:00 – 12:00	Presentations by groups	
12:00 – 1:00	Making the results of the studies and workshops available to other countries in the networks	Working groups by regions
1:00 – 2:30	Lunch	
2:30 – 3:00	Presentations by regions	
3:00 – 4:00	Working groups: How to design projects which promote connectivity	Cross regional working groups
	Break	
4:30 – 5:30	Presentations by groups	
5:30 – 6:00	Evaluation/ follow up	
7:00 – 10:00	Closing ceremony, dinner and cultural presentation	Local organizing committee

13 October, Thursday - Enterprise Fair and Symposium

9:00	Inauguration: Fair-Symposium	Secretary of Agriculture Phillipines
9:20-11:00	Symposium: New and different products from bananas around the world	
9:20 – 9:40	Using <i>Musa</i> Fibres for new products	Marites de leon, Phillipines Textile Research Institute
9:40 – 10:00	<i>Musa</i> fibres for handicrats	Dr. C K Narayana, Indian Research Centre on Banana
10:00 – 10:20	Food products from <i>Musa</i>	Ms. Zainun Che Ahamad, Malaysian Agriculture Research and Development Institute
10:20 -10:40	Juices/wine from <i>Musa</i> – critical aspects and alternative technologies	Dr. Chris Hansmann, ARC Infruitec-Nietvoorbij
10:40 – 11:00	One town – one product	Piroge Suvanjinde, director of Horticulture Research Institute-Thailand

Enterprise Fair from 9:00 through the afternoon

Appendix 5: Highlights of the Proceedings of the 1st Global Banana Uses

Enterprise Workshop and Banana Techno Fair, Manila Southwoods Manor and Cavite State University, Carmona and Indang, Cavite, PHILIPPINES, October 10-13, 2005

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Outputs of the Enterprise Workshop:

- Presented and analyzed the country studies to identify critical factors in the promotion of **Musa** processing businesses and in strengthening the corresponding business support environment which will contribute more effectively to rural development and **Musa** biodiversity
- Identified the project mechanisms for a more effective **Musa** processing business establishment for rural development
- Developed a proposal for the preparation of the manual on **Musa** processing technology developed by food technologists
- Determined the priorities, recommendations, themes for new projects, and follow up actions for a **Musa** processing enterprise platform identified by workshop participants
- Developed a strategy for the feedback of results to regional **Musa** networks

Program Presentations:

Keynote Speech of Secretary Estrella F. Alabastro

(Department of Science and Technology-DOST, Philippines)

Growing and Nurturing our Small Banana Farmers and Processors

Banana has always been a part of Filipinos lives. There was a time when almost all rural households with spaces to spare in their backyards grow not one but a couple of banana plants either for their own consumption or for added income. And these plants didn't even cost farmers anything for they grow and bear fruits the traditional Filipino farmer's way.

Then, there is the serving of the local dish "adobo" with steaming rice garnished with fresh sliced banana to add flavor to the already delicious dish. Most rural mothers do this to boost the appetite of their growing children. For snacks, Filipinos relish bananas covered with brown sugar and placed on sticks, locally known as "banana-que" and the tasty chips loved by both the young and old alike.

And you will notice that fresh banana fruits will be served in at least one meal during this workshop to cap the already delicious food served for you. Such is the "trivial" yet important part of banana to the lives and diet of most Filipinos.

But more than these trivial importances, banana immensely contributes and plays a greater role in the country's economy providing it the needed income to push it forward.

Banana is the most important fruit of the country producing about 4 million tons annually. About 2.8 million households are dependent on the banana industry. In 2003, the banana industry contributed 40% of the Gross Value Added in fruits amounting to P13.15 billion.

In the global scene, the Philippines ranked fifth among the world's top major producers of banana in 2003, with 5.37 million tons or a share of 7.63% of the world production. The country ranked third among the banana exporting countries with Ecuador and Costa Rica on top of the list. We are exporting fresh bananas, chips/crackers, and catsup. Fresh bananas constituted the main bulk of our export representing 98% of the total volume exported. In 1995-2003, the average volume exported reached about 1.86 million tons valued at US\$315 million. These were exported in countries like Japan, China, Korea, Taiwan, and the United Arab Emirates. In 2004, the total exports for chips were 36,538 tons valued at US\$ 36.86 million.

Overall, these show the lofting standing of the country compared with other banana-producing countries in terms of banana production and income. It shows that we have what it takes and given the proper support and direction we can be the best in

the industry. In the same manner, our standing as a global banana producer paints a bright picture full of opportunities and optimism for the country and the thousands of banana producers where 75%

constitute small growers. Shining more brightly is the opportunities presented by the banana processing industry.

We at the Department of Science and Technology, along with other government stakeholders, share the same optimism and commit to transform that optimism to reality. This commitment we have long tried to fulfill through various R&D programs and activities.

Over the years, national programs have been implemented to support banana as an export winner commodity. These programs include the Science and Technology Agenda for National Development (STAND) of DOST, the High Value Commercial Crops Program (HVCC) of the Department of Agriculture, and the Investment Priority Plan (IPP) of the Board of Investments of the Department of Trade and Industries.

