Siphandone:
The Mekong Under Threat

Photos by Suthep Kritsanavarin

MEKONG REGION WATER DIALOGUES SERIES **PUBLICATION NO.1**

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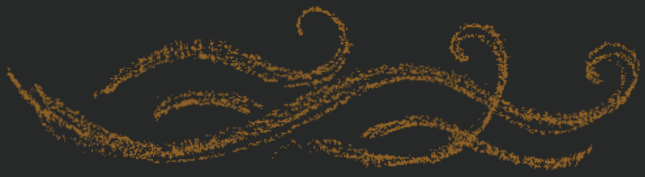

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Foreword

I believe that the heart of policy making lies not in figures, data, and calculations, but in an understanding of how people live within fragile ecosystems and sustain their livelihoods. Livelihoods and healthy ecosystems are intricately linked. And there is no better example of this than the Siphandone region in Southern Laos.

The Siphandone or Four Thousand Islands encompasses a fascinating 50 km stretch of the Mekong River consisting of a maze of extensively braided channels, islands and sandbars, rocky rapids, seasonally flooded riverine habitats and the largest complex of waterfalls in Asia. This part of the river is also home to one of the last groups of the Mekong Irrawaddy Dolphin and over 200 species of freshwater fish. Siphandone is a significant site with a unique local fishery where elaborate traditions and fishery techniques have been developed and handed down through generations for hundreds of years. Today, the livelihoods of around 100,000 people living in this region are closely linked to the seasonal resources provided by the river.

But as with all fragile ecosystems anywhere in the world, Siphandone too is under threat from planned development. Anyone who visits the region will agree that it would make an ideal RAMSAR site for Laos, and qualifies for World Heritage status. This is what we would encourage planners and policymakers to consider before any grandiose economic plans are drawn up for the region.

The present book is a fantastic visual documentation of the natural beauty, biodiversity and the livelihoods in the Siphandone region captured by the Thai photographer Suthep Kritsanavarin over a period of three years. The text includes many sections in italics based on Suthep's personal observations and reflections, interspersed with passages of a more technical report style of writing. I am sure the book will be of tremendous value to policy makers, researchers, civil society organiations and others not only interested in the Mekong region but in the conservation of natural and environmental heritage anywhere in the world. It is up to the readers to take the message forward.

This book is the first in a series of publications to be brought out under the Mekong Region Water Dialogues project funded by the Ministry for Foreign Affairs of Finland, and facilitated by the Regional Water and Wetlands Programme, IUCN, Asia office. We believe that good water governance is linked to sustainable livelihoods and to ecosystem conservation. Through this series of publications we could like to get stakeholders to start thinking about strategies and work towards a just and sustainable management of water resources in the Mekong Region.

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We are also grateful to Ian Baird, Roger Mollot, Eric Meusch, Delia Paul and Virginia Addison for reviewing earlier drafts, and providing very important comments and inputs that have greatly improved the final version of this book.

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Contents

A fisherman risks his life walking along a cable across Khone Phapheng falls to fish on the other side. Any small mistake would be fatal.

This hollowed-out boat is being paddled against the current through the rapids near the Li Phii falls. The boat-owner has to make this treacherous journey everyday to reach his *Li*

Thousands of fish fall into a *Li* trap in a single day at the start of the rainy season. The fishermen of Siphandone have developed several types of fishing gear that enable them to catch huge quantities of fish by blocking their migration paths.

These fishermen from Hang Sadam village are carrying the head of a Mekong giant catfish weighing about 44kg. The Mekong giant catfish is listed as critically endangered in the IUCN Red List.

Women wash and collect water in front of the dolphin pool. Up to now people and dolphins have managed to live peacefully together, but unbridled development may soon change all of this.

Ma Khamputhorn's face is covered with fish scales from preparing fish to make fish paste which he will later sell.

Siphandone

"an ecologically unique area that is essentially a microcosm of the entire lower Mekong River. Such a site is so rare in nature that every effort should be made to preserve all of the Khone Falls from any development"

Hill and Hill, 1994.

Introduction

Over 4,000 km from the melting snows of the Tibetan Plateau, and less than 800 km from the South China Sea, the Mekong River passes through a part of Southern Laos known as "Siphandone" or the four thousand islands. Lying at the northern tip of the Great Mekong Plain, Siphandone is wedged between the Dongrak Mountain range to the west, and the foothills of the Bolovens Plateau to the North-east and East (Daconto, 2001).

This fascinating 50 km long stretch of the river consists of a maze of extensively braided channels, islands and sandbars, rocky rapids and seasonally flooded habitats, including the largest complex of waterfalls in Asia. A short distance downstream from the falls is a deep pool straddling the Lao-Cambodian border that is home to one of the last groups of the Mekong Irrawaddy Dolphin. The Siphandone area is critical to the life-cycle of many fish species on which the livelihoods of millions of people in Laos, Thailand, Cambodia, and the Mekong Delta in Vietnam depend. Siphandone is "*an ecologically unique area that is essentially a microcosm of the entire lower Mekong River. Such a site is so rare in nature that every effort should be made to preserve all of the Khone Falls from any development*" (Hill and Hill, 1994).

There are 25,000 species of fish in the world -10,000 are freshwater and 3,500 of these are found in Asia (Kottelat and Whitten, 1996) with up to 1,200 in the Mekong, which has more fish species than any other Asian river (Vidthayanon et al., 1998). At one site in Siphandone 205 species have been identified (Baird, 2001). The lower Mekong supports one of the most productive fisheries in the world – 2.6 million tons of fish caught each year provide up to 80% of the protein intake for 56 million people (Hortle, 2007).

Map 1: The Mekong River, showing the locations of proposed Lower Mekong mainstream dams.

Samnieng Khamphai, one of the few fishermen still using this technique, scoops up the fish from his fall-back trap in the Khone Phapheng falls.

Hundreds of kilos of fish were caught in this 5 metres cylindrical trap (*rope*) placed at the end of a large enclosed fence trap or *rouang kriang*

Today 100,000 people live along the river banks and on the islands of Siphandone, where they grow rice, raise livestock, cultivate vegetables, fish, and trade. Livelihoods are closely linked to the river and the seasonal cycle of resources it provides. Over the centuries a very rich capture fisheries tradition has developed. A few villages located in the southern islands, where suitable paddy land is scarce, rely on capture fisheries to an even greater extent. It is here that the most elaborate (and often dangerous) fisheries traditions and techniques have developed, based on a remarkable knowledge of the local ecology of the Mekong River that has been handed down from generation to generation.

