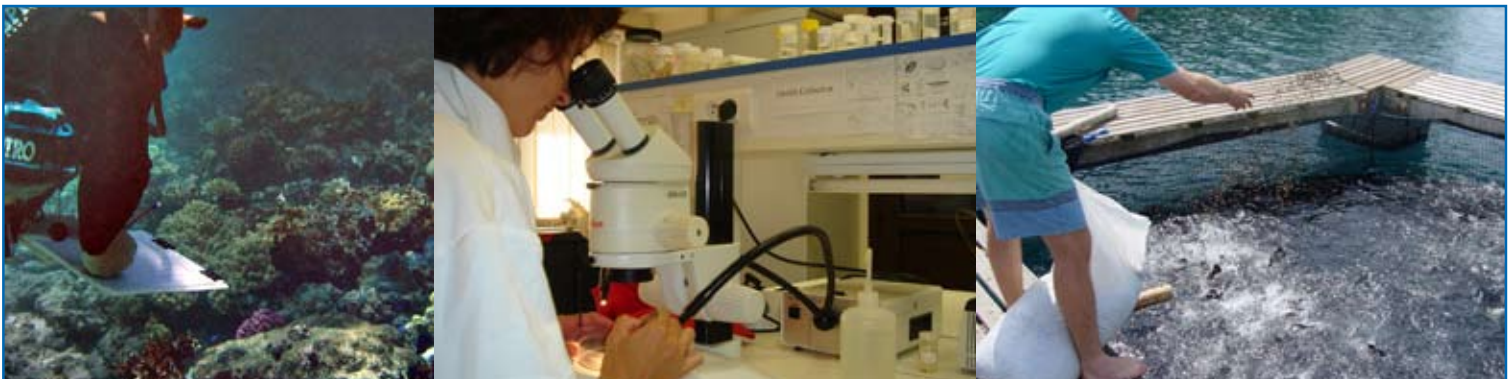


Aquatic biosecurity



Aquatic biosecurity is a system of procedures for dealing with the risks of diseases, pests and other hazards (such as genetic pollution) in aquatic environments. In the Pacific region, the main aims of aquatic biosecurity are to safeguard human health, the environment, and national economies.

Good biosecurity requires a holistic and proactive approach. This requires proper quarantine services to prevent the introduction of invasive species, adequate disease surveillance to detect and control disease outbreaks, and food quality control systems to protect the health of people who eat of fish products.

Pacific Island country and territories (PICTs) have an obligation to maintain biosecurity through their commitments to international agreements such as the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the United Nation's Convention on Biological Diversity (CBD).

What does biosecurity involve?

Implementing an effective aquatic biosecurity programme in the Pacific will require unprecedented cooperation between the region's quarantine, environment, fisheries and aquaculture authorities to:

- assess, manage and communicate the potential and real risks that imports pose to human health, the environment, and national economies;
- control national borders to prevent or manage risks associated with the entry of potential hazards through imports or other means;
- monitor and report the biological status of each PICT, in terms of existing species, pests and diseases, to enable significant changes to be identified and appropriate responses to be made.

What are the benefits?

There are many examples of the economic and social benefits of having effective aquatic biosecurity in place, and the potentially disastrous consequences of neglecting this responsibility. The benefits for PICTs include the ability to:

- protect the health and biodiversity of their aquatic ecosystems;
- facilitate development of potential new aquatic production systems;

Protecting our endemic biodiversity from invasive species





The multi-coloured *Lentipes venustus* fish has only recently been discovered in the Milne Bay islands of Papua New Guinea. This unique fish is vulnerable to extinction from invasive species such as the Mozambique tilapia.

- maintain the sustainability of food resources and export industries;
- strengthen their capacity to engage in fair trading practices;
- protect, and capitalise on, the Pacific's reputation as a pristine environment.

Pacific biosecurity challenges

- Lack of technical capacity and resources to conduct appropriate risk analyses;
- Inadequate information on natural biodiversity, disease status and hazards at the national and regional level;
- Lack of resources and trained personnel to conduct border control, surveillance and response activities;
- Need for updated legislation and clear policies relating to biosecurity, to ensure effective enforcement and better inter-agency coordination;
- Need for political commitment to the core values of biosecurity.