Although we gained considerable success in these endeavors, in terms of production and post-production technologies, and management systems, we also noted a remarkable difference between the corporate and smallholder banana farms. While big banana producers used established technologies and strict quality control, the small growers employed low levels of technologies, which result in low quality product. Small growers were not benefiting much from our efforts but chose to rely on their old practices to grow their crop.

To address the gap, the DOST through the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) funded and developed the S&T Anchor Program for Banana in 2004. The program focuses on smallhold farmers growing saba, lakatan, and latundan in selected areas. It provides technological interventions and appropriate delivery systems for a community-based farming system.

The aim of the program is to improve the productivity and socioeconomic welfare of small banana growers in selected growing areas. It hopes to transform the banana sub-industry to a higher level of efficiency and competitiveness through its three major components – R&D intervention; R&D utilization; and socioeconomic studies.

We have also established a strong partnership with the International Network for the Improvement of Banana and Plantain (INIBAP) in drawing a workable scheme for the distribution and proper management of disease-free planting materials to farmer-cooperators. Likewise, INIBAP through its wide germplasm material has introduced hybrids with good potential for processing.

Along with these efforts, we are also implementing a separate but associated project in Luzon, the Investment Package for the Commercial Production of Fresh Bananas, which started this year. The project aims to match technological intervention with proper marketing system and well-supported organizational structure. Through this, we hope to develop modernized and sustainable smallhold banana farms that will supply the local fresh banana market and banana chips processors in Luzon with the required quantity and quality fruits.

The plants for the project's Science and Technology farms are now in their fourth month in the farmers' fields in Cavite and Batangas. A recent farm visit of the project team showed that the plants are growing robust and the farmers are excited in trying out the recommended technologies in their fields. They have learned to value the importance of these technologies, which provide better results than their traditional way of growing bananas.

Complimenting the S&T anchor program on banana and the investment package are projects aimed to spur the development of the processing industry. Today, we now have technologies and products that are waiting to be commercialized and adopted by the growing industry.

Leading this thrust is the Philippine Council for Industry and Energy Research and Development (PCIERD), which funded and coordinated various projects implemented by other DOST agencies.

We now have a variety of processed products developed by the Industrial Technology Development Institute (ITDI). These include banana flakes, banana powder, flavored strings and crackers, frozen 'turon' (or crepe) and banana fries. These products have the potential to capture both the domestic and international markets because of the unique and delicious taste of banana and the nutrients it can provide.

The Philippine Textile Research Institute (PTRI), on the other hand, has also developed a textile material derived from banana fiber. This will compliment our other popular export -- the abaca fiber.

When all of these products are commercialized, we would definitely have new export products that can earn for our country and give added income to our farmers.

Ready to provide technical support at the local level are the DOST regional offices through the Provincial Science and Technology Offices (PSTO). The PSTO supports prospective and even existing small food processing businesses with the preparation of feasibility studies and technical training on food processing through the Small Enterprises Technology Upgrading Program (SET-UP) and the Technology Incubation for Commercialization Program (TECHNICOM).

SET-UP and TECHNICOM are among the flagship programs of DOST that seek to provide support, including technology transfer, to at least three million local entrepreneurs.

In a nutshell, these are our current efforts in the promotion and development of our banana industry. We have all the elements now in place. What we need now is sustaining these efforts so that farmers can truly use the technologies and information and benefit from these activities.

Indeed, banana is part of Filipinos' lives, but we in the R&D sector aim to make it play an even more significant role that of feeding, clothing, and send-to-school families of our small banana growers. We hope that the results of our R&D efforts, matched with a good analysis of the present condition and requirements of the domestic and global markets, we will be able to achieve this and hopefully further boost the country's economy.

With the holding of the First Global Uses Enterprise Workshop, we know that we can learn and likewise share information and experiences, which we can all use in our efforts in our respective countries. We also look forward to working with you through cooperation so that we can really make a difference in the lives of our banana farmers and processors.

Good morning and have a pleasant stay in our country.

Welcome Remarks of Dr. Patricio S. Faylon

(Executive Director, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD-DOST))

It gives me great pleasure to welcome long-time friends in collaborative research and development to this workshop. To our guests from all over the world - Latin America, Africa, Europe, and Asia - welcome to the Philippines. I hope you all have a rewarding and pleasant stay in our country.

Thank you for being here, for your great interest in this very important fruit, said to be the most popular fruit in the world, banana or *Musa* as we term it in the science and technology community.

Interestingly, just by being here, you bring with you a piece of history. From my readings, banana originated from Malaysia, which then travelled from there to India in the 6th century. Eventually, the fruit reached Madagascar on the south-eastern coast of Africa, and then travelled westward to the Canary Islands. Many years after, Portuguese sailors got a taste of this sweet fruit and soon enough its rootstocks were being shipped to the Caribbean around 1516. It wasn't long before banana spread its popularity throughout Central America. Three hundred fifty years later, the Americans got their first taste of this delightfully sweet fruit. And the rest, as we say, is history.

