Pacific Horticultural and Agricultural Market Access Program (PHAMA)

Report to the Solomon Islands Market Access Working Group (SIMAWG)

Report on Giant African Snail in Solomon Islands

19 MAY 2011

Prepared for

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Abbreviations

Abbreviation	Description
AFAS	Australian Fumigation Accreditation Scheme
AQIS	Australian Quarantine and Inspection Service
AUD	Australian Dollars
AusAID	Australian Agency for International Development
FBA	Fly Busters AntiAnts Ltd
FCL	Full Container Load
GAS	Giant African Snail
MAL	Ministry of Agriculture and Livestock
NZD	New Zealand Dollars
NZMAF	New Zealand Ministry of Agriculture and Forestry
PARDI	Pacific Agribusiness Research for Development Initiative
PHAMA	Pacific Horticultural and Agricultural Market Access Program
PNG	Papua New Guinea
RDP	Rural Development Program
SBD	Solomon Dollars
SCHS	Sea Container Hygiene Scheme
SIAQS	Solomon Islands Agriculture Quarantine Service
SIG	Solomon Islands Government
SIMAWG	Market Access Working Group
SIPA	Solomon Islands Ports Authority
SPC	Secretariat of the Pacific Community
URS	URS Australia Pty Ltd
USD	United States Dollars

Currency Exchange Rates

1 SBD = 0.15 AUD
1 SBD = 0.13 USD
1 NZD = 0.80 USD

Executive Summary

Since first being detected in 2006, Giant African Snail (GAS) has spread widely in and around Honiara and to several areas on Guadalcanal. To date GAS has only been identified in two provincial areas: eradication appears to have been achieved at Noro while the response is in its early stages at Makira. However, due to limited surveillance and awareness in provincial areas, GAS may be distributed more widely than currently understood.

Eradication is beyond the resource capability of the Solomon Island Quarantine and Inspection Service (SIAQS) and they are now focused on control strategies to manage the pest on Guadalcanal while preventing its spread to other islands. These strategies are generally appropriate; however, implementation has been inconsistent and had limited impact due to a lack of resources and limited collaboration between stakeholders. It is recommended that:

- The Secretariat of the Pacific Community (SPC) be requested to assist SIAQS in finalising development of a fully costed national GAS Response Plan in consultation with stakeholders and that this be used as a tool to seek appropriate funding.
- SIAQS ensure appropriate GAS awareness and control activities are integrated into the work plans of other agencies in the Ministry of Agriculture and Livestock (MAL).
- SIAQS engage with the Ministry of Health and Honiara Town Council to ensure their participation in awareness and control activities on Guadalcanal.
- MAL Research investigates appropriate cost effective low technology methods for longer term management of GAS on Guadalcanal as part of an integrated pest management approach.
- SIAQS consider lobbying Solomon Island Government (SIG) via Ministerial or Cabinet level papers to recover revenues from the logging industry to assist with GAS management.

The presence of GAS mainly represents a market access issue in relation to Australia and New Zealand. Containers from Pacific Islands are recognised as high risk for invasive species and having high contamination rates. They are required to be inspected upon arrival (and washed if necessary) imposing high costs on shipping companies. The Sea Container Hygiene Scheme (SCHS) has been established in Papua New Guinea (PNG) and Solomon Islands to manage these container hygiene risks and lower costs to shipping companies. Containers are washed prior to export by the Solomon Islands Ports Authority (SIPA) for which they charge fees for service to shipping companies. Depending upon the level of compliance demonstrated by ports in the SCHS (measured by contamination rates for containers upon arrival) containers are subject to gradually decreasing levels of inspection upon import into New Zealand and Australia. The scheme is funded by Swire shipping and audited by New Zealand and Australia quarantine agencies. To date compliance by Honiara port has been variable mainly due to port congestion leading to issues with container availability and time for washing.

The SCHS has a strong positive benefit to cost ratio for shipping companies although recent increases in SIPA charges for washing have reduced this somewhat. Maintaining good compliance levels significantly increases the benefit to cost ratio. Not all shipping companies are involved in the scheme but there is no resulting shipping price differential. This indicates that scheme improvements are unlikely to result in reduced shipping charges. However, it is still important to maintain the scheme to facilitate trade and maintain a positive cost benefit to avoid shipping charges possibly increasing. This means the focus should be on reducing operational costs and improving consistency of compliance. It is therefore recommended that:

- Pacific Horticultural and Agricultural Market Access Program (PHAMA) staff (in association with SIAQS) contact SIPA to examine whether contestability of the washing services is viable and would lower costs.
- To develop potential local third party audit capacity SIAQS engage with management of the Rural Development Program (RDP) to ensure audit training and exposure to required standards for the SCHS are included in planned training assistance to SIAQS by New Zealand Ministry of Agriculture and Forestry (NZMAF) via RDP.
- SIPA is consulted with by SIAQS to ensure planned extensions to the current wharf areas will include adequate provision for container washing facilities.

New Zealand and Australia require for imported agricultural or timber products from Solomon Islands to be fumigated with high levels of methyl bromide due to concern over the risk of GAS. This imposes additional costs on exporters. Due to the identified GAS risk Australia requires pre-export fumigation while New Zealand requires fumigation upon arrival. Establishment of pest free areas is not considered a feasible option to assist with improving this situation. Fumigation standards in Solomon Islands are low and not well regulated. Currently there are two operators only one of whom is approved by the Australian Quarantine and Inspection Service (AQIS) to fumigate for Australia. Solomon Islands should take steps to improve the standards and level of assurance in fumigation operations in order to support approaches to importing countries to reduce the need for inspections and/or fumigations upon arrival. Also methyl bromide fumigation is damaging to the environment and is being phased out internationally making its future supply and use as fumigant in Solomon Islands a potential issue. To improve this situation it is recommended that:

- PHAMA fund training by AQIS of private sector and SIAQS staff under the Australian Fumigation Accreditation Scheme (AFAS).
- PHAMA staff be tasked to develop in association with SIAQS and stakeholders an appropriate and sustainable regulatory structure for fumigation.
- PHAMA consider on a regional basis the funding of research into alternative fumigants, such as methyl iodide, which may be used to meet GAS fumigation requirements.

Background

The Solomon Islands Market Access Working Group (SIMAWG) in its February 2011 meeting identified that the presence of the invasive pest the Giant African Snail (GAS) has resulted in quarantine requirements being imposed on Solomon Island exporters by importing countries resulting in additional costs in terms of container hygiene and fumigation measures. It was decided that further examination of the issue was required and a report commissioned.

The specific objectives set by the SIMAWG for the report are that it:

- Define the market access implications and costs associated with container hygiene and mandatory fumigation requirements for products that may be contaminated with GAS for importers and exporters in Solomon Islands.
- Outline possible future strategies to reduce the impact of GAS on importers and exporters.

