



# Advocating Sustainable Management of Fish Conservation Zones in Lao PDR: the Case of Nam Houm Reservoir

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Nam Houm Reservoir in Lao PDR is located about 30 km north of Vientiane Municipality and is under the administrative jurisdiction of Naxaythong District of the Capital City of Vientiane. Commissioned in 1981, Nam Houm Reservoir has a total water surface area of 500 ha or 880 ha at full supply level and an average depth of about 8 m. Living in the vicinity of the Reservoir are 3,300 people in four villages with 82 registered fishers, only 50% of whom could be considered fulltime. A local fisheries management group was established by the Mekong River Commission to ensure that fisheries in Nam Houm Reservoir is managed in accordance with the Fishery Law and relevant regulations of Lao PDR. The Reservoir is used not only for irrigation but also as source of water supply as well as for navigation, fisheries, fish culture, and tourism among others. Four major inlet streams supply water to the Reservoir. A permanent fish conservation zone or FCZ has been established in the Reservoir (1,500 m from the dam) where no fishing is allowed for all types of fishing gears the whole year round.

Lao PDR is a landlocked country with a total area of 236,800 km<sup>2</sup>, and is bordered by Cambodia, China, Myanmar, Thailand, and Viet Nam. The country's fisheries activities are concentrated in reservoirs constructed in the Mekong River and its tributaries. Specifically, reservoir fisheries are small-scale inland fishing activities, and are important source of food and income for rural communities. As such, it has become imperative to manage reservoir fisheries

for sustainability so that it could continue to provide the local people with source of protein and income. Since the country's Fishery Law provides that communities have the right to manage the resources under their jurisdictions, communities have established community management systems for the actual management of small water bodies in their respective domains.

FAO (2006) reported that more than one-half of the communities in northern Lao PDR have their own systems of traditional aquatic resources management. These include the establishment of conservation zones such as deep pools in rivers where fishing activities are controlled by their own regulations; putting into effect seasonal fishing restrictions



Nam Houm Reservoir, Lao PDR

**Table 1.** Fisheries production of Lao PDR (2008-2012): volume in metric tons (MT), value in US\$1,000

Fisheries of Lao PDR	2008		2009		2010		2011		2012	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Inland capture fisheries	29,200	240,334	30,000	93,168	30,900	-	34,000	-	34,105	-
Aquaculture	64,300	91,141	75,000	111,801	82,100	-	95,600	-	101,895	-
<b>TOTAL</b>	<b>93,500</b>	<b>331,475</b>	<b>105,000</b>	<b>204,969</b>	<b>113,000</b>	<b>-</b>	<b>129,600</b>	<b>-</b>	<b>136,000</b>	<b>-</b>

Source: Fishery Statistical Bulletin of Southeast Asia 2012 (SEAFDEC, 2014)

during spawning of economically important species; and advocating the use of responsible fishing gears and practices, *e.g.* prohibiting the use of poisonous chemicals and dynamite, banning the use of destructive gears, and using only selective gears that do not capture the juveniles and migrating fish species. Nevertheless, enforcement of such schemes remains a problem considering that management of the country's natural aquatic resources by the communities is still governed by local customary regulations.

Fisheries in Lao PDR could be classified into inland capture fisheries and aquaculture. The country's statistics showed that its total fisheries production has been growing steadily during the five-year period from 2008 to 2012 (**Table 1**) at an annual average rate of 9.0% in terms of volume (SEAFDEC, 2014).

Although the country's concerned agency has been exerting efforts to compile and come up with its annual fisheries production, there is a need to examine more carefully the country's production from capture fisheries considering that production from this sub-sector is fully derived from inland fisheries. In order to address this concern, the country has been seeking assistance from various agencies and organizations for the improvement of its system of collecting and compiling fishery statistics in order that the status and trend of its fishery sector could be established (SEAFDEC, 2014).

