Impact of SPS standards on agri-food trade: A case study of the invasive fruit fly (*Bactrocera invadens*) in Kenya

HANNEKE LAM, ANDREW EDEWA, and ULRICH KLEIH

Sanitary and phytosanitary (SPS) measures have become increasingly important for trade in agricultural and food products, and may particularly affect developing countries' ability to access higher value markets. This article presents a case study of trade-related problems caused by the invasive fruit fly (Bactrocera invadens) *in Kenya, which led to a ban of avocado exports to South Africa. The ban had substantial economic, social, environmental, and institutional consequences for the agricultural sector in Kenya, which (as in many developing countries) provides a livelihood and source of income for thousands of smallholder producers. The Kenyan public and private sectors are now in the process of introducing a variety of technical and institutional measures to resolve the problem and to reduce SPS risks for the agri-food sector. The case study is illustrative of the importance of a supportive infrastructure to implement SPS control measures and to ensure continued international trade in agri-food products.*

Keywords: international trade, trade standards, sanitary and phytosanitary measures, avocado, pests

IN MANY DEVELOPING COUNTRIES agri-food exports offer opportunities to increase income levels, generate employment, and enhance rural livelihoods. The agricultural sector is an important engine for growth in the majority of developing countries, where it may contribute up to 50 per cent of GDP (World Bank, 2011). This makes the sector truly the backbone of the economy. In recent years, health and safety requirements related to food safety, animal health, and plant health, known as sanitary and phytosanitary (SPS) measures, have become increasingly important for trade in agricultural and food products (Jaffee and Henson, 2004; Henson, 2009).

Whilst all countries have to ensure that their (export) products comply with SPS measures and the standards of importing countries, developing countries in particular may find that these regulations limit their ability to gain or maintain access to international markets

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Trade flows can be significantly affected for countries with weak SPS management capacities

for their agricultural and food products. Concerns that trade flows can be significantly affected are particularly relevant for those low-income countries that have weak SPS management capacities (Henson, n.d.; UNIDO, 2007). This will affect the nation's economy as a whole, but will also impact directly on the livelihoods of the small-scale traders, processors, and farmers, who often account for the largest share of agricultural outputs.

This article presents an example of the effect that SPS trade measures can have on the agricultural sector. The case study analyses South Africa's import ban on avocados from Kenya, caused by the presence in Kenya of the invasive fruit fly, *Bactrocera invadens* (Diptera: Tephritidae) (Drew *et al*., 2005), which had substantial economic and social impacts, especially for smallholder avocado producers. At the same time, the study is illustrative of the urgent need for developing countries to adopt a supportive SPS management and coordination structure that facilitates the implementation of SPS measures. Although the article refers to the technical measures that are being implemented by Kenya to address the fruit-fly problem, the main focus is on a socio-economic and institutional assessment of the trade ban. Similarly, although on a global level several initiatives exist to eradicate *B. invadens* as well as other fruit fly species, the geographical emphasis of this study is on Kenya and East Africa, which is also reflected in the literature review.

Outline of the article

The first section introduces the case study and provides insight into the damage inflicted on the horticultural sector by *B. invadens*. That the damage caused in Kenya is not only of a physical nature (i.e. wasted fruit), is explained in the second section which shows how South Africa prohibited avocado imports from Kenya as a precautionary measure against the risk of introducing the invasive fruit fly into South Africa. This section also describes the economic, social, environmental, and institutional impact this ban had on Kenya. The third section explains what technical and institutional measures Kenya is taking in order to get the ban lifted, and what other measures are still needed to build SPS capacity and prevent similar situations from arising in the future. This leads to the conclusion presented in the final section of the article.

Trade measures can include import bans of produce that does not conform to SPS regulations

SPS measures: The South Africa–Kenya avocado trade ban

Trade measures can be introduced in many forms. In the context of SPS measures taken by importing countries, they can include outright import bans or the rejection or interception of consignments

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of produce that do not conform to the importing country's SPS regulations. The origins of a ban can be manifold, but all are related to serious concerns about food safety, animal health, or, in this case, plant health.

In February 2007, South Africa informed Kenya that it would no longer issue import permits for avocados (*Persea americana*) from Kenya and that it was recalling all existing permits. The reason for this was that records regarding the distribution of the invasive fruit fly *B. invadens* in Africa had raised concerns in South Africa that there was a risk of introducing the species to South Africa through avocado trade with Kenya (Edewa et al., 2010).

