



Catch and Culture

Fisheries Research and Development in the Mekong Region

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INSIDE

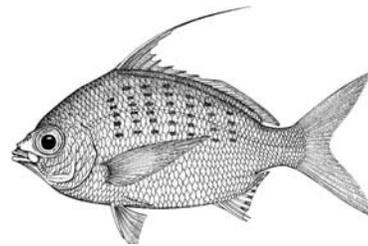
- Tonle Sap yields record haul
- Harvesting insects in Cambodia
- Shrimp hit by duties on dumping
- Financing for Lao dam signed
- Breeding the experts of the future



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Editorial panel

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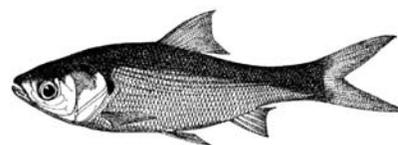
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Tonle Sap yields record haul



By Kent Hortle, Ngor Pengbun, Hem Rady and Lieng Sopha

The catch in 2004-05 from the dai fishery in the Tonle Sap was the largest for 10 years. The high flood contributed to the increased catch, but other factors must also be involved.

Catches from the Tonle Sap bagnet (or *dai*) fishery have soared to more than 16,000 tonnes this year, almost three times the previous season's haul and the highest since systematic records started to be kept. The record catch from the fishery, which targets a small cyprinid species known as *trey riel* in Khmer, accompanied higher water levels on the Tonle Sap but may also reflect a reduction in illegal fishing.

