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Costs of Overcoming Market Entry Constraints to Uganda's Export-Led Growth Strategy

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Abstract

Uganda's export sector has experienced tremendous growth over the last two decades for example merchandise exports rose US$178 million in 1990 to US$ 877 million in 2006. Nevertheless, it has been faced with a number of market access and supply-side constraints in producing sufficient quantities of acceptable quality and timely delivered export products. Although tariff related barriers to trade have reduced significantly, Uganda's exports are still faced with inadequate capacity to reduce transaction costs relating to storage facilities, post-harvest losses, transport and ensuring health and food safety concerns. This paper attempts to undertake a situational analysis of existing capacity and also quantifies cost estimates of capacity gaps in Uganda relating to complying with food safety requirements in export markets. The costs of compliance in exports markets imposed on both public institutions and private sector here are understood as additional costs incurred by exporters in meeting the requirements placed on them in the importing country. The findings of this paper are that the benefits of investment in upgrading the capacity of addressing some market entry constraints far exceed the costs of such investments, hence suggesting a joint public-private sector efforts in overcoming supply side constraints like compliance with quality requirements.

1. Introduction

Ugandan economy is heavily reliant on agricultural activities in terms of food, contribution to GDP, inputs into agro-processing industrial activities, employment, income, export earnings, etc. Agricultural farmers make a significant market for industrial output in forms of consumer goods/services; farm implements and inputs into production. The majority of Ugandans, particularly rural communities where over 80 percent of the country's population live, derive their livelihoods directly or indirectly from the agricultural sector. Increasing the welfare of the majority population in Uganda therefore would entail taking actions that increase the productivity and competitiveness of economic agents engaged in agriculture and its associated activities. This is consistent with Government's over riding development goal of poverty reduction through the export-led, private sector-driven growth strategy.

Uganda undertook sweeping economic policy reforms (including investment and trade liberalisation, privatisation of state-owned enterprises) since early 1990s following which poverty in Uganda reduced sharply (e.g. about 56 percent of the population below the poverty line in 1992 reduced to about 31 percent in 2006). The policy reforms[2] in Uganda since late 1980s aimed at enhancing the volume and diversity of exports. These policy reforms led to increased volume and diversity (basically commodity composition) of the country's exports. Uganda's exports mainly comprise of unprocessed products namely traditional exports such as tobacco, coffee, tea and cotton; and non –traditional exports comprising agricultural products such as fish, flowers, cereals, cocoa, beans and maize, fruits and vegetables, livestock and products thereof; manufacturing products such as soap, metal products, alcoholic drinks, plastics, paper and printed materials, beauty products, textile, clothing and garments, confectionaries; minerals, etc. The non-traditional exports have taken over traditional exports as the main source of foreign exchange. For example, the share of export earnings contributed by non-traditional exports rose from just 14 percent in 1991 to about 68 percent in 2006(UBOS, 2006). The continued low export earnings in Uganda have often been attributed to constraints such as the poor terms of trade and poor or limited market access. According to UNCTAD (2003), primary products have faced difficulties in export markets in terms of declining, low and volatile prices; shrinking demand due to resource-saving technologies and emergency of synthetic substitutes.

Uganda has faced a rising trade deficit within the last 15 years stemming from the import bill increasing faster than export earnings. Export earnings increased from US$ 178 million in 1990 to US$ 877 million in 2006 while Uganda's import bill rose from

[2] Here (and henceforth throughout the paper) these policy reforms are referred to as first generation set of policies.

US$ 551 millions in 1990 to US$ 1,891 million in 2006, increasing the country's trade deficit by almost 3 times from US$ 373 million in 1990 to US$ 1,014 million over the period (MFPED, 1998; UBOS, 2006). As a result, Uganda's debt stock rose from about US$ 3.7 billion in 1996/97 to US$ 4.6 billion in 2006 (MFPED and Background to the Budget, 2006).

The foregoing discussion suggests a need for shifting of focus to policies aimed at enhancing the productivity, efficiency, value addition and cost reduction particularly in agricultural activities to reverse current trade deficit levels, debt burden and poverty. This second set of generation of policy actions are necessary and timely to boost export earnings by addressing constraints to exporting along the supply-distribution-marketing chain in order to exploit new market opportunities and in products whose demand is income elastic. Such actions are essential in enhancing the competitiveness of dynamic and promising products with great potential for contributing to export earnings, employment creation, income generation and poverty reduction in Uganda.

2. Emerging constraints to Uganda's export sector

Trade liberalization, globalisation, changing consumer demands, greater emphasis on quality and safety requirements; changes in production, distribution and marketing systems all have critical implications for the flexibility, efficient and timely delivery of exports. Exploiting these opportunities may increase incomes, skills, and employment of the exporting country. However, a demand-driven production and supply systems, cold storage facilities and technical support are essential to realise the potential benefits of high-income products. The supply of high perishable products to target high-income consumer markets requires demand oriented and marketing system. Such dynamic markets need adequate capacity of suppliers capable to adjust to changing market conditions and requirements. The production and distribution infrastructure and services (transportation, communications systems, inspections and storage facilities, etc.) is often not conducive to the development and functioning of the export supply throughout the chain for timely responding to dynamic market conditions. Supply chains for perishable products into which Uganda needs to diversify require; reliable and affordable cold storage and transportation facilities throughout the distribution chain. Small scale and disadvantaged producers often lack the capacity to adjust to new and changing market conditions since they lack technical, market knowledge and investment resources.

One of the major problems facing the export sector in Uganda is the difficulty in producing adequate quantity, quality and competitive export products. Addressing this problem may require actions on both sides of the market chain (i.e. the supply side

and market). Market access is only part of the story to have the product produced and delivered in the market. It may sound bizarre but if Uganda for example is allowed to access industrial markets today with no conditions (whether relating to quality, tariffs or quotas, etc.) attached, it should come as a no surprise when the country finds it very difficult to mobilise sufficient volumes and quantities to export and take advantage of the market access granted with no conditions. The problem becomes more complicated if the country's exports are to comply with health and safety regulations in the importing markets. As indicated in Table 1, for a long time Uganda has been exposed to duty-free and quota-free market access such as those under African Growth and Opportunity Act (AGOA), Everything but Arms (EBA), Generalised System of trade Preferences (GSP) but has not effectively and fully taken advantage of those market opportunities. This is just an indication that factors constraining supply side for effective market entry are important and need to be identified and addressed. Uganda's major handicap is her inability to enter and sustain presence in export markets.