The intimate linkages between the way of life of the local people and the river throughout all its seasons and moods are the subject matter of this book which hopes to illuminate the visually stunning waterscapes and fisheries activities and the immense value of this place and its people. Photo-essays and simple text reveals some of the changes that development has already brought, and concerns about significant impacts of future developments are raised. Readers will be left in no doubt that this astounding combination of natural and cultural heritage that comes together in the fisheries of Siphandone has little chance of survival in a modern world focused only on economic growth and material wealth at all costs.

(Above) - This young civet is taking its pick of the Siamese mud carp (*Pa soi*) that the villagers have spread out to dry on the rocks. (Below) - This Indian Shag seems to catch fish in the Mekong River with ease, sharing in the bounty of the river with many other species as well as the local fishermen.

These fishermen have just finished cleaning their *Li* and checking the stability of its construction. Strong currents can wash the entire *Li* downstream in the blink of an eye.

Kantara (Tong) Khamputhorn, one of the younger generation of fishermen swims against the current back to the shore near Li Phii Falls, with his catch in his mouth.

"Up to 75% of the fish catch in Tonle Sap depends on fish that migrate to the deep pools found from Kratie to Siphandone and beyond, for dry season refuge (Poulsen et al., 2002)."

Map 2: Siphandone, showing the proposed dam in the Sahong channel.

Fishing at Siphandone

Description of Siphandone Wetlands

Flowing towards Siphandone, with an initial width of about 1.5 km, the river first splits north of Done Sanh and continues to branch around the many islands until it reaches a maximum width of 14 km at Done Khong. This northern section includes more large islands and wide river branches with a series of deep pools. In the central section, the eastern portion is dominated by the large Done Som separated from the left bank by a wide channel, while the western portion includes a complex of large alluvial islands separated by narrow channels, rapids and a large number of smaller islets.

In the southern section there are first a few sandy islands, after which the river corridor constricts to around 10 km. As it flows across E-W geological fault lines the steep drop creates a large complex of rapids and waterfalls along the characteristic narrow rocky channels (*Hou*) that are squeezed between the islands. The Done Phapheng, Done Sadam and Done Sahong islands are separated by the Hou Phapheng, Hou Sadam, and Hou Sahong channels. The largest step of 10-15m in the Hou Phapheng Channel gives rise to the world-famous Khone Phapheng waterfalls – just one of a series of waterfalls collectively known as the Khone Falls. The *Hou* all discharge into a single deep pool on the border with Cambodia, home to the most northerly remaining group of the endangered Mekong Irrawaddy Dolphins (*Orcaella brevirostris*) (*pa kha*) (Baird and Beasley, 2005). Immediately to the south the river once more narrows to around 3 km width as it enters Cambodia (Dancanto, 2001).

(Above) - During peak migration periods, using a long-handled scissor net looks easy but the force of the river requires the user to use all their experience and strength. (Below) - Fon is struggling to carry a large rope through the water to place at the end of the *louang khang* in the Sanong channel.

(Above) - In the dry season a fisherman is placing a large net at the site of an old *Li*. (Below) - Two Southern Lao fishermen are working together to build a fall-back trap in the Khone Phapheng falls at the start of the dry season, in preparation for the February migration of small cyprinids such as Siamese mud carp.

Siamese mud carp try to jump up the Khone Phapheng falls. After repeated failures they eventually turned back and chose another path – through the Sahong channel. Once again this illustrates the irreplaceable importance of the Sahong channel for fish migration in the Mekong.

Mekong Fish Migrations and the importance of Siphandone

Most species of fish in the Mekong are migratory (Poulsen et al., 2002), and the habitats of Siphandone are critical to successful migrations. As waters recede at the start of the dry season fish move out of their feeding grounds in the floodplains and tributaries and move upriver to their dry season feeding and refuge areas, including the many deep pools in the Siphandone area (Baird and Flaherty, 2005; Baird, 2006b). At the end of the dry season when the monsoon rains start once more and water levels start to rise, fish migrate south down the Mekong and/or migrate into streams where they spawn. The rising floodwaters of the rainy season carry their eggs, larvae and juvenile fish which drift into the floodplain areas including the Tonle Sap and the Delta, providing a vast flood-season feeding-ground for the growing fish. Up to 75% of the fish catch in the Tonle Sap depends on fish that migrate to the deep pools found from Kratie to Siphandone and beyond, for dry season refuge (Poulsen et al., 2002).

Although many species are known to migrate over the Khone falls, the narrow fast-flowing channels or *Hou* of the southern part of Siphandone are important bottlenecks for dry season fish migrations. In particular the Hou Sahong is well known by local communities as the most important channel for upriver migrations year-round, and is the only sizable channel that is passable by migrating fish at some times in the dry season. At various times during the 1960s, 1970s, and 1980s the Lao government has specifically banned fishing in the Hou Sahong. Villagers living upstream from Hou Sahong often point out that if the channel was blocked people living all the way upriver to Vientiane would not have enough fish to eat (Baird 2001).

(Left, above) - A young fisherman throws a fish to the top end of his *Li* – when fish are falling into the *Li* so rapidly, the fishermen have to remove them equally quickly to ensure the *Li* does not collapse under the weight of the fish. (Left, below) - So many fish can be caught just setting the net a single time, during upriver migrations. (Right, above) - Stringing fish together to make it easier to carry them.

Fish and sticky rice is the staple food in Siphandone.

This Mekong giant catfish aroused a lot of curiosity in the village. Although they are caught in *Li* traps more or less every year, because of their heavy weight they are often butchered in the *Li* before being brought to the shore, so many people have still never seen a living Mekong giant catfish up close before.

"It's early in August. Clearly excited, Pao tries to explain that he saw a very big fish fall into their Li. Later five men with an engine-powered boat take another three hours before they could bring this giant fish out of the Li in the middle of the rapid of the Hou Sahong channel."