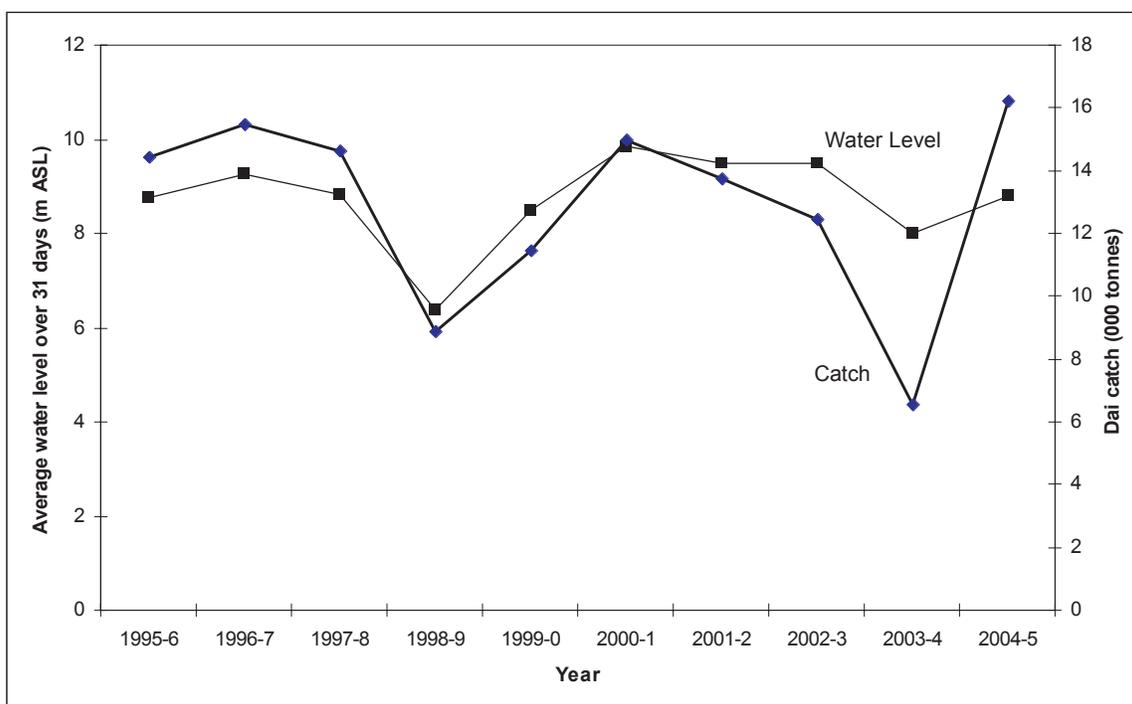


Figure 1. Bagnet catches and peak water levels in the Tonle Sap

Water level is for Phnom Penh Port which is well correlated with levels elsewhere in the Tonle Sap and Great Lake. Bagnets, or *dai*, are similar to trawl nets and are suspended in one location. Each *dai* is about 25 metres wide and 120 metres long, extending a few metres to the river bed.

The 2004-5 season had 65 dais in 13 rows.

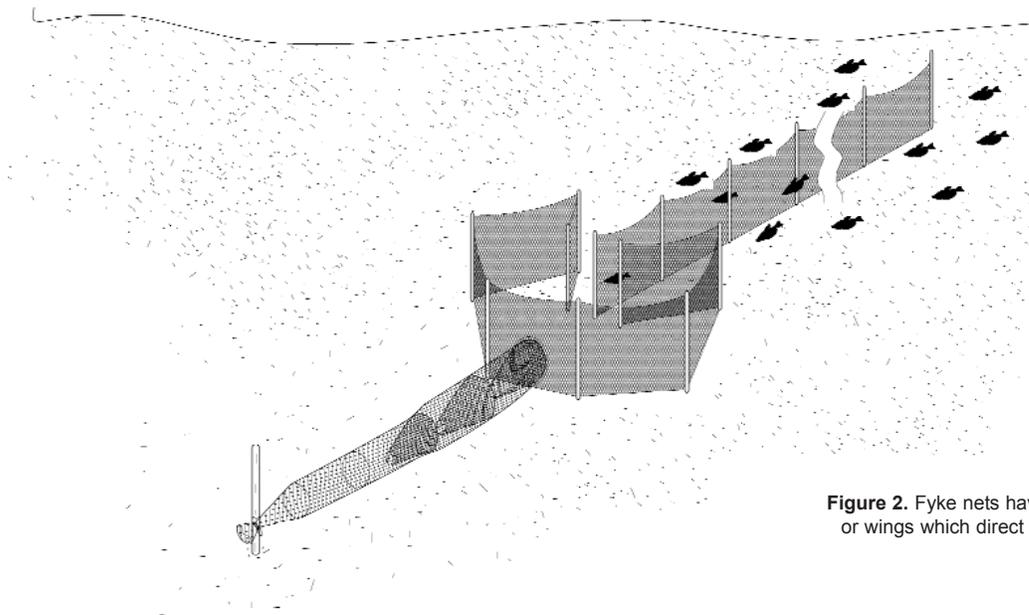


Figure 2. Fyke nets have long leading arms or wings which direct the fish into the trap.

In 2003, light rainfall and lower flood levels sharply reduced fish production, a situation exacerbated by illegal fishing during the closed season (see *Catch and Culture*, April 2004). As a result, the bagnet catch during the 2003-4 season plunged to barely 6,000 tonnes, the lowest since systematic monitoring began in 1994-5.

In 2004, flood levels were slightly above average and the Tonle Sap's production rebounded. Catches from another bagnet fishery in southeast Cambodia (targetting a separate cyprinid species known as *trey linh*) were also much higher, and anecdotes suggest generally good catches throughout Cambodia during the 2004-5 season. This has been good for bagnet owners, gill-net fishers and fish buyers (but maybe not for Lao fishermen in the Khone Falls area - see accompanying article on page 7).

Based on flood levels alone, the record bagnet catch was higher than expected (see Figure 1). One possible cause for the very

high catch could be greater production of fish on the floodplains upstream due to a reduction in illegal fishing. Despite limited funding, Cambodia's Department of Fisheries carried out a major campaign of education and enforcement in 2004. Education included billboards on fishing regulations, news items, and support for community fisheries. Illegal gear destroyed included more than 21,000 fine-mesh fyke nets, more than 7,000 electro-fishing units and more



An aerial view of a row of bagnets, or *dais*, in the Tonle Sap near Phnom Penh, Cambodia.

