

Zambia: SPS Management

Recommendations of a Joint World Bank/USAID Assessment Team

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Acknowledgements

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It is hoped that the findings and recommendations of the team will be used and adopted by Zambian stakeholders and their development partners.

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I. INTRODUCTION

Standards play a key role in facilitating trade and development and in enabling countries to achieve objectives related to human health, environmental protection, and agricultural productivity. Primary producers and subsequent processors and traders who cannot meet regulatory and/or commercial requirements may endanger consumers, fail to access particular markets, and/or be unable to sustainably and profitably compete in those markets.

For low income countries that aspire to diversify their trade into higher value or value-added agro-food and light manufactured products, there are growing challenges related to compliance with food safety, agricultural health, environmental, and/or other standards being applied by (potential) trade partner governments and/or private sector buyers. The capacities to meet commercial quality requirements as well as comply with these other standards are, increasingly being seen as a core competence for effective participation in international trade. Yet, in many developing countries, there is an underdeveloped ‘culture’ of quality plus only limited or isolated capacities to manage food safety, agricultural health and environmental risks.

Zambia’s Ministry of Agriculture and Cooperatives (MACO) has expressed concern that available technical, human, and financial resources are inadequate to enable the sufficient monitoring and management of sanitary and phytosanitary (SPS) risks, as demanded by (some of) the country’s trading partners. To address this concern, MACO has received support from several external partners to strengthen selected capacities, or at least minimize the adverse impacts of breakdowns in SPS management measures. Examples of the former include recent assistance by the FAO to update and revise Zambia’s phytosanitary legislation and on-going assistance by the Dutch Government to minimize plant health risks associated with floricultural/horticultural exports to Europe. An example of the latter is a new IFAD-supported program to revive the stock of draught animals in smallholder production areas to compensate for large losses due to animal diseases.

In late 2005, MACO approached both the World Bank and USAID, seeking assistance to upgrade the capabilities and (especially the) equipment of the Plant Quarantine and Phyto-Sanitary Services (within the Zambia Agricultural Research Institute), and also to consider other forms of support to enhance SPS management capacity. The GOZ and World Bank agreed to include a funding line for SPS management within the Institutional Component of the new Agricultural Development Support Program (ADSP). USAID agreed to explore possibilities for assistance in this area—especially in relation to promoting regional trade—through its existing MATEP and other programs. It was agreed that the World Bank and USAID would conduct a joint assessment to ensure that the most pressing and significant SPS management issues had been or could be identified. Particular attention would be given to trade-related matters pertaining to plant health and food safety.¹

¹ Parallel analysis on animal health and animal disease control constraints and opportunities has been undertaken by IFAD as part of the preparation for its Smallholder Livestock Investment Project.

Between March and May 2006, three sets of consultations took place. The first, from February 6 to 10, 2006, involved a field visit for Zambian officials to Kenya, organized by the USAID RAISE project. That visit gave special attention to the management of plant health risks related to Kenya's horticultural/floricultural industry and the specific role of the Kenya Plant Health Inspectorate Service (KEPHIS). The second consultation took place between March 13 and 31. Two consultants working for the World Bank carried out a wide range of discussions with MACO officials and with private sector representatives from various agro-food sub-sectors. The primary purposes of those consultations were to (i) examine SPS management issues within the broader set of competitiveness constraints facing Zambian exports, and (ii) delimit a selected set of capacity building and strategic issues that could be practically addressed under ADSP, MATEP, or other donor programs in the very near term. These latter issues were then the foci of a joint World Bank/USAID team that visited Zambia between May 15 and 30, 2006.

This report provides a brief summary of the Joint Team's recent assessment and recommendations. The purpose here is to lay out the very broad observations made by the Team and to highlight specific (and costed) recommendations to the GOZ and to the teams managing the ADSP, MATEP, and other pertinent projects. More detailed coverage of the underlying issues and more elaborated descriptions of institutional and other responsibilities are to be found in the Working Paper appendices.

This summary report is structured as follows. Section II seeks to put SPS management concerns and constraints in a proper context by examining recent patterns in Zambia's agro-food trade and categorizing or classifying the nature and relative significance of different types of constraints. Section III summarizes the team's main findings and recommendations related to plant health. Section IV summarizes the team's main findings and recommendations related to food safety. Section V summarizes the team's findings and recommendations related to diagnostic laboratory testing. A series of annexes provide more detailed coverage of institutional arrangements and capacities and analyses of specific sub-topics.

II CONTEXT OF TRADE AND STANDARDS

With its extensive natural resource base, Zambia has substantial, yet highly underdeveloped potential for agricultural production, processing and trade. Historically, agriculture was regarded as a secondary sector, the primary functions of which were to provide a source of food and raw materials and to serve as a sort of population holding station for the 'real' economy in mining and urban-based manufacturing. Only in the face of significant declines in mining revenues and sustained job losses in manufacturing during the 1990s, did the strategic position and the specific growth potential for Zambian agriculture and agribusiness come under the spotlight of policy-makers and the financial and business community. Prior to the recent surge in international copper prices, concerns about the long-term viability of Zambia's mining sector led many stakeholders to focus

on the prospects of agriculture and agribusiness for underpinning a more diversified economy.

Historically, Zambia had a significant trade deficit with respect to food and agriculture. Its agricultural sector was inward-looking and generated few competitive exports. The sector depended upon imports of fertilizer and agro-chemicals, plus Zambia imported a broad array of foods for which domestic production could not meet local demand. In 1990, Zambia's agro-food exports totaled only \$30 million, while similar imports totaled \$62 million. In the early 1990s, Zambia's agro-food exports were dominated by cotton and sugar—processed and marketed through parastatal agencies—with limited additional sales of tobacco and horticultural products. Yet, with the liberalization of the economy, the privatization of several parastatals, favorable commodity prices, and the advent of low-interest loan programs introduced by several international banks and donor agencies, there occurred substantial growth and diversification of Zambian agricultural exports during the mid-1990s.

Such exports climbed to \$146 million in 1997, led by a surge in cotton exports, expanding vegetable sales, the emergence of a cut flower industry, and renewed interest and commercial farm investment in coffee and tobacco. Opportunistic regional trades in maize, meat and other products also emerged, plus efforts were made to enter into newer product markets (i.e. paprika and natural colorants). With this growth in both traditional and non-traditional agricultural exports, Zambia's agricultural trade balance moved into positive territory for the first time in the country's post-independence history. After leveling off in the late 1990s and early 2000's, Zambia's agro-food exports have surged again in recent years, totaling nearly \$280 million in 2005. Most of the recent growth has been accounted for by the traditional products—especially sugar, cotton, and tobacco.

For its 'traditional' commercial commodities, Zambia's market access and trade performance has largely been conditioned by international price trends and preferential market access terms, although the political developments in South Africa and Zimbabwe, and the overall macroeconomic situation in Zambia have also strongly influenced investment trends in these areas. For many of Zambia's non-traditional agro-food exports, market access and performance have also been affected by the ability of supply chains (and the Zambian government) to comply with either official or private requirements related to food safety, plant/animal health, and/or environmental management.

Table 1 provides an overview of some of the pertinent requirements associated with Zambia's mix of traditional and non-traditional agro-food exports. At least for trade with developed countries (or with trade with countries that are themselves significant agricultural exporters), considerably more attention has been given in recent years to managing food safety and agricultural health risks. This attention has been especially strong in relation to the trade of fish, live animals, meat and other animal products, fruits and vegetables, and planting materials. In some countries and some market segments, official regulations have been supplemented by (often more stringent) private protocols or 'codes of practice'.