A Year of Life, Culture and Fisheries at Siphandone

It is Makha Bucha Day or the 15th day of the third lunar month. The Buddhist Monks are praying. The loud rhythmic chanting heard all over the Hang Sadam village comes from the monastery. Surrounded by many large mango trees and located only a hundred meters away from the dolphin pool, the wind blows fresh cool air from the river to the temple. People emerge from their traditional wooden houses built on stilts to allow circulation of air in the hot season, protection from flooding in the rainy season, and to provide a place for feeding livestock under the house. The houses are surrounded by mango, papaya and coconut trees, which also line the unpaved roads that cut through the rice fields now lying bare golden-brown in the dry season. Most families grow rice for their own consumption, and until just a few years ago everyone used buffalo for plowing. Recently, some wealthier families have begun to use Chinese-made, walk-behind tractors for farming, but they are still the exception rather than the rule. The villagers are assembling themselves inside the monastery. Most of them are old. It's not a big surprise. Most young men are guarding their fish traps in the Sahong Channel. After the Buddhist ceremony old men are still chatting, while children play around the temple.

Between January and March very large schools of up to 32 species of small species of cyprinids especially *Henicorhynchus lobatus* (*pa soi*) and *Paralaubuca typus* (*pa tep*) migrate upriver from the flooded forests of Cambodia including the Tonle Sap River and Lake to Laos via the Khone falls and Hou Sahong channel (Baird et al., 2003). Their movements are associated with lunar cycles and they start to appear at the Khone falls during the second new moon after the winter solstice (Chinese New Year). This is an extremely important fishery both below and above the Khone falls. Villagers often make fish paste (*pa dek*) and large quantities of sun-dried and smoked fish during this period (Baird, 2001).

Hang Sadam villagers congregate at the temple to make merit at the start of Buddhist Lent. As the society is in transition, the proportion of younger people attending such ceremonies is declining each year.

(Above) - Growing paddy rice for family consumption is an important part of life in Siphandone.
(Below) - Most houses in Siphandone are still built of wood in a traditional style, raised off the ground to avoid flooding.

While not out fishing Uncle Ma is repairing his pushcart that he uses to transport fish. Don Sadam has no mains electricity or paved roads, so there are no cars, although cheap motorcycles imported from China are becoming increasingly popular amongst the younger generation.

At the temple, the village chief Mr. Phao is discussing with other old men about the issue of young men leaving the village to go to work in Bangkok, the capital of neighbouring Thailand. Up to now, the number leaving their home in Siphandone seems to be fewer than in other parts of the country. This may be because of rich natural fishery that allows them to make a living. However, the thinking and lifestyle of youngsters has changed. It is strange how popular and "necessary" motorcycles have become in this small island, which has just a few kilometres of unpaved road to drive on.

The space underneath the house is normally used for a variety of activities – especially on hot summer days. In this rural society most women are still more likely to be housewives than going out to work.

(Above) - The Mekong River is not only a source of food and water, sand is also collected for use in construction. (Below) - While the men are out catching the fish, women play their part too – in this case preparing fish to smoke for sale.

By April, the first schools of small migratory catfish arrive at the Khone falls from Cambodia. *Pangasius macronema* (*pa gnone siap* or *pa ngone thamada*) is caught in large quantities, particularly in the Hou Sahong channel. Also in April, schools of the important large cyprinid *Cirrihnus microlepis* (*pa phone*) migrate up the Mekong River from Cambodia to Laos, and they too pass through the Hou Sahong channel at the height of the dry season (Baird, 2001). In May and June when the monsoon rains begin to fall and the Mekong River rises dramatically, villagers living just above the Khone falls use narrow bamboo funnel traps (*kasone*) to target schools of *Hemibagrus nemurus* (*pa kot leuang*) which are migrating south to Cambodia. At the same time, many species of medium to large size pangasid catfish migrate up the Mekong River from Cambodia to Laos via the Khone falls and Hou Sahong (Baird, 2001). This is a time of intense fishing both with large-mesh gillnets and with the large immovable wooden and bamboo wing traps known as *Li* – an iconic symbol of Siphandone fisheries. The *Li* are used from April or May onwards until they are submerged or washed away by floodwaters – usually some time in July onwards. (Baird et.al., 2004; Roberts and Baird, 1995).

Collecting fish from a *Li* can be a very risky business – sometimes requiring the fishermen to swim in dangerous currents or pull themselves hand over hand along a rope to reach the *Li*. In such dangerous waters, any errors can be fatal.

The diversity of fish caught in the early rainy season including silver sheatfish (*Pa nang ngern*) and sutchi river catfish (*Pa suay*).

It is evening, and Uncle Ma is collecting together all the fish he has caught to take them back to his house before selling them. As he is getting older he has to rely on his sons more and more to help him with this heavy work. Most of his sons do not want to be fishermen any more. They prefer to find work in the city.

A gentle breeze helps to cool down the hot June day, Ma Khamputhorn a 55-year-old fisherman is busy preparing to make a sacrifice to the spirit of the jungle at Tat Pho rapid in the Sahong Channel. Villagers believe this offering can help bring success in fishing. The big rock on the river bank is used as a sacred spot to place the offering including boiled chicken, rice whisky, candles and incense. He pours rice whisky on the rock and starts to pray. "Please let us be successful in catching fish this year". Then he examines the chicken mandible for a sign. As hoped for, this time the jaw is bending and point forward, indicating good fortune so he and his friends celebrate with a small party of chicken and rice wine. Later, Tong his youngest son, walks for 30 metres along the monkey-bridge to the Li to check its strength before the first school of catfish comes in the next few weeks. The Li must be constructed during the dry season, usually from March until early May. The number of Li has increased in recent years and the size of some is getting bigger. It takes at least 3 people to build a Li. Wood is cut from the nearby forest. Nails and concrete have been introduced to make them stronger, but, the force of the Mekong during the monsoon is too strong for most Li and they are washed away in the floods. Each Li has 6 levels or "rooms", as fishermen call them, used to measure the level of the water and forecast fish migrations. When the water reaches the 2nd room, fish will begin to fall into the Li. When water reaches the 3rd or 4th room, it is the best level to get fish. Big fishes like giant barb and giant catfish only get trapped when the water reaches the last room. Ma Khamphouthone told me that the first Li was introduced by a man from Ubon Ratchathani in northeast Thailand.