Specified actions to be undertaken in developing the report are:

- Engage with Ministry of Agriculture and Livestock (MAL) and industry to determine the current distribution of GAS within Solomon Islands.
- Engage with industry and Ports Authority to determine the current additional costs and charges for exporters associated with GAS.
- Review current or proposed MAL eradication and or control strategies for GAS.
- Document current Australia and New Zealand phytosanitary requirements with respect to GAS.

Current Situation

1.1 Distribution

Giant African Snail (*Achatina fulica*) was first identified in Solomon Islands in 2006 at Ranandi on the outskirts of Honiara. The likely path of entry was via uncontrolled imports of dirty logging equipment and machinery from Asia. Indications from life cycle stages identified at the Ranandi site are that GAS may have actually been present in the area as early as 2001.In 2006 an assessment of the incursion was conducted by the Secretariat of the Pacific Community (SPC) which concluded that at that stage GAS was only present in 3 areas (Ranandi, Feraldoa and Foxwood) and that eradication was feasible[1].An eradication plan was proposed and costed. Unfortunately funds were not secured for implementation and since that time GAS has spread widely in and around Honiara township and is now found throughout the Ranadi industrial estate area, central dump sites, Fulisango settlement, Gwaomao, Vara Creek, Fijian Quarters, Skyline Ridge, Chinatown and along the banks of the Mataniko river. It has also established itself further in Foxwood in Eastern Guadalcanal and more recently in the residential areas associated with two mine sites in Central Guadalcanal. Solomon Islands Agriculture Quarantine Service (SIAQS) has conducted control measures in all identified sites but the local spread of the pest has continued and it can now be considered to be well established on Guadalcanal.

In 2008 a survey by SIAQS targeting major logging sites did not detect any signs of GAS in provincial areas. However, since then GAS has been identified in two sites in other islands. It was detected in the Noro port area in early 2010 and is thought to have been introduced with scrap metal imports from Papua New Guinea (PNG). An intensive rapid response by SIAQS of baiting, manual collection, salt water spraying and destruction of potential breeding sites appears to have eradicated the pest in Noro; however, the site continues to be monitored with baits. More recently in February 2011 GAS was detected at Arosili 2 District in Western Makira at a logging camp site in Marou bay. Although SIAQS have attempted to establish internal control measures for logging and other heavy equipment leaving Guadalcanal to other islands it appears that GAS has been introduced to Makira via movement of a container and equipment by a logging company from a Ranandi site. The Marou Bay site was subject to a delimiting survey by SIAQS and the infected area defined as being quite small with 13 adult snails found. Response measures were undertaken within the demarcated area such as clearing of habitat, baiting, application of salt water, physical collection and establishing monitoring baits. Trace back of equipment movements in Makira has been conducted and intensive awareness on GAS has been conducted in and around the infected area. The response is ongoing and SIAQS staff will be revisiting the site in June and are hopeful that with the early detection that eradication at the Marou Bay site can be achieved.

At this stage it is clear that GAS is well established in Honiara and its surrounds and in a number of areas of Guadalcanal. Identified spread to other islands appears at this stage to have been limited. However, given that active surveillance and awareness activities in provincial areas have been limited to date and that the likelihood of passive transfer via agricultural and timber goods, equipment and vehicles is high, there is a distinct possibility that the pest has already established undetected in other areas of the country.

[1] R. Masamdu, SPC, 2006; Report on Achatina fulica in the Solomon Island, An assessment of current of the incursion, and options for management.

1.2 Control Strategies

Responsibility for control of GAS remains with SIAQS as the department still considers it to be an exotic pest. SIAQS have identified it as a priority in their departmental work plans and MAL corporate plans. Since GAS was first identified SIAQS has spent an estimated SBD 2,000,000 of recurrent budget on response measures (for comparison SIAQS total annual recurrent budget is now approximately SBD 4 million up from SBD 2.6 million in 2009). Also in 2009, Solomon Island Government (SIG) provided SIAQS an additional SBD 500,000 specifically for GAS control. Some donor assistance has also been provided: in 2006 the SPC provided SBD 50,000 for baiting activities and provided some technical assistance with planning and response, more recently they have also assisted with publication of GAS awareness materials and response planning including the provision of a generic GAS response action plan. The World Bank / International Fund for Agricultural Development / European Union / AusAID funded Rural Development Program (RDP) has in 2010 provided some limited support for GAS control measures and is currently funding the response activities in Makira.

SIAQS recognise that given how well established the pest is in Guadalcanal that eradication is no longer likely to be feasible and regardless is certainly beyond their current capability in terms of resources. Their current strategies to control the pest fall into 6 main areas:

1. On Guadalcanal the application of control measures in identified infested areas to try and manage the active local spread of the pest.

   This involves conducting physical removal of snails, baiting (using molluscicides such as “Blitzem” metaldehyde baits), and monitoring activities. SIAQS also seeks to educate local communities and companies on GAS and encourage them to conduct their own control measures such manual removal and controlling habitat. The broken terrain in and around Honiara, extensive vegetation and gardens, high rainfall and many water courses make control a very difficult challenge. Also lack of funds has meant that in reality implementation of control measures (particularly baiting) has been on a limited scale and intermittent basis. As a result impact of SIAQS’s control activities has been limited as evidenced by the continued spread of GAS in and around Honiara. It is worth noting that it appears MAL Research (which holds responsibility for pest management *within* the country) are yet to be effectively engaged by SIAQS in responding to and managing GAS. As an example in their 2011 work plan Research have no activities defined to assist with GAS. Also it is not clear given the potential for GAS as a vector for human disease (eosinophilic meningitis resulting from the zoonotic parasitic nematode the rat lungworm, *Angiostrongylus cantonesis*) what level of engagement has occurred with the Environmental Public Health Unit and Municipal Town Council on control and awareness activities in Guadalcanal.

2. Implementing internal control measures between Guadalcanal and the rest of the country to try and limit the passive spread from Guadalcanal to other islands via high risk items such as logging equipment, vehicles and machinery.

   Quarantine Control Orders to this affect have been issued by SIAQS under the Agriculture and Livestock rules under the Agriculture and Livestock Act (Chap 35). Similar control orders have been established for any area in the provinces found to be infested (such as Makira and Noro). SIAQS have tried to establish relationships with shipping and logging companies to ensure compliance with these internal control measures. However, in reality, uncontrolled movements occur as it is difficult for SIAQS to verify all internal shipping movements. This is evidenced by the recent Makira outbreak associated with logging equipment from Guadalcanal. It is worth noting that

no internal movement control measures are in place for agricultural products, timber or other risk items as this would simply not be a practical option and likely unenforceable given the nature and scale of informal trade in these items between islands and level of uncontrolled small boat traffic. This unfortunately means that significant pathways for likely spread to other islands will always remain open.