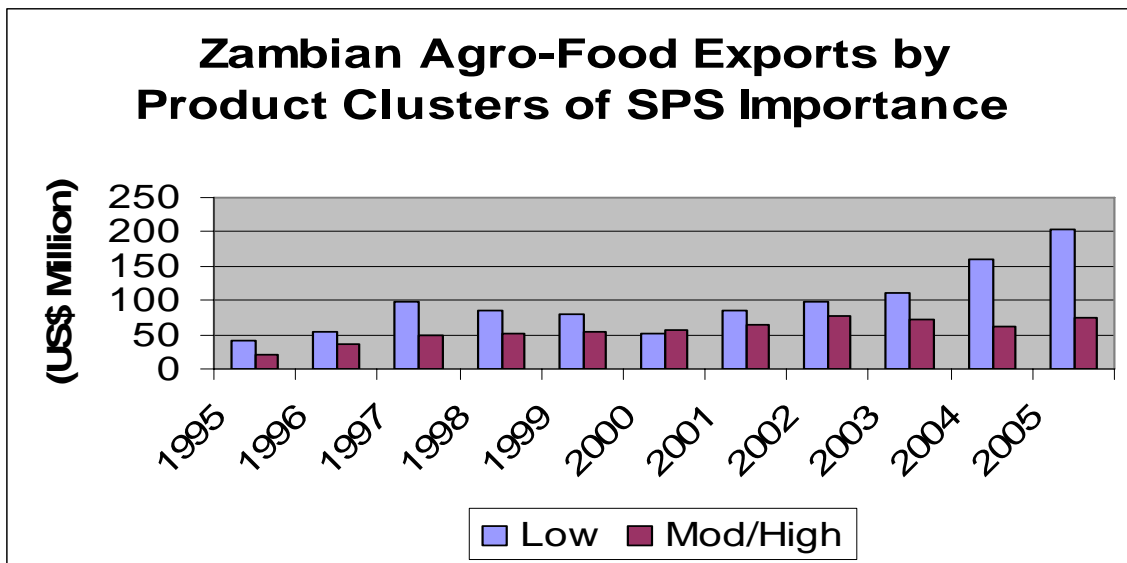
Table 1: SPS + Environmental Standards Potentially Applied to Zambia’s Agro-Food Exports

Product Group	Food Safety Standards	Animal/Plant Health Requirements	Environmental Requirements
<i>Traditional Exports</i>			
Sugar	Foreign matter and contaminants limits		
Tobacco			Removal of use of methyl bromide as nursery soil fumigant
Coffee	Microbiological standards Mycotoxin tolerance levels	Fumigation requirements	Codes for organic practices and certification Codes for ‘shade grown’
Cotton	Pesticide residue limits in cotton seed oil	GMO variety approval	Codes for organic practices Restrictions on pesticide use
<i>Non-Traditional Exports</i>			
Fresh Fruits and Vegetables	Pesticide residue limits Microbiological standards Produce traceability requirements Pack house hygiene requirements	Plant material quarantine Pest risk analysis Fumigation requirements Phytosanitary certificates	Pesticide use restrictions Water/soil contaminat. reg. Codes for organic practices/certification
Live Animals and Meat Products	Vet. drug residue limits Microbiological standards	Disease-free areas Disease surveillance Restrictions on veterinary drugs Animal traceability	Codes for organic practices and certification Regulations on animal waste effluent
Cut Flowers		Plant material quarantine Pest risk analysis needs Fumigation requirements Phytosanitary certificates	Pesticide use restrictions Regulations on water/soil contamination
Cereals, Oilseeds, and Animal Feed	Microbiological standards Limits on Pesticide residue + mycotoxins GMO labeling	Fumigation requirements or restrictions Animal feed ingredient regulations + labeling	Biosafety/GMO regulations Codes for organic practices and certification
Hides and Skins		Animal health status for raw hides/skins	Water effluent regulations Chemical use restrictions
Honey	Pesticide + antibiotic residue limits Microbiological standards Hygiene requirements	Pesticide and antibiotic surveillance Antibiotic use restrictions Export certificates	Codes for organic practices and certification Antibiotic use restrictions
Paprika	Limits on Pesticide residue + mycotoxins Microbiological standards	Fumigation requirements and restrictions	Codes for organic practices and certification

Yet, it is important to recognize that there are wide differences in the actual application/enforcement of such (official and/or private) requirements in different markets, and varying degrees of difficulty in actually attaining compliance with these requirements. Zambia’s agro-food trade is directed to Europe, to neighboring countries (especially DRC), to South Africa, and to a range of other developed and developing countries. SPS and/or environmental standards continue to have little or no effect on Zambia’s agro-food trade within the region. The primary exception to this relates to Zambia’s trade (both its exports and its imports) with South Africa, although many other factors have also inhibited the competitiveness of Zambian products in the South African market. Zambia has experienced periodic SPS-related problems in its trade of selected products with Europe, although, again, SPS measures have generally not been a binding constraint.

Given the overall composition and direction of Zambia’s agro-food trade, and based on a review of past experience, one can conclude that the SPS measures of the country’s trading partners has had an only (very) minor impact on the overall performance of this trade. Other competitiveness factors—especially primary producer and processor productivity, continuity/reliability of supply, logistical costs and macroeconomic factors—together with international commodity price trends—seem to have played much more dominant roles in explaining Zambia’s agro-food trade performance.

For example, in recent years, Zambia has experienced impressive growth in its exports of sugar, tobacco, and cotton, taking advantage of its increased EU quota for the former and of the market space provided by declining Zimbabwean production of the latter two. Trade in these commodities is largely governed by price, quality, and logistical considerations with minimal impact of SPS measures. Zambia’s recent trade in more-SPS sensitive products (i.e. vegetables, cut flowers, animal products, spices) has been relatively flat due to a range of supply chain problems. New or more stringent SPS measures adopted by Zambia’s trading partners have not had a profound impact on recent trends. Graph 1 contrasts this recent growth in trade of traditional commodities (for which SPS measures are of little importance)² versus trade in the range of non-traditional products for which food safety and/or agricultural health concerns might apply. Trade in many of the latter mix of products has either declined or been stagnant in recent years, although SPS-related factors have generally not been significant contributors to this stagnation (or decline). Rising air-freight costs, the appreciation of the Zambian Kwacha vis-à-vis major currencies, and financial or supply-related problems facing particular firms have been more prominent factors.³



Zambia exports very little food (other than sugar) and is a large net importer of food. With the notable exception of sugar, much of Zambia’s food processing industry is not

² That is, cotton, tobacco, sugar, and coffee.

³ See Annex 6 for more details

internationally or regionally competitive. Its processed food exports are directed at the DRC or other neighboring countries where prevailing official and private standards are similar (and similarly un-enforced) to those in Zambia. Zambia's food trade with more SPS-observant countries is less than \$20 million, and, in recent years, this has been declining. This consists of a limited basket of vegetable sales to the U.K., Holland, Australia, and South Africa, and sales of honey and paprika to a few countries. Some SPS-related challenges have and are being faced, but these are not the cause of the recent trade declines. Zambia imports a broad range of foods, although considerable parts of this are of products which would be considered of low to moderate risk from a food safety point of view. The imports of foods for which there might be health risks (i.e. meat and dairy products, fish, canned foods) tend to come from countries where relatively higher standards of food safety controls apply.

