

**FAO TCP Project
Improving National Carp Seed
Production System in Nepal
-Lessons Learnt**

**Weimin Miao
Aquaculture Officer
FAO Regional Office for Asia and the Pacific
Bangkok**

Issues to be Tackled by the TCP

Poor production performance of carp due to poor genetic quality of seed resulted from:

- No national regulatory framework for fish seed production and distribution (regulation, quality control system and standards not in place)
- Poor genetic quality of carp brood stock due to genetic degradation resulted from inbreeding, crossbreeding and negative selection
- Large number (100 in 2011) hatcheries with poor hatchery/nursery management practices (aquaculture production: 36000 tons in 2013)
- Poor capacity (human and physical) for fish genetic improvement work and fish quality control system

Improving national carp seed production system in Nepal

Project duration:	Jan 2011-April 2013
Government Ministry responsible for project execution	Ministry of Agriculture and Cooperatives (MoAC)
Implementing Agency	Fisheries Development Directorate
	Nepal Agriculture Research Council
FAO Contribution	US\$ 330, 000

Output 1

A national regulatory system for managing and monitoring fish seed production in Nepal, which include registration and certification system of fish hatchery, related standard requirements and code of conduct for good hatchery management practices.

Activities

- Reviewing the existing regulations and management system for aquaculture fish seed production in Nepal;
- Developing proper national legislative regulations for management of fish seed production and distribution and technical protocol for good management practices of fish hatchery;
- Setting up implementable certification and registration scheme for fish hatchery and nursery;

Output 2

A framework of well-structured national fish seed production system with clearly defined functions and adoption of good management practices, which includes nucleus hatcheries for development and management of broodstock of major cultured carp species, breeding hatcheries for mass propagation of different carp and other cultured species and nursery farms for production of high quality fingerling and supplying to the fish farmer.

Activities

- Evaluation of existing government and private hatcheries involved in carp seed production;
- Setting up the general structure of sector which can meet the need of aquaculture development for the next 10-20 years; selection of qualified hatcheries for being included in the new system for different functions;
- Improving their technical and managerial capability;
- Improvement of physical capability of nuclear breeding centres

Output 3

Improved genetic quality of broodstock of major cultured carp species through introduction and adoption of applicable technologies for good broodstock management and breeding program and possible introduction of germplasm of carp strains with good genetic quality

Activities:

- Demonstrative activities of genetic improvement of existing carp stocks at nuclear breeding centres
- Introduction of good/improved carp strains from natural/abroad
- Farm test of carp seed produced from improved hatchery practices

PIT tags, Scanners and implanters for Stock identification



PIT tagging and scanning



Inception workshop of TCP/BGD/501, 28-30 May 2014, Dhaka

Pilot selective breeding of common carp



Inception workshop of TCP/BGD/3501, 28-30 May 2014, Dhaka

Output 4

Capable human resource base in the field of fish seed production, genetic improvement of broodstock, good hatchery and nursery operations at different levels in the country.

Activities:

- Training workshop for government officials and professionals on fish seed production regulation and fish genetic improvement technologies
- Training workshop for hatchery/nursery operators and staff on good hatchery/nursery management.
- Short overseas training of key technical staff involved in project implementation on fish selective breeding technologies
- Demonstration and hands on training on methodology of molecular genetic study and Cryopreservation