Table 1: Examples of major preferential market access programs

The *Generalised System of Preferences (GSP)*	Based on the 1979 Enabling Clause that created a permanent waiver to the most-favoured-nation provision in the General Agreement on Tariffs and Trade. Selected products originating from developing countries are granted non-reciprocal preferences in the form of reduced or zero tariff rates. Least developed countries receive preferential treatment for a wider coverage of products and deeper tariff cuts relative to their competitors. GSP schemes represent unilateral preferences that differ in their design and duration across preference granting countries. The following WTO members currently operating GSP schemes include: Australia, Belarus, Bulgaria, Canada, the European Community, Japan, New Zealand, Norway, the Russian Federation, Switzerland, Turkey and the United States of America.
The *Cotonou (ACP-EU) Agreement*	Between the EU and 77 African, Caribbean and Pacific countries since 2000 and provides preferential access to the EU market in addition to and beyond GSP. The Agreement grew out of the four phases of the Lomé Convention that governed the relations between the EU and its former colonies in the ACP region from 1975 until 2000. It grants non-reciprocal and comprehensive market access preferences and allows partners to count the value-added in imports from other ACP countries as local input when determining the origin of a product ("full cumulation"). However, the EU exempts bananas, beef, and sugar from these preferential access arrangements. The Agreement has been concluded for twenty years, with a clause allowing for periodic review. In 2008, the present market access preferences are supposed to be replaced by arrangements to be agreed upon in Economic Partnership Agreement (EPA) negotiations which will replace the current non-reciprocal with reciprocal trade arrangement.
EU's *Everything But Arms (EBA)*	Initiative of 2001 which grants duty-free access to imports of all products from least developed countries, except to arms and munitions. Only imports of bananas, rice and sugar were not fully liberalised immediately. Duties on those products were to gradually be reduced until duty free market access is granted for bananas in January 2006, for sugar in July 2009 and for rice in September 2009. In the meantime, there are duty free tariff quotas for rice and sugar. The EBA provisions have been incorporated into the EU's GSP scheme. The rules of origin of the latter allow for "diagonal cumulation" in only four regions: in the Caribbean, East Asia, Latin America, and South Asia, intermediate inputs from regional partners are counted as local value-added if the degree of prior transformation of the inputs would have conferred origin in the regional partner country. Outside these regions, only imported inputs from the EU can be counted towards local value-added ("bilateral cumulation"). The regulation on EBA foresees that the special arrangements for LDC's are to be maintained for an unlimited period of time.

African Growth and Opportunities Act (AGOA)	Initiated in 2000, AGOA extends the GSP scheme of the United States to additional products, notably garments, from African countries that satisfy certain economic, social and political criteria. A special program for countries with a gross national product per capita of less than US$ 1,500 relaxes the otherwise strict rules of origin for apparel and allows qualifying countries to count yarn and fabric from anywhere in the world as local content in apparel assembled in their countries. AGOA is a time-bound program that requires periodic renewal by the US Congress. The special textile benefits expire in September 2007, while the overall program is scheduled to run until 2015.

Source: Authors own compilation

3. Market access and market entry requirements

Barriers to trade are measures in place in the importing country which make it difficult, and at time impossible, for exports of goods and/or services to access export markets. Such measures are considered undesirable in the context of world trade, because they restrict the flow of goods and services, drive prices up and are detrimental to the consumer. At the end of the Uruguay Round of multilateral negotiations, the WTO Secretariat{ XE "WTO, World Trade Organization:Secretariat" } (then the GATT Secretariat) estimated that implementing the WTO Agreement, i.e. reducing trade barriers, could increase world trade by up to US$ 510 billion by 2005. These barriers take many forms, and are generally divided into two broad types, namely *tariff barriers* and *non-tariff barriers*. As tariff and tariff related barriers to trade continue to decline through trade liberalisation and regional integration, non-tariff barriers to trade including those relating to compliance to quality requirements are increasingly gaining prominence.

Market entry conditions may be defined as the requirements that exporters have to meet before accessing targeted markets and these include: quality, appearance, cleanliness or taste; safety (e.g. level of pesticide residue and microbial presence); authenticity (guarantee of use of traditional production process); worker health and safety, or to environmental impact; cost and speed of delivery. Compliance with such market entry conditions is a prerequisite for successful and competitive exporting. These market entry conditions are distinct from market access conditions since market access[3] is the *possibility* of entering foreign markets which depends on market access conditions (determined by the legal and administrative conditions imposed by the importing countries under internationally agreed trade rules). On the other hand, the *ability* to enter a market is a function both of the competitiveness of the exporter (determined by the relative cost and quality of the product), and of the characteristics of supply chains. Market access however is a prerequisite for market entry to occur, but would not be sufficient. Exporters as well as the Government need to go beyond market access concerns and also focus upon the conditions governing actual market entry.

[3] See UNCTAD, "Export diversification, market access and competitiveness," TD/B/COM.1/54, 26 November 2002.

Table 2: Market entry and access constraints to Uganda's exports

- Inadequate trade negotiation competences at almost all levels
- Insufficient national export development competences leading to inability to negotiate, execute export orders and develop appropriate export plans, marketing strategies and export management systems at company level especially for small and medium size companies.
- Tariff and tariff-like barriers that impede easy access of Uganda's products to export markets
- Non-tariff barriers (NTB) especially in the export markets to Uganda's exports, particularly those relating to technical barriers to markets in the areas of: consumer safety and health requirements, technical specifications (HACCP, GAP), traceability, quality and standards assurance, packaging, handling, environmental issues and social accountability
- Inadequate market information due to limited resources and capacities of trade promotion institutions and export firms to subscribe to and access international trade databases and tools.
- Lack of critical supply capacity as subsistence system continues to dominate the agricultural sector in Uganda
- Fragmented and small sized business enterprises which cannot consolidate supply capacity and sustain export competitiveness
- Limited competences and low internet connectivity to rural production units.
- Lack of affordable and accessible export finance given that commercial banks do not readily support agriculture and agro-based export businesses.
- Lack of targeted and aggressive export promotion programmes.

Source: Adapted and modified from UEPB *(*2004*)*

Meeting market entry conditions potentially has positive results for the efficiency and competitiveness of exporting enterprises but to tap into such results would necessitate the provision of adequate opportunities for capacity-building and policies addressing areas such as standardization, quality control, access to market information, investment facilitation, technology promotion, small and medium-size enterprise development and upgrading and/or diversification of agro-related industries. Inability to meet market entry conditions would result in market exclusion. This paper focuses constraints relating to quality which does not suggest in any way that other constraints are less important. We attempt to quantify, to the extent possible, costs relating to compliance with quality (specifically food safety) requirements facing Ugandan exports.