Bactrocera invadens: *a threat to horticulture*

B. invadens is a relatively new fruit fly species in Kenya. It was first detected there in 2003 and has since been reported spreading rapidly across Africa. The flies eventually also reached South Africa, where they were reported in 2010 (IPPC, 2010). It is suspected that the species originates from Asia, and although Kenya was its place of discovery in Africa, it cannot be assumed that this was the fruit fly's point of entry into the continent. Drew et al. (2005) considered that it may well have been overlooked in other countries. The species had initially been identified as an unusual variant of several other fruit fly species but is now well described and documented by Drew et al. (2005). *B. invadens* is highly polyphagous: it has been recorded on over 41 host species belonging to 22 different plant families (EPPO, no date). The pest particularly affects mangoes, but it is also found on, for example, citrus, guava, papaya, bananas, tomatoes, avocados, and a number of wild hosts (Stonehouse et al., 1998; Drew et al., 2005).

Fruit flies are not a new threat to the agricultural sector in Africa. Various species have been recorded throughout the continent, with the Mediterranean fruit fly (*Ceratitis capitata*) most widely distributed. Members of the *Ceratitis* genus, as well as various *Dacus* and *Bactrocera* species are amongst the most important types of fruit fly attacking crops in Africa. Currently, the invasive *Bactrocera* seems to be rapidly displacing the native *Ceratitis*, but all of the species can cause serious damage to a wide variety of fruits and vegetables. The nature of the damage varies from fruit to fruit. Typically, female fruit flies lay their eggs underneath the skin of the fruit or vegetable. During this process the fruit is infected with bacteria that cause the tissue around the eggs to rot. When the eggs hatch, the maggots feed on the fruit flesh, creating galleries, which provide entry for additional pathogens and these increase the fruit decay, making fruits unsuitable for human consumption (Ekesi and Billah, 2006).

All fruit fly species can cause serious damage to a wide variety of fruits and vegetables

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Research carried out by the International Centre for Insect Physiology and Ecology (ICIPE), under the African Fruit Fly Programme, indicates that, on average, out of almost 2 million tonnes of mangoes produced annually in Africa, a staggering 30–50 per cent is destroyed by fruit flies (Ekesi and Billah, 2006). Although avocado is not attacked to such a large extent, the fruit can be a host for *B. invadens*, particularly when it becomes ripe. Both the native as well as the invasive types of fruit fly have the potential to spread to other tropical regions. This risk becomes even more real with the growing globalization of trade in agricultural products. Nearly all fruit fly species are quarantine pests (Ekesi and Billah, 2006) so presence of any fruit fly causes indirect losses because trade is prevented by quarantine restrictions that are imposed by importing countries to prevent entry of fruit flies.

Fruit flies cause indirect losses because of quarantine restrictions to prevent their entry

SPS Agreement

Under the 'Agreement on the Application of Sanitary and Phytosanitary Measures', a WTO Treaty established in 1995 which is better known as the 'SPS Agreement', countries have the right to require the compliance of imported agricultural products with their national SPS regulations. The primary aim of these regulations is to protect human and animal or plant life or health from pests and diseases that may be brought in through agricultural and food imports (WTO, 1995). However, the SPS Agreement provides that such SPS measures should be risk-based or based on international standards. They should not be applied by WTO member countries to cause unjustified barriers to trade.

Considering the potential damage *B. invadens* may cause to fruits, and the potential risk that access to international markets may become restricted once the species is identified in a country, countries not yet affected by *B. invadens* logically try to protect themselves by preventing the pest from crossing borders through trade in (potentially) infested agricultural products. This is the route taken by South Africa, invoking the precautionary principle of the SPS Agreement. Under the Agreement, a key obligation is to first consider whether the use of one of the established international standards could ensure the level of protection that a country considers as appropriate. For plant health issues, these are the standards adopted by the Commission for Phytosanitary Measures of the FAO International Plant Protection Convention (IPPC). If a country considers these standards inadequate to ensure that plant health is protected, it should base its requirement for more stringent measures on an assessment of the health risks related to continued trade of the product.

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Prevalence of B. invadens *in Kenya*

Although initially the assessment carried out by South Africa was disputed, it is now recognized that *B. invadens* is present in Kenya. Research surveys indicate that it prevails in all the major agro-ecological zones (Coast, Eastern, Central and Rift Valley provinces), although it is predominantly present in lowland areas, i.e. below 1,600 m above sea level (Muchemi et al., 2010). The main avocado production areas for export fruits are in the Central and Eastern provinces (Edewa et al., 2010). Avocado grows best in the higher midlands to lower highlands at an altitude of between 1,200 and 2,200 m above sea level, and the avocado grown in the overlapping altitude zones (1,200–1,600 m) are therefore most at risk of infestation with the fruit fly, although it will first seek to attack one of its more preferred hosts, rather than avocados.