3. Conducting awareness and communication activities for the public and target groups such as logging companies, transporters and shipping operators.

   This has generally taken the form of posters and leaflets being placed in public areas such as schools, clinics and on village notice boards, holding meetings with communities, and informing staff of logging and shipping companies amongst others. SIAQS have also recently begun screening of television segments on GAS. The awareness materials include information on identification of GAS, its risk to the economy and health, and possible control measures. It is difficult to judge the affect these awareness activities have had on the behaviour of the general public. It is worth noting that the scale of these activities in the provinces has been relatively small due to limited funding for travel although there has been some distribution via SIAQS provincial staff and MAL extension offices. It is also difficult to gauge the uptake by target groups such as logging company employees on the risk of GAS spread and expected control measures. This lack of awareness or willingness amongst these companies to comply with biosecurity measures is likely to be an ongoing issue. Given that GAS was most likely introduced by the logging industry and they remain the highest risk of spread it may be appropriate for SIAQS to consider lobbying SIG via MAL for charges to be levied off the logging industry to assist funding of GAS activities.

4. Conducting active surveillance in provincial areas for GAS in identified high risk areas such as in and around logging sites and port areas. Implementation of this strategy has been limited by a lack of funds. SIAQS has identified 63 logging camp sites in Choiseul, Western Province, Malaita, Isabel and on Guadalcanal which they intend to survey for GAS. However, funding remains problematic
5. Conducting rapid response to reports of GAS in islands other than Guadalcanal in an effort to achieve early control and eradication in provincial areas. Although funding remains an issue with SIAQS having only a small budget contingency for pest response they have shown in Noro and Makira an ability to respond quickly and appear to have the technical knowledge to apply effective response measures. These response efforts have also shown that other MAL staff such as Extension can be effectively engaged in response measures. However, the lack of budget resources potentially limiting SIAQS's ability to consistently implement and maintain adequate response measures is a serious concern.
6. Development of a well structured nationally agreed GAS Response Plan to use as a basis for securing funding from SIG and donors and to encourage collaboration and coordination between public agencies and private sector in GAS management. SIAQS have developed a draft modelled on an SPC generic regional plan. The plan formalises the strategies mentioned above in a structured framework for action, it also includes the possible examination of whether imported bio-control agents would be appropriate based on regional experience. The draft is being consulted on within MAL before being discussed with stakeholders. SIAQS have also, based on the draft plan, developed a budget for funding implementation of activities, mainly aimed at limiting spread of GAS to other islands. Requests were submitted in 2010 to SIG for SBD 3 million to fund this plan but this was not approved. However, it does appear that SIAQS have now secured an additional SBD 1 million of budget warrant for release in mid-2011 for GAS control. This will help improve the

situation in regard to implementation of the control strategies but is below the total level of funding required and is likely to be a one off warrant release for 2011 only.

Overall, SIAQS's control strategies can generally be considered appropriate given the information that they currently have on distribution and their resources. They recognise correctly that eradication from Guadalcanal is beyond their capability and that trying to engage the public, private sector and other government agencies in assisting with control of the pest is needed. They also recognise that their key focus should be on trying to limit spread to other islands by focusing on high risk movements and targeted risk areas. They also understand the technical elements of the tasks required to do this: ensuring awareness and communication on the pest, the need to establish internal control measures, maintain effective surveillance, and to respond quickly and effectively. They have demonstrated in Noro and Makira that they can actually respond and effectively control and even eradicate GAS if it is identified and contained early in provincial areas. It is unfortunate that this did not occur with the initial GAS incursions when first identified in Honiara but it must be remembered that SIAQS was at that time still dealing with the difficulties of the ethnic tensions, extremely low budget and very limited staff resources.

The main thing is that SIAQS do now have a plan and understand what needs to be done. Whether maintaining the current level of response and focusing on internal control will remain appropriate will depend upon what surveillance in provincial areas shows in coming months. Should better surveillance (and awareness) demonstrate that GAS is actually distributed more widely than currently thought it may be more appropriate to focus entirely on longer term management measures.

The key issues that need to be addressed now are all about getting recognition of the GAS Response Plan, securing resourcing, successful engagement of other stakeholders to assist with implementation and finding cost effective measures for control of GAS that suit Solomon Islands environment. In this regard in relation to SIAQS's control strategies the following actions are recommended:

- That SIAQS engage with the Biosecurity and Trade Section of SPC to secure technical assistance to help finalise the development of their GAS Response Plan and actions.
- That SIAQS engage with all agencies in MAL to ensure appropriate GAS awareness and control activities are integrated into their annual work plans based on the planned actions derived from the GAS Response Plan once it is finalised.
- That SIAQS engage with the Ministry of Health and Honiara Municipal Council to ensure their participation in awareness and control activities.
- That MAL Research should investigate appropriate cost effective low technology methods for longer term management of GAS on Guadalcanal to limit impact on gardens and crops. Examination should be given to combinations of cultural (crop selection, planting and management techniques) and chemical methods for control as part of an integrated pest management approach, and to investigation of potential bio-control using species already present in Solomon Islands. Any consideration of importation of any bio-control agents should be approached with care as little success has been had internationally with bio-control agents, often as a result of their own adverse affect upon other flora and fauna.
- That SIAQS consider lobbying SIG via Ministerial or Cabinet level papers for charges to be placed upon the logging industry to raise revenues to assist with GAS management.
- SIAQS should insist upon pre-export cleaning and certification of imported logging equipment and other machinery from GAS countries to limit the likelihood of newly imported equipment adding to

spread if shipped direct to provincial logging sites. This is also good practice to avoid importation of other pests or diseases.

Very few countries have been able to eradicate GAS once it is well established and this has generally required sustained application of significant resources. Overall the potential to eradicate GAS from Solomon Islands appears limited particularly given the likely resources available. In December of 2010 the Rural Development Programme (RDP) funded a report examining pest issues in Solomon Islands and potential control measures as part of an integrated pest management plan[2]. This report also concluded that eradication of GAS was not feasible and that SIAQS should focus on control/management in Guadalcanal and trying to prevent its spread to other islands. From a trade perspective this means that GAS is likely to remain a factor for consideration in market access for Solomon Island exporters for the foreseeable future.

1.3 Impact on Trade

1.3.1 Market Access Implications

As discussed above it appears likely that GAS will remain in the Solomon Islands. This presents questions as to what affect this has upon markets that Solomon Islands can export to and under what conditions. It also poses questions as to what options there are to meet those conditions and the costs involved.

