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Development of a comprehensive fish passage approach for floodplains of the lower mekong basin

Oudom Phonekhampheng  
*National University of Laos, Vientiane*

Douangkham Singhanouvong  
*National University of Laos, Vientiane*

Lee Baumgartner  
*National University of Laos, Vientiane*

Tim Marsden  
*National University of Laos, Vientiane*

Garry Thorncraft  
*National University of Laos, Vientiane*

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Oudom Phonekhampheng, Douangkham Singhanouvong, Garry Thorncraft, Lee Baumgartner, Tim Marsden, Craig Boys

International Conference on River Connectivity (Fish Passage 2018)
Albury, Australia
Many fish species (over 850 species).....need to consider them all
Social Importance of fish

LMB – approx 2.2 million tonnes per annum
About 2% of total world fish catch

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<thead>
<tr>
<th></th>
<th>Fish</th>
<th>Beef</th>
<th>Pork</th>
<th>Chicken</th>
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<tbody>
<tr>
<td>Lao PDR</td>
<td>29 kg/person/year</td>
<td>5 kg/person/year</td>
<td>6 kg/person/year</td>
<td>5 kg/person/year</td>
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<td>(48% animal protein)</td>
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<tr>
<td>Cambodia</td>
<td>37 kg/person/year</td>
<td>2 kg/person/year</td>
<td>3 kg/person/year</td>
<td>2 kg/person/year</td>
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<tr>
<td>(79% animal protein)</td>
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The problem

Thousands of migration barriers Throughout the Lower Mekong Basin

Creating severe declines in commercial and sustenance Fisheries on floodplains
The problem
Four stage project

Scope/research

Construct/Assess

Downstream
Stage 1. GIS mapping of existing infrastructure
Team inspections
Ranking process
Stage 2. Research effective mitigation options
Study Site
Research different design aspects
Different designs
Different designs
Stage 3. Construct a permanent fishway at the experimental site
Pak Peung Demonstration Fishway
Stage 4. Return to the Mekong
To return to the Mekong fish must leave the wetland through undershot gates.
Fish welfare

- Pilot experiments in Australia and Laos PDR show that more fish are injured or killed by undershot weirs than overshot weirs – BUT why were fish impacted?
Undershot fish mortality

- Nongteng pilot experiments
Installation and testing of overshot Layflat gates

• ‘Fish-friendly’ overshot Layflat gates have successfully replaced undershot gates at over 50 sites in Australia;
• Experimental Layflat gate retro-fitted upstream of existing gates at Pak Peungn (demonstration site)
Understanding how fish are injured - pressure
Understanding how fish are injured - shear

Fish Delivered through tube

Pump generates high nozzle velocity

High velocity at nozzle to generate shear

Fish collected here
Wider uptake by other stakeholders

- District, Provincial and National government agencies visiting demonstration sites, receiving briefings and exposed to social media interest
- Development agencies (ADB and WB) including fish passage mitigation in new projects (Northern and Southern Lao)
- But now need to demonstrate economic, social and environmental benefits – ongoing now!!
Lessons learned

- Focus on upstream fish migration is not enough
- Need conceptual models to help understand system function
- Need to work in the field with actual migrating fish is the key
- Many species of fish (over 130) were attempting lateral migrations into wetlands (white/black/grey)
- Engage and employ villagers in all aspects of work
- Demonstration sites are very effective!!
Lessons learned

• Good interaction with village/district/province/national government, but need to work on relationships with higher level policy development agencies in Lao PDR and across the region.
Acknowledgements:

National, Provincial, District and local community participants in the project – local engagement in all aspects of the work crucial to the projects success