Avocado trade ban

Trading partners should be notified before introduction of an SPS trade measure

Under the WTO system, trading partners should be notified before the introduction of an SPS trade measure, giving them the opportunity to respond to the notification within a 60-day time-limit. Once the new regulation is published, an additional six months should be given to allow trading partners to adjust to the new requirements. There are numerous cases, however, where trade measures have been introduced without following the official WTO notification procedures. In most cases, such measures are taken as precautionary measures pending further scientific information based on a risk assessment. In these events the SPS Agreement requires that the precautionary measures should not be maintained longer than necessary. Trading partners should exchange relevant information necessary to resolve the problem without undue delay.

Both countries are working towards a solution, but the import ban is still in place

Despite the various correspondence, meetings, and technical information exchanged between South Africa and Kenya, as of early 2012 the problem had not been resolved. Kenyan stakeholders argued that avocados destined for export from Kenya were harvested at a stage very unlikely to be infested by *B. invadens* (on top of the small chances of the fruit fly attacking avocado at all). They also passed through a very rigorous post-harvest handling process that would rid the fruits of the pest if it were present. Both countries are working towards a common solution, but the import ban is still in place.

Although there is now a trade dispute between Kenya and South Africa on avocado trade, this has not been officially brought to the WTO Dispute Settlement Mechanism. This is often the case at regional level, where countries operating under regional trade agreements may attempt to resolve trade disputes directly and bilaterally, without alerting the international community.

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Whilst there is a potential physical, direct threat to avocados caused by *B. invadens* attacks, in terms of possible damage to yield and fruit quality, the indirect damage to trade is very real and has impacted heavily on the agricultural sector, with severe socio-economic consequences. The next section will explore this in more depth.

Impact of the trade ban

This section explains the economic, social, environmental, and institutional impact on the Kenyan avocado sector, caused by the ban. The analysis draws heavily on the study *Impact Assessment of Sanitary and Phytosanitary Measures: A Case Study of South Africa's Ban of Avocado Imports from Kenya*, which was conducted by Edewa, Otieno, and Kleih in 2010 to carry out a sustainability impact assessment (SIA) in order to assess the cause and effect relationships related to the ban. Fieldwork and data analysis for the assessment took place between November 2009 and February 2010.

Sustainability impact assessment

The sustainability impact assessment undertaken by Edewa et al. (2010) was based on a causal chain analysis (CCA) and data collection methods used in qualitative surveys and participatory rural appraisals (e.g. semi-structured interviews with stakeholders in the Kenyan avocado value chain). CCA explores cause and effect relationships along a clearly defined set of stages as outlined in Figure 1 (Kirkpatrick

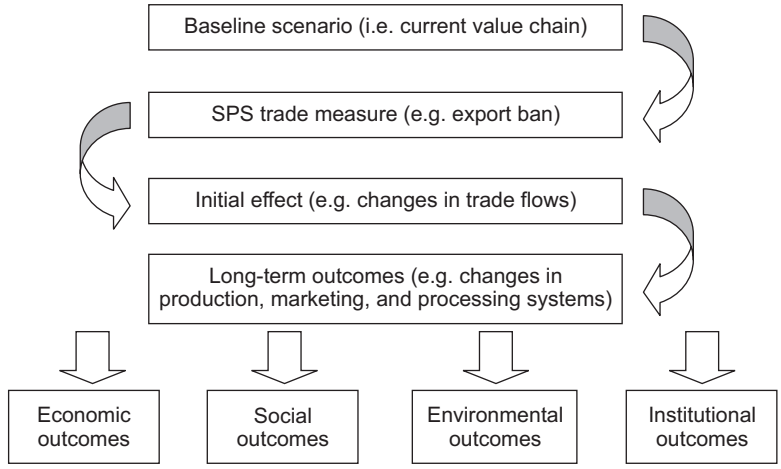

Figure 1. Logic of sustainability impact assessment of SPS trade measures using causal chain analysis
Source: Adapted from George and Kirkpatrick (2004)

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and Lee, 2002; George and Kirkpatrick, 2004). Applying this model to the avocado ban case study helps in understanding the initial effects of the trade ban (e.g. changes in trade flows) as well as the long-term outcomes (e.g. changes in production, marketing, and processing systems) in Kenya.