GAS is recognised to be one the most invasive species in the world[3] due to its potential adverse effect upon agricultural production, biodiversity and food security. As a result countries without GAS often have stringent market entry requirements to exclude it, and these can impact upon the viability of export trade to those markets for countries with GAS such as Solomon Islands. It is considered to be a quarantine entry risk by importing countries because of its potential presence (as snails or eggs) on specific commodities (such as sawn timber) or on the exterior or interior of shipping containers. In terms of market access implications GAS is well established in many Asian countries so it is not a market access issue for Solomon Islands' trade with Asia (such as its containerised cocoa exports). Trade between Solomon Islands and other Pacific Island markets is limited and trading partners such as PNG, Vanuatu and Fiji also already have GAS. As a result GAS mainly represents a market access issue in relation to trade to Australia and New Zealand.

Both of these countries have identified Solomon Islands as being high GAS risk with the Australian Quarantine and Inspection Service (AQIS) placing it on its published GAS Country Action List and New Zealand Ministry of Agriculture and Forestry (NZMAF) placing it on its unpublished High Risk Country List (New Zealand is also particularly concerned about the risk of invasive ant species from Solomon Islands). As a result imports of agricultural products, wood or other items considered to potentially harbour GAS are subject to mandatory inspection and fumigation (these are discussed in detail in sections below on costs). This poses a significant market access issue and results in exporters incurring additional pre-export and import costs. At present Solomon Islands only exports untreated sawn timber to New Zealand and Australia; however, future exports of any other agricultural or forestry product would be subject to similar market entry requirements and subsequent costs (potential crop exports requiring fumigation at high levels to kill GAS is an example).

[2] S.Lal, RDP Oct. 2010; Integrated Pest Management Plan, Consultancy Report
[3] IUCN/SSC Invasive Species Specialist Group database

The other main market access issue relating to GAS is in regard to container hygiene. Currently approximately 4,000 containers are shipped annually out of Honiara to ports in New Zealand or Australia. 95% of these are empty and are being shipped to port hubs for redistribution either within New Zealand and Australia or elsewhere. NZMAF import interception data[4] has shown that historically the Pacific Islands have been the origin of most contaminated containers into New Zealand. A NZMAF survey in 2006 indicated that although empty container imports from the Pacific islands only constituted 11% of container arrivals they accounted for approximately 80% of all contamination of empty container imports. In the same survey containers from nine of fifteen Pacific countries of origin demonstrated contamination rates that were over 20% (58% of empty containers from Solomon Islands were found to be contaminated). This contamination included insects, plant material, and soil and other items which can be a pathway for introduction of viruses and pests. A wide number of pest species were recorded infesting containers, but the main concerns are GAS and invasive ants such as Yellow Crazy ant (Anoplolepis gracilipes). Ants from the Pacific Islands are disproportionately represented in NZMAF interception data relative to trading partners from other regions of the world and NZMAF survey work has shown ant infestation rates on containers from the Pacific Islands from uncontrolled ports have been at rates from 1% to over 10%.

Due to these contamination associated risks (including GAS) all containers from Solomon Islands are potentially subject to inspection and washing upon arrival in New Zealand and Australia which represents a huge cost in terms of additional inspection charges, washing activities, additional container handling and potential demurrage charges (for delays). All of these costs are imposed on the shipping companies and ultimately add to freight charges and prices paid by importers and exporters in Solomon Islands.

As already discussed, the presence of GAS in Solomon Islands is not likely to change, it (and invasive ant species) are recognised by New Zealand and Australia as pests threats they wish to exclude and that in this regard containerised trade from Solomon Islands is seen as a significant biosecurity risk. Given that risk the conditions imposed by New Zealand and Australia on imports from Solomon Islands in regards to inspection and fumigation are understandable and (given the prior history of interceptions) are justifiable. The question is what can be done in Solomon Islands to find ways to either better manage the demonstrable level of risk associated with containers (and particular export products such as timber) and/or reduce the costs associated with measures required to manage that risk.

1.3.2 Costs Associated with Container Hygiene

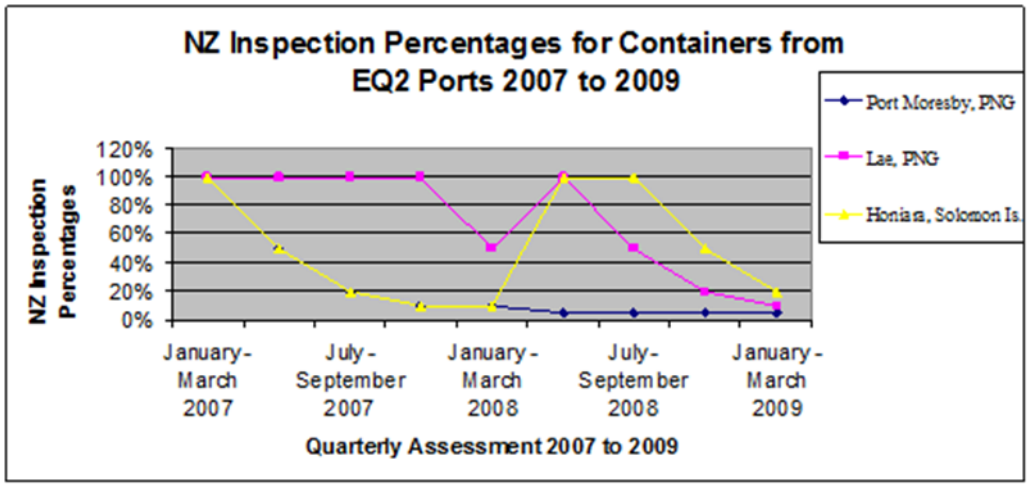
The GAS risk in relation to importing countries requirements for containers can be managed through ensuring adequate container hygiene in Solomon Islands by washing to remove snails, eggs and other contamination. This is currently conducted at Honiara Port as part of the NZMAF operated Sea Container Hygiene Scheme (SCHS). The SCHS was established in 2006 with the intention of lowering risks to New Zealand posed by contaminated containers from the Pacific through establishing cleaning and disinfestation treatment procedures at selected Pacific Island ports in association with shipping companies. The scheme began in PNG (Port Moresby, Lae) and Honiara operated under agreement with Swire Shipping. The scheme was expanded in 2007 to include Apia in Western Samoa with a consortium consisting of Swire Shipping, Reef Shipping, Pacific Direct Line, Pacific Forum Line,

[4] NZMAF, Cost Benefit Analysis: Application of Sea Container Hygiene Systems in Papua New Guinea, Samoa and the Solomon Islands

Sofrana, and Polynesian Shipping lines. The SCHS has been instrumental in markedly reducing container contamination rates from participating ports including Honiara (although compliance has been variable contamination rates found by NZMAF on SCHS containers from Honiara have regularly been below 5% when compared with historical rates of between 22–58% contamination). As a result Australia is now joining the scheme and will be using it to alter inspection and washing rates for containers imported from participating ports.