(Above) - Samnieng Khamphai continues the tradition of building a fall-back trap, taught to him by his father and grandfather before him. Only a few people use this dangerous technique. (Below) - Villagers dive to collect large stones to strengthen the foundations of their *Li*.

Phapheng village fishermen work through the night collecting fish from their *Li*. Elders explain that fish migrate at night avoiding noise and disturbance from humans. A *Li* must be constructed in just the right position. While this *Li* is full of fish, a nearby one has none.

The locations of *Li* have recognized "owners" – usually a single family, (although some are jointly owned) and are handed on from generation to generation. A recent study (Kiguchi, 2008) was based on 55 *Li* traps of which 36 were in the Hou Sahong which is fished by villagers from three surrounding villages (Hang Sadam, Houa Sadam and Don Sahong). It was estimated that fish caught from the *Li* traps in Hou Sahong alone has an annual value of US$36,000 to US$147,000. A single pair of *Li* monitored by Ian Baird over 4 years yielded 106 different species of fish. *Pangasius conchophilus* (*pa pho/pa ke*) migrating upstream was the most abundant, making up over 40% of the total catch, while *Henicorhynchus spp.* (*pa soi*) caught as they were moving downstream, was the second most abundant (12%) (Baird et al., 2004).

Krempf's catfish *Pangasius krempfi* (*pa souay hang leuang*) is also caught in *Li*. Up to 1m in length and 20 kg in weight this economically important species migrates all the way from the Mekong Delta and the South China Sea. The entire adult population joins this long-distance annual migration past the Siphandone wetlands, continuing far up the Mekong River for spawning. It is one of the few Mekong fish that can survive part of their life-cycle in salty-water (Hogan et al., 2007), and has been likened to the "salmon of the Mekong" (Roberts and Baird, 1995). Recently, advances have been made in the captive breeding of this species in Southern Laos (Panousith et al., 2006).

The giant catfish or Sutchi catfish *Pangasianodon hypothalamus* (*pa souay kheo*) another species of huge economic importance is caught less frequently in *Li*. This fish spawns in deep pools in the Mekong from Kratie to beyond Siphandone, and larvae drift with the current all the way down to the Mekong Delta. Fry are extensively harvested in Cambodia and exported to Vietnam as seed stock for aquaculture forming the basis of a US$1 billion/year aquaculture export industry. "Basa, Panga and Sutchi" fish fillets are sold all over the world (often replacing cod and haddock as the fish of the famous "fish and chips" in the UK).

10 am., 17 June, 2006 at Sahong Channel: The wind is coming... clouds are moving faster and faster. In just a few minutes, the sunny day turned black as night. The thunder storm will arrive soon. Nobody bothered about the strong wind. Lao fishermen still harvest the fish that are migrating in the early monsoon. In the river, nearly 20 Li fishing traps lie like so many halves of broken bridges scattered on the rapids. Ma remarked that 'Normally, during the rainy season the water level is high until October. But, in the past few years the water is very unusual. The fish migration cycle is also becoming more uncertain'. 'Sometimes we even don't have fish to eat anymore.' Ma's wife added.

From late June until July, small and medium-sized cyprinids migrating downstream are caught in bundle-basket bamboo traps (*kha*). By later in July and through to September, the water levels are high and fishing becomes difficult. Wing traps are covered by water or swept away by the strong current. Gill nets are also largely unusable. Villagers use funnel traps (*lope*) falling-door bamboo traps (*chanh*), long lines (*bet phiak*) and other hook and line gear to catch mainly non-migratory fishes, mostly for subsistence purposes (Baird, 2001).

(Left, above) - With modern development such as the Don Sahong dam we may see the gradual disappearance of fishing gear developed from local wisdom such as these fence-filter traps into which fish are flowing in early March.
(Left, below) - The large number of river catfish fish tails pocking through the *Li* indicate it is full to the brim with fish. The owner of the *Li* and his friends will have to remove the fish quickly to avoid the *Li* collapsing from the weight.

Mekong Giant Catfish

11 August 2007: "Giant fish...giant fish...giant fish". The shouts approach closer and closer to the house of the Chief of Houa Sadam village. In a minute Pao, a young fisherman arrives at the house surrounded everywhere by green swathes of young stalks of rice fields. It's early August. Clearly excited, Pao tries to explain that he saw a very big fish fall into their Li. Later five men with an engine-powered boat take another three hours before they could bring this giant fish out of the Li in the middle of the rapid of the Hou Sahong channel.

Within a couple of hours people from the village and nearby areas come to see the fish. It's a Mekong Giant Catfish which may weigh around 150 Kg. Some of them have never seen a big fish as close as this before. Many times when fishermen here catch big fish, most of them die and they are butchered inside the Li. This time they tie the fish near the bank of the river. Khan, the village chief tries to sell the fish to a merchant. However, he was only offered a very low price – not worth the risk of being caught breaking the law as the fish is protected. During the two days people lift the fish, touch and play with it. Finally, the fish died at the end of second day. Fishermen brought it to be butchered in the village. They divided the fish into several pieces and distributed them. They seemed to be very happy with this gift from nature.

The critically endangered Mekong giant catfish *Pangasianodon gigas* (*pa beuk*) can grow up to 3 metres in length and 300 kg in weight – which according to The Guinness Book of World Records, makes it the planet's largest freshwater fish, (However the biggest giant of the Mekong is actually the Mekong giant stingray which grows to a weight of 400-500 kg). The Mekong Giant Catfish is at least a gentle giant - according to fishermen, it eats algae and aquatic plants and the stomach of the giant catfish is sometimes filled with green liquid. Historically the Mekong giant catfish was distributed throughout the large rivers of the Mekong River Basin in Vietnam, Cambodia, Laos, Thailand, and possibly Myanmar and south western China. In recent times it has been introduced to rivers and

In August 2007 this 150 kg Mekong giant catfish was caught in the Sahong channel. It took several hours to bring the fish from the *Li* to the village. These photographs provide the first documentary evidence that Mekong giant catfish migrate through the Sahong channel.

reservoirs throughout Thailand. Mekong giant catfish are migratory, but the migratory patterns of the fish are not well understood. Evidence from genetic analysis (Na-nakorn et al., 2006) and Mekong giant catfish caught in *Li* traps in Siphandone (Mollot et al., 2008), confirms there is a single population in the Mekong River Basin.