### Inland Capture Fisheries

In 2012, the country's total production from inland capture fisheries was reported at 34,105 metric tons (MT) which accounted for about 25% of the country's total fisheries production (SEAFDEC, 2014). In its report, FAO (2006) indicated that full-time fishers are very rare in Lao PDR although most families are engaged in subsistent fishing. Commercialization of the country's fisheries is constrained by the attitude of fishers to fish, first and foremost for their own subsistence, which is coupled by the seasonal nature of fishing activities in rivers and floodplains. Nevertheless, the FAO report also indicated that most aquatic resources

in the country are heavily exploited with an average catch per unit effort of 300 g/hour of fishing.

Catch from inland capture fisheries of Lao PDR comprises numerous species (**Box 1**) but is dominated by the small fish species. It is noteworthy that the use of explosives, chemicals and electric fishing had been banned as stipulated in the country's Fishery Law, but many observers have noted that such practices are still being used in remote water areas.

### Aquaculture

The aquaculture sector in Lao PDR although growing slowly has been contributing a big portion to the country's annual total fisheries production, especially in terms of volume. During the five-year period from 2008 to 2012, the country's aquaculture production accounted for an average of about 73.0% of the country's total annual fisheries production, as shown in **Table 1**. The most common species cultured and the culture systems adopted are shown in **Box 2**. FAO (2006) reported that in addition to the most common species cultured such as tilapia and Indian carp, other species such as the indigenous silver barb (*Barbodes gonionotus*) and *Barbodes* spp. are also cultured in some highland areas. Although not intended for culture, other wild aquatic species such as snakehead, climbing gourami (*Anabas* spp.), catfish, eels, small freshwater shrimps, and other aquatic animals (OAAs), *e.g.* frog, and snails, could be harvested from ponds providing additional source of nutrition and income for rural households. The culture systems adopted by most households include pond culture, rice-fish culture in rain-fed and irrigated rice fields, and cage culture in reservoirs and river tributaries.

### Fish Utilization

Products from fish and OAAs play an important role in sustaining the source of nutrition for the people of Lao PDR contributing a large share of the people's fish consumption, and as source of income and employment of rural people. Collected mostly during the rainy season from water bodies and wetlands, many fish species could also be available