4. Costs for ensuring quality requirements

In order for a country to effectively address basic international food safety like Sanitary and Phytosanitary (SPS) measures or comply both with voluntary and regulatory standards and norms, several critical capacities and support structures need to be in place. First and foremost a country needs to have a food safety regulatory framework to support growth in trade and market access. A country also needs to have mechanisms in place to ensure that a general level of awareness is created in the public and private sector to address new and dynamic international trade requirements. This paper attempts to take the stock of existing capacities in Uganda (and therefore gaps) and to make estimates of costs and benefits of overcoming such capacity deficiencies.

Costs of compliance are understood in this paper as additional costs incurred by exporters in meeting the requirements placed on them in complying with a given quality related requirement before accessing export market. Compliance with SPS measures in export markets imposes costs both on public institutions and the private sector. To capture full costs of complying with SPS measures on Ugandan exports, information was collected from both public and quasi-public institutions (collective costs), and at firm-level (private costs) through a field survey undertaken between May and September 2006. Collective costs comprise costs relating to: legislation development; training and awareness raising; infrastructure development and equipment upgrading; inspection, testing, and other monitoring and control mechanisms. Firm-level compliance costs include additional costs incurred by producers and exporters in ensuring quality systems including, for example, costs relating to necessary changes in the production systems, infrastructure building and upgrading, training, consultancy services and certification costs, etc. For the public sector the procedures in place to implement SPS requirements (i.e. institutional capacity, adequacy of legislation and analytical capacity, etc.) were assessed while at the firm level, key producers with export capacity provided the information regarding main constraints to meeting quality requirements in the targeted markets. This assessment helped to identify current capacity inadequacies and the associated resource gaps.

4.1 Costs at the public sector level

Analysis of the requirements on the public sector set by the WTO SPS Agreement highlights the critical control systems that ensure food safety. Several institutions in Uganda constitute this food safety control system: the Uganda National Bureau of Standards (UNBS) which responsible for setting and enforcing standards; the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) responsible for some sanitary and all phytosanitary issues; and the Ministry of Health (MOH) responsible for ensuring food safety. These institutions are the focal points for the international standards institutions, i.e. UNBS for the TBT Agreement, MAAIF for SPS and the Ministry of Health for Codex.

Establishing a Food Safety Control System pre-supposes that a number of elements are in place and/or are reinforced. Such elements are still inadequate in Uganda. First, some acts/legislations (e.g. The Public Health Act, 1964, UNBS Act 1983, etc.) impacting on national food safety legislation need updating. Second, standards-setting organisations like UNBS do not have sufficient capacity (number of personnel and level of expertise, financial and other resources) to monitor and enforce the set standards, i.e. more investments in terms of staff recruitment, systems development and acquisition equipment. Third, the increased capacity to ensure the provision of credible export certification services at affordable costs is lacking. The lack of credibility may potentially lead to stricter and more cumbersome inspection

procedures in importing countries and eventually loss of markets, for example, the ban on Ugandan fish exports into the European Union in the late 1990s (Rudaheranwa, *et al.*, 2003).

It is for these reasons that countries need to strengthen their export certification services. Plant and animal protection departments must have adequate infrastructure (including simple tools at border control points), equipment (field testing equipment for inspectors, means of transport) and staff (sufficient number of inspectors with adequate training). Inspection procedures have to be developed and implemented. The system should be clearly documented (standard operating procedures, traceability, quality manuals, etc.) so that importing countries can evaluate these. However, adequate investments in infrastructure, equipment and staff to upgrade these structures are costly and still lacking in Uganda. The costs involved in upgrading these capacities are significant, as is clearly shown in Table 3. Finally, complying with import controls, quality control officials need testing equipment, improve training of personnel and upgrading or construction of quarantine and incineration facilities.

Table 3: Collective costs of ensuring food safety

ORGANISATION	OBJECTIVE	COST (US$)
Uganda National Bureau of Standards	Review and update the 1983 legal framework	120,000
	Develop standardisation capacity	80,000
	Develop certification capacity	130,000
	Promote implementation of SPS standards	400,000
	Improve participation in international standards setting	130,000
	Recruitment of staff	10,000
	Sub-Total	**870,000**
Department of Plant Protection and Department of fishery Resources (MAAIF)	Review and update legal framework	160,000
	Develop capacity to deal with SPS issues	30,000
	Develop inspection and quarantine capacity	220,000
	Develop export certification capacity	140,000
	Strengthen information, surveillance systems	130,000
	Modernise procedures for registering and control of pesticides	30,000
	Promote implementation of SPS standards	210,000
	Improve participation in international standards setting (SPS)	90,000
	Upgrade infrastructure to allow efficient implementation of phytosanitary systems	30,000
	Recruitment	50,000
	Sub-Total	**1,090,000**
Ministry of Health	Review and update public health act	100,000
	Develop inspection capacity	80,000
	Improve Information Systems	80,000
	Promote Implementation of Safety Standards	40,000
	Improve Participation In International Standards Setting	80,000
	Infrastructure development	160,000
	Training of staff	20,000
	Sub-Total	**560,000**
TOTAL COSTS		**2,520,000**

Note: In some cases, information on cost items was not available and estimates had to be made based on capacity needs identified during the interviews. Cost estimates for the review of the legislation are made on the basis of the discussion the fieldwork team had with officials in respective institutions taking into account the experience elsewhere (for example see UNCTAD (2005), Costs of Safety and SPS Compliance: Mozambique, Tanzania, Guinea Tropical Fruits, UNCTAD/DITC/2005/2). Costs relating to recruitment of staff in standards institutions exclude wages and salaries or other benefits/incentives but do include the initial costs of placing, facilitating and reorienting the required staff. The fieldwork team encountered difficulties in obtaining information on (number and level of) staffing in various institutions but staff recruitment costs indicated in Table reflect the extent of staff needs in respective institutions.
Source: Author's computation based on interviews with officials in relevant institutions (May-September, 2006).

Surveillance systems must be in place to monitor spread and outbreaks of food borne diseases, pests or diseases. These surveillance systems make it possible to detect problems in time to prevent disease spread within the country and outside through exported commodities. If a problem is detected the country has the obligation to notify the relevant international organisation. This involves mainly the Ministries of Agriculture and Health, who have implemented the monitoring systems. Discussion with stakeholders suggests that in Uganda there is a lack of information on pests and a lack of capacity to collect the information, yet this information is instrumental in undertaking the pest risk analysis (PRA) which is essential to accessing major imports markets for Ugandan exports. Capacity for this purpose is in the form of testing

equipment, training of staff in modern phytosanitary issues, communication systems and the development of databases with pest and disease distribution data.

