



**Regional Technical Meeting**  
on  
**Fisheries Resource Enhancement in Southeast Asia**

*Bangkok, Thailand, 24-26 April 2018*





# Regional Technical Meeting on Fisheries Resource Enhancement in Southeast Asia

*Bangkok, Thailand, 24-26 April 2018*



## **AGENDA 3.1**

# **Laos: Fisheries Resource Enhancement (1)**



# A Lao Perspective on Freshwater Fisheries Enhancement: Challenges and Opportunities



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# Outline

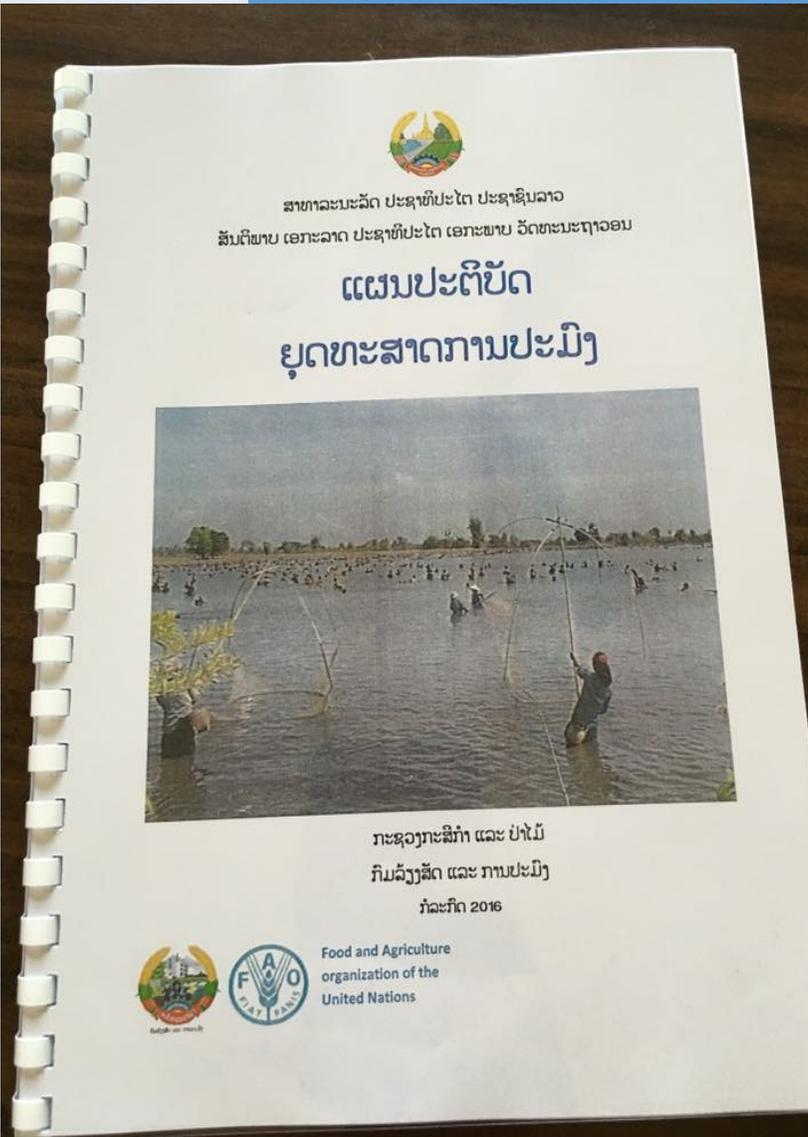


1. **Basic fisheries strategy**
2. **Fisheries enhancement**
3. **Conservation zones**
4. **Fish passage**



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# Strategic Implementation Plan (2016-2020)



## Three priority areas:

- 1) Fishery production for food security;
- 2) Fishery production for commodity and trade;
- 3) Sustainable fisheries mant. & devlpt. with focus on CC adaptation.