Box 1. Inland fishery resources of Lao PDR

Fish Resources			Habitat <sup>1</sup>					
Scientific Name	Family	Lao Name	MR	TR	RL	WSP	RFP	IW
<i>Akysis variegates</i>	Akysidae	Pa khao	X	X	X	X	X	X
<i>Amblyrhynchichthys truncatus</i>	Cyprinidae	Pa khao tapo	X	X	X	X	X	X
<i>A. bantamensis</i>	Babinae	Pa khao	X	X	X	X	X	X
<i>Acantopsis choirorhynchos</i>	Cobitinae	Pa it	X	X	X	-	-	-
<i>Anabas testudineus</i>	Anabantidae	Pa kheng	X	X	X	X	X	X
<i>Amphotistius laosensis</i>	Dasyatidae	Pa phahang	X	X	-	-	-	-
<i>Amyda</i> spp. (soft-shelled turtle)		Pa phaong	X	X	X	-	-	-
<i>Aaptosya grypus</i>	Cyprinidae	Pa sanak	X	X	X	-	-	-
<i>Acantopsi</i> ssp.	Cobitinae	Pa harkkoy	X	X	X	-	-	-
<i>Arius stomi</i>	Artidae	Pa khat ock soplem	X	X	X	X	X	X
<i>Achiroide</i> ssp.	Soleidae	Pa pane	X	X	X	-	-	-
<i>Annamia normani</i>	Homalopteridae	Pa thihin	X	X	X	X	-	-
<i>Barbichthys laevis</i>	Barbinae	Pa cheork	X	X	X	X	-	-
<i>Bagrarius bagrarius</i>	Sisoridae	Pa ke	X	X	X	X	-	-
<i>Botia hymenophysa</i>	Cobitinae	Pa khieokai	X	X	X	X	-	-
<i>Bagroide macropterus</i>	Bagridae	Pa kihia	X	X	X	X	-	-
<i>Bangana behri</i>	Cyprinidae	Pa vananor	X	X	X	X	-	-
<i>Barbichthys nitidus</i>	Cyprinidae	Pa vahangdam	X	X	X	X	-	-
<i>Chitala blanci</i>	Notopteridae	Pa tonkay	X	X	X	X	-	-
<i>C. ornate</i>	Notopteridae	Pa tonkquay	X	X	X	X	-	-
<i>Catlocarpio siamensis</i>	Cyprinidae	Pa khao	X	X	X	X	-	-
<i>C. enoplos</i>	Cyprinidae	Pa khao	X	X	X	X	-	-
<i>Cirrhinus jullieni</i>	Cyprinidae	Pa dork ngyo	X	X	X	X	X	X
<i>C. molitorella</i>	Cyprinidae	Pa keng	X	X	X	X	-	-
<i>C. microlepis</i>	Cyprinidae	Pa phone	X	-	-	-	-	-
<i>Cirrhinus lineatus</i>	Barbinae	Pa soi	X	X	X	X	X	X
<i>Clarias batrachus</i>	Clariidae	Pa douk na	X	X	X	X	X	X
<i>C. macrocephalus</i>	Clariidae	Pa douk ouy	X	X	X	X	X	X
<i>Channa marulius</i>	Channidae	Pa kho na	X	X	X	X	X	X
<i>C. micropettes</i>	Channidae	Pa kado	X	X	X	X	-	-
<i>C. orientalis</i>	Channidae	Pa kouan	X	X	X	X	-	-
<i>C. striata</i>	Channidae	Pa ko	X	X	X	X	X	X
<i>Discherodontus ashmendi</i>	Cyprinidae	Pa seou	X	X	X	X	X	X
<i>Dngila spilopleura</i>	Cyprinidae	Pa khao	X	X	X	X	X	X
<i>Euryglossa panoides</i>	Soleidae	Pa pane	X	X	X	X	-	-
<i>Hypsibarbus lagleri</i>	Cyprinidae	Pa paktongpae	X	X	X	X	X	X
<i>H. mekongensis</i>	Siludae	Pa nang hang dam	X	X	X	-	-	-
<i>Heterobagrus bocourti</i>	Bagridae	Pa kagneng	X	X	X	X	-	-
<i>Kryptopterus apogon</i>	Siluridae	Pa nangnoy	X	X	X	X	-	-
<i>K. schilbeides</i>	Siluridae	Pa nangleuang	X	X	X	X	-	-
<i>K. cheveyi</i>	Siluridae	Pa nanghangdeng	X	X	X	X	-	-
<i>Labeo erythrurus</i>	Barbinae	Pa ya	X	X	X	-	-	-
<i>L. dyocheilus</i>	Barbinae	Pa vanoy	X	X	X	-	-	-
<i>Mekongina erythrospila</i>	Cyprinidae	Pa sa ih	X	X	X	-	-	-
<i>Morulius chrysophekadion</i>	Cyprinidae	Pa phia	X	X	X	-	-	-
<i>M. nemurus</i>	Bagrinae	Pa kot leuang	X	X	X	X	-	-

<sup>1</sup> MR = Mekong River; TR = Tributaries; RL = Reservoirs and Lakes; WSP = Water sheds and Ponds; RFP = Rain fed paddy field; IW = Irrigation weirs  
Source: FAO (2006) cited from DLF (2001)