Cave paintings near Ubon Ratchathani indicate that fishing for giant catfish may have occurred for over 3,000 years. Fishermen in Northern Thailand and Northern Laos conduct an elaborate ceremony at the start of the fishing season, whilst in Cambodia it is not deliberately targeted by fishermen. Lao fishers in the Khone Falls area traditionally believed it was bad luck to catch giant catfish. During interviews recently conducted by WWF (Mollot et al., 2008), fishermen in Siphandone referred to the Mekong Giant Catfish as being a spirit fish described or *pa khamkhoun*, a fish associated with spiritual merit and good luck. The fishermen reported that protecting a *pa khamkhoun* is believed to bring the person good luck and prosperity in the future, whereas harming such a fish could bring bad luck to the family. In the past the local reverence for *pa khamkhoun* meant the people were hesitant to eat or sell the Mekong giant catfish, while today with the changing nature of fish marketing and the increasing value of wild-caught fish, traditional values and taboos towards the pa khamkhoun are less frequently upheld. Although fishermen are not deliberately targeting Mekong giant catfish, nevertheless, as they are building *Li* traps that are bigger and stronger than before, they seem to be catching more Mekong giant catfish in these traps than they used to. (Mollot et al., 2008)

The Mekong giant catfish population has reduced by up to 80% in the last few decades prompting IUCN – the International Union for Conservation of Nature to add it to its list of Critically Endangered species in 2004. Fishermen continue to catch and sell the fish. The catch of giant catfish is often incidental (not deliberately targeted) and often goes unreported, as people are afraid of being fined for catching a protected species.

The stretch of river between Chiang Khong and Chiang Saen in Thailand is almost certainly spawning habitat for Mekong giant catfish. Harmful river modifications in the area include port construction (Chiang Saen) and rapids blasting (as part of the Mekong Navigation Improvement Project). The Tonle Sap Lake, the largest floodplain in Southeast Asia, is a rearing ground for Mekong giant catfish. As the forests of the Tonle Sap are

The villagers of Hang Sadam are preparing the meat of the Mekong giant catfish caught in the Sahong channel, for distribution in the village.

cleared for firewood, and to make space for agriculture, the habitat and resources available to the Mekong giant catfish decrease. Dams on the Mekong in China may impact the spawning migration of giant catfish in Thailand and Laos, because spawning behaviour may be triggered by water quality or flow.

The Mekong giant catfish is an important and charismatic species. As a flagship it symbolizes the ecological integrity of the Mekong River. Its continued existence and successful recovery is an important part in the sustainable management of the Mekong River Basin. However, it is far more likely that a planned cascade of mainstream dams between Luang Prabang and Vientiane, if built, will spell the end of the natural Mekong Giant Catfish spawning migration, and lead to its extinction in nature.

The rainy season is over, and this time the water reached its highest level for several years. The end of the Buddhist Lent period, which falls on the full moon of 11th lunar month, is celebrated by people of Siphandone with an illuminated boat procession. Boats from different temples decorated with candles and lanterns illuminate the night as they float down the river. All members of villages will help to make the boats from bamboo

The 44kg head of a Mekong giant catfish. This fish was caught in the Sanong channel in August 2007.

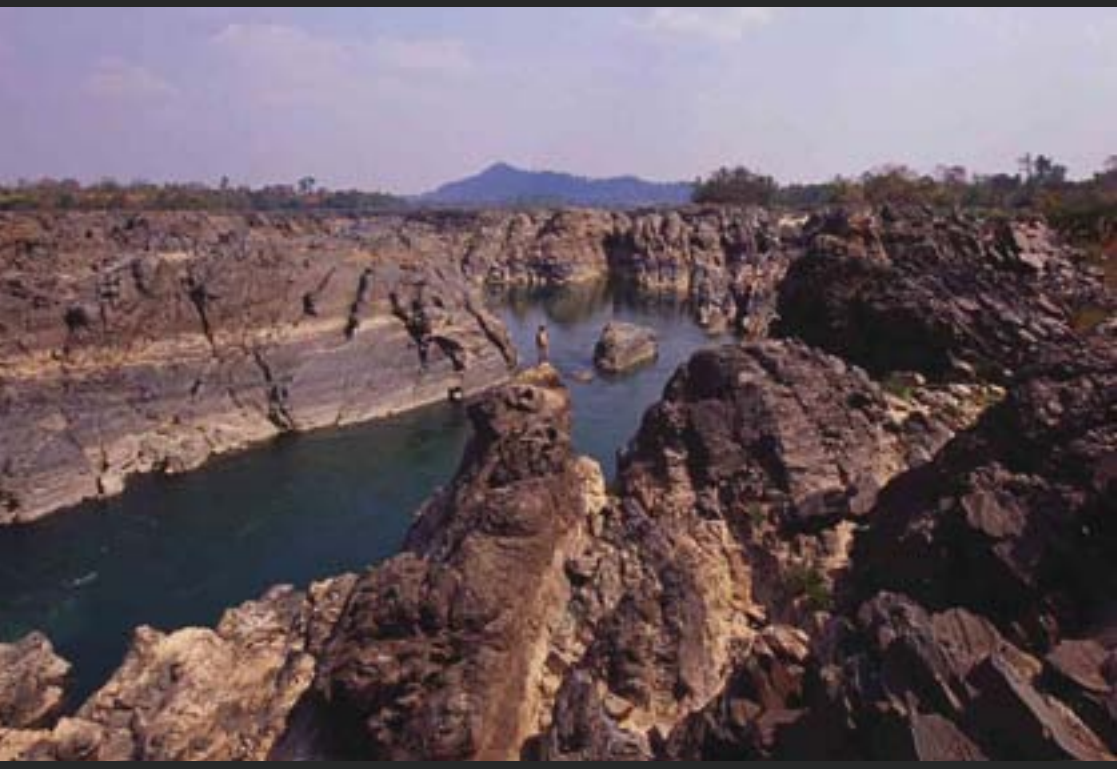
and banana trees. Some big villages may have up to three boats. At Hang Sadam village, the fire boats float from the south end of Khone Island past the village. The villagers build two beautiful fire boats this year. One is Naga shaped and the other ship shaped. After the last boat has gone, the dark night once more envelopes the whole Mekong, only a few lights from candles dotted here and there can be seen from the distant shores of the Cambodia side of the river. I wonder about the simplicity of this way of life and strong culture – how much longer can it continue?