Indeed, banana is a fascinating fruit, as rich as its history. As we know, there are about 300 species, but only 20 varieties are commercially cultivated. The two main varieties, the sweet banana and the plantain, are the sources of our gastronomic delight, whether raw, cooked, or prepared in culturally different ways.

It is the perfect supplement for those who are anemic, those with high blood pressure, those who are stressed out, those low in brainpower, and even those who suffer from depression. They say that rubbing the inside of a banana skin on a mosquito bite reduces swelling and irritation. And as we often joke about here, eating bananas will give you a smooth skin, like the monkeys.

Inasmuch as it is valued for its nutritional and health benefits, banana is an economically important crop for countries that grow it. In the Philippines, for instance, banana is one of our most important fruit crops, contributing about US\$200 million annually, mainly as fresh fruit exports.

If we reorient the industry toward high-quality processing enterprises for banana-based food and nonfood products, the country can be earning more. It is a viable rural and smallholder enterprise.

Therefore, we in the public research sector must make substantial progress in forging workable linkages with the industry and the private sector so that we can help focus on a proactive approach to ensure successful banana-processing enterprises in particular, and a prosperous banana industry, in general. From the planting material to production, postharvest, marketing and distribution, until the fruit reaches the consumer—these are the components, which we have to work on improving.

It is important that we put premium effort not just on banana research and development, but also on its promotion as a viable business enterprise. Thus, I would like to express our deep appreciation to the International Network for the Improvement of Banana and Plantain (INIBAP) and the International Plant Genetic Resources Institute (IPGRI) for sponsoring this global workshop, which is a big step in that direction.

I cannot overemphasize the critical role our partnership play in creating the enabling environment for our small banana-based enterprises to prosper. We have to ensure that there is room for our smallholders to grow, especially in this age of globalization.

If we look at it, the Philippines for example, a country of 84 million, we don't need to look beyond our shores for a market. The real market is here; the international market is a bonus, inasmuch as it is a gauge of quality standard with which local products have to measure up to. So whether we are producing for the local or the international market, value adding is the name of the game and creating niche markets is the ultimate goal. We must produce quality products and identify enterprise niches for our small farmers and entrepreneurs. This is where innovations in processing and product development come in.

For this reason, I am looking forward to the sharing of country experiences and studies. This is our venue to share, listen, and learn from international and local speakers about the enterprise prospects of and innovations for this magnificent fruit called banana.

For instance, I understand that somewhere in Africa, they use bananas in brewing beer. In the Philippines, we process bananas into food and beverages. In Uganda, there's a lucrative enterprise for banana fiber-based paper. Bananas are also made into cosmetics and are used as animal feed. The possibilities are endless. If coconut is the tree of life, then banana is its herbal counterpart.

I am sure this global forum will give us fresh perspectives and open our senses into the many possibilities for banana-based processing enterprises. Certainly, we are all keenly committed to make the next three days dynamic and productive.

I'd like to end by saying this century is a time of rapid change, with huge opportunities for those courageous enough to put their best foot forward in forging win-win scenarios for all, especially for the marginalized. No doubt that banana does more than keep the doctor away, as it is a versatile fruit not only as a source of nutrition and well being, but also of livelihood for farmers and entrepreneurs, whether small-scale or large-scale.

On behalf of the Department of Agriculture-Bureau of Agricultural Research and PCARRD-Department of Science and Technology, I welcome you, once again, to this global workshop on banana uses enterprise.

Presentation of Country Studies

1) Analysis of Banana processing businesses and their support environment in the Philippines (Arturo Arganosa, Perlita Nuevo, Jocelyn Eusebio and Bessie Burgos)

Contributions of business to rural development

- Create market for bananas
- Generate jobs for farmers, processors and unemployed workers
- Increase income
- Increase knowledge through trainings
- Increase economic activity in the community

Follow up Actions

- Develop strategies to establish connectivity among small food processors and support service providers
- Primer on available support services on food processing
- Strategies to promote the importance of banana in the Filipino diet
- Compliance to HACCP/GMP

Limitations of the Study

- Reluctance of the business owner to allow the survey team to enter into their premises
- Survey focus is limited to the Southern Tagalog Region

Support Services for SMEs in the Philippines (Mr. Jerry Clavesillas, Assistant Director, Bureau of Small and Medium Enterprise Development-Department of Trade and Industry. Philippines)

Presented the SME Development Plan 2004-2010, which integrates efforts to strengthen and stimulate the SME sector so it can contribute significantly to the country's development. This aims to make the SME sector a key factor in the country's economic growth by 2010.

