

Preface

Africa's population has grown from 200 million to 500 million in 30 years and is projected to grow to 2 billion by 2050. With the rapid increase in population growth, the region has been the focus of great concerns for food security. Per capita food availability remains the lowest, at an average of 2 100 kilocalories per day. Over 200 million people suffer from chronic malnutrition. It is projected that at current levels of consumption, without allowing for additional imports of food, Africa would have to increase food production by 300 per cent to provide minimally adequate diets for 2 billion people by 2050.

The majority of African populations have traditionally relied on fish, derived mainly from capture fisheries, as the primary source of animal protein in their diet. Fish represented more than 50 per cent of animal protein consumed by developing countries during the mid-1990s and some African countries fall into this category. However, for Africa as a whole, fish availability has declined, and in some countries (for example Ghana, Liberia, and Malawi), the average diet contained less fish protein in the 1990s than it did during the 1970s. Fish catches from the wild are declining due to land and catchments degradation brought about by the rapid increase in population and human activities and over-fishing. Under this situation, a growing number of African farmers consider aquaculture as an option for improving food production and farm income.

Unlike in Asia, aquaculture in Africa has only been slightly exploited to meet the needs of the growing population. The total aquaculture production in Africa in 2000 was estimated at 392 213 t and contributed only about 1.1 per cent of the global aquaculture production. Tilapia accounts for about 40 per cent of aquaculture production in the region. To realize the potential for aquaculture to contribute to food security and compensate for the low growth of capture fisheries, productivity in African aquaculture needs to be increased, made more efficient, and sustainable. Hence, a growing number of African nations are examining ways to achieve this. While there is room for increasing aquaculture production through better farm management, the increases in production needed to meet the demand will require the use of genetically improved and/or better fish breeds, as has been the case in crops and livestock.

Genetic improvement of tropical fish has recently begun to help increase productivity from aquaculture and enhance benefits to the farming community. Studies undertaken in Asia have clearly indicated that production from aquaculture operations in tropical countries could be substantially increased through selective breeding of major aquaculture species. Recognizing the potential of this, efforts are now underway in various parts of Africa to domesticate new species for aquaculture and improve fish production through genetic enhancement.

Africa is the world's repository of diverse freshwater fish fauna and home to native tilapias. The region has 7 502 freshwater fish species distributed in natural water bodies of 48 countries. It also boasts of large natural and man-made lakes, which are important fish and conservation areas. Lake Nyasa, for example has the highest species diversity of any lake in the world, while Lake Tanganyika has a greater diversity of fish families and, in terms of genetic diversity, is the richer lake.

Genetically improved fish developed through selective breeding and other genetic improvement technologies have been projected to bring socio-economic benefits, especially to poor farmers. However, despite these benefits, there might be risks associated with intentional and non-intentional introductions of the improved fish into natural waters. Hence, while there is an urgent need to enhance fish production by developing improved fish breeds, it is also imperative that valuable genetic resources and biodiversity are conserved and protected.

In view of this, African scientists and international organizations involved in aquaculture development and biodiversity conservation felt that guidelines that will help foster the development of aquaculture while maintaining biodiversity and sustaining capture fisheries were necessary.

Bringing awareness among African institutions, agencies, planners of the issues involved in improving production through the introduction of improved breeds and alien species while sustaining biodiversity is the first crucial step in this process. In view of this, the WorldFish Center in collaboration with the Technical Center for Agriculture and Rural Cooperation (CTA), the Food and Agriculture Organization of the United Nations (FAO), the World Conservation Union (IUCN), United Nations Environment Programme (UNEP) and Convention on Biological Diversity (CBD) organized an “Expert Consultation on Biosafety and Environmental Impact of Genetic Enhancement and Introduction of Improved and Alien Species in Africa” during 20-23 February 2002 in Nairobi, Kenya, to bring together fishery and conservation experts, resource managers, geneticists and policy-makers from African countries (Cameroon, Cote d’Ivoire, Ghana, Kenya, Malawi, Nigeria, South Africa, Tanzania, Uganda, and Zambia), advanced scientific institutions, and regional and international organizations to discuss ways to increasing production without compromising biodiversity conservation.

This proceedings volume reviews the potential and constraints for aquaculture development in Africa, the status and potential for genetic improvement, introductions and risks of introduced improved and alien species, and tools and policies for introductions and movements of improved and alien species.

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