Examples of aquatic biosecurity in the Pacific region



Pests			
Biosecurity issue	Benefits	Biosecurity hazards	Examples of risk mitigation options
 <p>Mozambique tilapia</p>	Community-level fish farming for food security.	<p>Indigenous freshwater fish (including traditional food fish) are now under threat where tilapia have established in the wild.</p> <p>Mozambique tilapia is widespread among PICTs, but considered much less suitable for farming than another species, the Nile tilapia.</p>	<p>Do not allow further spread of tilapia to islands or catchments where they have not yet been introduced.</p> <p>Where Mozambique tilapia cannot be eradicated and food fish are in demand, consider introducing Nile tilapia for use in well-managed and sustainable aquaculture projects.</p>
 <p>Kappaphycus seaweed</p>	<p>Cash crop suitable for marginalised communities in outer islands.</p> <p>Up to 2000 tonnes of dry product is exported from the Pacific.</p>	Other species can 'hitch-hike' on imported seaweed plants, and may become pests.	Hold incoming stocks in closed tanks to eliminate the risk of introducing 'hitch-hikers' directly into the wild.

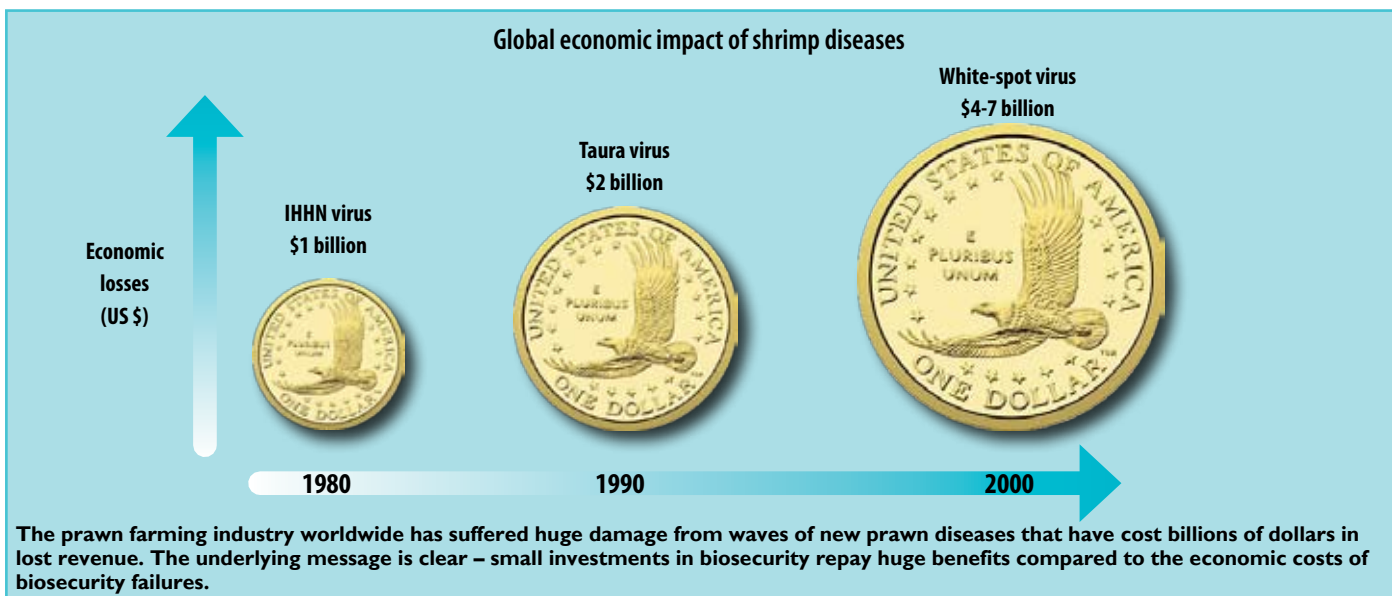



Increasingly stringent trade standards

The Pacific is a major exporter of live ornamental fish and invertebrates, which contribute to the income of hundreds of households in the region. Strict new regulations passed by the European Commission require shipments into Europe to be accompanied by an animal health certificate. Failure to meet these obligations will put the future of livelihoods from the ornamental trade at risk.