Zambia's trade faces relatively few plant health constraints and those that it does are not or should not be binding. Appropriate pest survey, monitoring, inspection, and reporting activities by Zambian agencies could reduce the costs or other effects of existing measures imposed by trading partners. Trading partners express a lack of confidence in official Zambian positions regarding pest status and the integrity of phytosanitary certification. These shortcomings can be addressed and specific recommendations are made here. Considerable attention has been given to the completion of long delayed pest risk assessments to enable selected Zambian vegetables to be accepted by plant health authorities in the United States. This had been a 'binding' constraint, although the underlying commercial potential for that trade—given freight costs and competition from other, nearer sources—is minimal.

Several notifiable or economically significant animal diseases are now endemic in Zambia (i.e. Foot and Mouth Disease, East Coast Fever, Swine Fever), while geographically specific outbreaks of other diseases (i.e. CBPP; Newcastle Disease) are increasingly common. Such diseases have had a devastating effect on the livestock holdings and draught animal power available to smallholder farmers. The commercial farm herd has been much less affected due to far better (private sector) animal health and disease control measures. Zambia is a net importer of animal products. Exports are mostly confined to day-old chicks and to intermediately processed hides and skins.

Periodic interest has been raised about the prospects for contributing to the large beef import demand of South Africa. Basic supply capability and cost/competitiveness constraints exist, although the Assessment Team found renewed interest to explore the feasibility of this trade, including compliance with animal health (i.e. FMD-free zones) and food safety (i.e. abattoir standards) requirements. Currently, domestic prices within Zambia are attractive, plus the exchange rate renders Zambia a non-competitive supplier. Yet, there could be modest trade potential in the future. While the feasibility of this should be explored, official attention to animal health and disease control is and should remain on its domestic herd maintenance and productivity aspects rather than its trade-related aspects. To follow-up on the trade-related dimension, terms of reference for a technical and economic feasibility study should be prepared in conjunction with the ZNFU and interested commercial ranching and meat processing companies.

Table 2: Zambia Current Agro-Food Trade and SPS Risks (US \$ Million; 2005)

	Export Value	Import Value	Plant Health	Animal Health	Food Safety
Sugar + Confectionary	67.76	6.16			
Cotton	64.70	7.13			
Tobacco	60.25	NA			
Cut Flowers	32.09	0.62	X		
Fresh Fruit and Vegetables	17.66	6.87	X		X
Coffee + Tea	11.53	1.23			
Seeds	11.00	1.58	X		
Cereal Products	8.01	13.00			X
Cereals	3.66	41.82	X		X
Live Animals and Animal Products	2.24	12.26		XX	XX
Animal Feed	1.20	3.21		XX	X
Dried Peas/Beans	0.98	3.70			X
Vegetable Oil	0.55	50.75			
Sauces/Soup/ Prep/Spices	0.50	7.97			X
Processed Fruit and Vegetables	NA	6.69			X

X Moderate Risk XX Higher Risk

As indicated in Table 3 below, despite an overall positive balance of trade in food and agricultural products, Zambia remains a large net importer of food. Given the relative compositions of its agro-food exports and imports, the latter could potentially be associated with a broader range of food safety and/or agricultural health risks than the former. In policy and practice, Zambian authorities have given special attention to restricting the entry into Zambia of genetically modified maize and related products. Numerous consignments of such products have been denied entry. No other clear prioritization of SPS management in relation to imports is evident. Rather, economic or commercial considerations seem to take precedence. Zambian producer organizations or processors frequently lobby to have imports restricted or delayed, with SPS concerns used as the official pre-text. Several such restrictions have been adopted (e.g. on-going restrictions on imports of poultry products). *Overall, Zambia has probably created more barriers to tangible food imports than its trading partners have restricted Zambian exports.*

Table 3: Zambia Agro-Food Trade and SPS Risks (\$ Millions; 2005)

Category	Value of Exports	Value of Imports
Total Food + Agriculture	286.8	174.2
Total Food	115.2	165.8
Total Food –excl Sugar	47.4	159.6
Food + Ag Trade with Minimal SPS Risk	208.3	71.5
Food + Ag Trade with Moderate or Higher SPS Risks*	78.5	102.7
Plant Health-related	64.4	50.9
Animal Health-related	3.4	15.6
Food Safety-related	35.3	94.4

* The three categories add up to more than the total as some products are associated with more than one category of risk.

Arguably, the biggest challenges faced by Zambia in relation to food safety and agricultural health currently relate to domestic production and the domestic market rather than to the country's trade per se. Although given little priority, Zambia almost certainly faces more significant food (and water) safety issues in its domestic market than are associated either with its exports or with its imports. Zambia has experienced frequent outbreaks of cholera, while available epidemiological data point to relatively high incidences of diarrhea and other expressions of food or water-borne illness. Such food (or water-) borne illness can be devastating to highly vulnerable persons, such as malaria and HIV patients, causing dehydration, poor absorption of food, significant weight loss, and further weaknesses which increase rates of mortality. Yet, food safety in Zambia is addressed almost entirely through responsive, crisis management measures, rather than through preventative or promotive measures. The Assessment Team will recommend several demonstration projects of the latter type.

Zambian domestic expenditure on higher value, SPS-sensitive foods is many times larger than its current and prospective trade in such foods. For example, estimated domestic expenditure on vegetables was some \$372 million in 2003, compared with exports and imports of fresh/processed horticultural products each being some \$15 to 20 million per annum. Domestic expenditure on meat (at some \$186 million) is thirty times the value of either animal product imports or exports. While much of this expenditure is by Zambia's poor, the purchases by its middle and upper income segments exceed those for Zambian exports and, almost certainly, have larger growth potential. For most Zambian producers, processors, and traders, more tangible opportunities relate to servicing the middle to upper end of the domestic (and neighboring country) food market than to competing in markets further afield. The Assessment Team will be recommending a specific program to promote safer/more reliable producer supplies of horticultural produce to domestic supermarkets, caterers, etc.

In relation to plant health, perhaps Zambia's greatest challenge is to stem the spread and limit the adverse impact of the larger grain borer beetle on its maize and cassava production and stored crop. The LGB was first reported in Zambia in 1993. It was initially restricted to one district of Northern Province, yet in 1995 large quantities of LGB-infested maize were imported from Tanzania and distributed as famine relief. LGB is now present throughout Zambia, contributed to high losses for farmers and annual costs of some \$5 million per year for a National LGB Containment and Control Program which has thus far had only limited success. The annual crop and financial losses associated with LGB are certainly a large multiple of the 'lost' trade or added compliance costs associated with meeting the phytosanitary requirements of Zambia's trading partners.

As noted above, various endemic animal diseases have resulted in very large losses in the cattle herd in smallholder areas, reducing the availability of draught power - and thus farmer productivity - and decimating the savings of large numbers of smallholder households. Many millions of rural Zambians have been adversely affected. The costs of these productivity and asset losses are a large multiple of any 'lost' livestock product

trade that the country has experienced due to the endemic presence of certain animal diseases and the absence of measures to attain disease-free status for certain sub-locations.⁴

While the domestic dimensions of food safety and agricultural health may well be more significant than the trade dimensions, this does not mean that the latter should be ignored. While Zambian exporters have faced few binding market access constraints, there have certainly been experiences of periodic losses—due to official or private consignment rejections or price discounts—or circumstances where compliance or inspection costs have been non-trivial (see Table 4). Concerns about (own company or official) compliance with food safety or agricultural health requirements have contributed to some patterns of ‘defensive commercialization’ where firms have simply structured their product mix and market orientations to avert potential compliance problems. There are also several potential threats to Zambia’s current trade associated with food safety or agricultural health risks, although in the judgment of the mission, these threats are neither imminent nor of enormous or unmanageable consequence.

Several of the recommendations made below are geared toward addressing current problems, minimizing the risk of future threats, and enabling firms and primary producers to move beyond ‘defensive commercialization’ by facilitating improvements in farm/firm management practices to enable them to meet the requirements of more discerning buyers and consumers—whether abroad, regionally, or in the domestic market.

