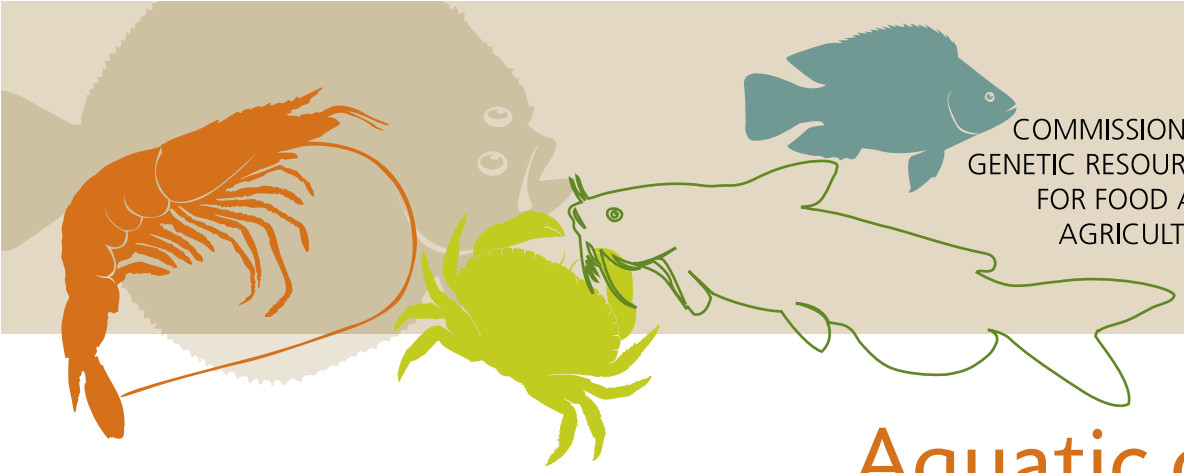


COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Aquatic diversity

UNDERWATER AND UNEXPLORED

Aquaculture and capture fisheries production make vital contributions to global food security and provide important livelihood opportunities and income for many subsistence fishing and farming families. The world's wealth of fish genetic resources provides great potential to enable the aquaculture and fisheries sector to further enhance its contribution to food security and meet future challenges in feeding a growing human population. Yet, despite estimates that an additional 40 million tonnes of fish per year will be required to meet global demand by 2030, the opportunities that fish genetic diversity has to offer remain largely unrealized and unexplored.

Capture fisheries: Maintaining aquatic biodiversity, including fish genetic diversity, in capture fisheries is fundamental to guaranteeing the productivity of fish stocks, their resilience and their adaptability to environmental change.

- Production of marine capture fisheries has increased to the extent that there is no room for further expansion, with more than 50 percent of the world's marine fish stocks fully exploited, 17 percent overexploited and 8 percent depleted or recovering from overuse.
- Production of inland water fisheries is often affected by heavy fishing but, more importantly, by the effect of environmental degradation and modification of river basins, which affect fish production potential and biodiversity. The Millennium Ecosystem Assessment found some 20 percent of the world's freshwater fish species have been listed as threatened, endangered or extinct, in just the last few decades.

A blue revolution in the twenty-first century

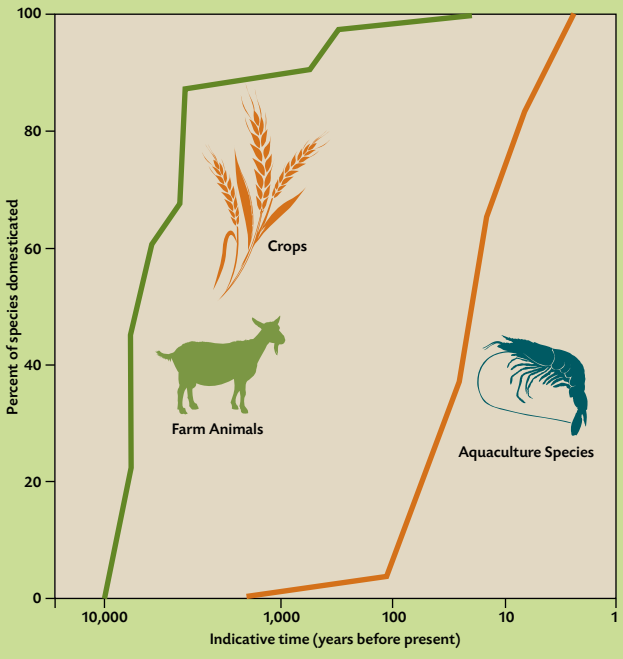
Although humans began to domesticate plants and animals for use in agriculture about 12,000 years ago, more than 90 percent of aquatic species presently in culture have only been domesticated since the beginning of the twentieth century. FAO estimates that 236 species of fish and aquatic invertebrates and plants are farmed around the world, many only domesticated in the last 25 years.