Box 2. Most common aquatic species cultured in Lao PDR and culture systems used

English name	Scientific name	Lao name	Culture System
Tilapia	<i>Oreochromis</i> spp.	Pa nin	Culture in ponds and community ponds, seed production in state and private hatcheries, cage culture in reservoirs, and rice-fish culture
Common carp	<i>Cyprinus carpio</i>	Pa nai	Culture in ponds and community ponds, seed production in state and private hatcheries, cage culture in reservoirs, and rice-fish culture
Indian carp	<i>Cirrhina mrigala</i>	Pa marican	Culture in ponds and community ponds, seed production in state hatchery, cage culture in reservoirs
Javanese carp	<i>Puntius gonionotus</i>	Pa paak	Culture in ponds and community ponds, seed production in state and private hatcheries, cage culture in, reservoirs
Bighead carp	<i>Aristichthys nobilis</i>	Pa hua nyai	Culture in ponds and community ponds, seed production in state and private hatcheries, cage culture in reservoirs
Silver carp	<i>Hypophthalmichthys molitrix</i>	Pa kedleab	Culture in ponds and community ponds, seed production in state hatchery, cage culture in reservoirs
Rohu	<i>Labeo rohita</i>	Pa rohu	Culture in ponds and community ponds, seed production in state hatchery
Snakeskin gourami	<i>Trichogaster pectoralis</i>	Pa salid	Pond culture
Catfish	<i>Clarias</i> spp.	Pa duc	Culture and seed production in state hatchery

Source: DLF at <http://rfdp.seafdec.org.ph/meetings/manila-meetransb/report-lao.html>



during the dry season after having been trapped in shallow ponds. In some cases, harvesting of fish from cage culture in reservoirs and river tributaries is timed so that fish could be available during the dry season. In an effort to supplement the supply of aquatic products during the dry season, fish is preserved into various forms based on cultural preference and local conditions. However, the fish processing industry in Lao PDR still adopts traditional processing systems and management, and remains underdeveloped in terms of food safety and quality. Bounma (2007) suggested that there is a need for the country to establish or improve its institutional infrastructures as well as enhance the skills of human resource in fish processing in order that the country could attain good quality and safety of its fish and fishery products. Generally produced by households as backyard industry, the most common forms of preserved fish products are fermented fish (*pa daek*), pickled fish (*pa som*), other fermented fish (*pa chao*, *ka pi pa*, *pa jao*), fish sauce (*nam pa*), dried fish (*pa heng*), and smoked fish (*pa lon fai*).

## Fish Marketing

In Lao PDR most fish produced from inland fisheries and rural aquaculture is consumed domestically with only small portion sold in local markets due to inadequate transportation and preservation facilities, and insufficient supply of ice especially in remote areas. Nevertheless, FAO (2007) noted that there is considerable fish trading activity between Thailand and Lao PDR where Lao traders market high-value fishes to Thailand through the Mekong River transport system.

## Fish Consumption

As of 2012, many reports have shown that the total population of Lao PDR was 6.5 million increasing at an average annual population growth of 2.0%. The total land area of 236,800 km<sup>2</sup> and population density of about 28 people per km<sup>2</sup> of land area makes Lao PDR one of the least densely populated countries in the world. Of its total population, about 67% are engaged in various forms of fisheries activities. Many reports also indicated that the country's total consumption of fish and other aquatic animals (OAAs) is 29.0 kg/person/year, implying that the amount of fish and OAAs consumed in the country in 2012 could be about 188,500 MT.

Phonvisay (2013) reported that out of the total consumption of 29.0 kg, 24.1 kg comprises fish, 4.1 kg OAAs, and about 0.4 kg from imported marine products, implying that 156,650 MT of fish was consumed in Lao PDR in 2012. Since the reported total fish production of Lao PDR in 2012

was 136,000 (**Table 1**), therefore there is a need for these figures to be reconciled in order to get the actual picture of the total annual fish production versus consumption of fish in Lao PDR.

## Reservoir Fisheries in Lao PDR

Most hydropower dams/reservoirs in Lao PDR (**Box 3**) are used not only to generate hydropower and as source of irrigation water, but also for fisheries which could comprise a total area of about 96,000 ha or 960 km<sup>2</sup> (Phonvisay, 2013). In addition, small water bodies that include shallow lakes, small natural pools, peat swamps, and wetlands could



comprise another 114,800 ha or 1,148 km<sup>2</sup> of water bodies used for fisheries activities while irrigation reservoirs and weirs could also contribute another 60,000 ha or 600 km<sup>2</sup> of water areas for small-scale fisheries (**Table 2**).