- **Practical Training on molecular genetic analysis**



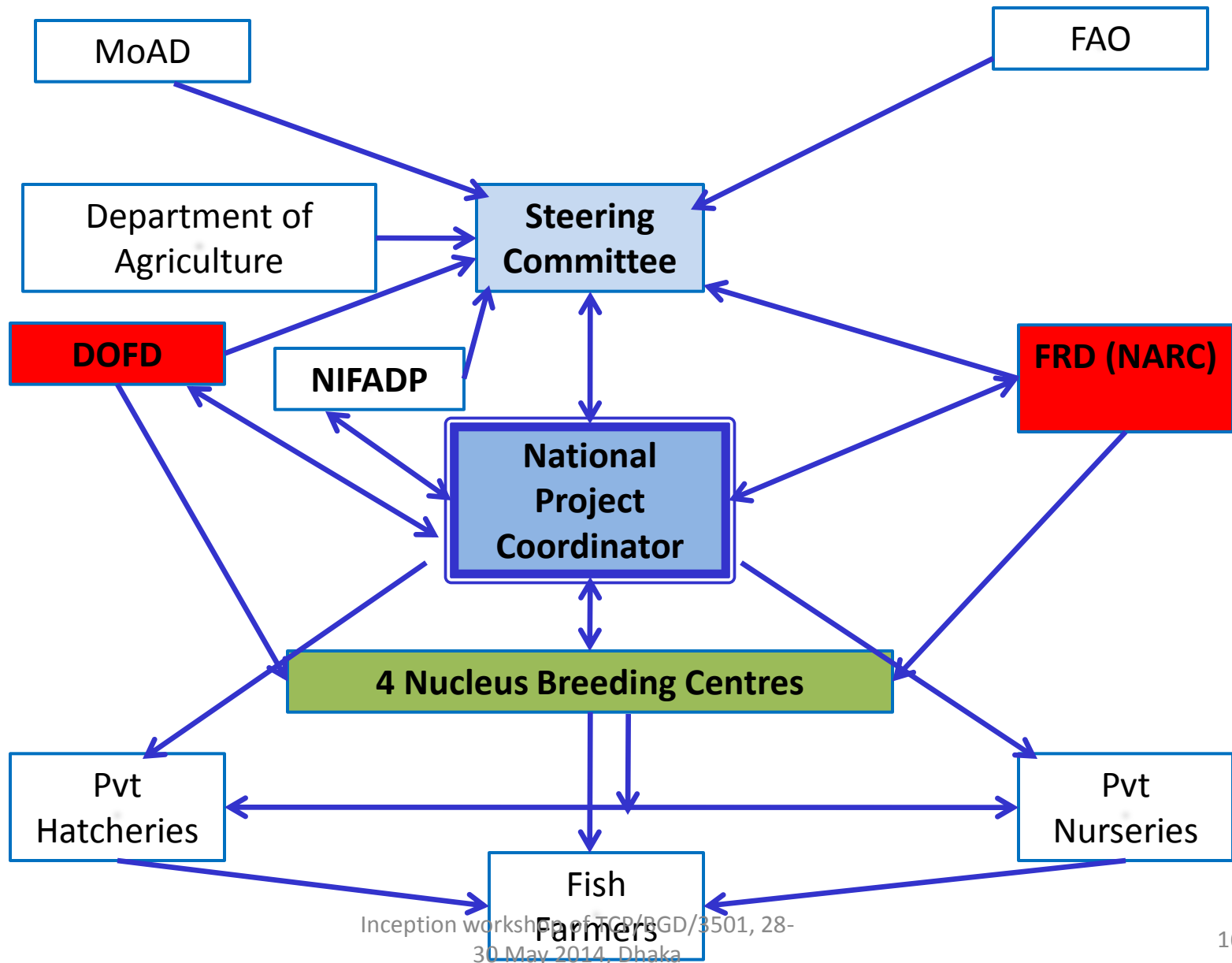
Training on Chinese carp hatchery/Nursery management



Practical training on use of cryo-milt for stock improvement



Institutional Arrangements



Major Achievements of the Project

- Drafted Fish seed act and Regulation
- Prepared best management practices for fish hatcheries and nurseries operation
- Formulated code of conduct for hatcheries and nurseries operation
- Mandatory registration and seed certification?
- Recommended the new structure of national fish seed production program
- drafted a national carp breeding program

Major Achievements of the Project

- Introduction of pure original strains of 5 carp species from China and India, material base for future broodstock improvement and breeding program
- Initiation of genetic improvement program of carps with new selective breeding methodology
- Establishment of Molecular and cryopreservation lab
- Human capacity building in the field of genetics and seed production, training on breeding technologies, good hatchery practices, fish molecular genetic analysis, etc, over 100 participants in 8 training activities

Major gaps in achieving the targets

- Pilot selective breeding program could be implemented following the program designed by consultants
- No farm test of fish seed produced through improved hatchery practices;
- Introduced pure carp strains are not well maintained;
- Condition of nuclear breeding centres not significantly improved
- Fish seed quality control system and new national fish seed breeding, production and distribution system exist on paper only

Problems

- Some project targets were not realistic
- Institutions involved in the project implementation not fully committed
- The identified nuclear breeding centers is poor in human capacity and the new function not institutionalized
- The identified nuclear breeding centers have poor infrastructure, facilities and equipment
- FAO contribution not best used to improve the condition of nuclear centres (total \$ 5000 only)
- Lack of needed financial and other support from the government

Questions?

- What is the situation with our project?
 - Targets?
 - Conditions?
- How to effectively deliver the project outputs and achieve the overall project objective?