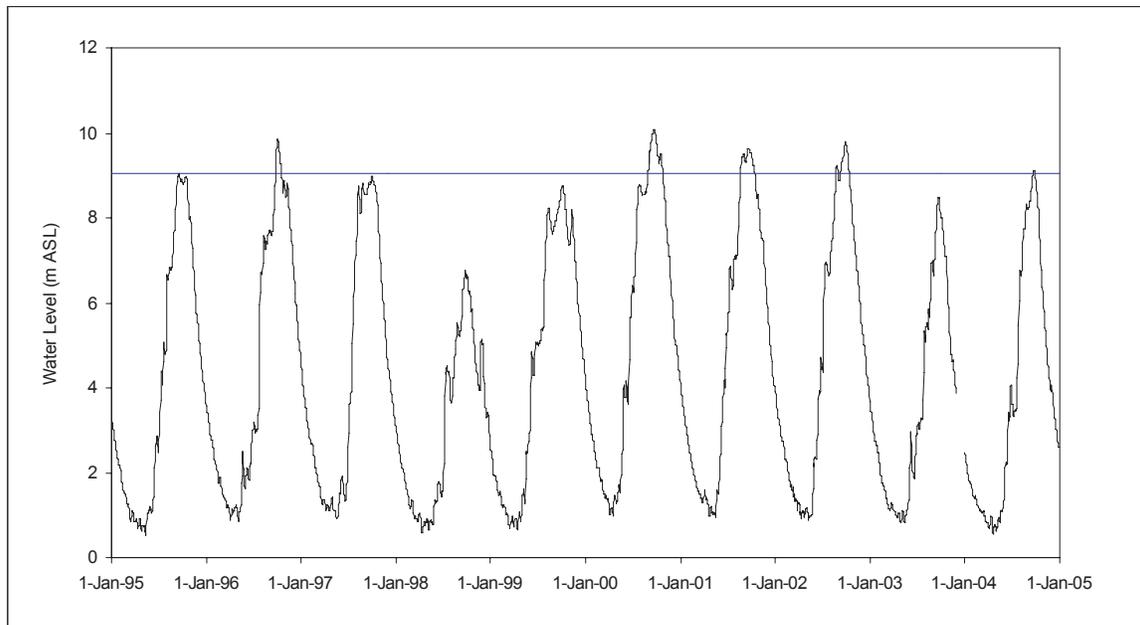


Figure 3. Daily water levels of the Tonle Sap (1995-2004)

Data from Phnom Penh Port. The horizontal line shows mean levels based on a 31-day period around the peak.

than 2,000 kilometres of fences, known as *saiyouen* or *lu sbai mong*.

In recent years, fine-mesh fyke nets have increasingly been used on Cambodia's floodplains (Figure 2). Made from mosquito netting with a two-millimetre mesh, they catch a wide range of species at very small sizes before they can grow. Most of the tiny fish are sold to feed snakeheads (*Channa* spp.) and other carnivorous fishes grown in aquaculture farms. The Department of Fisheries is introducing a ban on the use of wild-caught fish as feed in aquaculture, as one step in ensuring wise use of the natural fisheries resources. Although the ban does not come into effect until June this year, it may have already had some effect in reducing demand for small fish for feed.

The bagnet season runs from October to March and peak catches are usually in January, when most fish migrate down the Tonle Sap. During the latest season, however, the peak - about two thirds of the total - was in December. Hydrographs did not show any features which might explain the earlier migration (Figure 3).

The flood peak, for example, was September 25 which was in line with the long-term average.