To improve Uganda's food safety control system, the regulatory institutions need to develop appropriate standards and update the legislation, develop systems for assessing conformity to standards, train staff and promote standards, improve information flows, develop effective mechanisms for the control of imported and exported produce and improve participation in international standards setting. Details of requirements for the key institutions analysed and implied cost estimates were collected during the interviews with key stakeholders.

4.1.1 Costs relating to sampling, testing and analysis

Verifying the quality of exported and imported products requires adequate analytical capacity to evaluate various parameters including the presence of diseases and pesticide residue analysis. The laboratories must be accredited to an international level for the results of the analysis to be recognised in major markets of destination of the country's exports. For example, without accreditation the Ministry of Health cannot credibly guarantee the food safety and the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) cannot provide credible phytosanitary certificates.

Laboratories in Uganda, operated both by private and public institutions, have varying degrees of capacity to perform plant and food analysis. Key public institutions include the Uganda National Bureau of Standards (UNBS), Uganda Chemist laboratories, Kawanda Agricultural Research Institute, National Water and Sewerage Corporation (NWSC), Uganda Coffee Development Authority (UCDA) for mycotoxins and different departments in MAAIF and MTTI. Critical laboratories for food safety are chemical and microbiological laboratories. Privately operated laboratories in Uganda include, but are not limited to, Chemiphar (U) Ltd and SGS (mainly for inspection services).

Only the microbiology laboratory at the UNBS, the chemistry and microbiology laboratories at Chemiphar (U) Ltd are accredited in Uganda, while the Chemistry lab at the UNBS and Residue Analytical lab of the Uganda Chemist are preparing for accreditation. Even the accreditation of the microbiology laboratory at the UNBS is currently limited to a few parameters, specifically: *total plate count, total coliforms, faecal coliforms, yeast and moulds, Escherlirichia coli, Vibrio cholera, Salomonera, staphylococcus aureus*. The accreditation of these parameters benefited from the support from UNDP/UNIDO (Rudaheranwa, et al., 2003: 380). The South African National Accreditation System (SANAS) accredited the microbiology laboratory at

US$ 20,000[4] while the preparation for accreditation amounted to US$ 82,000. About US$ 25,000 is required for annual audits to ensure that the accredited parameters are up to standard. More parameters e.g. *clostridium species, bacillus cereus, campylobacter jejuni, listeria monocytogenes*, etc., need to be accredited in the microbiology laboratory but such an undertaking is still hampered by a lack of resources (personal discussion with officials at the UNBS in May 2006). Costs relating to the preparation process for accreditation (including training and accreditation fees) of these parameters are estimated in the region of US$ 200,000. Currently, the chemistry laboratory at the UNBS is being upgraded with support from UNIDO worth US$ 150,000 to analyse chemical residue limits and traceability requirements. However, this is not sufficient, as the example of the pesticide residue laboratory of the Uganda Chemist indicates.

4.1.2 Accreditation costs: Example of the Government Analytical Laboratory

The Government Analytical Laboratory has been in existence since the 1930s and is a Department that periodically moved to different ministries, i.e. Ministry of Defence until 1962 when it was transferred to the Ministry of Internal Affairs under the Uganda Police section. Following the imposition of the fish ban on Uganda by the European Union due to the use of chemicals in fish capture in 1999, the Government Analytical Laboratory was given an additional mandate for the analysis of pesticide residues in fish and other food stuffs; hence the establishment of a Pesticide Residue Laboratory (PRL).

[4] This includes professional fees for reviewing documents prior to physical verification and on-site inspection, air tickets and costs relating to accommodation during the physical verification exercise. This type of cost varies with the amount of work to be done (the complexity and number of parameters and testing methods fronted for accreditation) and therefore the duration of the auditing exercise. As clearly noted here this accreditation phase only covered limited test methods and parameters and there are more such parameters that require accreditation.

Table 4: Costs relating to accreditation of Uganda's Pesticide Residue Laboratory (PRL)

Activity	Elements	Costs (US$)
Renovation of accommodation	Extension to the buildings including appropriate internal renovation	42,000
Equipment procurement, running and maintenance	Basic equipment	220,000
	Consumable materials required for the equipment	15,280
	External contracts for servicing and instrument calibration	25,700
	Glassware	27,800
Laboratory accessories	General laboratory accessories	6,250
	Laboratory consumables	20,840
Textbooks and reference materials	Textbooks and other reference materials	2,780
Staff Training and Consultant inputs	Professional consultancy	45,140
	Training in ISO 17025	15,625
	Training in the measurement of uncertainty[5]	10,416
	Attendance at international workshops and conferences	5,560
	Participation in a proficiency testing scheme	2,083
	The accreditation process (pre-assessment, assessment and any follow-up)	26,400
Total		**465,874**

Notes: Exchange rate US$ 1= Ushs 1,800. To capture any increase in estimates above due to various factors including inflation, a scale factor of 25 percent has already been used to arrive at the final estimates indicated in Table 4. Costs of training and recruitment of new staff are outside of these estimates. Running costs are difficult to capture but, based on the discussion with senior officials at the PRL should be at most 20 percent of the cost estimates indicated in Table 4.
Source: Adapted and modified from the consultancy report on the Uganda Chemist by Cox (2005), *Review of the Pesticides Residue Laboratory of the Ugandan Government Chemist Laboratory and an assessment of its future development.*

The cost structure shown in Table 4 relates to the accreditation of the Pesticide Residue Laboratory alone and excludes costs relating to staffing. As indicated below, it would cost a further US$ 66,000 to close the current staffing gap in the Pesticide Residue Laboratory. Costs of accrediting the Chemistry Laboratory and that at the Department of Fishery Resources in the Ministry of Agriculture, Animal Industry and Fisheries would be roughly similar to those costs estimated for accreditation of the Pesticides Residue Laboratory. Clearly it would not be cost effective to have all laboratories in Uganda accredited for similar parameters or testing methods given the limited resources. Instead, it would make more economic sense if each of these labs is accredited for different parameters or testing methods so as to ensure complementary analytical service delivery and rationalisation of scarce resources.

It came out clearly from interviews that currently there is no incentive to motivate staff in institutions providing inspection, testing and certification services particularly in public and quasi-public institutions largely because there is no link between the revenue generated and the service provided. Revenue from such services goes to the central government treasury and budgetary allocations are made to the public

[5] For explanation and more details refer to ISO/IEC 17025 (1999), General requirements for competence of testing and calibration laboratories, First edition 1999-12-15

institutions that generated the revenue (not necessarily in the same proportion of the revenue generated). Staff receive their normal monthly remunerations irrespective of the amount of work undertaken hence there is little incentive to reduce delays in service delivery: Such delays are prominent in government owned institutions involved in inspection, testing and certification services relative to those privately provided such as Chemiphar (U) Ltd.