Domestication of additional species and genetic improvement will assist efforts to increase production and productivity and improve fish nutritional value, resistance to disease and ability to adapt to adverse conditions.

However, capitalizing fully on the enormous potential of fish genetic resources also requires recognizing and overcoming:

- the current lack of information regarding the genetic characterization, performance, location, threats and accessibility of fish genetic resources;
- inadequate national fish genetic resources programmes and information systems; and
- the lack of a global policy and management approach to fish genetic resources.

The challenge is to maintain a broad genetic base for the future, not just focus on improving a limited number of commercially viable fish strains.



The aquatic chicken

EXPANDING ACCESS TO IMPROVED TILAPIA

Nile tilapia, often called the "aquatic chicken" because it grows so easily, is a freshwater fish indigenous to Africa. In the early 1990s, several specimens were exported from Egypt, Ghana, Kenya and Senegal to Asia, beginning a highly successful breeding programme that resulted in improved fish stock with increased production, resulting in improved diets and enhanced income generation and employment in several countries. Understandably, African countries want access to the improved tilapia strains. However, there is a risk. If the new strains of tilapia escape from African fish farms into the wild, they could displace or cross-breed with the native tilapia. Comprehensive risk assessments will be required for each potential re-introduction that will both take into account the risk of genetic erosion in the centers of origin for tilapia, and potential opportunities to enhance income, employment and food security among low income African fish farmers.

Aquaculture: The contribution of aquaculture to world food fish production soared from 3.9 percent in 1970 to about 48 percent in 2006, with growth expected to continue. Aquatic genetic resources are of pivotal importance for the further genetic improvement of fish strains, to achieve sustainable development of aquaculture.

Aquatic ecosystems: Rising temperatures associated with climate change are threatening low-lying coastal areas of both island and mainland nations, affecting species distribution and creating conditions that are conducive to the introduction and spread of invasive alien species and the resulting loss of aquatic biodiversity, which will have potentially negative impacts on the type and size of catches.

AQUATIC GENETIC DIVERSITY

The need for conservation and responsible use

Collection of fish genetic resources has taken on a sense of urgency that reflects the pressures on the earth's aquatic ecosystems and habitats. The process of conserving fish genetic resources is challenging, complicated and often expensive. Efforts are increasing, but gene banking of fish genetic resources is still at an early stage.

There are many potential strategies for the sustainable management of aquatic genetic resources. The FAO Code of Conduct for Responsible Fisheries promotes the conservation of aquatic genetic diversity, maintaining the integrity of aquatic communities and ecosystems, and responsible use of living aquatic resources at all levels, including the genetic level. Ecosystem approaches to the development of responsible aquaculture and capture fisheries also emphasize management of fish genetic resources. FAO has a long tradition of using an ecosystem approach in fisheries and, in 2007, published Technical Guidelines on Genetic Resource Management to support the Code of Conduct for Responsible Fisheries.

THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Taking steps to identify and sustain aquatic genetic resources

The Commission on Genetic Resources for Food and Agriculture considered the issue of managing aquatic genetic diversity for the first time in 2007, calling upon its Members to initiate steps to determine the current state of the world's aquatic genetic resources. Initial results have found that valuable information that has the potential to contribute to improved management of fish genetic resources is scattered, kept in diverse assortment of incompatible formats, neither readily accessible nor archived in a secured manner.

Recognizing the urgency of the situation, and as a first step toward compiling the first State of the World's Aquatic Genetic Resources for 2013, the Commission has launched a review of existing information systems, and will work to develop a more streamlined reporting system for national and international organizations. With the number of farmed fish strains, hybrids and other genetic resources increasing in aquaculture, information systems are needed to identify and determine their relative contributions to farmed fish production. Similarly, better information on the genetics of wild fish populations should contribute to better understanding the needs for conservation and sustainable use.

In addition, the Commission will identify and develop cooperative action and partnerships, which together with an enabling policy environment, will support the maintenance and conservation of a broad genetic base in aquaculture and capture fisheries. This will include working in cooperation with FAO's Committee on Fisheries to expand upon the elements of the Code of Conduct for Responsible Fisheries that target the conservation and sustainable use of aquatic genetic resources.

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