## Nam Houm Reservoir

Nam Houm is a small irrigation reservoir in Naxaythong District near the Capital City of Vientiane. The Reservoir also supports capture fisheries, cove aquaculture and pond aquaculture. Fisheries activities in Nam Houm are managed by the Ang Nam Houm Village or Community Fisheries of Nam Houm Reservoir. Local fishers use traditional gears for fishing such as gillnet, cast net, long line and fish traps among others.

Reports have shown that there are 82 registered small-scale fishers living around the Reservoir and are organized into six (6) fishing groups. Fish production from the Reservoir during the wet season (July-September) is reported to be not less than 100 kg/day and an average of 60-70 kg/day during the dry season (October-May). The total annual fish production from the Reservoir is about 57.0 MT/year. Meanwhile, aquaculture in Lao PDR is practiced in fish ponds, oxbow lakes, irrigation weirs, rice-fields (rice-fish culture), and in water bodies (cage culture).

**Box 3. Hydropower dams/reservoirs in Lao PDR**

Dam/reservoir	Year commissioned	Main purpose	Surface area at full supply level	
			km <sup>2</sup>	ha
Huay Siet	1987	Irrigation	1.7	170
Huay Xone	-	Irrigation	0.4	40
Nam Bak 2	<i>planned</i>	Hydropower	4.9	490
Nam Houm	1981	Irrigation	8.8	880
Nong Niaou	-	Irrigation	0.5	50
Nam Leuk	2000	Hydropower	17.2	1,720
Nam Lik 2	2010	Hydropower	24.4	2,440
Nam Lik 1	2011	Hydropower	22.3	2,230
Nam Mang 3	2004	Hydropower	11.0	1,100
Nam Ngum 1	1971	Hydropower	460.0	46,000
Nam Ngum 2	2010	Hydropower	122.2	12,220
Nam Ngum 3	2014	Hydropower	25.6	2,560
Nam Ngum 4b	<i>planned</i>	Hydropower	0.2	20
Nam Ngum 5	2018	Hydropower	14.6	1,460
Nam Song Diversion	2011	Hydropower	1.3	130
Nong Taleuk	1990s	Irrigation	1.5	150
Nong Seuam	1990s	Irrigation	1.6	160
Nam Souang	1981	Irrigation	15.0	1,500
Pak Peung	1990	Irrigation	3.9	390

Source: Adapted from Hortle (2007)

Table 2. Utilization of inland water resources in Lao PDR and estimated fish production

Fisheries	Water resource	Total area (ha)	Production (kg/ha/year)	Production <sup>2</sup> (MT)
Capture fisheries	Mekong River and tributaries	304,704	70	21,329
	Large hydropower reservoirs	96,030	317	8,405
	Shallow lakes, small natural pools, pit swamps, wetlands	114,800	150	17,220
	Irrigation reservoirs and weirs	60,000	150	9,000
	Rice-fields, small streams, floodplains <sup>3</sup>	1,161,347	100	33,143
	<b>Sub-total</b>		<b>1,736,881</b>	<b>787</b>
Aquaculture	Fish ponds	22,000	1,500	33,000
	Oxbow lakes and irrigation weirs for aquaculture	15,000	600	9,000
	Rice-fields for rice-fish culture	5,000	250	1,500
	Cage culture in water bodies	-	- <sup>4</sup>	11,250 <sup>5</sup>
	<b>Sub-total</b>		<b>42,000</b>	<b>-</b>
<b>TOTAL</b>		<b>1,778,881</b>	<b>-</b>	<b>143,847</b>

Source: Adapted from Phonvisay (2013)