Diseases			
Biosecurity issue	Benefits	Biosecurity hazards	Examples of risk mitigation options
 <p>Marine shrimp (penaeid 'prawn')</p>	<p>Scope for lucrative export industries, and import substitution.</p> <p>Production and export of high-quality shrimp is New Caledonia's largest agro-industry (USD 20 million/year).</p>	<p>Several 'killer' viruses that affect shrimp have caused severe economic losses globally (see box below). Most PICTs are free of these diseases but must remain vigilant.</p> <p>Lack of local broodstock or hatchery capacity causes pressure to import live adults for breeding, or live larvae for stocking.</p> <p>Insufficient local shrimp production causes pressure to import whole, uncooked, frozen shrimp from countries that have shrimp viruses (not killed by freezing).</p>	<p>Develop domestic shrimp breeding programmes to avoid having to import live animals.</p> <p>Limit the import of uncooked, head-on, frozen shrimp that if discarded could introduce viruses into the natural environment.</p>
 <p>Black pearl</p>	<p>With its large and lucrative export market, pearl farming has benefits for both urban and rural people.</p> <p>Pearls make up the second largest economic sector in French Polynesia, with exports exceeding USD 150 million/year. Production is expanding elsewhere in the Pacific.</p>	<p>In Japan, akoya virus (introduced through imported live oysters) caused 80% mortality and the collapse of what was the world's largest pearl industry.</p> <p>The Cook Islands suffered a pearl disease outbreak, which led to the demise of the industry and, overall, cost the country around NZD 100 million dollars in lost gross revenue.</p>	<p>Prevent the import of live oysters, molluscs or used aquaculture material that could carry diseases and viruses.</p> <p>Avoid trans-shipment of live pearl oysters between atolls and islands.</p>



Genetics			
Biosecurity issue	Benefits	Biosecurity hazards	Examples of risk mitigation options
 <p>Sea cucumber</p>	<p>Restocking valuable but depleted sea cucumber fisheries.</p> <p>Sea ranching as a new rural livelihood.</p>	<p>Importation of sea cucumber juveniles from overseas (e.g. from Australia) poses disease risks.</p> <p>Re-stocking using broodstock collected from other places introduces new genes into the local gene pool, and can result in 'genetic pollution' of local stocks.</p>	<p>Juveniles for re-stocking and sea ranching should be bred locally using broodstock collected from the same place as where the juveniles are to be released.</p>

Recommended policy actions

At a regional level

- Establish a regional unit as a focal point to share information and provide specialist biosecurity advice and assistance.

Within PICTs

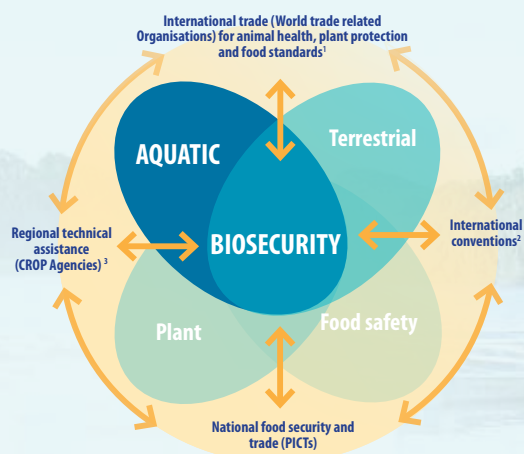
- Invest in the legislation, facilities, human resources and budgets needed to maintain effective biosecurity programmes;
- Develop effective mechanisms for coordinating aquatic biosecurity functions across fisheries, environment, veterinary and quarantine services;
- Conduct baseline surveys to contribute to regional information databases on biodiversity and hazards;
- Adopt aquatic biosecurity principles as a core component of the development and management of the fisheries and aquaculture sectors.

Technical assistance

For assistance with aquatic biosecurity, contact the SPC Coastal Fisheries Programme (cfpinfo@spc.int). For assistance with terrestrial biosecurity, contact SPC's Biosecurity and Trade Support Unit (spcbiosecurity@spc.int).

A framework for regional cooperation on biosecurity is highlighted below:

Framework for International, Regional and National Cooperation in Aquatic Biosecurity



¹Including the Codex Alimentarius Commission for Food Standards, OIE World International Organisation for Animal Health and IPPC International Plant Protection Convention.

²Including the Convention on Biological Diversity, Convention on International Trade in Endangered Species and the Cartagena Protocol on Biosafety of living modified organisms.

³Including Secretariat of the Pacific Community.

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Further reading

Aquaculture biosecurity: prevention, control, and eradication of aquatic animal disease. Scarfe, D., Lee, Cheng-sheng and O'Bryen P.J (ed.). 1st Edition. Blackwell Publishing Ltd.