4.2 Private sector costs relating to SPS in Uganda

Costs for quality assurance in exporting activities impact on the competitiveness of various products differently depending on the nature of the product (livestock products, fish and fish products, fruits and vegetables, flowers; whether organic or inorganic products; fresh or dried; stage of processing and targeted market). As just noted, costs of inspection, testing, monitoring and certification services also vary depending on whether the service provider is a public or private institution and the degree of competitiveness between institutions. These costs are discussed here by focusing on two commodities namely fish and honey as illustrative examples but findings and implied policy actions here are equally relevant to other exporting sectors and products.

4.2.1 Fish sector

The Uganda fishery industry is based on the capture of fish from lakes, rivers and swamps although efforts are being made to develop aquaculture or fish farming. Major commercial fish species include Nile Perch and Tilapia but Nile Perch is the major exported fish product to the markets of Europe, Australia and South East Asia. The export of fish and fish products increased from just over US$ 5.3 million in 1991 to about US$ 143.6 million in 2005 (based on the latest information available from the Department of Fishery Resources). The upward trend was interrupted between 1997 and 2000 by a series of bans relating to health concerns by the EU on Uganda's fish exports.

Fresh fish is a highly perishable product with a shelf life of not more than 14 days when chilled. Fish exports take different forms but mainly as chilled and frozen. Processed fish products include whole gutted frozen/chilled fish, skin on fillet frozen, fish heads, steaks, etc. Fish processors are organised under the umbrella of the Uganda Fish Processors and Exporters Association (UFPEA) which was established in 1993. The Department of Fishery Resources is the competent authority responsible for ensuring safety and hygiene in the fish industry through regular tests on fish, water and water sediments to check for heavy metals, microbial tests and pesticide residues; and for carrying out inspections. At factor sector level, UFPEA members have implemented the HACCP safety management system, which is a requirement of EU directive 91/493/EEC, the USA, Japan and other major markets. In addition the entire

fish processing industry is now ISO 9001:2000 certified. Detailed indicative costs relating to quality compliance in the fish industry are given in Table 5 below.

Table 5: Analysis of costs of ensuring food safety in the fish processing sector in Uganda

Quality compliance at upstream	**One off costs (US$)**	**Recurrent costs (US$)**
Insulating, cleaning and maintaining fish vessels/boats on the lake; icing fish at collection points to prevent contamination and spoilage and for preservation	26,720	2,300,000
Conforming to required hygiene conditions at fish landing points	88,960	36,000
Insulating, refrigerating, cleaning and maintaining transportation equipment e.g. 5 ton vehicles	444,480	5,100,000
Quality compliance at the processing plant		
Approval and licensing of plants	-	4,480
Fish handling and processing area (e.g. appropriate floors, walls, ceilings, doors, ventilation, lighting and suitable cleaning facilities)	3,200,000	384,000
Chill rooms, ice rooms and cold stores (capacity of about 60 tonnes)	16,000,000	960,000
Protection against vermin and undesirable animals	160,000	192,000
Provision of appropriate working equipment (e.g. cutting boards, knives, conveyor belts, containers, etc.)	400,000	960,000
Ensuring supply of appropriate water	1,600,000	960,000
Water waste and waste management	640,000	960,000
Sanitary facilities (e.g. changing rooms, showers and toilets, clothing and other hygiene enhancing gear for workers), uniforms, etc.	480,000	384,000
Cleaning and disinfecting of transport vehicles		20,000
Freezing and cold storage facilities	16,000,000	534,400
Compliance with HAACP requirements	**320,000**	**534,400**
Labelling and traceability (e.g. record keeping)		778,680
Establishing and enforcement of monitoring procedures	320,000	534,400
Chemical and biochemical tests (e.g. toxic heavy metals, pesticide residues, microbiological tests, etc.) at average of 50 samples	-	2,075,680
Labelling of fish samples	-	106,670
Corrective measures for non-conformance		1,067,200
Train staff for managing food safety systems and traceability	20,000	320,000
Quality inspections at airport, SPS certification and other levies		40,200
Grading and packaging including labelling		10,600,000
Certification and audit for quality compliance	16,000	400,000
Total estimated (private) cost for quality compliance in the fish sector	**39,108,160**	**27,938,230**

Notes: Costs indicated here aggregated to sectoral level based on average costs of 5 fish processing firms (there are currently about 16 fish processing firms in Uganda) that provided the research team with relevant information.
Source: Author's computation based on cost data provided by fish processing firms (2006).

While fish processing factories have invested heavily to ensure hygiene and quality requirements, there are further quality problems down the supply chain particularly at remote landing sites. Strict quality compliance currently starts at the landing site in the islands but little effort to ensure quality is applied to the fish prior to this, i.e. from the lake to the landing sites. This results in rejection rates of about 40 percent due to poor quality. With the provision of ice and other quality enforcement measures this rejection rate could potentially be reduced to 3 percent as was the case when the fish processing plants put facilities (supply of ice, etc.) in place to ensure quality between

the landing sites and the fish processing plants that reduced fish losses due to quality deterioration by about 13 percent following the ban of fish exports to the EU in the late 1990s.

Fish rejected due to poor quality encourages fishermen to catch as much as possible to ensure that at least a proportion of what they catch meets the quality requirements. Improving quality through the chain right from when and where fish is caught (e.g. using insulated facilities supplied with ice) through the entire distribution chain, for example, would potentially increase the fish shelf life from the current nine days up to 14 days. Furthermore, it would reduce the post-harvest losses and pressure on fish resource depletion.

Undoubtedly, the capacity of Fish Quality Assurance in Uganda has been strengthened over the last few years: for example all fish processors have adopted the HACCP system and there are supportive laboratories. Further actions are however needed particularly to improve the fish handling infrastructure at landing sites and to increase awareness of the need for quality management for export products through the training of the fishing community down the chain, for example, at remote landing sites.