Word of the high catches in December spread quickly, and thousands of villagers arrived in small boats from throughout Cambodia's lowlands. Although such seasonal fishers arrive each year, this season was notable for their high density the Tonle Sap. These small and middle-scale fishers were surveyed in January, when it was estimated that over 7,000 boats were fishing on the Tonle Sap and around the Mekong Junction. Most were using drifting gill nets, with some using larger gears such as seines and trawls. The total catch from these boats was estimated at between 4,000 and 5,000 tonnes in February, a similar amount to the bagnet catch that month.

The increasing importance of the Tonle Sap fishery to Cambodia's economy can be judged from Figure 4, which shows the increasing price of *trey riel*, the most abundant fish in the bagnet fishery. Despite the very high catches this season, prices fell very little, showing that demand is accelerating. Not only does

Cambodia's population continue to grow, but trade routes to Thailand and Viet Nam are improving, allowing increased exports of fish.

The results from monitoring the bagnet fishery during the latest season show a great improvement in the catch, perhaps partly as a result of improved enforcement and management. Maintaining the systematic monitoring is essential, as it provides the

only reliable long-term data that can show trends in the Tonle Sap fisheries. However, it is important that other monitoring is also carried out as fishers using many other gears also make large catches. An annual census of seasonal fishers should be considered as an important adjunct to the bagnet data which are collected by staff of the Cambodian Department of Fisheries in conjunction with the Mekong River Commission.