In September and October, villagers start to target short distance migrants (so called "black fishes") that move from seasonal streams and wetlands back to perennial water bodies as the floods start to recede. By the end of October fish begin migrating up the Mekong River from Cambodia. Just below the Khone falls villagers use gill nets to target medium and large size species (Baird, 2001).

Ma's house in the center of the Sadam Island is surrounded by rice fields. Chong, his second son has come back from Vientiane to help his parents farming with his younger brother Tong. Chong is one of only a few people in the village that have had an opportunity to study in university. That night, the family reunion is celebrated with a hotpot party. The meat is catfish as usual. In this family, only Tong the youngest son is still living with his parents. His eldest brother is now working in a tourist resort 250 km away. As with other families, most young people move away, leaving the older generation alone at home. It is a familiar development model replicated from neighbouring northeast Thailand. The end result is a villages of old folk – often minding their young grandchildren who are also left behind.

Around mid December as the Mekong's water levels continue to drop, the first of the long-distance migratory small cyprinids arrives, starting with *Henicorhynchus lobatus* (*pa soi houa lem*). Villagers use bamboo and wood traps (*tone*) placed in various channels around the Khone falls to catch these fish. They are soon followed in December and January by a wave of medium-sized cyprinid fishes that migrate from the Sekong, Sesan and Srepok Rivers to the Mekong at Stung Treng in Cambodia, and then upriver to Laos (Baird and Flaherty, 2004). They pass through the Khone falls area via the Hou Sahong and then continue upstream past Pak Se and up the Mekong River to the Lao-Thai border (Warren et al., 1998). These fish are targeted with set and drift gill nets as well as traps both above and below the Khone falls and support an important fishery for the local people. Much of this catch is smoked and sold.

Between November and early January gill net catches include many large spawning fish of the endangered *Probarbus jullieni* (*pa eun ta daeng*) and the related *Probarbus labeamajor* (*pa eun khao*). Most of these are sold fresh to traders who resell them in larger towns such as Pakse, or in Thailand (Baird, 2006a).



These canyons formed by the erosive force of the water create an attractive vista, and are also home to hundreds of species of fish. Inappropriate development could easily destroy all of this.

"Even so, over 15 years since the establishment of the first co-management arrangements in Khong District, it is difficult to believe that the next generation will be satisfied with the same simple way of life of their forefathers."

Nobody knew why this baby buffalo died on Sadam Island– but that did not stop them from butchering it and enjoying the meat.

Changing Fishing Practices and Fisheries Management at Sipnandone

The mist covers the Khone Phapheng fall and the sound of the fall resonates all around like a deep roll of thunder. Here, it is impossible to communicate with someone in the middle of this, the strongest fall in the world that has more than twice the power of Niagara. I saw Samnieng, a Lao fisherman from Tha Kho village working in one of the most dangerous places to get only 2-3 kg of fish. He followed his father's path to continue this job, fishing in the Khone falls even though the number of fish has declined. His younger brother "Sian" was also continuing the fishing tradition until a health problem with his leg prevented him from walking. His wife had to go fishing instead of him. She told me, 'The first time when I had to walk on a sling to our fishing trap my legs were shaking and I was frozen with fear and could not move. But we didn't know what we would do if we couldn't fish.'

In the past, when the villagers wanted to eat fish, they just went to the river and caught what they needed. They could gather enough food for their needs on their first catch, which is quite different from the situation today. The decline of fish catch has come from many reasons including dams, overfishing and illegal fishing. Some Lao said 'During the time the Khmer Rouge ruled Cambodia there was no fishing in Cambodia. Fish were there all the time, we caught as much fish as we wanted, until we didn't want to fish anymore. After the war ended, people in Cambodia started to catch fish again but they used bombs, poisons and illegal gear.'

The force of the Khone Phapheng falls is twice that of Niagara – but it is still not enougn ɪo prevent local fishermen using fall back/waterfall chute traps to catch striped river barb (*Pa sa-ee*) and other small cyprinids a they try to pass the falls in dry season migrations.

Synouan Khotboury, a 24-year-old fisherman from Don Khone told me that he went to work in Thailand for 3 months. 'My wife and I were arrested and detained in jail for two weeks because we didn't have work permits. But, we had food for every meal in jail and we had an electric fan when it was hot. The only thing that I didn't like was that our boss cheated us.' Then, I asked him that if he had chance to, would he want to try to work in Thailand again? He said yes if he could get money. If you visit many villages in Siphandone these days, don't be surprised if you only see old people feeding their grandchildren. Samnieng and his wife's last question still rings loud in my ears: 'Could you take our daughter to work with you in Bangkok?' I kept quiet.

Until as recently as the 1950s and 1960s fisheries practices at Siphandone were largely traditional, for subsistence purposes. The human population was much lower and fishing gear were made of local materials. The last few decades has seen significant changes in aquatic resource use and management. Population has increased, and nylon gillnets have become the most ubiquitous piece of fishing gear. An increase in the value of fish, increased mobility of fishers and traders, improved road transport north to Pakse and widespread availability of block ice have greatly expanded the marketing of fresh fish.

In the early 1990s, with many fishers concerned about declining catches, new fisheries management arrangements were developed involving communities and local government working together in what is called co-management. First the "Lao Community Fisheries and Dolphin Conservation Project" and subsequently the "Environment Protection and Community Development in Siphandone Wetland Project" helped establish 63 fisheries co-management systems in Khong District between December 1993 and August 1998. The success of this approach was based on the ability of villagers to use and adapt their own understanding of the local ecology - referred to as Local Ecological Knowledge or LEK (see Baird, 2007b); the willingness of villagers to adjust resource management strategies to meet local conditions; a strong sense of community spirit and solidarity; limited external cultural influences; and an integrated and holistic way of viewing nature. (Baird, 2001). While this is the most extensive documented experiment in inland fisheries co-management ever undertaken in Laos, in fact anywhere in the Mekong Basin, and even in South-east Asia, WWF will also soon communicate the experience of a similarly large but more recent effort of 70 community fisheries in 5 provinces of Southern Laos which has also led to the development of community fisheries guidelines (DLF and WWF, 2009). Even so, over 15 years since the establishment of the first co-management arrangements in Khong District, it is difficult to believe that the next generation will be satisfied with the same simple way of life of their forefathers.