Following the model, the analysis will be presented in four steps: 1) the baseline scenario; 2) the SPS trade measure taken; 3) the initial effects; and 4) the long-term outcomes, focused on economic, social, environmental, and institutional impact.

Baseline scenario. The baseline scenario represents the status quo (point of departure) prior to the introduction of trade measures and resulting negotiations. In 2007, Kenyan avocado exports represented 15 per cent of a total production of about 100,000 tonnes. The main export varieties were Fuerte and Hass, with consumer preference internationally (particularly in Europe) shifting towards Hass. Kenya's tropical conditions and diverse production regions provided an all year production cycle. Of all the avocados grown within Kenya, 85 per cent were produced by smallholders, mainly of the Fuerte variety. Avocado represented around 17 per cent of the total horticultural exports from Kenya and in 2007 avocado exports earned the country over Ksh850 m (~US$11.4 m). The main export markets were France, Netherlands, United Arab Emirates, United Kingdom, Spain, and South Africa, which constituted 1.5 per cent of the total avocado export volume, and 2.3 per cent of total avocado export value. More importantly, however, export to South Africa was a rapidly growing trade opportunity, offering Kenya a market for avocados between November and February, when the country has its second avocado season. In this period the European market (which Kenya normally supplies) is saturated, while avocado production in South Africa is low (Edewa et al., 2010).

Of all the avocados grown in Kenya, 85% were produced by smallholders

SPS trade measure. The SPS trade measure, in this case, is the South African ban on avocados imported from Kenya. The ban was imposed in 2007 and is still in place as of early 2012. Details of the ban and its history are presented above.

Initial effects. This stage in the causal chain analysis focuses on the initial impacts resulting from the introduced SPS trade measure. The initial effects are the immediate reactions to the trade measure in terms of lost exports, changes of trade patterns (e.g. trade diversion), and changes of relative prices. Although compared with the other major markets such as the EU, Kenyan avocado exports to South Africa were relatively small, the ban is considered to have nonetheless caused a significant loss. As the South African market was rapidly

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The ban has resulted in lost export earnings worth in excess of $2.1m

growing, industry sources estimate that the ban has resulted in a lost trade opportunity for export earnings worth in excess of Ksh150 m (or $2.1 m, using 2008 exchange rates) per annum, although this figure could also be higher (Otieno et al., n.d.). This estimate is based on potential, feasible weekly avocado exports of 400 tonnes between November and February, according to leading Kenyan horticultural exporters (Edewa et al., 2010).

Long-term outcomes. As the South African import ban persisted, it had knock-on effects at production level, in particular since many smallholders depended on avocado exports to South Africa during parts of the year when the European market is supplied by other sources (i.e. during the second rainy season between October/November and February). This was particularly true for the smallholders in Central Kenya, which is best suited for avocado production during this period. Here, producer prices deteriorated when the export ban was introduced in February 2007; farm-gate prices dropped from Ksh3.5 per piece to below Ksh1 per piece. There has been oversupply of the Fuerte avocado variety in the local wholesale and retail markets leading to a significant price drop and wastage. Even for the avocado oil processing industry the processing capacity has been exceeded during peak production seasons (Edewa et al., 2010).

It has been estimated that more than 10,000 smallholders and 30,000 to 50,000 seasonal jobs have been affected by the ban

In terms of socio-economic consequences, the avocado surplus production has meant reduced incomes to farmers as a result of a collapse in marketing channels and reduced prices, in particular in those districts which relied on exports to South Africa. It has been estimated that more than 10,000 smallholders have been affected in the major avocado-producing districts of Kandara and Gatanga and other parts of Kenya's Central Province, in particular as a result of deteriorating prices. Because of the loss of export markets and an oversupply in the domestic market, the majority of affected producers had to uproot or replace their Fuerte orchards with Hass, which are better suited for export to Europe.

Casual workers who would be employed for avocado harvesting operations could no longer be hired if market outlets are not guaranteed. On average each smallholder was employing three to five short-term casual workers during harvesting season in addition to using family labour. This means that approximately 30,000 to 50,000 seasonal jobs have been affected by the ban. With reduced farm incomes, smallholders depending solely on avocado as a cash crop were finding it difficult to meet their financial obligations. This, in turn, had substantial social implications, because the money earned was often used for school fees, hospital bills, weddings, funerals, etc. Fortunately the majority of smallholders do not rely on avocado production alone as their main source of income.