<sup>2</sup> Production data in 2007

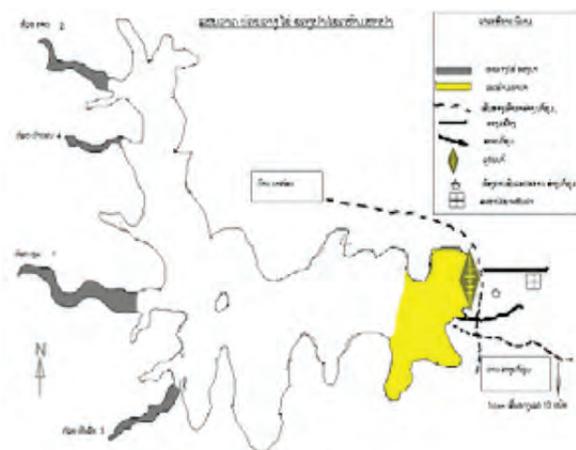
<sup>3</sup> This includes wet-season rice-fields (632,850 ha), dry-season irrigated rice-fields (153,677 ha), wet-season irrigated rice-fields (344,820), and flooded areas (30,000 ha)

<sup>4</sup> Estimated number of cages: 4,500

<sup>5</sup> Estimated production: 2.5 MT/cage

### Fish Conservation Zones

Results of a survey conducted by SEAFDEC (2010, unpublished) showed that Nam Houm Reservoir is used for many purposes such as for irrigation, water supply, navigation, fisheries, fish culture in cages, and tourism. There are about 3,300 people living in four villages in the vicinity of the Reservoir. A permanent fish conservation zone (FCZ) located in front of the dam (1,500 m from the dam) has been established, where no fishing is allowed in the FCZ area for all types of fishing gears the whole year round. Another four seasonal fish conservation zones are located in the headwater area or small tributaries/streamlets that supply water to the Reservoir. These areas are declared as no-fishing zones during the fish spawning season that usually starts from May and could last until August.



Nam Houm Reservoir showing permanent Fish Conservation Zone (yellow)

As in other reservoirs in Lao PDR, management initiatives have mostly been focused on the conservation and protection of the fishery resources through the



establishment of protected areas in critical breeding and spawning grounds, and re-stocking of economically important fish species. In addition, cage culture has been promoted to provide alternative source of income for fishers and decrease pressure from exploiting the natural fish populations.

### ***Reservoir Fisheries Management Committee***

In addition to conservation and protection of the fish resources, the local communities have been empowered as the stakeholders in fishery management. In 2000, the Management of River and Reservoir Fisheries in the Mekong River Basin (MRRF) initiated the establishment of a local management body for Nam Houm Reservoir, the so-called “Reservoir Fisheries Management Committee of Nam Houm”. The members were elected from representatives of village organizations such as village headman, village elders, village security, youth, women, fishers, and other stakeholders. The Nam Houm RFMC has a total of 20 members representing the four villages located around the Reservoir and has been officially approved by the District Governor.

### ***Traditional Fish Processing and Marketing***

Fishery products derived from fish in the Nam Houm Reservoir are usually home-made and comprise a variety of traditional products such as dried fish, fermented fish, fish sauce, and smoked fish among others. While in the past, the district authorities leased the right for buying and selling fish to private entrepreneurs based on annual bidding contracts where the winning bidder pays annual taxes from sale of fish to the district authorities, starting in 2005 however, Nam Houm RFMC had taken over the full responsibility of harvesting and marketing fish from the Reservoir. Under such scheme, local fishers sell their catch to a collection unit of the RFMC at the main fish landing site located in front of the dam.

In an effort to improve their fishery products, MRRF organized a study tour for Nam Houm RFMC members to visit and learn about processing fish and fishery products in Thailand, especially in improving the quality and safety of fish and fishery products. After the study trip, members of the Nam Houm RFMC especially the women, organized themselves into fish processing groups and started producing various value-added products from fish caught in the Reservoir.

### **Activities of Nam Houm RFMC**

The Nam Houm RFMC has been exerting efforts towards improving its organization as well as enhancing the capability of the fishers’ groups. Thus, the RFMC has been improving the awareness of its members and local people on the Fishery Law and fishing regulations of Lao PDR, conducting patrol activities of the Reservoir and FCZs especially during fish spawning season.

Moreover, the RFMC has been conducting re-stocking and stock enhancement activities of economically important fish species, and conducting experiments on cage culture in the Reservoir using high-value fish species. In addition, the Nam Houm RFMC has also considered establishing its Reservoir Management Fund using as seed money the proceeds from fish auctions. The Nam Houm RFMC has envisioned that in the near future, it would be able to develop a micro-finance system that could be availed of by the households around the Reservoir.