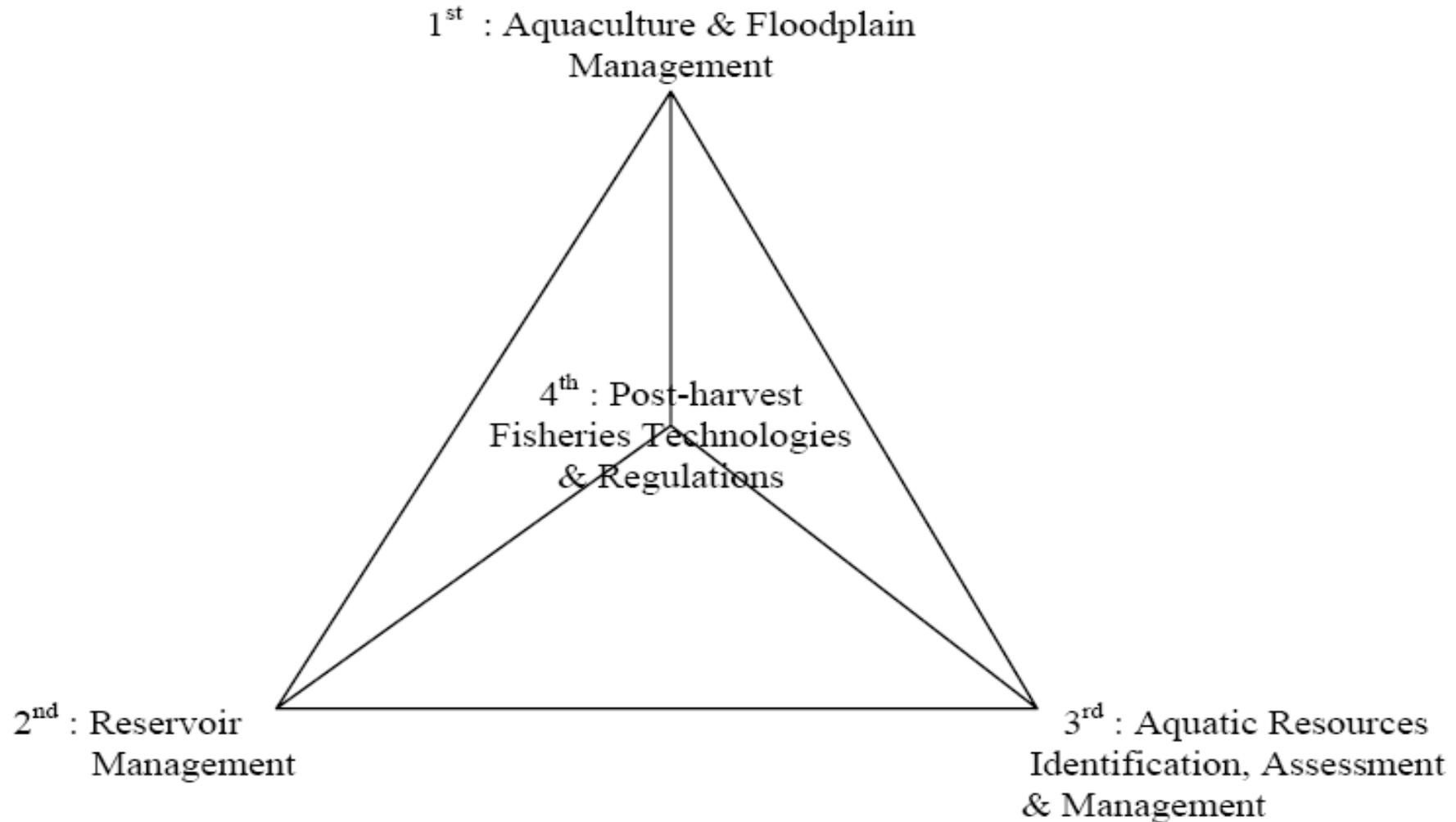
## Eight priority programs:

- 1) Zoning for fishery mnt. & devlpt;
- 2) Increasing aquaculture productivity;
- 3) Sustainable fishery management and CC adaptation;
- 4) Fishery research;
- 5) Fishery extension and services;
- 6) Basic infrastructure improvement;
- 7) Human resources development;
- 8) Monitoring and evaluation.