A) For individual SME

1. Developing capacities of entrepreneurs and workers
 - Information support
 - Counselling and advisory program
 - IT-enabled SMEs
2. Managing for Business Excellence and Competitiveness
 - Assistance from SME centers
 - Management advisory, technology and productivity development programs
 - Modeling from successful productivity applications
3. Harnessing knowledge and technology
 - Technology applications promotions
4. Designing linkages and business models
 - Linkages through SME CENTERS AND INTER-REGIONAL FACILITATION
 - Organizing linkages for competitive support
5. Provision of business opportunities
 - Strategic business planning
 - Product development and design services
 - Support to startup enterprise in selected areas
6. Business opportunity and enterprise creation
 - Enterprise development programs

- Promotion for innovative ideas
- Opportunities caravan

B) For the Priority Sectors

1. Strengthening/establishment of industry centers
2. Strengthening and integrating sector support and technical and managerial capacities of enterprises, including enhancement of design, creativity and quality
 - Product development and design workshops
 - Design competition
 - Market intelligence support
 - Packaging and labeling technology development
 - Industry productivity and quality improvement programs
3. Development of communication tools to link needs of the leading industries and provide comprehensive support for potential local SMEs
 - Development of SME data-bases and information system
 - Enhanced support for trade fairs and access to market services

C) For Operational Environment

1. Develop SME financing support programs and strengthen the institutions that provide direct and appropriate financial services to SMEs
2. Streamline the systems that provide support programs and incentives for SMEs
3. Streamline the implementation of SME policies and regulations
 - Magna Carta for Small enterprises
 - Barangay Micro Business Enterprises
 - Consumer Awareness Programs and Fair trading advocacy
 - Incentives/policy measures for business cooperatives

**2) Musa Processing businesses and their support environment in India
(S. Sathiamoorthy, C.K. Narayana, S.D. Sivakumar)**

Contribution of business to rural development

- Provide job to 3-4 people directly and much more indirectly.
- It is the biggest potential job provider.
- Workplace healthy and non-hazardous.
- Opportunity for maximum interaction among people from different regions, communities, etc. due massive movement of men and material.
- Due to movement of men and material (raw and finished goods) from and to far off regions, physical environment like transport, housing, telecom, etc. is improved.
- The salaries earned by individual employed in units have ensured regular household income; related businesses provide income to other employees indirectly.
- Do not compete for natural resources with other industries, no pollution, wastes are economically used.

Follow up Actions

- Meeting to set targets for promotion of *Musa* processing businesses
- Increased training on new products
- Convene services providers to respond more closely to needs in nearby regions to National Banana Research Center
- Promote *Musa* processing to incipient entrepreneurs who have received training
- Arrange forum on buyer – seller linkages

3) Musa processing business in Malaysia (Nik Masdek Hassan, Abu Kasim ali and Zainun Che Ahamad)

Provide employment

- Increase opportunity for business
- Environment friendly/no waste, no noise, no smoke pollution

4) A Diagnostic of the Small *Musa* processing sector in Costa Rica

Contribution of Musa businesses to rural development

- Businesses owned by farmers' associations add value to local production
- Additional employment generated for children and wives of plantain growers
- Add value to lower quality plantains through minimally processed products
- Waste products as source of animal feed
- Opportunity to promote organization of poor households and to train in business management
- Workers in export quality businesses learn skills to seek employment

Follow up Actions

- processors interested in direct marketing contracts to reduce price fluctuation to producers and improve quality and timing of raw material
- National Plantain Program plans to incorporate processors into producers' round table
- CITA increases services to small scale family frying business – food safety and quality control

5) A Diagnostic of the Small *Musa* processing sector in Nicaragua

Contribution of business to rural development

- Important role for women-run businesses
- Use of waste products contributes to animal feed and other products
- Opportunity to promote organization of poor households and to train in business management
- Source of employment

Follow up Actions

- Develop an association of *Musa* processing businesses to defend interests and to promote low-cost, quality services which increase comparative advantage for export of value added products

6) An analysis of *Musa* processing business and their support environment in Cameroon (Gerard Ngoh Newilah)

Contribution of business to rural development

- Stimulate agricultural activities among the members of the group > source of income
- Provide employment throughout the year> integration among members of the community

Follow up Actions

- Inventory of all *Musa* processing business in Cameroon
- Analysis of added value through (fibre products) commercialization of raw materials
- Economic analysis of the *Musa* business
- Compliance to HACCP/GMP

7) A Study on the analysis of *Musa* processing business and their support environment in Malawi (Dickson Banda and Victor Mshani)

Contribution of business to rural development

- There is a lot of interaction with consumers and suppliers
- Promotion of other businesses like small groceries which keep resins
- Development of physical capital for production
- Increased income for the women and suppliers of raw materials such as yeast

Follow up Actions

- Postharvest handling techniques, banana cultivars, banana local network
- Stakeholder meeting

- Recipes for various products
- Development of banana products to diversify utilization options for value added products
- Improvement of packaging and labels
- Promotion of the banana enterprises
- Scrutinizing of existing policies in relation to the promotion of inhibition of **Musa** processing

8) **A Study on the analysis of *Musa* processing business and their support environment in Nigeria (Sunday Oliseyi Akinyemi and Oyenike Sadiat Babalola)**

Contribution of business to rural development

- Create employment
- Generate income
- Reduces rural-urban migration
- Improve nutrition of the populace
- Environmental development/popularity of the area
- Reduction of postharvest losses

Follow up Actions

- Conduct of forum, training/workshop for **Musa** producers and processors
- Development of pamphlets and training materials
- Formation of Interdisciplinary Research Group