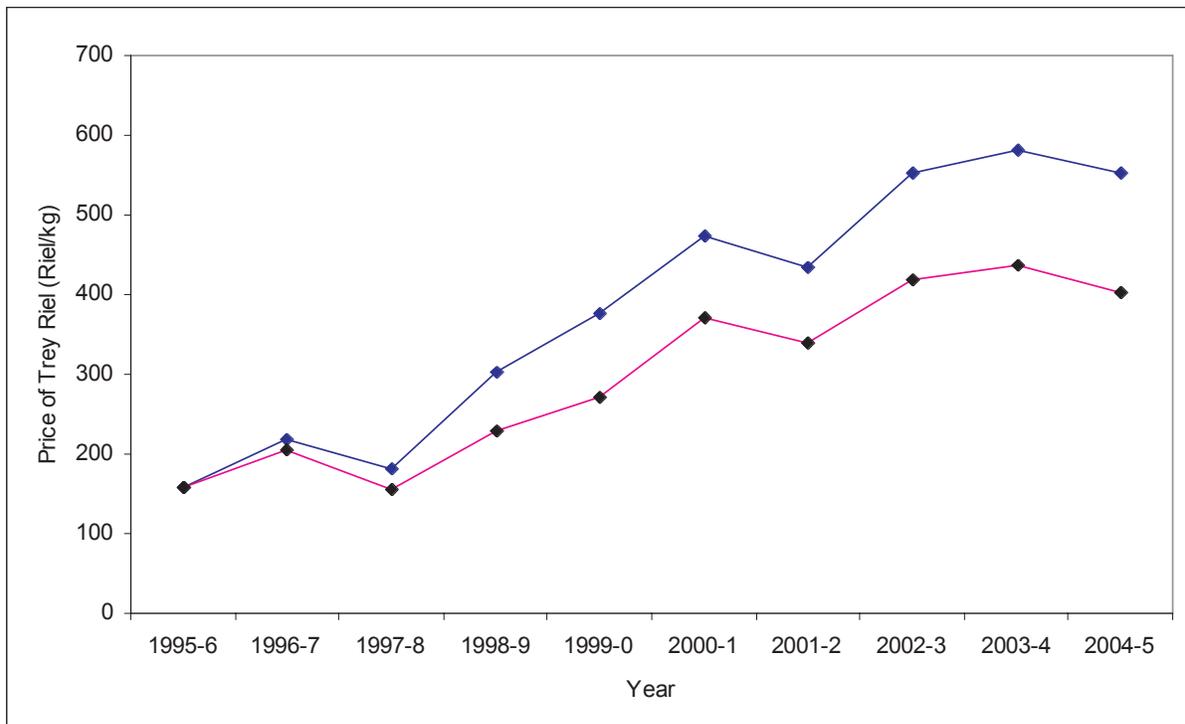
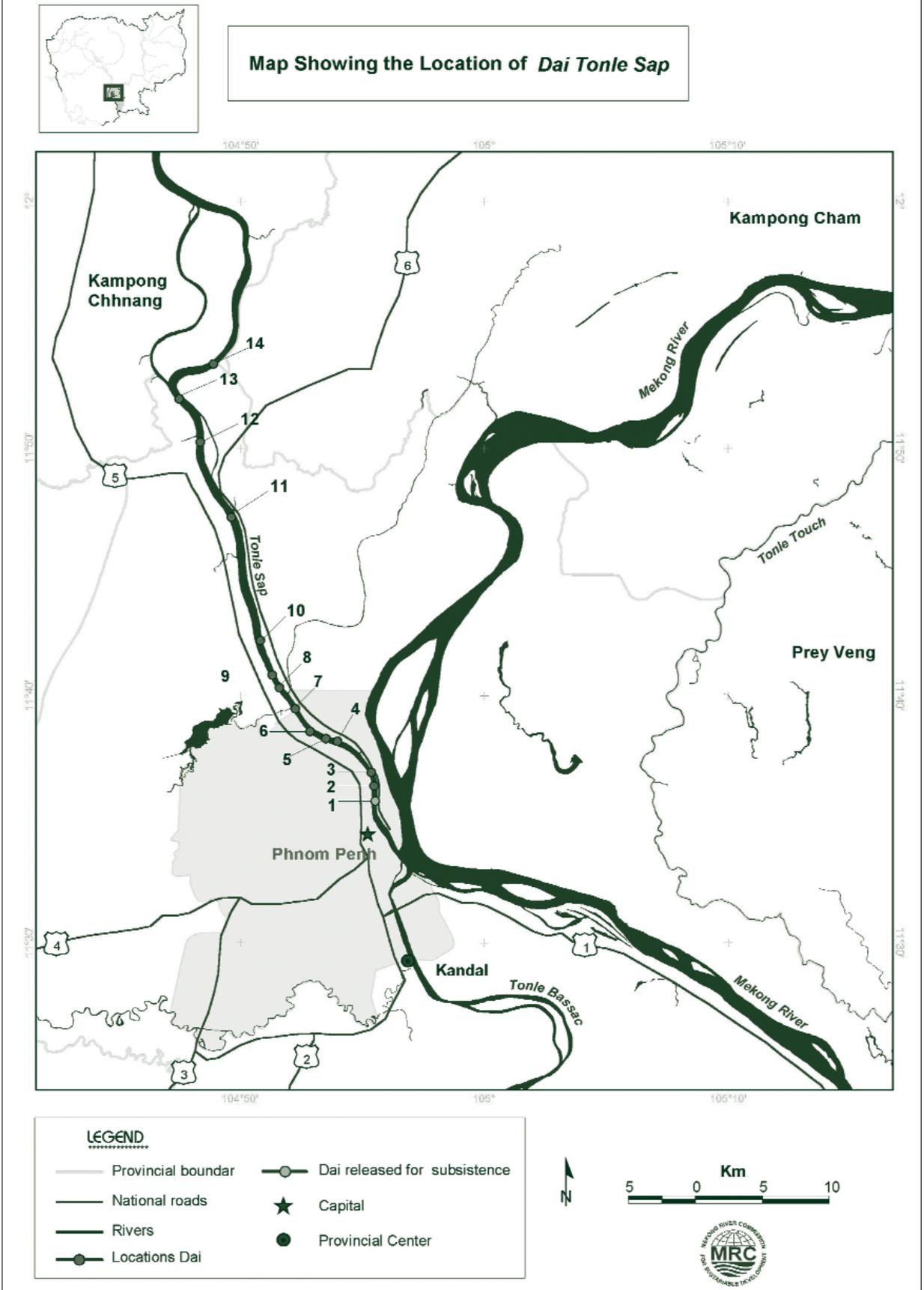


Figure 4. Prices for trey riel (*Henicorhynchus* spp.)