⁴ As would be attempted, for example, in order to access the South African beef market.

Table 4: Impacts of SPS Measures on Zambian Agro-Food Trade

(Temporary) Binding Constraint	Periodic Losses	Significant Compliance Costs	Defensive Commercialization	Potential Threats
Animal diseases and livestock/meat trade to South Africa, Zimbabwe and beyond	Paprika, aflatoxin, and private price discounts in EU sales	Paprika testing costs in relation to export value	Meat processing and beef marketing	Tourism and adverse food safety episodes
AFB disease, product irradiation and accessing South African market for organic honey	Official rejections of mangetout + snap peas in EU due to presence of caterpillars	Cut flower inspection costs in Holland	Airline catering procurement	Actual incidence of avian flu + maintenance of regional market access
Ban on poultry product imports from most East + Southern African countries	Day-old chicks, avian flu rumors + temporary DRC + Malawi restrictions	Disease surveillance and testing costs in poultry sector	Groundnut marketing	Actual establishment of AFB in bee population
GM maize/maize product imports from South Africa + int'l sources			Perceived problems for vegetable exports to SA	Introduction of <i>thrips palmii</i> (for impact on cut flower trade and inspection)
Imports of stone fruit from South Africa due to non-achievable mitigation measures				Contaminated water as traded consumer product and as input into food processing Incidence of ochratoxin in coffee and EU trade

III REVIEW AND RECOMMENDATIONS RELATED TO PLANT HEALTH

An assessment was carried out of the Zambian legislation, institutional structures and capacities, and recent experiences in relation to phytosanitary management (Annex 2). The operating constraints and on-going performance of Zambia’s national plant protection organization (NPPO)—the Plant Quarantine and Phytosanitary Service (PQPS) within MACO—were reviewed by pertinent managers and staff and tentatively evaluated by the Assessment Team in relation to the ‘core functions’ which the International Plant Protection Convention designates for such NPPOs. The Team also carried out a risk assessment related to Zambian honey and the measures required by its trading partners to ensure the absence of a specific disease.

Summary Findings

Table 5 provides a summary analysis of the capacities and performance of the PQPS in relation to twelve core functions identified by the IPPC. While the ‘scoring’ made here is subjective, it does provide an indication of prevailing strengths and shortcomings.

Table 5 Evaluation of PQPS’s capacity based on IPPC’s 12 core functions

SPS - Twelve Core Functions			
	FUNCTION	SCORE*	NOTES
1	Designate an Official National Plant Protection Organization (NPPO)	3	Not all requirements of IPPC have been met
2	Issue of Certificates	3	Mistakes being made due to need for a document control system
3	Surveillance of growing plants	2	Activity is focused on a few crops for export near Lusaka only partial compliance with A VIII para 1 (a) of IPPC
4	Inspection of consignments	3	Requires upgrading especially of casually traded items
5	Disinfestation or disinfection of plant consignments	3	Document control needed e.g. identification manuals
6	Protection of endangered areas and surveillance of pest free areas	2	Activity is focused on export horticulture near Lusaka
7	Conduct of pest risk analysis	2	Must be founded on other activities and information which are not being carried out
8	Ensure through proper procedures phytosanitary security after certification	2	No procedures manual e.g. at border post
9	Information dissemination within Zambia on regulated pests	1	No manuals or information leaflets
10	Research and investigation in the field of plant protection	1	No staff
11	Issuance of phytosanitary regulations	3	Partial
12	Submit a description of NPPO to IPPO secretariat	3	IPPO Website OK but not all data has been submitted
	Key		
	1 = Poor		
	2 = not adequate		
	3 = adequate		
	4 = good		
	5 = represents best practice		

Source – Assessment Team’s estimates based on interviews and observations

Certain functions are performed adequately by PQPS's small staff or by complimentary staff working in other departments of ZARI or elsewhere in government (i.e. in the customs department). Recently drafted legislation will supercede prevailing obsolete laws and regulations and bring Zambia's phytosanitary laws in conformity with IPPC guidelines. However, there are serious shortcomings in phytosanitary information and reporting. Besides for some periodic 'one off' activities, there exists virtually no coordinated national program for pest and disease surveillance. Within and outside of the NPPO, there remains little knowledge of the status of the national list of quarantine pests. And, there is practically no information dissemination within Zambia related to regulated pests. The lack of effective surveillance and up-to-date pest lists, together with minimal capacities to carry out pest risk analysis virtually prevent Zambia from providing a scientific justification for its own phytosanitary measures and weaken its credibility when providing phytosanitary information to (potential) trading partners.

Field and border post operations are constrained by insufficient staff training, absence of up-to-date manuals, and lack of effective transport. A poor pay structure and lack of other incentives make it difficult to recruit and retain capable staff, with upwards of 40% of technical staff positions currently being vacant.

Recommendations

A number of specific recommendations have been made to the management of PQPS, ZARI, and MACO to improve the underlying performance and sustainability of PQPS and to improve its working relationships with other entities. For example, it is recommended that:

- PQPS managers formally designate particular staff to lead or coordinate the performance of specific core NPPO functions;
- Specific strategies be developed to increase inter-service and interdepartmental cooperation within ZARI/MACO to achieve NPPO objectives (such as national surveys and surveillance for pests and diseases);
- Responsibilities for SPS responsibility for bees and bee products be transferred from the Department of Veterinary and Livestock Development and the Forestry Department to PQPS;
- Regular performance reviews be conducted of PQPS performance, using appropriate indicators and involving evaluations by management, staff, Zambian 'clients', and representatives of NPPOs of Zambian trading partners; and
- Consideration be given to restructuring the PQPS as a quasi-independent agency for purposes of staffing, financing, etc., by applying suitable models effectively applied elsewhere.

Other recommendations, requiring technical assistance, training, and/or equipment include the following:

1 *Pest and disease surveys and associated training*

As Zambia does not have accurate and up-to-date knowledge of the distribution of pests, it cannot prepare import risk assessments – and indeed, neither can countries that want to import from Zambia. It is therefore necessary to improve this deficiency before it impacts even further on Zambia's trade. It is recommended that a series of pest surveys are carried out as part of a program of in-service training. By combining the preparation of pest surveys with specific training inputs, it solves two problems, i.e. the problem of out-dated pest lists and ensures that permanent staff are trained to maintain them. The Assessment Team recommends:

- ✓ The creation of a list of existing and potential quarantine pests using a series of targeted surveys which have been selected based on immediate priorities for trade. The surveys should cover the distribution and status of AFB, *Bemisia* spp and *Trialeuroides vaporariorum*, *Thrips palmi* and *T. hawaiiensis*, and *Ceratitis capitata*, *Bactrocera invadens*, *B. cucurbitae*, *B. dorsalis*, *B. zonata*, and citrus canker (*Xanthomonas campestris* pathovar *citri*). If AFB status is surveyed, it will considerably help the trade in honey to South Africa.⁵ The work on *Trialeuroides* will simplify imports of fruit from South Africa while the work on *Trips* should reduce the cost of flower inspections in Holland.
- ✓ That border controls and procedures be strengthened so that all material is inspected and not merely commercial consignments. In addition, simple monitoring of key pests, including some of those listed for national surveys should be introduced using simple manuals and procedures so, where necessary, customs officers can help prevent the entry of restricted pests.