Spear-fishing can normally only be done in April when the water is at its clearest. The water at Siphandone is about the only place in the lower Mekong where the water is clear enough to really see underwater, as much of the silt settles out.

The fisheries of Siphandone are threatened by unsustainable fishing, and some fishing practices in Siphandone are contributing to the decline of important species. The fishermen cleverly exploit the natural features of the river that funnel large fish migrations through narrow areas where large numbers are caught with *Li* traps as well as nets and other gear. The beautiful photographs in this book reveal the fantastic diversity and abundance of fish at Siphandone – but from another perspective they also provide a clear record of over-fishing. The prolific harvest at Siphandone is taken in some ways at the expense of other places and other people in different parts of the river. It is now recognized that the *Li* trap fisheries may be contributing to over-harvesting of a number of species, and under a proposed new fisheries law currently being drafted in Laos, they may be made illegal, or their use greatly restricted.

In October 2008, WWF coordinated a meeting between fishermen from 4 villages in Siphandone with fishermen from 4 nearby villages in neighbouring Cambodia. The Cambodians unanimously pointed to the use of *Li* traps on the Lao side as a factor contributing to the decline of fisheries. They expressed concerns about the fishery in the Siphandone area because much of it takes place during a time of year that is traditionally "closed season" in Cambodia. Closed season was specifically designated to restrict certain types of fishing pressure, and thus allow fish to migrate, reproduce and disperse. Cambodian fishermen are not very happy then, when their upstream neighbours use the same period as a time to target fish intensively (WWF, 2008).

(Above) - Uncle Won is the owner of a 2 rai near Kasoum island that is extremely productive, earning him an income of several thousand dollars each year. (Below) - Barbs are a major source of food for people throughout mainland Southeast Asia. These were caught during a March spawning migration.

Development Impacts on Siphandone

Four thousand kilometers along the Mekong River, these 4,000 islands are truly a special place for people and for at least 205 species of fish, some of which travel 800 km from the South China Sea to spawn here. Effective local fisheries co-management alone cannot however ensure the continued existence of the impressive Siphandone fisheries if large-scale development projects are not properly managed.

Deforestation, agriculture, mining, and road construction can all increase the amount of silt and sediment in the river. Too much silt can clog up the gills of fish, suffocate freshly laid eggs, affect nursery grounds of juveniles, and reduce the amount of light penetrating the water – reducing plant survival. Degradation of seasonally inundated forests along the banks channels and islands of Siphandone also has significant impacts (Baird, 2001). Forest fruits, flowers, leaves, bark and roots are important food items for various species of fish of economic importance that feed in the flooded areas in the rainy season (Baird, 2007a).

Of all planned developments, Mekong mainstream dams, represent the single largest threat to the fisheries of the Lower Mekong and the local livelihoods those fisheries support. Dams and reservoirs block natural fish migration routes; dams also alter the amount, timing, and speed of flow of rivers; the river's natural patterns of erosion and silt deposition; as well as water temperature and water quality - all of which can have massive impacts on aquatic life. Dams act as a barrier to fish migrating upstream, and fish migrating downstream generally have to pass through turbines, resulting in many of them being killed. Dams with large storage reservoirs affect river hydrology, including changes in the onset of floods, the size of area flooded and the duration of the floods. Reduced "flood pulse" transport of sediment into the floodplains reduces the nutrients available for aquatic plant growth – the primary productivity engine directly and indirectly driving much of the fisheries productivity. At the same time, smaller floods of shorter duration

The Mekong (Irrawaddy) Dolphin group at the transboundary pool numbers only around 10 individuals. If construction of the Don Sahong dam goes ahead, this group is unlikely to survive.

(Above) - Pai Kaewjanta from Houa Sadam village drags himself along a rope, as he returns from the middle of the Sahong channel. If the Don Sahong dam goes ahead, this area will be flooded, and Pai, like many others, will have to move and find work elsewhere.

reduce the available habitat for fish, and reduce the survival rates of eggs and juveniles (Barlow, 2008). Changes in dry season flows, and changes in the timing of the start of the floods, can disrupt the spawning and migration cues that trigger the changes in fish behaviour needed for migration, reproduction and ultimately the survival of the species (Baran, 2006).

The proposed dam on the Hou Sahong channel is the most immediate threat. It would involve construction of a concrete wall across the downstream end of the Hou Sahong channel. Although described as a 'run-of-river dam', the wall may extend 10 m above the height of the channel banks, and although a large reservoir would not be formed, there would be some water retention for at least a couple of kilometres upstream. Operation will cause rapid and significant daily flow variations as electricity is generated to meet peak demand. The effects of blocking the critical fish migration routes through the Hou Sahong channel, would have huge impacts not just for the local Siphandone fisheries, but also the upstream and downstream fisheries (including in the Tonle Sap and Mekong Delta) that depend on Siphandone (Baran and Ratner, 2007). The loss of fisheries could cause fishing families up and down the river to lose hundreds of millions of dollars of income each year. The cost of replacing this source of free protein from nature with farmed animals would be even higher, and the development effort needed to ensure this would likely take decades to implement.

The dam would be sited less than 2 km from the transboundary dolphin pool on the Lao-Cambodian border. This would lead to the demise of this dolphin group, reducing the remaining range of the highly endangered Mekong dolphin by up to one third, and making it extinct in Laos (Bezuijen et al., 2007). It will destroy a way of life and fishing culture that could not be found anywhere else in the world. These things cannot be addressed by simple "mitigation measures" and once lost they will be lost from this world forever. It is unforgivable that such natural riches would be sacrificed for a meager 360 MW of electric power, which could so easily be generated in many other ways with very little environmental impact.

(Left, below) - Pictures of children playing in the river like this are a very common sight. But if the Don Sahong dam is built, who knows if we will still see the smiling faces of children like this?