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# National Strategy for Fisheries Management and Development from present to 2020





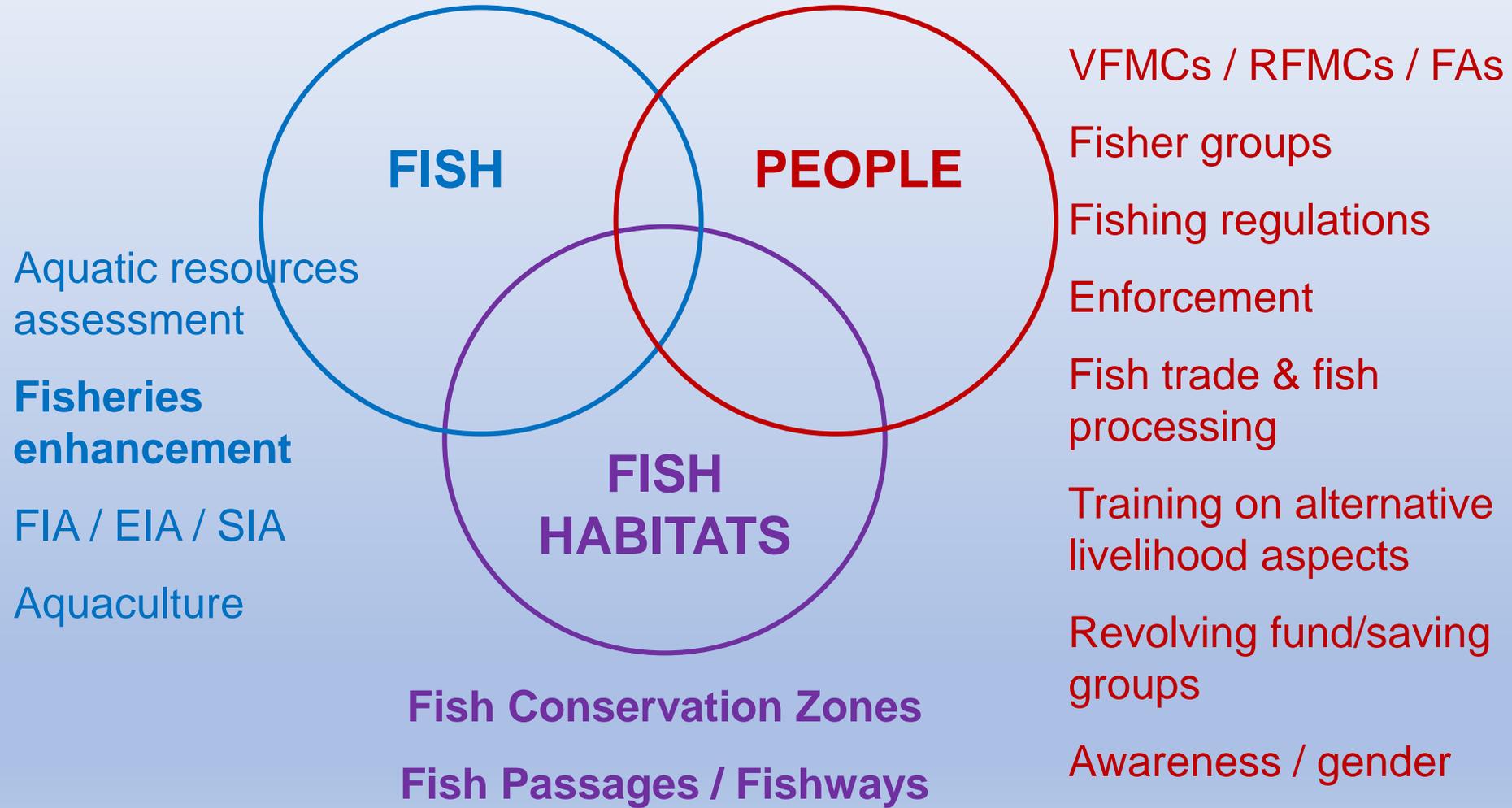
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## Problems and Challenges

- Food security and poverty reduction;
- Increasing population > consumption demand > illegal fishing / overfishing / destruction of fish habitats > declining fishery;
- Limited Govt. capacity for fishery management;
- Increasing aquaculture, but need more effective research and development, and management;
- External factors: deforestation, land erosion, land use changes, loss of wetlands, urbanization, water pollution, impacts from climate change (drought and floods, natural disasters), etc.
- Impacts from other development sectors: e.g. Hydropower, mining, irrigation, agriculture, industry, water use, navigation, infrastructure development.