Based on samples from the Tonle Sap bagnet catch, the upper line shows actual prices each season. The lower line shows prices in equivalent 1995 riel, adjusted for inflation. In 2004, 4,000 riel was equivalent to about US\$1.





Are the Tonle and Khone Falls fisheries linked?



By Peter Starr

The evidence is not conclusive, but it looks like Cambodia's bagnet catch may have an influence on the fortunes of Lao villagers hundreds of kilometres away

While the record catch is good news for bagnet operators on the Tonle Sap, Lao fishermen in the Khone Falls area are not celebrating. Anecdotal evidence from a recent visit to the Khong district in Champasak province indicates that this year's catch of small carp is down sharply. While the bagnet fishery uses nets similar to trawl nets suspended in one location, the Lao fishermen 400 kilometres upstream use a different method to target the same species. As they move upstream from Cambodia, migrating fish can hit obstacles such as steep waterfalls and rapids in the Khone Falls area. Fence-filter traps, known as *tone*, catch the fish as they move back downstream in search of one of the few channels that can be passed during the dry season.

Ian Baird, a fisheries biologist who conducted research in the Khong district during the nineties, reckons the success of the Lao fishery could be "strongly influenced" by how many fish are caught in bagnets in Cambodia. Baird, who now runs the Global Association for People and the Environment in the southern Lao city of Pakse, calculated that the peak catch for the fence-filter trap was usually about three weeks after the peak bagnet catch in Cambodia.

In a paper* published two years ago, he noted that particularly high bagnet catches in Cambodia coincided with low to moderate fence-filter trap catches in the Khone Falls area in 1995 and 1998. During the two intervening years, the Cambodian catches were low and the Lao catches were high. And although both were low in 1999, the bagnet catch was the worst in five years while the catch from fence-filter traps was higher than the previous year.

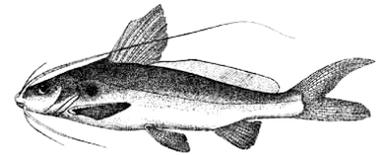


Baird also noted that accounts of an extraordinary abundance of fish in the Khone Falls area between 1975 and 1978 coincided with a Khmer Rouge ban on commercial fishing and severe limitations on subsistence fishing. Although the biologist concedes that the data from 1995 to 1999 is not conclusive, he notes that Lao villagers have long believed that the health of the cyprinid fishery at the Khone Falls is "largely dependent on what happens downriver in Cambodia."

In such an environment, Baird highlights the need for regional cooperation to ensure that countries don't adversely affect the fisheries of other countries. "Cambodia needs to make sure that Laos and Thailand get their fair share of migrating small cyprinids. On the other hand, the Lao and the Thais need to avoid impacting on hydrological cycles that influence natural processes downriver, or extracting too much water, or emitting too much pollution into the river system. If all countries in the basin do not cooperate to prevent and solve these critical problems, everyone is likely to suffer."

* *Rhythms of the River: Lunar Phases and Migrations of Small Carps (Cyprinidae) in the Mekong River*; National History Bulletin of the Siam Society 51 (1), 2003

Harvesting insects - a growing industry in Cambodia



By Kent Hortle, Roth Troueng, Joe Garrison and Greg Cans

Portable generators and ultraviolet lights are transforming the traditional harvesting of insects into a major new industry in Cambodia's northwest

It's not exactly fishing. Nor is it farming. But using lights to trap aquatic insects is rapidly developing across the Tonle Sap flood plains of northwestern Cambodia. In this annually-flooded landscape of ricefields and canals, thousands of villagers are now using ultraviolet lights each night to attract millions of insects to traps. The larger edible insects are boiled, sorted and sold as food. Common aquatic insects include water beetles (Dytiscidae) and giant water bugs (Belostomatidae). Both are considered delicacies, and are particularly popular as snacks with alcohol. Among the terrestrial insects commonly consumed there are grasshoppers (Acrididae), crickets (Gryllidae) and mole crickets (Gryllotalpidae).