The scheme involves all containers to be exported to New Zealand and Australia being cleaning internally and externally, water blasted with cleaning chemicals, inspected, sprayed with insecticide and then being stored in a clean designated area on tarmac. The port has a pest control plan established and management of waste, rubbish and pest habitats is carried out. Containers are loaded directly to the ship and segregated on board from "non-system" containers. Monitoring checks are conducted by ports management and documented. The port is visited twice per year by a New Zealand company (Fly Busters AntiAnts Ltd, FBA) who check compliance of cleaning operations, provide chemicals, and provide training and suggest system improvement as necessary. The port's compliance is audited directly by NZMAF (or AQIS) staff during a country visit once per year. Compliance of the outcomes of the scheme in terms of container hygiene are monitored by inspections conducted at New Zealand and Australian ports using a percentage sample size determined by a sliding scale (80-50-20-10-5) based on performance. A port's performance is measured in a cumulative manner over a 3 month moving window period with an action threshold of 5%. Ports that consistently show good performance can progress down the scale to the minimum of 5% inspection levels. Port Moresby and Lae have shown good compliance records and regularly operate at 5–10% inspection levels. Honiara's compliance has been variable as shown in Figure 1-1 below but its inspection level has been as low as 10%. The port is currently on 50% inspection as of April 2011 with a cumulative total contamination rate detected for the current quarter of 2.91% which is indicative of good current performance.

Figure 1-1 Compliance Records of SCHS ports 2007–2009[5]



The prime aim of the SCHS is to lower biosecurity risks for New Zealand and Australia and participation in the scheme is clearly an effective way for Solomon Islands to manage the container hygiene issue associated with GAS in a way that will allow it to meet New Zealand and Australia's

[5] Source NZMAF internal publication.

market entry requirements. The SCHS was not specifically intended to deliver lower costs to Pacific Island exporters and importers; however, it was expected that by lowering costs for shipping companies that there could be some benefit to Pacific Islands. The key issues for Solomon Islands to consider are cost benefits from its participation in the scheme and options to possibly reduce costs and improve compliance.

A cost benefit analysis conducted by NZMAF in 2009 showed that from the point of view of lowering NZMAF inspection costs and in providing benefits to the participating shipping agents the scheme has had a benefit to cost ratio of between 3 to 1 and 8 to 1 (depending upon the participating port) and Honiara was within this range. It was expected by NZMAF that if AQIS were to participate in the scheme (as they have now chosen to do as of 2011) the cost benefits could be increased due to the higher container volumes and higher inspection costs associated with the Australian market.

The costs associated with running the scheme in Honiara include:

- Setup costs for providing washing equipment, washing container stands, supply of chemicals, and training of ports staff. These are met by the shipping companies. For Honiara only Swire Shipping are involved in the SCHS.
- Funding internal control audit and training visits by FBA. These are funded by Swire Shipping.
- Funding of external audit by NZMAF or AQIS. Flights and accommodation are funded by Swire while NZMAF and AQIS staff time is provided in kind.
- Ongoing supply of chemicals. These are funded by Swire Shipping.
- Labour, container handling and utility costs for washing activities. These are incurred by Solomon Islands Ports Authority (SIPA) who then charge shipping companies fees for container washing.

No complete information is available on the cost of operating the scheme but some estimates can be made. An estimate of USD100,000 was provided by Swire Shipping for costs incurred annually to fund their responsibilities for the SCHS across ports in PNG and Honiara. It was considered USD 16,000 (approximately SBD 120,000) of this cost was attributable to Honiara. SIPA currently employs 8 casual staff for each 12 hour shift to wash containers. These washing operations are conducted on a 24-hour 7 day 52 week basis. Estimated hourly wage rate for workers is SBD 7. This results in a labour estimate of SBD11,000/week allowing for overtime or an annual casual labour cost of approximately SBD580,000.With addition of management and port machinery operator staff costs a total estimate of local staffing costs is approximately SBD650,000 (approximately USD 87,000)

No specific information on container handling equipment costs were available or on utilities associated with washing. It is noted that fresh town water supply water is utilised for washing which will add to utility expense. A sea water pump is available as a backup against water cuts. All pumps have been provided by Swire shipping although it appears SIPA pay Swire for the equipment on an instalment basis. Apparently a top-lifter container mover has been purchased by SIPA to handle containers for washing although it is not clear if this is solely used for this activity.

An estimate of total charges to shipping companies for washing of containers in 2010 is approximately SBD 1.2 million (USD 160,000). Fees charged by SIPA to shipping companies for container washing were amended in January with gazetting of a new schedule of ports user charges and tariffs. Charges for washing a 20 foot container have been increased from SBD200 to SBD600 and SBD 900 for a 40 foot container.

Currently approximately 4,000 containers are shipped to ports in New Zealand or Australia of which an estimate has been given that 80% are 20 foot containers. This means that under the new fees

schedule the projected cost of washing charges to shipping agents will be approximately SBD 2.7 million (approximately USD 360,000). From this information it is estimated that the projected overall cost of compliance with the SCHS for Solomon Islands will cost shipping companies (working on an average of 4000 full container loads [FCLs]/year) somewhere in the region of SBD 3 million (approximately USD 420,000).

The benefits to shipping companies for this expenditure are in a reduction in costs incurred upon arrival in New Zealand or Australia through reduced inspection charges, reduced additional charges for non-compliant containers requiring cleaning and inspection, faster clearance times reducing wharf charges and improving container turnaround times. No detailed information is available on actual cost saving; however, Swire Shipping provided an estimate that as a result of the SCHS they save approximately USD 2 million/year on inspection and wharf charges on containers imported into New Zealand and Australia from PNG and Solomon Islands. Swire Shipping has also apparently been able to significantly reduce the total number of containers they have in use in the region as a result of these improvements.

It is also possible to make some rough indicative estimates of costs saving for Honiara port using the following assumptions:

- Based on historical contamination rates prior to the SCHS up to 58% of empty containers have been found to be contaminated.
- Working on NZMAF current charges as a basis. These differ between ports and are very time dependent. NZMAF inspectors are charged at minimum of NZD 100/hour. All steps in the process of inspection, container movement to facilitate inspection, movement to washing areas, reinspection, and repositioning are charged for by either NZMAF or port authorities. Fumigation of containers often incurs significant charges to move containers to privately operated fumigation centres. Total potential charges for noncompliant containers can range between NZD 200–500 depending upon the need to rewash or fumigate the container and its size. NZD 300 is a conservative estimate of indicative costs for noncompliant containers.
- An annual volume 4000 containers.

Without the current pre-export washing 100% of containers would be inspected upon arrival and likely that up to 50% would require washing and reinspection. This would result in estimated charges of up to NZD 720,000 (USD 560,000). This does not take account of likely additional significant charges for delays and potential demurrage. This indicates that in comparison to the previous contamination rates operation of the SCHS has a significant positive cost benefit for shipping agencies although recent increases in ports fees have reduced the degree of that cost benefit significantly. Also if the port can operate at good levels of compliance and only 5–10% of containers inspected with minimal rewashing required (eg 2%) then the resultant cost benefit is very strong. Although this is a sign of success for the SCHS it is still an unfortunate reminder of the cost burden imposed by the presence of GAS in Solomon Islands. These estimates are also backed by discussions with shipping agencies which show that when the SCHS was suspended in 2010 for several months due to concerns over port operations additional costs of between NZD 200,000–300,000 per month were incurred in additional inspection and washing charges for containers from PNG and Solomon Islands.