When the accurate and up-to-date pest lists are established and proper border controls are instigated, it should be possible to establish certain areas in Zambia, or indeed the whole country, to be free of certain pests and diseases to the satisfaction of trading partners. In order to carry out the necessary taxonomic work that would be needed to undertake the pest and disease surveys, it is recommended that the services of CABI are contracted to support the in-country training programs. CABI's services could then be used by functional coordinators within PQPS to help with the formal identification of pests and diseases.⁶

2 *Document control and preparation of manuals*

It is recommended that a formal document control and business management system be introduced at PQPS⁷. The FAO project that helped establish the draft for the new Plant

⁵ A very specific set of recommendations has been provided related to the handling of AFB concerns in honey and terms of reference for an AFB survey have been prepared. See Appendix 2 of Annex 2 as well as Box 1 below.

⁶ In addition to CABI, there are other taxonomic services that could be accessed free of charge e.g. Tephritids can be identified by USDA-APHIS in Pretoria.

⁷ As a simple example, procedures and quarantine pest identification manuals need to be reviewed and/or created so as to tighten up border controls.

Protection Act did initiate a program of manual writing but this has yet to be finished. It is essential that it is completed and that there is a full review of the procedures and manuals for the movement of plant material into and out of Zambia. It is therefore proposed that:

- ✓ There be a review of document control systems within PQPS and that updated information on pest and disease status is published in fora such as the IPPC and international scientific journals. As controlled documents, policies, procedures, manuals and lists are created to ensure compliance with the IPPC policies and to ensure that national legislation and international treaties are adhered to correctly.
- ✓ Requirements to implement policies such as the creation and maintenance of National A1 and A2 lists as well as ensuring that a list of pests present in Zambia of concern to neighboring countries and trading partners are maintained and updated (i.e. List 3).
- ✓ Procedures and manuals need to be written for (i) the movement of agricultural produce in and out of Zambia for border inspectors, including customs officials to use, (ii) quarantine pests on all three pest lists for use by all branches of PQPS and where necessary customs officials, and (iii) the writing and review of the import control addenda.

3 *Limited procurement of equipment and services to improve on-going operations*

An improvement in communications is crucial to the efficient operation of PPQS. All technical staff and inspectors should have access to computers and the internet. Where appropriate, the technical staff should have subscriptions to scientific sites such as the American Phytopathological Society (APS) publications and other relevant electronic journals. Equipment for taking and transmitting digital photographs should be trialed at certain border points e.g. Chirundu and Lusaka International Airport and, if successful, introduced at all borders.

The laboratories at Mount Makulu have almost all the equipment that is needed to support PQPS's activities. Some supplementary equipment is needed; it is recommended that a small amount of equipment is purchased for the first isolation of fungal and bacterial plant pathogens along with growth cabinets, freezers, basic reagents and laboratory consumables. More complex identifications of, for example *Phytophthora* to species level, should be done by specialist laboratories.

Transport is required for head office technical staff as well as inspectors at border posts. Currently the department has only one dedicated pickup, which makes surveillance work difficult. The inspectors are hampered at some border posts because of the long queues of trucks and their work would be made easier by the provision of motor bikes.

Table 6 summarizes the range of recommendations, level of input, and estimated cost for interventions which could be supported under ADSP.

Table 6: Estimated costs of implementing recommendations to improve the effectiveness of PQPS

Recommendation	Objective	Actions	Detail of input	Cost (USD)
Review of legislation	Review of new Act	Technical review by Zambian lawyer and IPPC specialist	1 man-week	15,000
	Review of another NPPO Allow PQPS to retain funds	Review of KEPHIS & ARC Lobby Govt to support the Dutch initiative	1 man-week 2 man-weeks by ZARI	5,000
Restructure of support to technical staff	Ensure coverage of all core functions – appoint champions	Internal ZARI review		
	TA for on-the-job training	Appoint an organization to provide consultants	5 man-months of TA	100,000
Improve capability to identify pests and diseases and update A1, A2 and List 3	Complete quarantine pest lists	An end-product of TA support to champions		
	Initiate inter-service co-operation within ZARI to help with pest & disease identification	Internal review of ZARI management		
	Access to taxonomic resources	Negotiate with providers for taxonomic vouchers	1 week TA and cost of vouchers	30,000
	Train technical staff in taxonomic identification	Basic courses	1 month TA	20,000
Improve document control and prepare manuals	Introduction of document control system	TA, possibly supplied by KEPHIS	2 weeks TA	12,500
	Writing of policies, procedures & manuals	On-the-job training to write specialist documents by regional specialists – possibly from KEPHIS	4 man-months TA	50,000
Equipment and other capital costs	Internet access at ZARI	Computers and running costs	5 computers	15,000
	Internet access- main border posts	Computers and running costs	5 computers	15,000
	Transport for border posts	Provide motor bikes	5 motor-bikes	10,000
	Transport for surveillance and field inspections	Provide 4 wheel drive van	1 vehicle	35,000
	Communication between ZARI and border posts	Provision of digital cameras for main border post inspectors	5 digital cameras & microscopes	20,000
	Software to facilitate PRAs	Provide software – either Climax, @risk or GIS	1 program	5,000
	Laboratory equipment & consumables	Eg, water distiller, freezers, chemicals, growth cabinets		20,000
On-going reviews of PQPS	Ensure that PQPS continues to improve its service	TA for annual review of core functions	2 man-months TA	50,000
		Evaluation by major trading partners		
TOTAL				402,500

Box 1: Measures Needed to Access the South African Market for Organic Honey

International market access problems for Zambia's livestock products have not been generally reviewed in the current assessment because of other priorities identified by MACO and general perceptions that (i) Zambia's most pressing animal health issues relate to disease control measures to rebuild and preserve the smallholder livestock herd, and (ii) there are a multiplicity of factors that constrain the international competitiveness of Zambia's livestock products. However, the assessment team did examine SPS issues pertaining to Zambia's trade in honey, conducting a preliminary risk assessment and outlining a series of specific proposals (see Annex 2, Appendix 2). The team strongly recommends that follow-up steps be taken as there is a near-term potential to increase honey export revenues by some \$500,000 per year following mitigation measures which might initially cost about \$30,000 and then involve modest annual expenditures thereafter.

Some 10,000 farmers in North-Western Province of Zambia have been producing honey and beeswax for many years. This area is an accredited producer of organic and Fair Trade honey, providing scope for commanding considerable price premiums for producers and exports. Annual exports are some 600 to 700 tons per year, worth about \$1.5 to 2.0 million. Most exports have been directed to the European Union. However, the nearby South African market represents a large market opportunity for Zambia, with the potential for realizing considerable higher prices than currently obtained.

At present, imports of honey into South Africa from Zambia are required by SA authorities to be irradiated for the elimination of the possible presence of American Fool Brood (AFB)—a serious disease in honeybees caused by a spore-forming bacterium. Honey is sent to South Africa in bulk 200 liter containers and irradiated in Johannesburg before release for sale. The use of irradiation darkens the honey and nullifies the organic certificate. It is blended with South African honey and marketed as originating from South Africa. These conditions are applied because it is unclear to the South African National Department of Agriculture what is the status of AFB in Zambia. However, the NDA is prepared to look at proposals by MACO on alternatives to irradiation provided that the scientific basis is valid and MACO can assure NDA of its capacity to implement the agreed mitigation protocol.

The assessment team examined several alternative approaches and provided some degree of liaison between MACO and NDA. The recommended approach would combine (i) initial testing of all batches of Zambian honey, with (ii) a (sampling) survey of hives in the main producing areas of Zambia to confirm the absence of AFB. The necessary technical assistance, taxonomy work, and laboratory testing would cost approximately \$30,000. Draft TORs for the survey have been prepared.