4.2.2 Honey and honey products

The honey sector is organised under the TUNADO umbrella which brings together all actors in the apiculture sector. TUNADO is a private initiative established in 2003 and is mainly financed through contributions from members (Ushs 150,000 initial and Ushs 50,000 annual subscription fees for district associations and an initial fee of Ushs 700,000 and annual subscription of Ushs 200,000 for corporate bodies). TUNADO works with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) for technical backup but not financial assistance. The required annual quality analysis is costly and in 2005 was expected to cost as much as US$ 24,000. This financed a process of developing a national residue monitoring plan which was based on a study done by Chemiphar (U) Ltd and funded by Shell Foundation that assisted companies to become listed for exporting to Europe in April 2004. The exportation of honey in Uganda is still in its infancy and therefore faces a number of challenges. For example, the residue monitoring plan needs to be implemented and strengthened although limited resources have been cited as major constraint still constraining this noble activity. Bee Natural (U) Ltd, which has contracted farmers to supply it with honey, exported its first consignment to Europe in 2005. TUNADO required about Ushs 60 million (about US$ 33,500) for the apiculture sector to be audited and certified in 2006.

There are two seasons for the honey harvest in Uganda, namely March-May and August-November. The price of unprocessed honey on the world market is about US$

1,200 per ton which translates into US$ 1.2 per kg. Currently production is very low (about 100,000 tonnes) but could be increased to 500,000 tonnes if the national potential could be exploited. This would become a possibility if quality related concerns such as conformity assessment and certification issues could be addressed.

Attempts are being made to modernise the honey production by using yield-enhancing beehives. A modern beehive with langstroth technology, which costs about Ushs 140,000 (US$ 85) and has a life time of 25 years, has an output capacity of 50 kg per annum while the traditional beehive costs only Ushs 5,000 (US$ 3) but has a life time of not more than 2 years. Modern beehives do not need the use of fires (and therefore minimise quality deterioration from this source) during the process of harvesting of honey. The supply of langstroth beehives, which are manufactured in Uganda, is not sufficient to meet the demand given the relatively low technology used and lack of supportive resources.

Table 6: Costs of compliance with food safety and quality in the honey sub-sector

EUREPGAP requirements	Setup costs (US$)	Ongoing costs (US$)
Apiculture legislation	160,000	0
Training farmers in good production management	150,000	15,000
Acquisition of modern equipment	50,000	4,200
Traceability	10,000	2,000
Record keeping	6,000	3,600
Residue monitoring programme country wide	180,000	15,000
Establishment and support of one stop advisory centre	60,000	2,000
Laboratory analysis	0	15,400
Training on quality and safety issues	-	40,000
Waste and pollution management	1,800	500
Worker health and safety	47,490	4,250
Updating honey standards	-	20,000
Certification costs	1,000	2,000
Deployment of inspectors at critical quality points	-	50,000
TOTAL COSTS	**666,290**	**173,950**

Source: Annual costs adapted from UEPB (2005) and restructured based on discussion with officials from TUNADO and Bee Natural Products (U) Ltd in July 2006.

4.2.3 Quality assurance programs in Uganda's honey sector

In terms of honey production, the country is divided into nine ecological zones based on colour, size and taste of the honey. Honey is categorised into three types: clear honey, amber honey and dark honey. Honey has a long shelf life. Bees in Uganda are still disease free but pests (birds, rats, spiders, playing mantis, snakes and safari ants) are a problem. Other honey products include propolis bee product (which is in high demand); bee venom, bee jerry/wax, and pollination services. Honey production activity can be integrated with the production of other crops and is environmentally friendly particularly in areas with high population densities. No chemicals are used, no serious maintenance costs are involved and there is no heavy investment given that an investment of Ushs 1 million (US$ 550) can be recovered within three years.

The production of honey in Uganda in 2004 was about 48 tonnes all which was for the domestic market. Production of honey in Uganda is carried out on a small scale by farmers who are scattered country wide and only one firm (Bee Natural Products ltd) is currently exporting, mainly to the EU market. Working with 275 groups (of 20 persons each) of honey producers, Bee Natural Products Ltd produces packs and exports apiary products and natural foods. The company started exporting in 2005 with 20 tonnes but its target in 2006 was 90 metric tonnes of which 42 tonnes (over 45 percent) had been achieved by July 2006. A major problem in the apiculture industry in Uganda is the dynamic quality requirements imposed by importers which necessitates continuous investments for compliance. Unfortunately, extra investment for compliance with quality requirements is not associated with price increases though it enables exporters to maintain or increase their presence in the targeted market.

Challenges in the honey sector include: transportation, processing and exporting of honey; however, the biggest challenge in the honey sub sector is quality assurance. UNBS assisted TUNADO to develop honey standards and a process is underway to develop standards operating procedures. There is only one standard both for local and export markets. Standards are enforced at all levels of the distribution chain. About 300 samples are collected annually countrywide and there are on-the-spot tests as well. The Livestock and Entomology section in the MAAIF is responsible for quality assurance. Investment by the public and private sectors in areas such as quality assurance, training, enforcement, credible certification etc., to a tune of about US$970,000 (as suggested by TUNADO officials during field visits), could stretch the honey industry to a vibrant and sustainable level. Unfortunately, at present the contribution from government is small. The potential for expanding the honey sector exists as honey exports could potentially be increased to five times the current export levels if the sector is facilitated to reduce costs and increase quality to expected market expectations.

As noted above, Uganda has just been listed on the EU market among countries that are eligible to export honey to this market. This decision was reached after a lengthy process of verifying that the country had put in place systems that guarantee the quality and safety of the product for end users. It is therefore in the strategic interest of the sector to ensure that quality and safety assurances are built and maintained so that the established market is sustained.

A number of critical actions in this area are identified. The fist is a strict implementation of the Residue Monitoring Plan. Strengthening the competent Authority to enforce the provisions of the plan will be a priority lobby area. The second is establishing and seeking the support of a national bee advisory one-stop centre by the competent authority together with TUNADO, to enforce uniform

standards and best practices within the industry to guarantee quality products. Third, the Uganda National Bureau of Standards and the honey accredited laboratory (Chemiphar (U) ltd) are to jointly develop and regularly update the honey standards. Fourth, producers could be encouraged as much as possible to ensure that their product complies with quality standards. The fifth is to train agents in the honey sector in quality and safety issues on a regular basis with the objective of promoting compliance market standards and reducing the transaction costs relating to food safety certification processes. Further actions include the deployment of skilled inspectors to ensure quality and safety of the products in the industry at all critical points along the value chain.

5. Cost benefit comparisons

To compute returns on investment in SPS capacity in Uganda, the research team made rough estimates (indicative) of future benefits following investment for the five year period 2007-2011. Given the complexity of the exercise in terms of defining potential export revenues and quantifying financial costs for strengthening SPS capacity, it was decided to narrow the time horizon to five years. This should increase the accuracy and reliability of the calculations but at the same time under-estimate the potential benefits of the investments which would probably accrue over a longer time-period.