9) **A Study on the analysis of *Musa* processing business and their support environment in Tanzania (Mshaghuley I.M., Mgenzi, S.R.B., Staver, C. and Nkuba, J.M.)**

Contribution of business to rural development

- The business that contributes to a local population with additional skills and experience is banana wine and banana bicomposites products. The work premises are always healthy
- Trainers from outside and other learning groups of farmers visit the businesses on study tours income
- Businesses generate income for the households
- Other businesses like shops are attracted to sell other ingredients and equipment needed.
- All waste products can easily rot into compost and sometimes fed to livestock. The businesses are environmental friendly yet does not use noisy, smoky neither smelling materials

Follow up Actions

- Development of national **Musa** research strategy
- Adoption study of **Musa** processing technologies
- Scaling up of **Musa** processing training of Interdisciplinary Research Group
- Scrutinizing of existing policies in relation to inhibition of **Musa** processing
- Promotion of the banana cultivars suitable for different products
- Documentation of local technologies used in **Musa** processing
- Promotion of banana products
- Designing of packaging for **Musa** products
- Develop a methanol removal methodology from konyagi

Special Papers Presented

- 1) Support Services for SMEs in the Philippines (Asst. Dir. Jerry Clavesillas-Department of Trade and Industry, Philippines)
- 2) A Global Initiative for post-harvest development (Dr. Francois Mazaud)
- 3) Need of the market and chips quality and other banana products (Dr. Max Reynes)

- 4) Market system research: Understanding the coconut midrib-basket market-system (*Menno Keizer- IPGRI*)
- 5) Electronic resources and marketing for small **Musa** processing businesses (*Jason Donovan- CATIE CECOECO*)

Criteria Focusing on workshop Outputs:

1. Critical issues identified for the strengthening of **Musa** processing businesses and their support environment which will contribute to rural development and **Musa** biodiversity (based on 9 country studies)
2. Initiatives to be undertaken by INIBAP networks and country members which address issues identified across countries and regions
3. Ideas developed for how the method and case studies be documented and reproduced for use by other countries in the network
4. Ideas developed for how the method and case studies be documented and reproduced for use by other countries in the network
5. Proposals for the presentation of results of the case studies and workshop in the regional networks steering committees
6. Project strategies sketched out for the development of **Musa** processing businesses in targeted studies

Workshop Sessions

Session 1: Issues and Initiatives

The three groups- processing technology, business development, production will discuss the nine country studies in relation to the 3-5 issues identified below

Processing Technology	Business Development	Production
Product quality can be improved	How can micro and small businesses grow	Problems of postharvest losses and seasonal gluts
Product range is narrow	How to promote new businesses	Specific cultivars for specific processing
National standards are different from export standards	Creating new markets for new products	Using processing to conserve biodiversity
	Financing mechanisms	

1. Propose initiatives to be undertaken by INIBAP, networks and country papers which address issues identified across countries and regions
2. Present a specific statement of the issue and accompanying initiative to the plenary group; Who are possible partners in developing the initiative?, How would other member countries of the networks use the results of the initiative?

Session 2: Making the results of the studies and workshops available to other countries in the networks

1. The formation of groups by region will discuss how the results of the workshop and the country studies can be used to stimulate strategies and initiatives in the regional network;
 - make a list of ideas of how to improve the method and to make it more accessible and useful for other countries which do similar studies;

- how should method and case studies be documented and reproduced for use by other countries in the network;
- how should the results of the case studies and workshop be presented in the next regional network steering committee meeting;

2. Present key ideas to the plenary group

Session 1: Working groups (WG) by discipline

Group I: Processing Technology

Issue: The main issue identified by the working group is that information on *Musa* processing exists, but is not accessible to micro/small enterprises and service providers. The suggestion was made for countries to develop information in a form that is more accessible to SMEs and service providers.

Information should be grouped according to:

- a) raw materials
 - cultivar
 - maturity date
 - microbiological state

- b) type of processing
 - drying
 - frying
 - type of language to use
 - cooking
 - fermenting/distilling
 - juicing
 - baking

- c) type of technology/equipment

- d) diverse products already developed but not widely known
 - fibre
 - peels
 - fruits
 - candy
 - pastry
 - green banana derivatives
 - dried banana derivatives

The (primary) language of the output will depend on the importance of the output in a specific region.