# Approach to Fisheries Management and Development in Lao PDR



**How To Create Balance Between: Fish, Fish Habitats and People?**



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# Fish stock enhancement practices

1. Cascade rice field (the mountainous area in the north)
  - Brood fish stocked at the beginning of wet season
  - Main fish species used is exotic *Cyprinus carpio*
  - Fish eggs left in the rice field while the brood fish are removed
  - Before rice harvesting (6-7 months after spawning), all of fish are removed from the rice field
  - Managed by local people





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# Fish stock enhancement practices

## 2. Rice cum fish (the lowland rice field area in the middle)

- Preferred fish species: *Barbonymus gonionotus*
- Fish seed are available from the central and provincial fisheries stations, and private sector
- Managed by local people

## 3. Culture-based fisheries (close water bodies in middle and south)

- Preferred fish species: *Barbonymus gonionotus*, *Anabus testudineus* and *Oreochromis niloticus*
- Fish seed available from the central and provincial fisheries stations, and private sector
- Managed by DLF and villager communities



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## Fish stock enhancement practices

### 4. Fish stock enhancement in the natural water bodies

- Reservoirs, natural ponds, swamps, community pond, rivers/tributaries,
- The big event for fish stocking is the national fish release day (13<sup>th</sup> July)
- Preferred species: 7 indigenous fish species and 7 exotic fish species
- Exotic fish species must be released in enclosed water bodies
- Source of fish seed: government fisheries stations and private hatcheries
- Managed by DLF, No. of released fish: 45 million (DLF, 2017, **10%** )

# Fish species used for re-stocking in Lao PDR

**Exotic fish species  
(re-stocking in enclosed water bodies)**

No	Scientific names
1	<i>Aristichthys nobilis</i>
2	<i>Hypophthalmichthys molitrix</i>
3	<i>Ctenopharyngodon idella</i>
4	<i>Cirrhinus mrigala</i>
5	<i>Oreochromis niloticus</i>
6	<i>Labeo rohita</i>
7	<i>Cyprinus carpio</i>

**Indigenous fish species  
(re-stocking in open & enclosed water bodies)**

No	Scientific names
1	<i>Clarias macrocephalus</i>
2	<i>Puntioplites falcifer</i>
3	<i>Cirrhinus microlepis</i>
4	<i>Cirrhinus molitorella</i>
5	<i>Morulus chrysophekadion</i>
6	<i>Osphronemus exodon</i>
7	<i>Barbodes gonionotus</i>



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# Fish stock enhancement practices

## Constraints and challenges

- No baseline data for each type of water body
- Technical constraints: technical staff at all levels (central, provincial, district) need to be trained
- Lack of fish seed supply in the rural areas
- Local authorities/users need to be involved
- Financial constraints: sources of funding to cover stocking expenditures



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## Fish stock enhancement practices

- Need for inventory of water bodies having potential for fisheries management and development, i.e. reservoirs (hydropower and irrigation), natural ponds, wetlands, etc.;
- Need to conduct inventory of indigenous fish species and other aquatic animals (and aquatic plants?);
- Need to study biology and ecology of important / critical fish species (i.e. migratory, endangered spp.);
- Need to study river morphology and hydrology – e.g. models on relationship b/w hydrology and fisheries, etc;
- Other necessary studies? (e.g. fishery socio-economic, fishery management, fishery impact assessment, fishery monitoring, mitigation measures/techniques, etc.);
- Better fisheries data/information for design of fish passages.