Although insects have always featured in the Cambodian diet, harvesting them has become a major industry with the advent of cheap ultraviolet black lights, which are highly effective in attracting insects, and the ready availability of portable generators. Such commercial light-trapping seems to have started near Battambang about six years ago.

Villagers first used the lights to attract insects to



Insects are attracted to the light, hit the white sheet and drop into the water-filled collecting tray

aquaculture ponds to feed fish, and then decided to target the large edible species. Where a light is being used for "fishing", insects strike a sheet of plastic and fall into a plastic bath of water. In such a trap, even aquatic insects cannot escape, as they cannot climb the slippery sides to dry their wings.

Thuok Thouet of Chrey Tmei village is a typical insect fisher, the son of rice farmers. He owns no land, so recently started catching insects in the hope of earning more than he does as a mechanic. Up to 40 other insect-fishers operate in his district alone. Thouet has made 60 traps and spreads them over a distance of more than one kilometre. He bought a second-hand 5,000 watt generator to power the 60 lights via a long cable. The traps are set out each night and the insects

are collected each morning. At the peak time in December, he catches up to 80 kilograms of insects each night. This falls to less than three kilograms a night in March as the hot dry season withers the surrounding ricefields, but catches increase again when the wet season starts in May.

Mouen Sithak of Piam Ek village in Battambang got involved in the industry only in late 2004. He needs to supplement the income his wife earns from selling local produce to support their four children. His mother was a trader so he understood the business and could immediately earn money without large investments. He buys 20 to 50 kilograms of insects every day. In December, when many insects were being caught, he was paying between 27 and 40 cents a kilo. But as supplies dwindled during the dry season, he was paying \$1.20 a kilo in March. He sells the insects to local retailers who can sell them for up to \$2.00 a kilo. Other traders take much larger quantities, up to 1,000 kilograms a day, across the border at Poipet into Thailand, where prices are higher.

The industry is in its infancy, with no accurate information on the species composition of catches nor their size and value. The industry is even difficult to classify. As some aquatic species are targeted it ranks as some kind of a fishery, but clearly it is within other sectors also. The industry's impact on the environments from which large numbers of insects are being removed is not clear. Presumably, rice farmers would welcome insect-fishing as one way of controlling pests and aquaculturists would not lament the removal of large predatory bugs. But the effect of large-scale insect removal from fields prior to annual flooding must be deleterious for any insect-feeding fish which arrive with the flood.

Insects are nutritious and rank with fish as a source of protein. The Institute of Nutrition at Thailand's Mahidol University estimates that the edible tissues of insects contain up to 20 percent protein. Why insects are not more widely eaten in western countries "is pure caprice", according to the author of a study on Indian insects. "Mankind eats many curious things, including

oysters, shrimps, whelks and cockles, dried sea slugs and birds' nests ... and yet there is an absurd prejudice against insects." This prejudice is not apparent in Asia where insects are widely eaten, with the practice well documented in Viet Nam and Thailand. But little has been published about the industry in Cambodia.

Further reading:

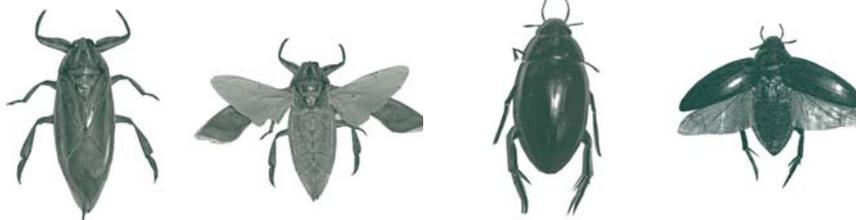
De Foliart, G.R. (2005). The human use of insects as a food resource: a bibliographic account in progress. www.food-insects.com.