Recommendations made by the working group include:

- to bridge the information gap
- to identify the countries' expertise
- to identify the specialists (this would be the role of the networks)

Group II: Production Group

a) Cultivars

- identified products
- identified which cultivar would be for this product
- a need for a complete characterization of the cultivars, biochemical analysis and effect of cooking
- role of INBAP, compile information
- countries role: do research, share information
- information on methodologies needed
- access to sufficient quantities of planting materials of the cultivars is needed

b) Practices

- preharvest practices is important
- proper techniques in harvesting must be practiced
- use of color codings
- transport is dependent on cultivars
- training
- extension to the farmers, techno transfer
- standard requirements of the industry need to be known as these will direct the management practices
- classify the results into different categories
- seasonality problem: solutions: stagger planting; organize farmers into cooperatives

c) Biodiversity Conservation

- strengthen programmes and awareness campaigns

Banana products and the most commonly used cultivars for each of the products

Product(s)	Cultivars
Chips	French Plantain (AAB), True/False Horn Plantain (AAB), Saba (ABB), Cardaba (ABB), Popoulo (AAB), EAHB (AAA), Bluggoe (ABB), FHIA-21 (AAAB)
Fig (dehydrated banana)	Ney Poovan (AB), Pisang Awak (ABB), FHIA-01, Robusta (AAA, Cav), EAHB, Foconah (AAA), Gros Michel, Figue Pome
Flour	Plantain, Kunnan group (AB), EAHB
Juice	Pisan Awak, Ney Poovan, Robusta - Cav, EAHB - brewing, FHIA-25, Gros Michel
Wine	Pisan Awak, Ney Poovan, Cav - Williams, Kabuthu (AAA), EAHB
Pickles	Pisang Awak, Mysore (AAB), Bluggoe
Candy	
Ketchup	

Discussion:

a) Cultivars

Three major needs were identified:

- The WG agreed that information is needed on the complete characterization of these selected varieties, including morphological characterization (eg, fruit shape and size is important for chips making), host reaction to biotic and abiotic stresses, biochemical characterization, suitability for specific use, etc. Some information is already available from companies, national institutions and universities and these informations should be compiled and shared (compendium, internet, ...). INIBAP and the individual countries have an important role to play here. In addition, more research is needed (eg, evaluation of popular cultivars from 1 region in another region). This will be the responsibility of the represented countries.
- Information is also needed on methodologies (eg, how to carry out biochemical analysis). It will be INIBAP's task to come up with technical guidelines, etc.
- INIBAP's role to help in the access to sufficient quantities of planting materials of these cultivars.

b) Practices

• *Quality is determined by:*

- Pre-harvest: cultural practices: e.g., bagging, propping ...
- Harvesting: correct harvesting technique is important

Maturity indices (angulation, colour, diameter) are important to identify the right time of harvesting; this depends on the cultivar and on the use (e.g., harvest at 80% maturity for chips making), and is also affected by weather conditions. The technique of colour coding can be helpful. More research is needed in this area.

- Post-harvest: Transport is very important (the effect is also dependent on the variety, e.g., FHIA-01 is more susceptible to bruising during transport). Training and extension to make farmers aware of these issues and help them limit loss of quality due to bad practices is of utmost importance. This is a responsibility of each of the countries.
- Processing: Standard requirements of the processing industry need to be known, as these will be determinant for the management practices during the production and postharvest stage. In order to limit the percentage of rejects, fruits could be classified into different categories and particular uses identified for each class (e.g., big fruits go to export, while smaller but otherwise equally "perfect" fruits that normally would be rejected can be used for processing). Processing is one of the possible solutions to the problem of seasonality of production. Other options include staggered planting and the organization of farmers into cooperatives for the production and the marketing. In countries where this is not commonly done, some research is recommended.

c) Biodiversity Conservation

The WG felt it would be hard to use processing as a strategy for biodiversity conservation. If there is no use for a cultivar, we cannot just invent a use for it. On the other hand, conservation will naturally follow if there is a good use for a cultivar, and we can try to promote this (e.g., share information about use of a certain cultivar from 1 country to another. This can be done through awareness campaigns, free samples; ... INIBAP can bring people together and organize study tours from 1 country to another.

Issues raised:

1. Can biodiversity be considered as a niche market (e.g., mixture of popular and less popular cultivars into 1 product, and sell it as a specialty product)?
2. Are we going to classify TC bananas as organic bananas?
3. The 1st cycle is not organic, because of the hormones added during the culturing, but the 2nd cycle is considered organic.
4. Certain bananas are already extinct because they are not used (e.g., Kunnan group). Awareness campaigns about the less-known uses of cultivars is important for their conservation.
5. Standards for products. FDA and CODEX collect data standards
6. There is a need to strengthen programs on clean management technologies

Group III Business Development

- How can small businesses grow?
- How to promote new business?
- Training for micro business
- Creating new markets
- Financing

a) Key elements in starting a business

1. *Business idea based on reliable information*
 - Government fiscal policy: *registration requirements, licensing, taxation, etc.*
 - Profitability
 - Availability of markets
 - Initial risk assessment
2. *Develop a business plan*
 - Define objectives a business plan
 - Situation analysis
 - Market analysis
 - Inputs requirement
 - Finance requirements and sources: equity, loans, grants, etc.
 - Statutory and regulatory framework
 - Technology requirements and acquisition
 - Management: organization and structure
 - Quality control
 - Marketing strategies
 - Pricing policy
 - Distribution
 - Promotion
 - Competition analysis

b) Elements to make a business grow

- Market
- Inputs

- Technology: has to be consistent
- Access to finances
- Quality standards
- Management
- Statutory regulatory market

c) What are the critical issues for the growth of small-scale *Musa* processing firms?