The Final word

During three years of taking documentary photographs I had the chance to journey to every corner of Siphandone. Some beautiful waterfalls like Khone Khokma and Khone Fang still await the arrival of their first tourists. Visitors don't know about the amazing fishing traps like Li and Louang Khang. Development in the Mekong today reminds me of several decades ago in the Chao Phraya River in Thailand. Today the Chao Phraya River is a nearly-dead river. Aquatic life is greatly reduced, some species are extinct, and water from the river can no longer be used for drinking. I have never had a chance to see the migration of Siamese Carp that I have heard about from old men. The Mekong is an international river and we need the cooperation of all Mekong countries to protect it. Do we Thais need this electricity so badly that we would deprive future generations of this unique heritage? Do we want the Mekong to become the next Chao Phraya River?

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After completing Ph.D. research in Borneo, Robert Mather joined WWF in 1993 in the Huay Kha Kaeng-Thung Yai Naresuan World Heritage Site in Western Thailand. He established WWF Thailand in 1995 and built it into a well-known and respected organisation with 60 talented staff by 2005. During this time he led projects on elephants, tigers, and marine turtles, as well as a environmental education and protected areas management. He also started many new partnerships with the private sector. Robert has worked on the Mekong River since 2001 and from 2005-2008 led WWF's Living Mekong Programme based out of Vientiane, Laos, focusing on environmental issues in hydropower development; road construction in headwaters and floodplain areas; conservation of priority sites from the Tibetan Plateau to the Delta; Mekong Dolphins and Mekong Giant Catfish, as well as local livelihoods and sustainable management of wetlands. Robert joined IUCN in 2008 and is now responsible for IUCN's programme in 3 countries – Laos, Cambodia and Vietnam.

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Suthep Kritsanavarin believes that a photojournalist must act as a conscientious observer, while also contributing to social change. His award-winning photographs have been published in influential media worldwide including Time, Days Japan and Geo, and exhibited in Europe and Asia. For "Siphandone: The Mekong Under Threat", Suthep focuses on the people who risk their lives as they struggle to net their daily catch at Siphandone, a unique stretch of the Mekong River in Southern Laos, and reveals some of the Mekong's most incredible endangered species. These remarkable images won Suthep a 2008 Best of Photojournalism award from the US National Press Photographers Association and a Days Japan International Photojournalism Special Prize. The Siphandone area is now threatened by the Don Sahong dam, one of eleven dams proposed for the lower Mekong River's mainstream. Suthep's photographs vividly uncover what would be lost if the dam is built.

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Ganesh Pangare is a water resources expert currently with IUCN as the Coordinator of the Water and Wetlands Programme, IUCN, Asia. His main area of work during the past two decades has been in water harvesting systems, watershed management, water governance, participatory irrigation management, private sector involvement in water projects and water and climate change issues. Ganesh has worked and done consulting work for The World Bank, International Food Policy Research Institute, Asian Development Bank, United Nations Research Institute for Social Development, FAO, UNESCO, Danida, GTZ, The Water Dialogue, India-Canada Environment Facility, WWF, Centre for Science and Environment, Institute of Rural Management, and many other national and international organisations. He is LEAD and Ashoka Fellow and has written and co-authored more than 10 books and several monographs and papers related to water resources management and development.

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Dararat Weerapong has more than 10 years experience working on communications for environmental conservation and sustainable development in Thailand as well as Laos, Vietnam, Myanmar, China and Cambodia. After graduating in 1994 from the Faculty of Arts, Silpakorn University, she joined the Thailand Environment Institute's editorial staff, working on its journal "Pli Bai". In 2001, she moved to WWF Thailand, where as Communicatoins Manager she worked on projects and campaigns raising environmental awareness among the Thai public. While at WWF, she completed a masters degree on Development Communication at Kasetsart University, Thailand. Her thesis focused on the media responses to the Mekong Rapids Blasting (Navigation Improvement) scheme. In 2005, Dararat joined the Stockholm Environment Institute as a Regional Communications Coordinator, where she was intensively involved with the Sustainable Mekong Research Network (Sumernet) until the end of 2008. Currently, she is undertaking a postgraduate course on communications through Malmo University, Sweden, and working as an independent communications consultant.

About this book

This book is the first in a series of publications to be brought out under the Mekong Region Water Dialogues project funded by the Ministry for Foreign Affairs of Finland, and facilitated by the Regional Water and Wetlands Programme, IUCN, Asia office. The Mekong Region Water Dialogues aim to facilitate transparent decision-making in the Mekong Region by enabling wider stakeholder involvement in processes associated with water resources governance. We believe that good water governance is linked to sustainable livelihoods and to ecosystem conservation. Through this series of publications we would like to get stakeholders to start thinking about strategies and work towards a just and sustainable management of water resources in the Mekong Region.

About the Mekong Region Water Dialogues

Through the Mekong Region Water Dialogues, IUCN is dedicated to facilitating equitable water governance in the region through sustainable mechanisms that:

- improve decision-making processes around water-related investments in the Mekong Region
- provide opportunities for business, government and civil society actors in the Mekong Region to participate in dialogues; and
- enable different perspectives on Mekong Region water-related development to be considered in decision-making.

About IUCN

IUCN, the International Union for Conservation of Nature brings together States, government agencies, and a diverse range of non-governmental organizations in a unique partnership. As a Union of members, IUCN seeks to influence, encourage and assist societies around the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. www.iucn.org and www.iucn.org/asia

About Siphandon Project

The Siphandon Photography Project has been active since 2000, when Suthep Kritsanavarin traveled to Siphandone in Laos. It was not only the Grand Li Phii Falls and Khone Falls that impressed him, but also the way local fishermen did their fishing by walking on rough rocks with furious river flows underneath them. There was no sign of fear in their eyes. For about four years Suthep did research, collected data, contacted relavant bodies, prepared the necessary equipment and built up his courage. With support from the Khamputhorn Family, he went back and forth to the area to capture those scenes through his camera, often risking his own life.

With the coming of the Don Sahong Dam project, Suthep is working with several organisations including TERRA, International Rivers and IUCN to raise public awareness of Siphandone with the hope of seeing the Mekong River continue to flow freely.

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