For fish, potential benefits are based on export values quoted by the Department of Fishery Resources for 2005, i.e. US$ 143.6 million. Given that export values have been affected in the last ten years by the ban on fish exports, two scenarios are presented to represent possible future growth rates in the sector: firstly if exports were to grow at a rate of 5 percent per year and secondly a situation of no growth from the base year. For costs, Table 8 includes the generic SPS costs referred to in Table 6 as well as the costs of laboratory accreditation referred to in Table 4. These are fixed initial costs amounting to US$ 2.7 millions thousand. In addition, for fish, the sector costs included in Table 8 consist of an initial investment sum as well as an annual variable component over the five year period.

Opportunity costs of potential market losses, both financial and socio-economic, are not included in the model at present but the cost data could be adjusted if it was thought that this was a significant risk in the next five years. An additional issue with the cost data is that while costs and benefits have been assessed for two sectors, fish and honey, it is likely that much of the investment for these sectors would have spillover benefits for other sectors. These positive externalities are not quantified in the model, potentially underestimating the returns to investment in SPS capacity.

For honey, potential benefits are more difficult to assess because this is a relatively new export sector and export volumes have fluctuated substantially. The figure of

US$ 60 million in 2005 is based on exports of 50,000 tonnes at a value of US$ 1,200 per tonne in 2005/06. Firms already exporting honey in Uganda predict that exports could rise to 500,000 tonnes in the near future. Because of the wide variation and uncertainty regarding the future, again two possible scenarios were applied to the honey export data, i.e. a growth rate of 5 percent and 0 percent. Potential benefit data for both the fish and the honey sectors are presented in Table 7.

Table 7: Potential benefits from upgrading SPS capacity in Uganda (Current values US$ Millions)

	Growth rate equal to 5%		**No growth from 2005**	
	Fish and fish products	Honey	Fish and fish products	Honey
2005	143.6	60	143.6	60
2006	150.8	63	143.6	60
2007	158.3	66.2	143.6	60
2008	166.2	69.5	143.6	60
2009	174. 6	72.9	143.6	60
2010	183.3	76.6	143.6	60
2011	192.4	80.4	143.6	60
2012	202.1	84.4	143.6	60
2013	212.2	88.6	143.6	60
2014	222.8	93.1	143.6	60
2015	233.9	97.7	143,600,000	60
Annual growth rate	5%	5%	0%	0%
Projected exports 2007-2011	874.8	365.5	718,000,000	300
Projected exports fish and honey 2007-2011	1,240.3		1,018	

Source: Department of Fishery Resources in case of Fish and fish products while Uganda Export Promotion Board in case of honey:

Costs of upgrading SPS capacity for honey are taken from Table 6 and comprise an initial investment value of US$ 666 thousand as well as an annual investment of US$ 174 thousand. Cost data for the two sectors are presented in Table8.

Table 8: Costs of upgrading SPS capacity in the fish and fish product and honey sectors (current values US$)

		Fixed costs for 5 years	Annual variable costs	Total variable cost for 5 years	Total cost for 5 years	Annual total cost
Costs of investment in the generic SPS infrastructure	Collective costs of ensuring food safety	2.5			2.5	0.5
	Laboratory accreditation costs	0.2			0.2	0.04
	TOTAL	2.7			2.7	0.5
Costs of SPS investment in the fish sector	Total estimated (private) cost for compliance	39.1	27.9	139.7	178.8	35.8
	TOTAL	39.1	27.9	139.7	178.8	35.8
Costs of SPS investment in the honey sector	Total estimated (private) cost for compliance	0.7	0.2	0.9	1.5	0.3
	TOTAL	0.7	0.2	0.9	1.5	0.3
Total SPS costs		**42.5**	**28.1**	**140.6**	**183.1**	**36.6**
Sensitivity Analysis	-50%				91.5	18.3
	-30%				128.1	25.6
	-10%				164.8	33
	10%				201.4	40.3
	30%				238	47.6
	50%				274.6	54.9

Source: Fieldwork July-September 2006

Given constraints in terms of time and resources for this analysis, some of the figures are approximations. More in-depth analysis is desirable. In addition, costs and benefits would need to be discounted to account for inflation and account would need to be taken of the fact that further testing may be required in future as the EU adjusts its market regulations for imports.

5.1 Combining costs and benefits

The most optimistic scenario presented for the next five years is that exports of fish and fish products and exports of honey expand by 5 percent bringing export earnings to US$ 1,240.3 million over the period 2007-2011. When combined with the lowest cost estimate of $91.5 million, the returns to investment in SPS capacity amount to US$ 13 for every US$ 1 invested. With potential benefits at only US$ 1,018 million and costs at US$ 274.6 million, the return on every US$ 1 invested amounts to only US$ 4. It is likely that returns to investment would lie somewhere between these two

extremes: the accuracy of the cost and benefit data used as well as the most likely future scenario for both sectors are issues that would merit further discussion with relevant stakeholders in Uganda.

6. Conclusion

Exploiting the market access opportunities under various trade arrangements and agreements depends critically on the country's ability to overcome stringent and dynamic market entry constraints including complying with food safety and health regulations or standards in the importing markets. Tariff-related barriers to trade have reduced significantly over the last two decades but Uganda's exports are still faced with inadequate capacity to reduce transaction costs relating to storage facilities, post-harvest losses, transport and ensuring health and food safety concerns. To improve Uganda's food safety control system, capacity upgrading in the relevant institutions is critical. This paper has attempted to undertake a situational analysis of existing capacity and also to quantify costs estimates of capacity gaps in Uganda related to complying with food safety requirements in export markets.

Information on requirements to assess the current capacity deficiencies and implied cost estimates were collected during the interviews with key stakeholders in 2006. Costs of compliance are understood here as additional costs incurred by exporters in meeting the requirements placed on them in complying with a given regulation in the importing country. Compliance with SPS measures in export markets imposes costs both on public institutions and the private sector. In order to fully capture the costs of SPS measures on Ugandan exports, data on costs were collected from both public and quasi-public institutions (collective costs), and at firm-level (private costs). Collective costs comprise costs relating to legislation development, training and awareness raising, infrastructure development and equipment upgrading, inspection, testing, and other monitoring and control mechanisms. Firm-level compliance costs comprise costs incurred by producers and exporters in ensuring quality systems including, for example, costs relating to necessary changes in producing systems, infrastructure building and upgrading, training, consultancy services and certification costs, etc. Clearly the benefits of investment in upgrading the capacity of addressing some market entry constraints far exceed the costs of such investments. This suggests that it is wise decision for both the public and private sector to put more resources in upgrading the food safety systems if market access opportunities are to be fully exploited.