It is worth noting that Swire is the only shipping company that operates in the SCHS from Solomon Islands and PNG. Although Sofrana Shipping also carries an estimated 20% of the 4000 containers to Australia and New Zealand they do not formally participate in the scheme. Their containers are washed by SIPA in Honiara and they pay the same charges to SIPA for this but since they do not

belong to the scheme Sofrana containers are treated as “non-system” containers upon arrival in Australia and New Zealand. This means they are subject to 100% inspection while Swire containers are subject to reduced inspection levels in line with the compliance status of the port. Information from NZMAF is that as a result of Sofrana having their containers washed their contamination rates are comparable to that of the Swire containers and although they are all inspected they are rarely subjected to any significant rewashing. Despite this Sofrana will still be incurring significant additional inspection charges and experiencing more delays in comparison to Swire by not participating in the scheme. It is not clear why Sofrana choose to operate this way and NZMAF has made multiple approaches to them regarding participation. It is possibly a reflection of their lower volumes of shipping to New Zealand, if so this may change now that AQIS have joined the scheme since Sofrana ship relatively larger volumes to there. It could relate to how they choose to configure containers on board vessels or simply be a reflection of a different business model. Given that Sofrana and Swire shipping freight charges are in fact comparable it is perhaps more indicative that there are larger factors involved in terms of cost competitiveness and determining pricing.

Regardless of the reason there currently appears to be no shipping price differential out of Honiara based on shipping company participation in the SCHS. This is probably a fair indicator that any improvements in the SCHS are unlikely to actually result in reduced shipping charges for exporters and importers. However, it is still important to maintain the scheme from the point of view of facilitating trade and maintaining a positive cost benefit for shipping companies in order to avoid shipping charges possibly increasing. It is appropriate to focus on the options available to reduce operating costs and improve consistency of compliance.

In terms of potentially reducing overall costs the options are: 1) Possible introduction of tendered independent contracts for conducting the washing in Solomon Islands, 2) Reduction of the costs of external audit visits through substitution of local third party audit capacity.

It is difficult to assess if the current container washing charges are reasonable or if it may be possible for an independent contractor to conduct the activities any cheaper without understanding the full costs of the operation (e.g. some costs may currently be absorbed by SIPA as part of its general operations). Given the status of SIPA as the legislated body to operate and control ports activities it may also be difficult to introduce contestability into delivery of the washing services on the wharf.

It is recommended that with direction from the SIMAWG Pacific Horticultural and Agricultural Market Access Program (PHAMA) staff (in association with SIAQS) engage with SIPA to examine contestability as an option and determine its feasibility.

There appears to be the opportunity to develop local third party audit capacity in order to reduce the external monitoring visits by FBA or possibly reduce the frequency of external audits. This would require development of credible capacity in an agency such as SIAQS to be able to conduct audits of the SCHS to the satisfaction of both the shipping companies and overseas agencies. It is worth noting that it would not be possible for SIAQS to undertake both the internal control role FBA currently perform as well as conduct the external audit. Discussions with Swire shipping showed that they would be reluctant to consider SIAQS for the internal control role as this is conducted on a commercial contract with FBA not only as a form of internal audit but as means of quality improvement and training. That contract is across the SCHS ports in PNG as well so it is unlikely that SIAQS could fulfil this role or that it would be able to significantly reduce the costs by doing so.

Any reduction in the external third party audits through development of local third party audit capacity would be a long term process and would be dependent upon SCHS parties accepting the concept. Discussions with shipping companies showed them to have concerns over the ability to develop credible local capacity and as to whether it would lead to reduced costs. Discussions with NZMAF and AQIS showed some tentative interest in the concept and that they could engage with SIAQS to assist with developing capacity to conduct system audits not only for the SCHS but other systems such as fumigation and privately operated transitional quarantine facilities (such as privately operated post entry quarantine facilities and approved container bases). Under the Solomon Islands Rural Development Programme (RDP) a training relationship has been established with NZMAF for SIAQS and this could be utilised to access training on systems auditing.

It is recommended that PHAMA and SIAQS engage with RDP and NZMAF to ensure audit training and exposure to required standards for the SCHS is included in this programme with a long term view to development of credible local third party audit capacity for the SCHS in order to reduce the frequency of external audits.

In terms of improving compliance of the SCHS operation to ensure the cost benefit is maximised there are relatively few options. The system's efficacy is essentially based on human operators consistently conducting a straightforward set of cleaning tasks. As long as those operators are diligent, have adequate time and equipment to correctly conduct the handling and cleaning required then compliance should be good.

The main issue at the port potentially affecting compliance is the relatively small port area creating issues with container congestion and subsequent issues with movements and time pressures. This was a particular issue in 2010 due to markedly increased container volumes in the latter part of the year from increased rice importations and several large loads of containerised equipment imports. According to shipping agencies this appears to have been a one off event but is still indicative of the limited ability of the port to absorb larger volumes of traffic.

It is understood that plans are currently being considered for an extension of berthing capacity at the wharf towards the Point Cruz area. This should increase the area of wharf available for container handling and storage and have a positive affect upon compliance. It is important that such planning takes account of the ongoing need to wash and store containers at the wharf.

It is recommended that SIAQS consults with SIPA to ensure any planned extensions to the current wharf areas will include adequate provision for container washing in terms of facilities and space.

At this stage it is unclear when the wharf extensions are expected to occur. In the interim one potential solution to container congestion is the utilisation of approved areas away from the port ("approved container bases") where containers can be delivered for possible cleaning and inspection prior to re-export. As an example a set of nearby off-port areas are successfully operated by the shipping companies in Lae which enable containers to be washed and stored before delivery to the port on trailers ("Mafi" cargo trailers) when ships are berthed, thus freeing up container space on the wharf. Unfortunately, this does not currently appear to be a viable option in Honiara due to the relatively low container volumes limiting the likely cost benefit for shipping companies to operate such areas, a lack of suitable areas close to the port and the likely increased costs associated with the need for additional container movements by truck based side-lifter. However, it is worth noting that the establishment of well managed approved container bases for large regular importers (such as Solrice)

could still be of value to SIAQS as a way of improving the management of quarantine risks for imports through better management of the unloading and inspection of containers. It is understood that the standards for approved container bases for this purpose are currently being investigated by SIAQS with RDP.