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An institutional impact linked to the ban was the disintegration and collapse of smallholder marketing groups, particularly in those districts that exported to South Africa. Before the ban, such collective operations had provided individual smallholders an opportunity to achieve economies of scale and increase bargaining power. Meetings of the marketing groups had proved to be social occasions, bringing together smallholder farmers who normally did not have the opportunity to meet. As avocado marketing was one of the drivers of the groups, once the ban was introduced they were difficult to sustain (Edewa et al., 2010). The impact of this sudden lack of incentives for the existence of marketing groups may have been further increased by the end of a donor-supported project around the same time when the ban was introduced. Export-oriented avocado production requires use of environmentally friendly production systems to meet the standards commonly demanded by buyers. Under formal contract farming before the ban, producers were required by exporters as part

Table 1. Overview of impacts of the South African import ban on Kenyan avocados

Type of impact	*Impacts and consequences of ban*
Initial impact	The immediate impact of the trade ban was the loss of the South African market and diversion of the fruit onto the domestic market.
	More importantly, according to key Kenyan industry sources, the South African avocado market had been identified as a significant and growing market opportunity during a four-month window (November to February). These industry sources estimate the lost export earnings at a minimum of Kshs 150 million (or about USD 2.1 million using 2008 exchange rates).
Socio-economic impacts	The oversupply of avocados led to a significant drop of prices at farmgate level (i.e., from Kshs 3.5 to below Kshs 1 per piece). Although the quantities of avocado exported to South Africa until 2007 have been relatively small, the knock-on effects of the ban on the market have been significant, in particular in those areas which were most affected (i.e., Central Province).
	As a result of the lost export opportunity, an estimated 10,000 farmers have been affected by the ban, plus 30,000 to 50,000 seasonal labourers who would have been employed during the harvesting season. Amongst other things, this led to reduced income in rural communities and related socio-economic consequences.
Institutional impacts	At community level the ban reportedly led to the collapse of smallholder marketing groups. It is possible, that the disintegration of these groups was also influenced by a donor supported project in the area which stopped around the same time when the ban was introduced.
	At national and international level, Kenyan authorities made attempts to negotiate the lifting of the ban with their South African counterparts. In particular, due to the lost export opportunity, major Kenyan horticultural exporters show a strong interest in the resolution of the conflict. Although more capacity-building and technical measures are required as outlined in the text, the industry is now better prepared to discuss matters related to fruit flies and the export ban, in particular in the National Horticultural Task Force and the National SPS Coordination Committee.
Environmental impacts	Production for the export market requires producers to have an environment management plan as part of exporters' quality management system. Production for the domestic market is likely to follow less stringent practices, although the use of crop protection products may decline owing to lower quality demands.

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of their quality management system (QMS) to have an environment management plan. In addition, extension services provided by traders and exporters made farmers aware of good agricultural practices (GAP). With the loss of the South African market, smallholders no longer connected to those traders and exporters are not always likely to maintain their QMS and GAPs. In addition, although use of crop protection products may decline owing to lower-quality demands especially in the domestic market, farmers are unlikely to engage services of commercial spraying. With limited knowledge, misuse and abuse of hazardous products may occur (Edewa et al., 2010). The impact of the ban at various levels, has been summarized in Table 1.

Measures to address *B. invadens* and strengthen SPS capacity in Kenya

Efforts to increase SPS capacity within the region help to prevent similar situations in the future

The Kenyan government, together with stakeholders related to avocado value chains as well as other agro-food industry actors, is developing and implementing a number of technical and institutional measures to address the *B. invadens* problem. At the same time, efforts to increase SPS capacity within Kenya and the region help to prevent situations similar to the South African trade ban from occurring in the future.

Technical measures

Given the major threat *B. invadens* represents to horticultural exports, Kenya is in the process of planning and undertaking, amongst others, a number of the following technical measures to address the fruit fly problem:

- The development of biological control with parasitoids, and the development of cost-effective food baits which have been researched at ICIPE and elsewhere (Cassidy, n.d.).
- Trials on cold sterilization and post-harvest heat treatment of avocado are being carried out by ICIPE and the Kenyan Plant Health Inspectorate Service (KEPHIS) together with major exporters of avocado.
- Preparation of a protocol on *B. invadens* surveillance and control, which is still under development. Such a protocol is required for fruits destined for export to quarantine-sensitive markets (e.g. avocado, citrus, mango), based on the International Standard for Phytosanitary Measure (ISPM) 26 developed by IPPC (FAO, 2006).
- Development of a surveillance programme. KEPHIS has introduced fruit fly traps in major fruit producing areas intended to facilitate early detection of any incursion of *B. invadens*. Monitoring of *B. invadens* needs to continue for at least four weeks in all areas

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where it has been eradicated in order to determine eradication success.