IV REVIEW AND RECOMMENDATIONS RELATED TO FOOD SAFETY

An assessment was carried out of the underlying regulatory framework for food safety, the associated institutional arrangements and capacities for food safety monitoring and inspection, and the patterns of awareness of application of appropriate health and hygiene measures in a sample of Zambian food industries and service establishments. A complimentary analysis of food safety and other diagnostic testing capacities was also carried out. Although not comprehensive, this review cut across both trade-related and purely domestic measures and operations. The detailed review is provided in Annex 3 & 4.

Summary Findings

The main findings of this review include the following:

- *Low Awareness:* There is an overall low level of social awareness on food safety issues in Zambia, with a lack of organized consumer demand or advocacy for food safety, and minimal or episodic efforts to promote household, primary producer, or food establishment adoption of safer practices. Underlying capacities to provide programmed information-communication-training activities in food safety are especially weak.
- *Absence of Strategy:* Neither in national health nor national agricultural strategic plans are there explicit strategies and policies for food safety management. No assessment processes have identified specific health or food system risks for which targeted approaches might be adopted. Rather, the de facto ‘strategy’ is crisis management, simply reacting to disease outbreaks, reports of contaminated foods, or pressures from trading partners. Proactive or preventive measures are largely absent, although there are some exceptions in the private sector.
- *Adequate Legislative Basis:* The Food and Drug Act (2001) and other supportive acts and regulations under the Ministry of Health, MACO, the Environmental Inspection Council, and others provide an adequate basis for proper food safety oversight and facilitation. Yet, in most regards, the underlying capacities to monitor and enforce the existing food laws are quite weak.
- *Weak Coordinative Structures:* Several different ministries as well as city councils, local government authorities, and private sector associations have important and designated roles to provide oversight and information related to food safety. Many coordinative committees have been formed at localized levels, yet most perform poorly due to lack of funds, staff or poor communications. Zambia lacks a National CODEX Committee. A national SPS Committee exists yet this rarely addresses food safety issues and only in the context of recommending approval/denial of food import permits.
- *Limited and Unfocused Food Safety Inspection Capacity:* The responsibility for inspecting food companies and establishments is divided between the Ministry of Health, Municipal governments, and local councils. Few personnel specialize in this function. Most lack appropriate training, tools, manuals, or guidelines for this type of inspection work. Lacking any clear strategy or priorities for surveillance, attention centers on periodic visits for license renewals and responding to consumer complaints.
- *Uneven Application of Food Safety Standards in the Private Sector:* Except for a limited number of food processors and hotels, the food safety standards applied in most Zambian food establishments is unsatisfactory. The physical structures, equipment, facilities, personal hygiene, food handling practices, testing and

calibration services, and other elements of ‘good manufacturing practices’ were found to be problematic in the majority of food establishments visited. The main exceptions to this pattern were among firms that are part/subsidiaries of international companies (i.e. in tourism; beverage industries) or selected firms that have had a long-standing export-orientation (i.e. a few fresh vegetable export operations).

At present, there appears to be little effective regulatory or consumer demand for ‘good hygiene practices’ or ‘good manufacturing practices’ in Zambian food processors and establishments. Some preference may be given to primary producers or firms applying these and other food safety-related practices in the procurement practices of local or regional tourist establishments or modern retailers, yet such practices have rarely proven to be a requirement, given on-going problems of simply obtaining reliable physical supplies in many Zambian agro-food supply chains.

However, the generally low level of awareness and application of food safety and ‘good’ hygiene or manufacturing practices within Zambian agriculture and agro-industry could certainly pose production, commercial and consumer risks in the future, plus inhibit the realization of future growth opportunities, whether at the upper end of the domestic consumer market, in supporting the expanding Zambian tourist industry, or in selling foods elsewhere in the region or abroad.

Recommendations

The Assessment Team recommends several initiatives to be undertaken to address pertinent risks and opportunities associated with food safety. The Team **does not** recommend a large capacity-building initiative that would overhaul existing institutional structures and invest large resources in physical infrastructure, facilities, etc. There are other health- and trade-related concerns which warrant greater attention. Rather, the proposals here are for a limited set of catalytic and demonstrative initiatives that will raise the food safety awareness and application of better practices to selected food system participants or monitors. The recommended initiatives are as follows:

1. Design and Initial Implementation of a Zambia Assured Produce Scheme (ZAPS)

In the mid-1980s, a few commercial farms began to export fresh vegetables to Europe. Initially the trade targeted wholesale markets, but later sales were directed to major supermarkets, especially in the U.K. and Holland. The volume and value of this trade grew over much of the 1990s. Export earnings peaked in 2002 (at nearly \$27 million), but have since declined due to the financial collapse of the largest company, increased air-freight costs, and, more recently, the sharp appreciation of the Kwacha. In 2005, export earnings were just under \$17 million and this will be considerably lower in 2006 as several of the leading are adjusting to the freight and exchange rate conditions by shifting resources into the production of staple food crops. There are currently three major producer-exporters, each of which is EUREPGAP certified. A limited number of

smallholder outgrowers had been linked to one of the (now defunct) export companies, yet their continued participation in the export market now appears doubtful.

Over the years, export-oriented horticulture (and floriculture) has received considerable support from international donors and financial agencies. Preferential financial support has been provided for farm development, cargo handling facilities, and outgrower schemes. Support has also been provided for the establishment of a training institute and program to train future technical and administrative workers in the industry. In contrast, the development of the domestic system of supply chains and markets for fresh fruits and vegetables has, until quite recently, been largely neglected by the GOZ and the donor community. Attitudes have begun to change, however, with a growing recognition of the current size and potential of this domestic market and the opportunities which it might afford for a larger number of small and medium-scale farmers.

According to the 2002-2003 CSO Living Conditions Monitoring Survey, urban household expenditures on vegetables were some \$101 million, of which \$16 million was by upper income consumers, \$12 million by middle income consumers, and \$73 million by low income consumers. Considering the middle and upper income segments and factoring in fresh produce purchases by hotels and restaurants servicing the growing number of tourists to Zambia, it is evident that the middle to upper end of the 'domestic' market currently has a value which is more than twice Zambia's fresh horticultural exports. This higher end domestic market will almost certainly increase in the years to come, while the future prospects for export-oriented horticulture are highly uncertain.

Currently, there are some 200 to 300 (small, medium, and larger) farmers that supply the higher end segments of the domestic market. Buyers have given preference to growers who are reliable and who can consistently supply good quality produce. Little direct supervision of suppliers occurs. The buyers generally lack the resources or personnel to advise farmers on matters of 'good agricultural practice'. Limited requirements and systems have been developed for production record-keeping, product traceability, etc.. Thus, the prevailing standards lag behind those for supplying supermarkets or the tourism industry elsewhere within the region.⁸

Based upon consultations with various stakeholders, the Assessment Team recommends the development of a Zambia Assured Produce Scheme as a stepping stone toward international standards, as a means to reduce the fresh produce procurement risks faced by Zambian retailers, tourist/hospitality operators, and food processors, and as a basis for promoting improved practices amongst Zambian producers and enabling those producers who do make operational upgrades to become longer term 'preferred suppliers' to remunerative segments of the domestic (and regional) market. ZAPS would:⁹

- ✓ Focus on (i) the safe and timely application and storage of pesticides, (ii) basic principles and practices of food safety, and (iii) proper record-keeping and systems of traceability. It would thus center on core aspects of international

⁸ Especially in comparison with standards applied in South Africa and Kenya.

⁹ See Annex 4 for more details of the scheme.