- Access to raw material
- Access to information
- Technology acquisition
- Product diversification
- General health and safety issues
- Access to finances
- Management
- Financial control

d) Critical issues in developing effective financial mechanisms for small *Musa* businesses

- Access to information in financial services
- Increased capacity to access financial services
- Access to finance for physical and working capital
- Increased capacity for financial management
 - * Proper record keeping and accounting process
 - * Financial control measures

The WG identified the following needs/initiatives:

- Capacity building
- Business awareness campaign
- Train researchers and food technologists how to do business plans.

Issues

- How are market demands translated into business transactions?
- Business approaches can be used to tackle rural development.
- Research
- Social analysis surveys
- Translate research into action.
- Another element to deal with is the organization of the sector, not just the business itself.
- In developing a business plan, before the formulation of the objectives of a business, there should be a mission and vision.
- All the service providers play a key role in organizing these businesses. In a business plan, there is indeed also a mission and vision.
- If a business is not properly managed, it may not be a good livelihood.
- Strategic alliances between service providers and businesses.

- How do we frame the issue into something that can be addressed by the network? What is the issue from our point of view?
- What we need is capacity building for entrepreneurs for banana.
- In Brazil, some processing business were technically established but not directed to the market. The products were good products but not consumption products.
- There are two ways: every agronomist learns to do business plans; or agronomists link up with people who are business advisers who have developed their skills in doing market studies.
- In the case studies, most of the respondents didn't have an idea what the market was like. Generate a general understanding of what is available, market demand, different actors, value chain, ...
- Everybody needs to do all of the above.
- INIBAP should push the generic promotion of bananas.

Session 2: Working groups by region

BARNESA working group

1) How to improve the method?

- a) The method needs to be refined to remove repetitions.
- b) Financial analyses of *Musa* processing businesses ought to be included in the report.

2) How to make the information accessible?

- a) Make several copies of the study reports and distribute them via print and electronic media to extension workers, NGOs, policy makers, private sector, NARS
- b) Responsible party: INIBAP, study teams

3) How to report to the network?

- a) The study reports ought to be reported to the regional networks.
- b) Regional network will organize national workshops.

Responsible party: BARNESA

BAPNET

1) How to improve the method?

- a) Sample size must be larger to be representative
- b) It is important to obtain the trust and cooperation of the interviewees to be able to obtain the information
 - More informal questionnaires
 - Interviewers must have a strong background knowledge before they go into the field in order to be able to ask the right questions
 - split questions into sub questions and extract the needed information yourself

2) How to make the information accessible?

- a) Proceedings: methodology, country studies, workshop recommendations
- b) Technical Guidelines for the methodology after revision
- c) Approaching government and policy makers: facts and figures, recommendations ...
- d) Promotional/awareness campaigns, media/press releases on *Musa* products, the benefits, nutrition, ...

3) How to report to the network?

- a) methodology
- b) summary of case studies
- c) conclusions
- d) open forum
- e) similarities and differences between countries

- f) matrix: who needs/wants what? who can provide what?
- g) directions, projects, funding, ...

MUSALAC

1) How to improve the method?

- a) Technical analysis must be done
- b) There was no induction of training prior to the use of the method
- c) Work must be oriented towards SMEs, without missing the recommendations of large companies

2) How to make the information accessible?

- a) Each country must have a project leader
- b) The report on the case studies must be improved and posted on the web page
- c) Technical bullets must be prepared for each product (diagrams, specifications, requirements for quality standards)
- d) Improve the structure of the guide and the format for providing info
- e) Funds must be provided for spreading the results of the workshop

3) How to report to the network?

- a) INIBAP in conjunction with MUSALAC will hold a symposium which will be a good venue for information sharing and dissemination

MUSACO

1) How to improve the method?

- a) Reduction of repeated questions
- b) Refinement of the questionnaire to make it suitable to the study environment
- c) Study team should have more of enterprise development and financial people
- d) The final workshop should involve more of the business/enterprise people that can easily pick up the results and put it into practice

2) How to make the information accessible?

- a) Documentation: distribution of hard copies, cds, etc.
- b) Meetings
- c) Website
- d) Initiating the study in other countries & expanding the investigations to other parts of CMR and NIG

3) How to report to the network?

- a) the results the project for each country should be presented at the regional meetings
- b) the project coordinator should present the results and outputs of this workshop during regional network steering committee meetings
- c) *Musa* business people should be invited at the network meetings

Issues:

- Improvement of methodology-- send suggestions and comments to Charles
- Regarding on passing it on the network, BAPNET will be a guinea pig
- IPR - Is each region willing to share information about their products?