1.3.3 Costs Associated with Fumigation

Commodity exports out of Solomon Islands requiring additional fumigation due to GAS presence are relatively limited. Commodities exported to Asia, such as cocoa and round logs are not subject to additional requirements. However, commodities such as sawn timber and agricultural products to Australia and New Zealand are an issue as these countries require additional inspection and fumigation levels due to GAS presence (and other pests such as ants) in Solomon Island. Of these products currently only untreated sawn timber (of hardwood species) is exported (approximately 20–30 containers).

For Australia the import conditions for untreated sawn timber from Solomon Islands can be summarised as:

1. An import permit is not required.
2. Each consignment is to be accompanied by a Treatment certificate or Phytosanitary certificate.
3. Each consignment must be free of live insects, bark and other quarantine risk material prior to arrival in Australia.
4. All FCL consignments of timber from Solomon Islands (as a GAS action list country) require either:
    a) Pre-shipment fumigation with methyl bromide at 128g/m³ for 24 hours (in comparison the normal timber fumigation rate for non-GAS country imports is 48g/m³ for 24 hours)
    b) On arrival fumigation with methyl bromide; or
    c) A full unpack and inspection of the container and timber at a Quarantine approved premises.
5. All break bulk timber and timber on flat racks and open topped containers from GAS countries require either:
    a) Pre-shipment fumigation with methyl bromide. In addition to fumigation, the consignment must comply with segregation requirements from the time of fumigation through transport on the vessel until discharge, to avoid reinfestation. Prior to export the importer must demonstrate to AQIS how they will meet these segregation requirements.
    b) On arrival fumigation with methyl bromide; or
    c) Full inspection of all accessible exposed surfaces of the timber.
6. Consignments that have been treated offshore pre-export and are accompanied by an acceptable Treatment or Phytosanitary certificate may be released on the presentation of documents. Treatments must be completed within 21 days of shipment or containerisation. AQIS accepts treatment certificates from all commercial treatment providers except where there has been a history of non-compliance and/or treatment failure. Treatment certificates and Phytosanitary certificates must include the duration of treatment, the treatment temperature and the maximum thickness of timber being treated.
7. All consignments are inspected upon arrival to monitor compliance of pre-export fumigations. If contaminants (including soil and giant African snails) are found at any inspection, then the consignment will be held and the contaminants removed or treated with methyl bromide, or the consignment will be re-exported or destroyed at the importer's expense.

For New Zealand the import conditions for sawn timber from Solomon Islands can be summarised as:

1. An import permit is not required
2. Each consignment must be:
    a) Free of regulated pests
    b) Packed and/or shipped in a manner that prevents infestation
    c) Relatively free of extraneous material (e.g. leaves, soil). NZMAF considers a contamination rate of 0.01% w/w extraneous material is acceptable.
    d) Bark-free wood
3. Each consignment must be accompanied by a Phytosanitary certificate or a Treatment certificate
4. Each consignment must be either:
    a) Pre-export fumigated with methyl bromide (at 80g/m³ for 24 hours) and upon arrival in New Zealand be subject to 100% inspection of the exterior of each stack of sawn wood and a 10% piece by piece (board by board) inspection of each lot
    b) 100% "break bundle" inspected upon arrival (within 12 hours of unloading for break-bulk consignments), or
    c) Fumigated upon arrival.

If the sawn wood is fumigated prior to export the sawn wood must be treated no more than 21 days before export to New Zealand.

There are some differences between the standards of two countries and in how they are applied. New Zealand does not specifically mention GAS in its standard where as Australia does. The reason for this is that the New Zealand standards were put in place initially over concerns regarding invasive ants species following a pest risk assessment on Pacific timber imports in 2003[6]. This occurred prior to GAS introduction into Solomon Islands. Discussions with NZMAF, however, showed that they consider GAS one of the reasons why they maintain differential standards for timber imports from Pacific countries they have identified as high risk such as Fiji, PNG, Solomon Islands and Wallis and Futuna. It is worth noting that neither country's standard actually mandates fumigation over break bundle inspection upon arrival but discussions with AQIS and NZMAF have shown that in reality fumigation is considered mandatory due to the recognised pest risks. Australia actually expects all shipments to be fumigated prior to export along with 100% inspection of containers upon arrival. In comparison although New Zealand encourages pre-export fumigation they still conduct 100% inspection of containers upon arrival and actually expect fumigation to usually occur within New Zealand. No data was available on fumigation rates conducted on imports into New Zealand but in discussions an estimate of 90% fumigation of untreated timber imports from Pacific countries was given. No specific interception data was available for Solomon Island timber imports into either country; however, discussions with AQIS and NZMAF showed that both consider imports of timber from Solomon Islands to be high risk based upon levels of contamination that have been detected historically. They are also aware of the conditions of the export chain in Solomon Islands and resultant risk of contamination from pests such as GAS, and they are also aware of the low standards of fumigation operations conducted.

Given that the pests of concern to Australia and New Zealand are likely to remain in Solomon Islands the requirement for mandatory fumigation will remain in place for the foreseeable future. The issues for Solomon Islands are how to reduce the high costs of that fumigation (at GAS effective levels),

[6] NZMAF, Pest Risk Analysis: Ants on Sawn Timber Imported from Pacific Countries, 2003

reduce the costs of the high levels of inspection upon arrival and reduce the potential risk of non-compliances (fumigation failures).

Costs of fumigation in Australia, New Zealand and Solomon Islands are difficult to compare since standards in Solomon Islands are low and poorly regulated so it is hard to know if fumigation methods applied are actually being charged appropriately. There is also very limited competition with only two commercial fumigators (only one of whom is recognised by AQIS to fumigate for the Australian market). The cost of pre-fumigation ranges from SBD3850 (AUD 480) for Australia (using the AQIS recognised operator) to between SBD 1000–3850 for New Zealand (depending upon provider). Prices for fumigation in New Zealand and Australia depend upon treatment provider, port of entry and the container handling involved and can range from approximately AUD 300–500/FCL. Based on these prices, and particularly given the relatively small numbers of containers involved (20–30/month), there appears to be no great cost differential between fumigation currently conducted in Solomon Islands and that conducted upon arrival in New Zealand or Australia.

The main issue for Solomon Islands exporters is that regardless of whether their products are pre-export fumigated they are still subject to inspection upon arrival (and in the case of New Zealand likely to be fumigated again). This is a result of both importing countries concerns over the efficacy of Solomon Islands fumigation and hence wishing to verify outcomes and control risks upon arrival. If Solomon Islands were able to establish robust pre-fumigation operations with outcomes that both New Zealand and Australia were able to regard with some assurance it could result in reduced inspections upon arrival (based upon demonstrable performance), overall reduction in the costs of fumigations (through reduction in the double fumigations that seem to often occur for the New Zealand market), and reduced risk of fumigation failures. Also any improvement in the number of fumigation providers in Solomon Islands would likely improve price competition particularly for the Australian pre-export fumigations.