### **Issues and Concerns**

Considering the need to improve collection system for fisheries data and statistics in Nam Houm Reservoir, the Nam Houm RFMC has been promoting capacity building activities for its fishers groups. In addition, RFMC also intends to develop an overall reservoir fishery management



plan for Nam Houm, enhance the fisher groups' skills in the operation and management of mobile hatchery to produce more seeds for re-stocking and enhancement, and promote the adoption of fish apartments for the conservation zones that would control the entry of illegal fishers and enhance the fish stocks in these zones.

In addition to the issues on inadequate fisheries data collection system, the Nam Houm RFMC is also strengthening its effort in combating IUU fishing in the Reservoir, considering that fish production from Nam Houm Reservoir had been decreasing resulting in the continued presence of illegal fishing operations in the Reservoir. Some fishers, especially from other villages not governed by any fishers' groups still continue to use illegal fishing gears such as electric implements and nets with small mesh size. The illegal use of such equipment resulted in overfishing that could be disadvantageous to legal fishers who comply with the regulations of the RFMC, as well as on the un-sustainability of reservoir fisheries. Nonetheless, all these concerns could be attributed to the inadequate enforcement of the country's Fishery Law and related regulations.

## Way Forward

The Government of Lao PDR has put greater emphasis on the need to manage its fisheries in a sustainable manner, considering that the people of Lao PDR depend on fish as major source of nutrition in their diets. However, the Government would need technical assistance from international and regional agencies and organizations to be able to achieve these goals. For example, in the collection and compilation of fishery statistics, especially from reservoir fisheries, there is a need to reconcile the figures from actual fish catch with those catch data reported to SEAFDEC and FAO. This effort could be carried out by the Government if the capacity in terms of knowledge and skills, of the staff responsible to collect, compile and analyze data is enhanced.



There is also a need for the restructuring of the over-all management plan of the country's reservoir fisheries to ensure that this is managed in a sustainable manner in order that it would continue to contribute to the socio-economic well-being of the rural people. In such manner, the country could consider adopting the ecosystem approach to fisheries management since under this concept, the well-being of the resources as well as those of the resource-users could be assured in a holistic manner. Aquaculture systems should be improved as this could provide alternative livelihoods and additional income to fishers, and at the same time reduce pressure on inland capture fisheries. Stock enhancement should be continued but should take into consideration the biodiversity of fishery resources especially in lakes and reservoirs of the country.

## References

- Bounma Pachone. 2007. Advancing Improved Fish Processing Technology in Lao PDR. *In*: Fish for the People Vol. 5 No. 3 (2007). Southeast Asian Fisheries Development Center, Bangkok, Thailand; pp 33-34
- DLF. 2001. <http://rfdp.seafdec.org.ph/meetings/manila-meetransb/report-lao.html>
- FAO. 2006. FAO Fisheries Country Profile – The Lao People's Democratic Republic. Food and Agriculture Organization of the United Nations. Rome, Italy
- Hortle, K.G. 2007. Consumption and the yield of fish and other aquatic animals from the Lower Mekong Basin. MRC Technical Paper 16: 1-88
- Phonvisay Singkham (2013). An introduction to the Fisheries of Lao PDR. Mekong Development Series No. 6. Mekong River Commission, Phnom Penh, Cambodia. ISSN 1680-4023. Eds: Kent G. Hortle, Virginia Addison, Ngor Peng Bun, Peter Degen and So Nam; 62 p
- SEAFDEC. 2010. Report on the preliminary survey of selected site freshwater reservoirs for diagnosis of fishing ground and evaluation of fishery ecosystem management in Lao PDR. Training Department, Southeast Asian Fisheries Development Center, Samut Prakan, Thailand; unpublished
- SEAFDEC. 2014. Fishery Statistical Bulletin of Southeast Asia 2012. Southeast Asian Fisheries Development Center, Bangkok, Thailand; 135 p

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