- protocols such as EUREPGAP, yet not include some of the latter's wider ranging issues or documentary requirements;
- ✓ Be designed and implemented with direction and oversight provided by a Council with wide representation from the major buying organizations, but also from the national farmers union, agrochemical association, and government;
 - ✓ Involve the development of suitable manuals, and training materials, the subsequent training of selected farmers and their staff, and subsequent audits to ensure the actual adoption of better management practices;
 - ✓ Feature a central involvement of the NRDC/ZEGA Training Trust in the conduct of baseline analyses, the design and implementation of training, and the subsequent audit processes.

It is proposed that assistance be provided under the World Bank-supported ADSP to establish the ZAPS (including the assessments and preparation of training materials/manuals), and to train two contingents of 25 farmers (and their staff). The establishment and demonstration/evaluation process should cost approximately \$110,000. It is expected that the ZAPS process and principles will be embraced not only by the 'upper end' of the domestic/tourist fresh produce market, but also exporters and processors who purchase other commodities or raw materials from smallholder or emergent farmers. Subsequent demand for training could involve companies or farmer organizations seeking support under the ADSP's matching grant facility or paying prevailing fees for training and audit services. In this manner, the support provided to launch the ZAPS is expected to give way to a more commercially based 'demand and supply' of better farming practices and associated service and training capacities.

2. Establish & Strengthen Model Food Industries for GMP and HACCP Implementation

At present, there is not a single food industry or establishment certified to the HACCP or ISO 9001 management system. The proposed support measures to improve food safety and quality management performance of food industries are the following:

- ✓ Conduct gap analysis of selected food industries and establishments from selected priority sectors;
- ✓ Develop matrix criteria to select model food industries and establishment for GMP and HACCP (ISO 22000) implementation;¹⁰
- ✓ Assist selected model food industries and establishment for GMP and HACCP (ISO 22000) implementation;
- ✓ Provide direct company training, and training of trainers for food industry GMP, HACCP (ISO 22000) planning;
- ✓ Follow up the implementation of GMP and HACCP (ISO 22000) in selected industries

The estimated cost to implement the needed assessments, training, and advisory services for two sub-sectors would be in the range of \$100,000 to 125,000. This would serve as a

¹⁰ Potential candidates include the tourism/hospitality industry, the meat processing sector, the dairy sector, and perhaps others.

demonstration program which could then be replicated in other sub-sectors, drawing upon available resources or matching grants from other programs.

3. Strengthen Information, Education, Communication and Training Capacity

One of the best mechanisms and modalities to achieve good performance in food safety and quality is to create informed and organized consumers and producers, and a competent food control authority through education, training, communication and information. The proposed assistance to strengthen food safety education, training, communication and information would include:

- ✓ Technical assistance to support Zambia's educational system to better incorporate messages or more advanced curriculum related to basic food hygiene and food safety, starting from the primary school level through to institutes of higher education;
- ✓ Technical assistance and financial resources to conduct national food safety weeks/days and prepare special programs and a campaign on food safety through banners, flyers, posters, brochures, panel discussions, workshops, and radio programs;
- ✓ Assistance to establish and strengthen consumer associations/food safety associations;
- ✓ Training workshops for members of the Zambian media on issues related to food safety and responsible news reporting in this field.

An initiative of this nature could be implemented at a cost of between \$100,000 and 125,000, covering workshops and local and international consultants.

4. Establish and Strengthen Model Inspection Operations

The food inspection system of Zambia is understaffed in terms of technically competent personnel, under equipped in terms of facilities, inspection tools, inspection manuals, etc. to undertake inspection, follow up and monitoring activities. The support given from the inspection system to food industries and food establishment is insufficient. It is based on crisis management to resolve complaints. There is no planned inspection activity as such, except the inspection activities conducted as part of licensing and license renewal activities.

A step-by-step approach is recommended to alleviate the multifaceted problems and challenges of the food inspection system.

- ✓ Provide intensive and extensive training, and training of trainers in courses for food inspectors;
- ✓ Establish model inspection operations and furnish the model inspections with the necessary trained and competent staff, inspection manuals, inspection tools, facilities, transportation systems by selected major cities like Lusaka;

- ✓ Develop an efficient management system and detailed and planned activities of inspections in the model inspection operations; follow up the implementation and evaluate the impact and relevance;
- ✓ Duplicate the model inspection operation as required;
- ✓ Establish a business plan for sustainable service of the inspection system;
- ✓ Conduct a periodical sensitization program at top management and policy level to acquire the necessary support and budget from the government.

To develop and apply such a ‘model’ approach, perhaps in the context of the Lusaka municipal area, would cost approximately \$150,000, covering necessary equipment, transportation facilities, training, and consultancy support. As the value of such a targeted and upgraded inspection service is demonstrated, it could then be replicated to focus on other priority locations and/or food safety risks.

V REVIEW AND RECOMMENDATIONS for LABORATORY TESTING

An assessment was carried out of the laboratories that are serving the agricultural and food sectors in Zambia. The importance of these for Zambia’s trade is to assure the buyers and regulators in the importing countries that the supplied products are safe and compliant with established standards. Diagnostic testing capacity is also important for monitoring and assessing risks—associated with pests, diseases, and food-related contaminants-- in the Zambian domestic market. In order to understand Zambia’s diagnostic testing capabilities, the team visited many of the existing laboratories, both publicly and privately owned. Interviews were also undertaken with a cross-section of food processing and food service/catering companies to gauge their testing needs and current approaches to meet those needs. Selected points are summarized here. Additional details are provided in Annex 5.

Findings

The main findings of this review include the following:

- *Limited commercial demand for testing services.* One of the biggest constraints to developing a sustainable testing system is the very limited commercial demand for testing from within Zambia’s agriculture, agribusiness and food service sectors. This stems from various factors, including the limited application of formal HACCP or other food safety management systems, the lack of domestic pressures for higher standards, the lack of confidence in government and/or university testing, the development of in-house testing capacities among certain leading companies, and reliance on external testing capacities for more complex tests. It is estimated that the private sector spends less than \$130,000 per year on testing services provided by Zambian government or university laboratories.
- *Lack of coordination or clear division of roles and responsibilities.* Government laboratories dealing with food and agriculture fall under four separate ministries, with little overall coordination with respect to division of responsibilities or joint approaches to staff training or equipment procurement/maintenance. Several

examples exist where multiple public labs pursue similar mandates, creating redundancy and competition for scarce human and financial resources. Requests for donor assistance for laboratory upgrading are fragmented and uncoordinated.

- *Severe capacity weaknesses in most public sector laboratories.* Each of the pertinent public sector labs visited exhibit major capacity or operational shortcomings including (i) lack of standards methods, processes, and systems, (ii) shortages of reagents and consumables, (iii) absence of quality assurance programs, (iv) weaknesses in equipment calibration, maintenance and repair, (v) weak record-keeping, and (vi) inadequate facilities/measures to ensure the safety of laboratory staff. (see Table 7). Some of the labs have experienced interruptions in power and/or clean water supplies. Many of these labs try to perform a wide range of tests, stretching their limited capacities and failing to develop certain specialized competences. There is no organized system for inter-laboratory testing among public sector labs.

- *Better performance in the private sector:* The team noted much better capabilities within the private sector where, in general, they performed a narrower range of tests and analysis. The laboratories are sufficiently well-managed and could sell their services to other companies. However, the low demand for the services of private laboratories results in a high cost structure making sustainability difficult. The reasons for the better performance of the private sector include:
 - The market demands timely and accurate results – which drives the capability and efficiency of the private laboratories.
 - Labs feature modern equipment and adequate supplies of consumables.
 - Proper management systems, processes, standard operating procedures, methods, and quality assurance have been applied.
 - They have the capability to standardize and calibrate equipment.
 - The staff is well trained in the use of the equipment, test methods, and follow quality procedures. There is on-going training for all employees.
 - All have a maintenance program for the equipment. Several participate in inter-laboratory studies that monitor performance relative to other international laboratories.