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# Fish Conservation Zones



Location of Fish Conservation Zones (FCZs) established by DLF with support from the Community Fisheries Project (ComFish/WWF) for the period from 2004-2015

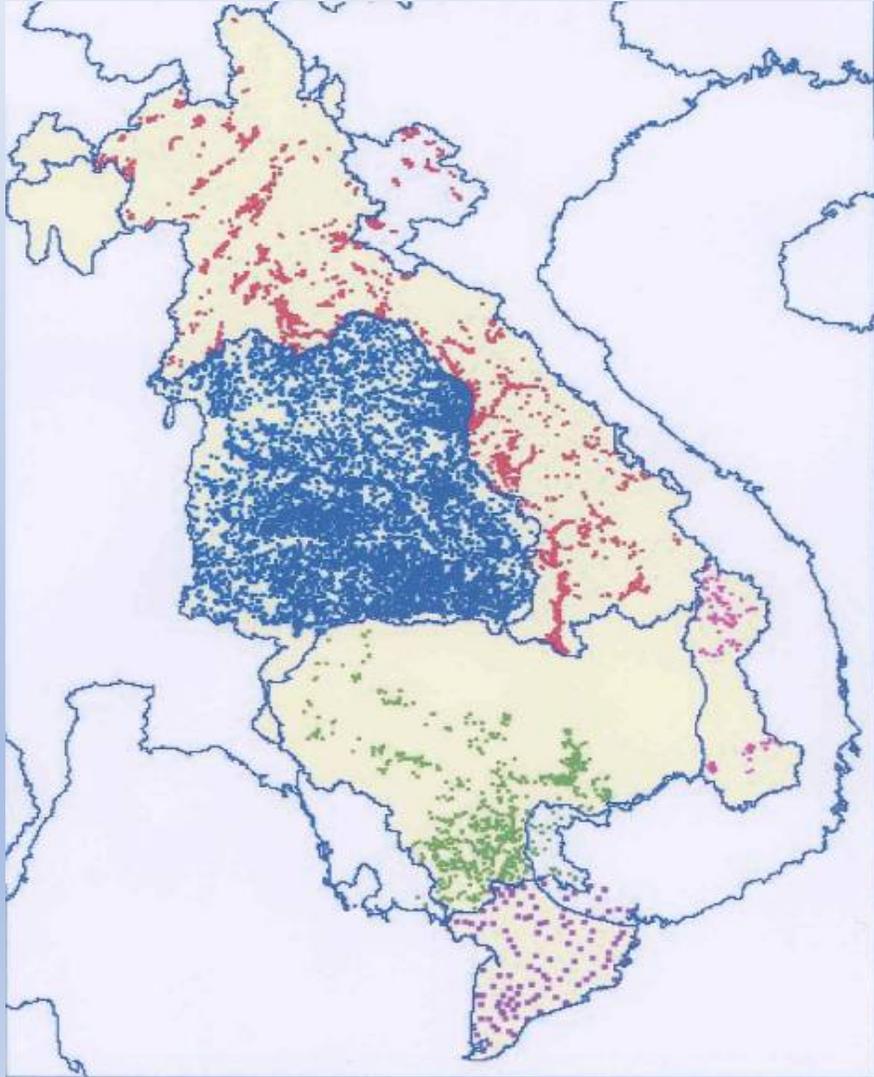
- 234 FCZs
  - 7 provinces (Bokeo, Bolikhamxay, Khammouane, Savannakhet, Champasak, Sekong, Attapeu)
- Remark: >1,000 FCZs for the whole country.

Presently – 800 FCZ (483 are registered)



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# Fish passage enhancement



## The problem?

- Thousands of migration barriers throughout Lower Mekong Basin
- No specific fishway design to inform construction for Mekong species



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# Fish passage enhancement

Problem: fish are actively migrating all year round and floodplain habitats disconnected



# Typical barriers





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# Fish passage enhancement

## 4 designs assessed so far.....



Cone fishway



Vertical slot fishway



Submerged orifice fishway



Rock ramp fishway



## Fish passage enhancement

### **Achievements so far.....**

1. Performed biological assessments of four fishway designs
2. Raised awareness of fish passage issues at floodplain regulators
3. Results accepted by international scientists
4. Fishway design criteria is now being based on swimming ability of Mekong species....very important step!



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## Fish passage enhancement

- Cone fish pass design considered most appropriate
- The design based on experiments in the Mekong Project management by NUOL and LARReC
- Demonstrated that fishways can be designed for local species and constructed by local staff. The result will be continued rice production as well as fish returning to the wetland





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# Fish passage enhancement



Fish Passage at Papeun Reservoir, Paksan district, Boilkhamxay Province





# Fish passage enhancement

## Fish Passage at Sui Reservoir, Savannakhet Province





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