Annex 1: EUREPGAP requirements to access EU markets

EUREPGAP requirements	Inputs
Traceability	
Establishment of a traceability system that allows product to be traced back to the registered farm Identify every orchard physically e.g. using description, map	*Stationary/forms* *Sign posting (label and stickers)* *Mapping* *Computers (hardware and software)*
Record keeping and self-inspection	
Keep up to date records for a minimum of two years. Keep records that reference each area covered by a crop with all the agronomic activities Records of all fertiliser applications Records of irrigation/fertigation water usage. Record all crop protection product applications Complete self-inspection and document it (annually)	*Develop record keeping sheets* *Hire personnel to complete them* *Build offices* *Consultant services*
Site management	
Prepare soil maps for the farm	*Consultant services*
Risk assessments (revised annually)	
Food safety, operator health and environment risk assessment Potential risks for organic fertiliser (disease transmission) Risk assessment for irrigation water Hygiene risk analysis for harvest and pre-farm gate transport process Risk assessment of hygiene aspects of the produce handling operation. Identify all possible waste products produced Risk assessment for working conditions	*Technical services for risk assessment*
Technical services	
Advice on Quantity and Type of Fertiliser: Use a trained technician to determine quantity and type of fertiliser to use. Use trained technician for choice of pesticides Use systematic methods to calculate water requirement of the crop. Use technician with recognised certificates or formal training to advise/carry out post harvest treatments Development of procedures for water management hygienic product handling (physical, chemical and microbiological contaminants) Waste and Pollution Action plan	*Hire specialised staff*
Laboratory analysis (Lab should be accredited to ISO 17025 or equivalent standard)	
Annual pesticide residue testing Check maximum levels for heavy metals established by the Codex Alimentarius Check microbiological contaminants criteria (CAC/GL 21-1997) Contents of N·P·K of organic fertiliser Analyse irrigation water at least once a year by a suitable laboratory Carry out annual analysis of water for post harvest washing Soil analysis	*Laboratory analysis*
Soil and substrate management	
Use cross line techniques on slopes, drains, sowing grass or green fertilizers, trees and bushes on borders of sites, etc.	*Consultancy services* *Seeds and other materials*
Fertiliser use	
Fertiliser Application Machinery	
Carry out verification of calibration by a specialised company, every year	*Services of a specialized company*
Fertiliser Storage Covered area free from waste, does not constitute a breeding place for rodents dry	*Build storage* *Maintenance costs*

EUREPGAP requirements	Inputs
well ventilated and free from rainwater or heavy condensation. at least 25 meters away from direct water sources.	
Crop protection	
Implement IPM techniques	*IPM training*
Modern application equipment	*Acquire machinery and sprayers*
Annual maintenance check of state of application machinery	*Services of a specialised maintenance company*
Pesticide Storage and Handling	
Crop protection products storage Sound and robust Secure Lockable a source of clean water no more than 10 meters distant and eye washing facility appropriate to the temperature conditions: built of materials or located so as to protect against temperature extremes fire-resistant well lit shelving made of non-absorbent material Utensils, e.g. buckets	*Build chemical store* *Buy equipment*
	Dedicated vehicle for pesticide transport
Chemical mixing area	*Build area*
Separate storage for empty containers	*Build storage*
Disposal of empty crop protection product containers in a safe manner	*Build chemical disposal site*
Application machinery with pressure-rinsing equipment for containers	*Special machinery*
Dispose of obsolete crop protection products securely	*Support national programme to dispose of obsolete products*
Irrigation/fertigation	
Implement a water management plan to optimise water usage and reduce waste.	*Consultancy services*
Harvesting	
Hygiene	
Removed packed produce from field overnight	*Build storage for produce* *Temporary holding shades* *Main holding shade with refrigerator*
Packaging/Harvesting Containers on Farm	
Use containers complying with recommended International Code of Practice for Packaging and Transport of Tropical Fresh Fruit and Vegetables (CAC/RCP 44-1995).	*Costs of containers*
Label in accordance with CODEX STAN 1-1985, Rev. 2-1999 plus: Produce variety and/or commercial type Name and address of Exporter, Packer and/or Dispatcher. Identification code Country of origin.	*Costs of labelling*
Produce handling	
Implement an hygiene procedure	
Post-harvest washing	
Where water is re-circulated for final produce washing, it is filtered and disinfected, and routinely monitored	*Water filtering system*
On farm Facility for Produce Handling and/or Storage	*Packing house* *Cold storage*
Floors designed to allow and ensure drainage with i.e. slopes, drainage channels Light bulbs protected/shielded so as to prevent contamination of food in case of breakage.	*Build storage*
Separate storage for waste material	*Build storage*
Waste & pollution management, recycling and re-use	
Waste and Pollution Action plan	
Implement a plan that covers wastage reduction, pollution and waste recycling is available.	*Consultancy services*

EUREPGAP requirements	**Inputs**
Farms have designated areas to store litter and waste.	*Build waste disposal facilities*
Treat waste water	*Water treatment facilities*
Worker health, safety and welfare	
Training	
Training workers operating dangerous or complex equipment Train personnel handling pesticides Train at least one person in First Aid Basic hygiene training for fruit handling by qualified people	*Training courses*
Facilities, equipment and accident procedures	
Toilets and hand washing equipment for harvest workers	*Build toilets* *Build hand washing facilities* *Build Shower facilities*
Medical equipment (packing house and cold store)	*First Aid kits*
Fire equipment (packing house)	*Fire extinguishers*
Signs warning of potential dangers placed on access doors Panels with emergency procedures	*Signs*
Separate storing for all the protective clothing.	*Build storage*
Acquire protective clothing (e.g. rubber boots, waterproof clothing, protective overalls, rubber gloves, face masks etc.)	*Buy personal protective equipment*
Welfare	
Health checks to staff working with pesticides	*Medical care*
The living quarters on farm are habitable, sound roof, windows and doors and have the potable water, toilets and drains.	*Build quarters for workers*
Environmental issues	
Carry out a base line audit of the fauna and flora on farm	*Environmental consultancy services*
Develop a wildlife conservation statement.	*Environmental consultancy services*
Training farmers on environmental impacts of agricultural activities	*Training course*
Implement wildlife and conservation measures	*Costs of corrective actions*
Certification	*Certification assessment*
	Certification costs
EUREPGAP procedures	*Hire specialised staff and train in EurepGap procedures*
	Adapt EurepGap Checklist to local/crop conditions
	Training course for growers

Source: UNCTAD (2005), Costs of Safety and SPS Compliance: Mozambique, Tanzania, Guinea Tropical Fruits, UNCTAD/DITC/2005/2

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