- Kenya is developing a multi-year fruit fly control programme, which aims to include, amongst others, the following components:
  - development of an eradication programme;
  - promotion of good agricultural practices and integrated pest management systems amongst agricultural producers;
  - establishment of areas of low pest prevalence, areas of low pest prevalence for fruit flies, and pest-free areas for fruit flies (in accordance with ISPM 22, 26 and 30);
  - further research with regard to *B. invadens* generation time and fruit infestation.

Many of these measures and methodologies to reduce the prevalence of *B. invadens* and other fruit fly species, or even to eradicate the pest, have been applied in other countries (e.g. Stonehouse et al., 2002, 2007; Manrakhan and Hattingh, 2012). Different approaches have been used as well. Fruit flies are not only a problem for Kenya; they are found on large parts of the African continent as well as other parts of the world. Obviously, the pest is not bound to country borders. To tackle transboundary issues such as the invasive fruit fly (but also other SPS issues) successfully, a regional approach is likely to be required. This could facilitate the design and implementation of efficient policies and measures (Mumford, 2004). Furthermore, it should enhance the exchange of information, experiences, and good practices, and could pave a way for cross-border activities such as joint research and monitoring. In West Africa, such a coordinated multi-stakeholder approach is being promoted to address the fruit fly problem within the Economic Community of West African States (ECOWAS). A five-year regional action plan, budgeted at €25 m, has been drafted, based on joint surveillance, pest management, applied research, and capacity building (Stonehouse et al., 2008; STDF, 2010). In East Africa a similar approach could be a way to tackle *B. invadens* within Kenya and its neighbouring countries. For example, Edewa (2011) outlines the elements needed for a more supportive SPS coordination system within the East African Community (EAC).

The pest is not bound to country borders and a regional approach is required

Building SPS capacity: introducing institutional measures

To ensure that the technical measures to fight *B. invadens* are implemented successfully and to eliminate further risk for the horticultural sector, a more structural approach to increasing SPS capacity within a country or region is also needed. This means that implementation of technical measures should go hand in hand with the development of supportive SPS policy, stakeholder coordination, and overall SPS capacity strengthening. As a first step, in order to find

Implementation of technical measures should go hand in hand with development of supportive SPS policy

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a solution for the disrupted avocado trade with South Africa, stakeholders from the public and private sectors in Kenya worked closely together (Edewa et al., 2010).

Development of a strong public–private partnership can be hugely beneficial to deal with SPS threats

The strong interest of the private sector to help resolve the issue indicates that, although in 2007 recorded exports to South Africa were relatively low, exporters saw great potential to develop this market to a much larger extent. In addition, the avocado ban proved that *B. invadens* could possibly be harmful to trade in other horticultural products as well. For example, the restriction on free movement of fruit and vegetables due to this single pest alone could derail the COMESA-EAC-SADC Comprehensive Trade and Transport Facilitation Programme (CTTFP) which addresses trade and transport facilitation challenges within the Eastern and Southern African region. Kenyan avocado exports are already banned not only in South Africa but also in Seychelles and Mauritius. A Federal Order in the US has cut trade in several types of horticultural produce from countries in which *B. invadens* is present (USDA-APHIS, 2009).

It has been demonstrated that the development of a strong public–private partnership can be hugely beneficial to efficiently deal with SPS threats such as fruit fly, for example, in South Africa, where a partnership between the public National Plant Protection Organisation (NPPO) and the private Southern African Citrus Growers Association proves to be a well-functioning structure to address the threat the destructive pest poses to trade (Cassidy, no date).

In Kenya, KEPHIS organized several consultative meetings with the industry and various government agencies to develop an action plan for dealing with the problem. Training sessions were conducted for both the public and private sectors, and surveillance studies of *B. invadens* carried out by KEPHIS were supported by the industry to a great extent. Based on the introduced routine surveillance, an early-warning system has been set up. In addition, the cooperation between various stakeholders increased awareness amongst all parties of the importance of SPS measures (Edewa et al., 2010).