This approach to recognise overseas fumigation providers has already been progressed by AQIS via their Australian Fumigation Accreditation Scheme (AFAS) where AQIS enters into formal agreements with participating countries, trains overseas operators and auditors, assists in establishing regulatory systems, and then monitors compliance through country audits and inspections upon arrival (levels of which are based upon performance). For AFAS participating countries AQIS then only accepts fumigation treatments by providers registered under the scheme. Most AFAS participant countries are in Asia as the main exporters of products to Australia. Imports from non-AFAS scheme providers or from non-AFAS countries are subject to 100% inspection. Discussions with NZMAF showed that they are in the process of adopting the AFAS scheme and will apply it to imports.

Solomon Islands is not currently a member of the AFAS. Its participation would result in improved fumigation standards (including improved occupational safety levels for operators and their staff), reduced environmental issues due to incorrect usage of the gas fumigants, and improved regulatory control to back export certification. Discussions with AQIS and NZMAF showed that with AFAS participation by Solomon Islands both countries would be willing (based on performance) to reduce inspections and fumigations upon arrival for timber imports. AFAS accreditation would also improve standards generally for all fumigation conducted in Solomon Islands which would potentially strengthen market access of other current (or future exports) of timber or agricultural products to other markets. Importantly it would also improve quarantine outcomes for the Solomon Islands by improving fumigation standards applied to imports of risk items. There are also potential indirect benefits from participation through the development of audit capacity in SIAQS as part of the AFAS audit training.

Development of audit capacity and experience would improve Solomon Islands ability to provide credible assurance to AQIS and NZMAF in other areas such as conducting import permit renewal inspections of premises in Solomon Islands for copra meal exports to Australia or providing local audit capacity options for the Sea Container Hygiene Scheme. For these reasons it is desirable for PHAMA to assist with the establishment of AFAS in Solomon Islands. This will require detailed discussions with AQIS on costs and training arrangements, and a degree of examination of the likely cost benefit. It is noted that under RDP SIAQS have already had detailed discussion with AQIS on potential establishment of AFAS in Solomon Islands and PHAMA should involve RDP in any discussions with AQIS

It is recommended that PHAMA fund training by AQIS of private sector and SIAQS staff under AFAS.

As part of the AFAS scheme development consideration will need to be given to the regulatory structure established to ensure it will be sustainable and not impose high costs upon fumigation operators. This is particularly true given the small container volumes involved and it is important to ensure that the maintenance costs of the system do not result in substantial increases in fumigation charges. It is noted that although current quarantine legislation in Solomon Islands is adequate to allow establishment of the AFAS scheme it is desirable that the passage of the draft Biosecurity Bill (2008) into legislation is completed as this will provide a generally more robust legislative framework for SIAQS regulatory activities.

It is recommended PHAMA staff be tasked to develop in association with SIAQS and stakeholders an appropriate and sustainable regulatory structure for fumigation operations in Solomon Islands.

Fumigation with methyl bromide is recognised internationally as being an important ozone depleting activity and under the Montreal Protocol[7] (to which Solomon Islands, Australia and New Zealand are signatories) it is has been agreed to gradually phase methyl bromide use out. Currently it is only allowed for quarantine use. Alternative measures are being sought; however, this is proving to be problematic and cost effective alternatives are yet to be identified. However, any change in the availability of methyl bromide as an option for pre-export fumigation or in the availability of supply of the gas itself would prove very difficult for smaller countries such as the Solomon Islands to manage. This is particularly true for GAS countries for whose agricultural and timber exports methyl bromide at high levels is the recognised effective treatment. Given these issues it is desirable to identify suitable alternatives. One potential alternative is methyl iodide fumigation which is recognised as being effective against GAS and is also not an ozone depleting agent. NZMAF have recognised this as a potential substitute for their import requirements for methyl bromide fumigation but cannot establish new standards for imports from Pacific GAS countries without conducting suitable experimental trials in a GAS infested country. A draft research proposal has been established; however, funding has not been secured. Given the importance regionally of GAS it is appropriate for PHAMA to investigate funding of this research. This will require further discussions with NZMAF and consideration of the research proposal. It may be appropriate to consider involvement of the Pacific Agribusiness Research for Development Initiative (PARDI) in consideration of potential options for support of such research.

[7] Montreal Protocol on Substances that Deplete the Ozone Layer, 1987

It is recommended PHAMA consider on a regional basis the funding of research into alternative fumigants, such as methyl iodide, which may be used to meet GAS fumigation requirements.

1.4 Summary of Recommended Actions

1.4.1 GAS Control Strategies

It is recommended that:

- SIAQS engage with the Biosecurity and Trade Section of SPC to secure technical assistance to help finalise the development of their GAS Response Plan and actions.
- SIAQS engage with all agencies in MAL to ensure appropriate GAS awareness and control activities are integrated into their annual work plans based on the planned actions derived from the GAS Response Plan once it is finalised.
- SIAQS engage with the Ministry of Health and Honiara Municipal Council to ensure their participation in awareness and control activities.
- MAL Research should investigate appropriate cost effective low technology methods for longer term management of GAS on Guadalcanal to limit impact on gardens and crops. Examination should be given to combinations of cultural (crop selection, planting and management) and chemical methods for control as part of an integrated pest management approach, and to investigation of potential bio-control using species already present in Solomon Islands. Any consideration of importation of any bio-control agents should be approached with care as little success has been had internationally with bio-control agents, often as result of their own adverse effect upon other flora and fauna.
- SIAQS consider lobbying SIG via Ministerial or Cabinet level papers for charges to be placed upon the logging industry to raise revenues to assist with GAS management.
- SIAQS should insist upon pre-export cleaning and certification of imported logging equipment and other machinery from GAS countries to limit the likelihood of newly imported equipment adding to spread if shipped direct to provincial logging sites. This is also good practice to avoid importation of other pests or diseases.

1.4.2 Container Hygiene

It is recommended that:

- With direction from the SIMAWG PHAMA staff (in association with SIAQS) engage with SIPA to examine contestability as an option and determine its feasibility.
- PHAMA and SIAQS engage with RDP and NZMAF to ensure audit training and exposure to required standards for the SCHS is included in this programme with a long term view to development of credible local third party audit capacity for the SCHS in order to reduce the frequency of external audits.
- SIAQS consults with SIPA to ensure any planned extensions to the current wharf areas will include adequate provision for container washing in terms of facilities and space.

1.4.3 Fumigation

It is recommended that:

- PHAMA fund training by AQIS of private sector and SIAQS staff under AFAS.
- PHAMA staff be tasked to develop in association with SIAQS and stakeholders an appropriate and sustainable regulatory structure for fumigation operations in Solomon Islands.
- PHAMA consider on a regional basis the funding of research into alternative fumigants, such as methyl iodide, which may be used to meet GAS fumigation requirements.

Limitations

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