

Policy on the transfer of Genetically Improved Farmed Tilapia (GIFT) from Asia to Africa by the WorldFish Center

Preamble

The Mission of The WorldFish Center is to 'reduce poverty and hunger through improved fisheries and aquaculture'. We work to achieve this through relevant research, development and technology transfer, partnerships, capacity building and policy support. Genetic improvement by selective breeding is an area in which WorldFish has been active and successful. An improved strain of tilapia (*Oreochromis niloticus*) is one of the products the Center is especially proud of. The improved strain is called GIFT, an appealing acronym for Genetically Improved Farmed Tilapia. Consistent with our mandate of reducing poverty and hunger WorldFish believes that we should make such improved strains available to the Governments of those partner countries likely to benefit from growing a more productive tilapia strain. We have shared GIFT widely in Asia, but not to Africa despite the interest expressed by several countries. The decision to not distribute GIFT in Africa so far has been based on the wish to avoid harming valuable genetic diversity in centers of origin of tilapia species. Genetic diversity may be harmed if escaped GIFT fish successfully interbreed with wild tilapia. The natural diversity is important because it helps to sustain natural populations over time and it provides a source of genetic diversity for future selective breeding programmes.

Definitions

The term fish is used in a broad sense, to include invertebrate as well as vertebrate aquatic animals.

Allele An alternative form of a gene (one member of a pair) that is located at a specific position on a specific chromosome. For example, the gene for color (albino or normal) in some fish exists in two forms, one form or allele for normal color (A) and the other for albino (a).

Center of Origin is the geographical native range of a species, containing wild populations with unique alleles that are important genetic resources for future genetic improvement, as well as for long-term persistence of the wild populations.

Gene frequency is a measure of the relative frequency of an allele at a genetic locus in a population. It is expressed as a proportion or a percentage.

Introgression is the incorporation of genes of one species or population into the gene pool of another by backcrossing of fertile hybrids with either parent species or population. For instance, escaped GIFT adults mating with native, wild *O. niloticus* adults would produce fertile hybrids, which could then backcross with more wild *O. niloticus* adults.

Selection is the choice of animals for use as parents.

Selective breeding is the process whereby parents are selected on the basis of one or more criteria, usually related to greater productivity.

Policy objective:

This Policy is designed to help ensure that the results of our research and development of GIFT contribute directly towards poverty alleviation and reducing hunger among the poor in African countries. It also outlines steps that will help ensure that while benefiting the poor, countries transfer, multiply and disseminate fish in an environmentally responsible manner. Action should be consistent with the FAO Code of Conduct for Responsible Fisheries¹ and the Nairobi Declaration on 'Conservation of aquatic biodiversity and use of genetically improved and alien species for aquaculture in Africa' and the Dhaka Declaration on 'Ecological risk assessment of genetically improved fish'.

Guiding Principles

- Genetic principles. The gene frequencies of the alleles favored by the selection programme will be different in the improved strains developed by selective breeding, from the wild, unimproved populations. Also, when selective breeding incorporates multiple sources of germplasm, the improved strains will have new alleles and may lose rare alleles present in local, wild populations. Both kinds of genetic change will happen whether the improved strain is developed in Africa, or in Asia and later transferred to Africa. Hence, the genetic risks posed by introducing GIFT to genetic resources in centers of origin in Africa are comparable to those posed by the local development of an improved strain.
- Environmental principles. The transfer, multiplication and dissemination of improved fish strains should be done in a way that minimizes the impact on the environment and on other fish populations.
- Social and humanitarian principles. WorldFish shall try to ensure that, wherever possible, poor farmers in developing countries capture the potential benefits from its research and development endeavors. In particular, it should be responsive to Government requests from such countries.

¹see <http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm>.

Policy:

1. WorldFish will make GIFT available to a government institution, provided the request comes from government, and if the request made to WorldFish meets the following conditions:
 - It has the approval of the relevant government authority of the country in question.
 - There is a well-defined strategy to maintain and disseminate the GIFT.
 - A government approved environmental risk assessment has been completed.
 - There is a clear plan for the management of environmental and biodiversity risks.
2. WorldFish will offer its services to oversee and provide advice on how to set up and maintain the GIFT stock, as well as to multiply and disseminate to farmers.
3. WorldFish will encourage, and help with, if necessary, the conduct of properly designed comparisons of GIFT with relevant local strains to evaluate the productivity advantage in favor of GIFT. WorldFish will also help with the conduct of properly designed genetic, environmental and disease risk assessments, as resources allow.
4. WorldFish's decision to support the transfer of GIFT to Africa is based on a commitment to link improving human well-being with conserving valuable aquatic biodiversity. This latter issue is becoming a high priority research and development area in the presence of a more active dissemination strategy of improved fish strains.
5. On request, and subject to resource availability, WorldFish will provide added support to assess, minimize and manage the risk of introgression of GIFT genes into wild populations. The accompanying document entitled 'Code of practice and manual of procedures for the introduction of GIFT to Africa' describes such measures. When help is sought an agreement specifying the obligations of the relevant parties will be drawn up.