The Kenyan horticultural sector offers many success stories from a developing country perspective, and there are mainly large-scale private entrepreneurs at the front line of this. For them, compliance not only with public SPS standards but also with the often more stringent private standards is of utmost importance. However, small-scale producers often are not aware of the importance of SPS standards and requirements nor do they have the resources to implement SPS measures. *B. invadens* is a particular problem as flies are not only found on cultivated crops, but also on wild fruits, which makes it even more difficult for the country to manage the pest.

In order to address these issues, regular meetings of a common forum consisting of a range of public and private sector actors could

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increase stakeholder participation and help to develop strategies for effective management of quarantine pests and other inherent problems. Whilst the uncoordinated proliferation of too many committees or working groups should be avoided, they can play an important role in addressing SPS problems if they have clear objectives and mandates (Kleih and Cassidy, 2010). The National Horticulture Task Force, with KEPHIS as its Secretariat, could be a driving force to battle *B. invadens* and eliminate its threat to the horticultural sector (Edewa et al., 2010). As part of this strategy, the government wants to expand and strengthen agricultural extension staff to raise awareness amongst agricultural producers, in particular smallholders, and provide training on new and emerging issues such as the identification and management of *B. invadens*. Better coordination and communication with private sector actors such as service providers, traders, and producer associations could also support the dissemination of SPS-related knowledge and information when public sector extension services are not able to reach all producers and other value chain stakeholders.

SPS coordination mechanisms

The avocado ban has provided a strong incentive for Kenya to further develop and enforce the implementation of the SPS Agreement. While Kenya has made progress with South Africa, based both on scientific facts and the SPS standards adopted by the IPPC, it has become clear that the country needs to strengthen its own internal SPS coordination system in accordance with the requirements of the WTO Agreement. This includes, for example, enhancing the efficiency of Kenya's National Notification Authority (NNA), a single central government authority responsible for implementing the notification requirements of the SPS Agreement. Functions of the NNA, which in Kenya is housed within the Ministry of Trade, include communication with the WTO Secretariat, liaising with competent SPS authorities in plant health, animal health, and food safety, engaging stakeholders and partners, and obtaining and distributing notification documents issued by other WTO members. Strengthening the NNA is part of Kenya's objective to integrate SPS coordination in its policy and practice. In addition, a National SPS Coordination Committee has been established to facilitate coordination and communication between various stakeholders dealing with sanitary and phytosanitary matters. Members of the SPS Coordination Committee include government ministries, departments and agencies, parastatal organizations, private sector actors from various levels, representatives from producer' associations, research bodies, and NGOs. The National Horticulture Task Force is represented on the Committee as well.

A National SPS Coordination Committee was established to facilitate coordination and communication between stakeholders

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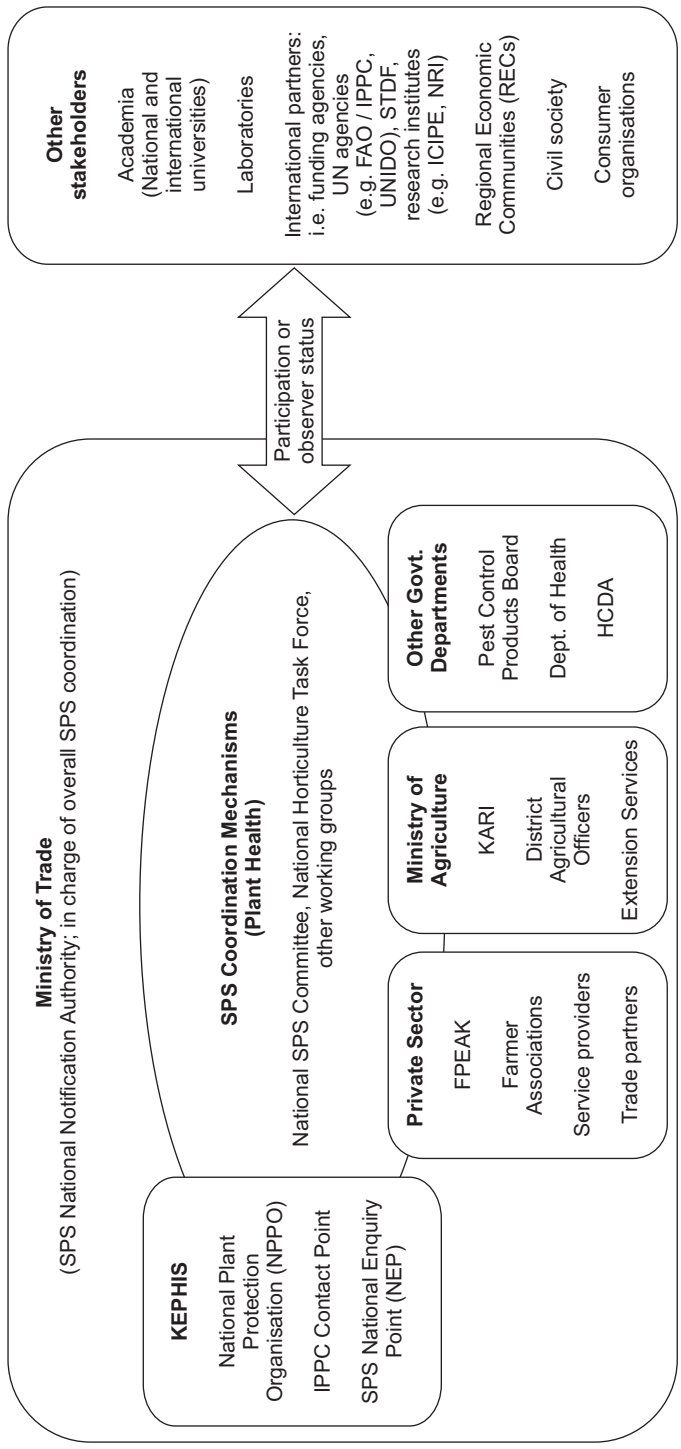