Session 3: Project Strategies (Connectivity)

Exercise

- a) Possible project objectives:
 - Increased competitiveness of micro businesses
 - Increased competitiveness of small exporters in the niche market

- Increased value adding by farmer groups/cooperatives
- Development of new products/markets

3 questions:

- i) What are the critical issues to be addressed by the
- ii) Presentation of the products (packaging)
- iii) Promotion of the products (advertisement)

Group 1: Cameroon, Malawi, Malaysia

Country case: Malawi

Project objective: Increased value adding by farmer groups/cooperatives

1) Critical issues to be addressed by the project

- a) Needs to understand the market better
 - iv) Distribution - market channels (where to market)
 - v) Presentation of the products (packaging)
 - vi) Promotion of the products (advertisement)
- b) Capacity to produce quality product
- c) Strengthen the organization of the farmers group
- d) Business administration – need to hire somebody to train them in various business aspects
- e) Equipping with processing technologies
- f) Identify the leader with entrepreneurship skills to take a leading role
- g) Business plan
- h) Capacity to produce quality product
- i) Strengthen the organization of the farmers group
- j) Business administration – need to hire somebody to train them in various business aspects
- k) Equipping with processing technologies
- l) Identify the leader with entrepreneurship skills to take a leading role
- m) Business plan

2) Key partners for project implementation (respective roles, motives and needs)

Key players	Roles / Motives / Needs
a. Government business development agencies : * Development of Malawian Enterprises Trust (DEMAT) * Malawi Confederation of Chambers of Commerce and Industry (MCCCI)	<ul style="list-style-type: none"> • Offers training in business management skills and loan facilities • Policy making and organising local trade fair
b. Micro finance institutions (Government and Private)	<ul style="list-style-type: none"> • Provide loans
c. Wholesalers	<ul style="list-style-type: none"> • Trading
d. Input suppliers	<ul style="list-style-type: none"> • Provide inputs (equipments, packaging materials, etc.)
e. Transporters	<ul style="list-style-type: none"> • Transportation and distribution of (raw materials & final products)

3) *Expected contribution to rural development:*

- Increased income & nutrition
- Employment opportunities
- Less social ill

Group 2: Philippines, Nicaragua, Costa Rica

Country case: Philippines

Project objective: Increased value adding by farmer groups/cooperatives

1) *Critical issues to be addressed by the project*

- a) Losses
- b) Marketing
- c) Feasibility studies/Assessment of the process return of the investment
- d) Marketing

2) *Key partners for project implementation (respective roles, motives and needs)*

- a) Farmers cooperatives
- b) Traders
- c) Technical staff: NGO, government
- d) Local Representatives : roads, facilities, transportations
- e) Farmers and traders/ win-win relationships

3) *Expected contribution to rural development*

- a) More jobs
- b) Increase the income of the farmers
- c) Improve the well being of the community
- d) To maintain the banana industry in the country
- e) Contribution in the nutrition of the population

4) *Components of the project:*

- a) Training
- b) Technology and processing
- c) Organization of farmers
- d) Marketing

Group 3: Tanzania, India, Nigeria

Country case: Tanzania

Project objective: Development of new products and markets (product: wine)

1) *Critical issues to be addressed by the project:*

- a) scaling up the existing units
- b) requirement of technology
- c) attractive packaging and labelling
- d) good equipment
- e) business flow and financial management
- f) quality control agency

2) Key partners for project implementation (respective roles, motives and needs):

- a) FADECO (NGO): technology and business management
- b) ARDI Maruku: technology development and dissemination
- c) SIDO- machineries and equipment
- d) Farmers bank: for financial acquisition
- e) Farmers--supplying raw material
- f) TANESCO- electricity
- g) BDS- Business development services; marketing: wholesale

3) Expected contribution to rural development

- a) assured market and stable price
- b) rural employment
- c) enhanced economic status of rural folks
- d) employment, new traders

Follow up actions to the workshop participants

- CD on workshop for each participant
- Send observations on methods modifications to power point - end of Nov 2005
- Write up improved method
- review of improved method guide by country teams - Q1 2006
- Print the guide in 1-3 languages (depending on funding) - March-April 2006
- Small working group formed on *Musa* products/quality information access - Q4 2005, Q1 2006
- Incorporate issues/initiatives into IPGRI-INIBAP Workplan 2006-2007 - Oct 2005
- Report back regional response
 - BAPNET 15-16 October 2005
 - MUSALAC March 2006
 - BARNESA September 2006
 - MUSACO June 2006

WORKSHOP EVALUATION — Client Satisfaction Feedback

- a) Twenty six participants (78%) who returned the feedback form answered that the objectives of the workshop were attained. Specifically, 78% rate the attainability of the workshop as Yes, 4% as partly attained, none for No, and 18% abstained
- b) Of the 28 participants, 61% responded good as to the program contents which include provision of new information/knowledge and its relevance to the participants present work/frontiers; 32% answered very good and 7% (2 participants) answered fair.
- c) As to the methods/process (e.g. presentations, discussions, and workshops) 32% rated very good, 56% good, and 5% fair.
- d) More than half of the respondents (57%) answered that the availability/adequacy of materials and equipment exceeded their expectations, fulfilled all the expectations, 32% and fulfilled some of their expectations, 11%
- e) About 36% answered that the speakers knowledge of the subject matter, clarity, effectiveness exceeded their expectations, half of the participants (14) fulfilled all their expectations and 14% answered that speakers knowledge fulfilled some of their expectations.
- f) In general, majority of the participants (64% remarked that the overall coordination of the workshop as well as the training venue/environment exceeded their expectations).