There is a perception—at least among government representatives-- that the weak capacity of public sector laboratories constrains Zambia's trade. This view is not generally shared by the private sector which has come to rely upon its own testing capacities or has the needed tests undertaken abroad. The private sector presently has little confidence in public labs to deliver timely and accurate results. Many government officials –including those involved with pest, disease, or food safety monitoring/inspection functions—also express concern about the reliability and timely response of public testing services to support the proper fulfillment of regulatory services.

Table 7 Summary of Laboratory Capabilities.

Area	Border Post	Plant Protection	UNZ, Food Science	Food & Drug	Central Vet.	NISIR	Private labs
Quality systems and process	0	1	2	2	2	2	4
Personnel (Staff Qualifications)	2	3	3	3	3	3	4
Personnel (training)	0	0	3	3	3	3	4
Management systems	0	1	2	2	2	2	4
Written procedures, checklists, defined tasks	0	1	1	1	1	1	4
Microbial testing	0	2	2.5	2.5	2	3	3
Analytical testing (includes chemical and measurements)	0	0	2	2	0	3	4
Entomology diagnostics	0	3	NA	NA	NA	NA	NA
Animal zoonotic disease tests	0	NA	NA	NA	3	NA	UNK
Plant pathology	0	3	NA	NA	NA	NA	NA
Access to internet	0	2	2	2	2	3	4
Equipment	0	2.5	2.5	2.5	2	2.5	3.5
Method development	0	0	1.5	1.5	2	1.5	3
Testing methodology	0	UNK	2	2	2	3	4
Internal audits	0	0	0	0	0	0	3
Records/reports	1	2	UNK	2	2	2.5	3-4
Facilities	0-1	2	2.5	2.5	1	4	3-4
Access to reagents/spare parts etc	0	1	1	1	1	1	4
Repair services	0	1	1	1	1	1	4
Test standards	0	2	1	1.5	2	2	4

Key

NA = Not Applicable,

UNK = Unknown

0 = Total absence of system or capacity

1 = Minimal system/capacity/process in place, yet clearly inadequate or dysfunctional

2 = System/capacity/process has some functionality and demonstrated competence

3 = System/capacity/process has good functionality, although is not validated through audits or recognized internationally

4 = Systems/capacity/process functions well and meets international standards

5 = Approaches international better/best practice and is audited

Recommendations

The Assessment Team explored several options to build a better performing and more sustainable system of laboratory testing to support Zambia’s agro-food trade and the pursuit and necessary regulatory functions in the management of risks associated with plant and animal pests/diseases and food safety contaminants. One option—maintaining the status quo—is considered unacceptable given the unnecessary risks which this implies for Zambian producers and consumers. Another option—the privatization of

testing capacities—is considered unrealistic, at least in the short to medium term, given the limited commercial demand for testing services. A third option—consolidation of public testing capacities in one or very few central laboratories—was also considered unrealistic given the varied goals and objectives of the existing labs and their home ministries.

However, a variant of this approach is recommended. This would involve:

- Targeted investment to upgrade specific capacities, thereby creating mini *centers of excellence* in the conduct of certain types of testing and enabling the development of a critical mass of people, equipment, and facility utilization in specialized areas. Priorities should be given to microbial and chemical analysis—both cross-cutting areas that would support a variety of food sectors and government regulatory services.
- Donors would assist this process by allowing interested laboratories to ‘bid’ for available resources, with proposals based upon market assessments and marketing plans, staff and management reviews, plans for the achievement of ISO 17025 certification, and detailed budget and revenue projections.
- Assistance being provided to the Zambia Bureau of Standards to enable it to develop an effective metrology laboratory and associated services, covering weights, measures, and temperature controls. The ability to accurately calibrate temperature, pressure, and volumes are fundamental not only to the food industry, but also to a broader range of manufacturing and other industries. The European Union has made commitments to finance testing capacity upgrades at ZBS. Upwards of Euro 1 to 1.5 million would be needed to develop the appropriate standards, facilities, training, equipment and other improvements related to metrology testing and services. The balance of EU resource commitments for laboratory capacity building could be channeled toward developing one or more ‘centers of excellence’ at labs other than that of ZBS.
- The development of coordinated programs for equipment procurement, equipment maintenance, and laboratory staff training among the different labs and, under the direction of ZBS, the initiation of inter-laboratory testing in critical areas, involving public, university, and private labs.

Looking toward the medium-term (perhaps three to four years from now), a system of Zambian diagnostic capacity can be envisioned in which:

- Support services improve public health, enable increased exports, and enhanced quality of domestic production;
- Diagnostic capacity is recognized by customers as providing accurate and timely results in a cost-effective manner;
- Diagnostic labs function as a coordinated system, with each lab building on the capabilities of others, rather than duplicating efforts;
- Key centers of excellence provide critical services for the government and private

- sectors. Those services will be provided on a pricing model based on cost recovery and re-investment;
- These centers of excellence will have necessary quality systems and processes and proper infrastructure to support their work. Several centers of excellence will either have achieved international certification or be well advanced in this direction; and
 - These centers of excellence will have strong linkages with other institutions, companies, and trade associations inside and outside of Zambia and participate in inter-laboratory testing and training.

This ‘vision’ on a national laboratory system for Zambia is certainly possible, yet it will not be attained without the adoption of a more coordinated and strategic approach, based on the support, input, and involvement of the government, industry, and the donor community. The application of ‘business as usual’, with fragmented and duplicative initiatives, will almost certainly result in poor diagnostic and testing services and the non-sustainability of existing (or newly created) capacity.

VI CONCLUSIONS

Zambia currently possesses quite limited capacities for food safety and agricultural health management. Limited capacities—in relation to pest/disease/food contaminant surveillance, inspection, risk analysis, and conformity assessment—are probably having more substantial adverse effects on domestic agricultural productivity and on domestic consumer health than on the competitiveness and market access of Zambia’s external trade. Limited capacities and resources, together with the relatively low prioritization seemingly given to matters of food safety and agricultural health, have resulted in a situation where crisis management is the dominant ‘approach’ to addressing emergent risks and problems. Thus, measures are taken to cope with or in response to outbreaks of diseases, pest infestations, and/or episodes of food or water-related contamination. With limited few exceptions, it is difficult to identify specific policies and/or pro-active strategies that are being adopted by government to manage SPS-related risks. The situation is somewhat better within the private sector, yet this pattern varies considerably between industries, and the overall picture is not impressive compared with prevailing patterns in many (competing) East and Southern African countries.

SPS-related measures have had only a limited impact on the performance and general competitiveness of Zambia’s agro-food trade. This stems from several factors, including the composition and market orientations of this trade, measures taken by the private sector (and their trading partners) to manage certain risks, and the importance of a broader array of factors—including macroeconomic conditions, the cost and availability of transport/freight services, etc.—which have heavily impacted on this competitiveness. Still, various examples have been found where certain SPS measures have inhibited

international market access for Zambian products, increased compliance and other types of transaction costs, or contributed to patterns of ‘defensive commercialization’ on the part of various Zambian firms and industries. In addition, several potential risks have been identified which could inhibit market access or raise compliance costs in the future.

Recommendations have been made here for selected interventions to resolve certain immediate constraints, strengthen certain capacities within government or the private sector, and/or pursue certain pilot activities in order to more effectively demonstrate the benefits from the adoption of improved SPS management practices. These interventions could be supported under the ADSP, MATEP, or other donor-supported programs.