Figure 2. Outline of the SPS coordination system dealing with plant health in Kenya

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Figure 2 shows the coordination system established in Kenya for stakeholders dealing with phytosanitary issues. It depicts interaction between and amongst various public and private sector entities as well as stakeholders from civil society. This overview is part of a bigger SPS coordination system, in which stakeholders dealing with animal health and food safety are involved as well.

SPS coordination systems like these, provided they function well and are designed to enhance communication and coordination between all stakeholders involved, seem a key condition to ensure SPS measures can be implemented successfully and to support compliance with SPS standards. This coordinated approach may help to eventually have the South African trade ban lifted, but even more importantly it will help to prevent similar situations from happening in the future. Already there is a growing concern that trade restrictions related to the invasive fruit fly may be introduced in other, sensitive markets which would potentially have a devastating impact on the country. Kenya's avocado industry, as well as the horticultural sector overall, is growing and looking to expand to wider markets. In order to do so successfully, SPS capacity must be addressed and strengthened.

Conclusion

This case study has demonstrated the adverse effects of the South African import ban of Kenyan avocados due to the presence of the invasive fruit fly *B. invadens* in Kenya. The trade ban has resulted in a substantial loss of export earnings, especially in areas which are best suited for production during November to February, when the South African market needs an increasing amount of avocado supplies. In addition to a substantial loss of income for smallholders in particular, there has been much less work for seasonal labourers. Also, these impacts need to be seen in the light of a lost trade opportunity in that Kenyan exporters have identified a relatively large market for Kenyan avocados in South Africa, which cannot be served because of the ban.

In order to tackle *B. invadens* and get the South African trade ban lifted, Kenya is developing and implementing a number of technical as well as institutional measures. These include an integrated pest-management approach, surveillance programmes, the introduction of an early warning system, and sector-wide capacity strengthening. These measures will also support Kenya's growing avocado industry in maintaining current markets and expanding to other, sensitive markets which require strict compliance with SPS standards.

The study highlights the importance of strengthening SPS capacity, particularly where agriculture is mainly by smallholders

The study highlights the importance of strengthening SPS capacity, particularly in developing countries where the agricultural sector is mainly built on smallholders. This includes the development of a supportive SPS policy environment, legal framework, and strong SPS

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coordination mechanisms fulfilling the requirements of the WTO SPS Agreement. Sound coordination between public and private sector actors seems key to successfully address SPS issues such as the invasive fruit fly. In Kenya, the establishment of the National Horticulture Task Force as a platform to bring together a wide variety of stakeholders is an example of a strong public–private partnership contributing to increased SPS capacity. Nonetheless, this partnership requires further strengthening in order to solve this important issue of the horticultural industry.

As many SPS issues, such as *B. invadens*, are a transboundary problem, a more regional approach will be required in the future. The need for regional strategies and SPS policies is underlined by the growing importance of regional economic communities and of regional trade.

Although the development of supportive SPS infrastructure and coordination mechanisms may demand significant investments from both the public and the private sectors in terms of human, financial, and technical resources, it is a necessity. In a growing global market where compliance with SPS standards becomes increasingly important, strengthening SPS capacity in Kenya as well as in other developing countries is essential to ensure continued international trade in agri-food products.

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