Maxwell-Lefroy, H. (1971). Indian Insect Pests. Today and Tomorrow's Printers and Publishers, New Delhi. 318 pp.

Puwastien, P., M. Raroengwichit, P. Sungpuag and K. Judprasong (1999). Thai Food Composition Tables. Institute of Nutrition, Mahidol University. 150 pp.

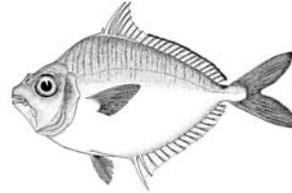


Insects for sale in the market in Battambang, north western Cambodia



Note: *it is interesting that most insects do not actually fly towards lights, but attempt to use lights to navigate by keeping them at a constant position in their eyesight, as they would the moon or stars. The effect is that insects spiral into lights!*

Shrimp hit by duties on dumping



By Peter Starr

The United States uses a controversial law to protect its shrimping industry from foreign competitors including Thailand and Viet Nam

The United States announced in January anti-dumping duties on imports of shrimp from Thailand and Viet Nam following a year-long investigation. The ruling by the International Trade Commission (ITC) also affected Brazil, China, India and Ecuador. In late April, however, the commission announced "changed circumstances" reviews for Thailand and India following the December tsunami which devastated many shrimp-farming communities across the region.

In its January ruling, the commission found that non-canned warmwater shrimp and prawns from the six countries were being sold at "less than fair value" in the United States. Such imports "materially injured" the local shrimping industry centered on the southern states along the Gulf of Mexico which formed an alliance to initiate the claim.

In reviewing the cases of Thailand and India, the commission said there were "sufficient changed circumstances" but stressed that the reviews did not necessarily mean that the anti-dumping orders would be revoked. The final decision, it said, involved determining whether revoking the orders was likely to lead to continued or recurring material injury to the shrimp industry in the United States.

The shrimp task force of the Consuming Industries Trade Action Coalition and the American Seafood

Distributors Association noted that the anti-dumping action under the so-called Byrd Amendment was illegal under international trade law. "The way that the dumping law is being applied in the shrimp case is simply wrong, counter-productive and anti-consumer," said task force chairman Wally Stevens, who is also president of the distributors association.

Stevens noted that the Byrd Amendment, also known as the Continued Dumping and Subsidy Offset Act, funnelled revenues from anti-dumping duties directly into the pockets of those seeking protection. The World Trade Organisation (WTO) has declared such "corporate welfare" illegal and authorised retaliation by members until the law is repealed. The anti-dumping duties on Viet Nam, which is not yet a WTO member, range from 4.13 percent to 25.76 percent. Those on Thailand are from 5.79 percent to 6.82 percent. The United States took similar anti-dumping action against Vietnamese catfish in 2003. Viet Nam is still negotiating its accession to the WTO, which is scheduled to hold its ministerial conference in Hong Kong in December.



A shrimp pond in the Mekong Delta being dried after harvest

Financing for Lao dam signed



By Peter Starr

The ambitious Nam Theun 2 hydropower project on two Mekong tributaries in Lao PDR carries significant risks, but the World Bank and the ADB say they can be managed - as long as the project is overseen properly.



The Nakai-Nam Theun 2 National Biodiversity Conservation Area
Photos courtesy of Nam Theun 2 Power Co

The World Bank, along with other public and private lenders and guarantors, has signed the remaining financing agreements for a \$1.25 billion hydroelectric dam project in Lao PDR. The signing in Hong Kong on 3 May 2005 followed an executive board meeting in Washington in March which approved the World Bank's role in the Nam Theun 2 project.

The bank's International Development Association (IDA) is extending a \$20 million grant to finance the Lao Government's 25 percent stake in Nam Theun 2 Power Co. (NTPC). It is also providing a partial risk guarantee

in the form of a 40-year credit of \$50 million to lower the project's risk profile for commercial lenders. In addition, the World's Bank's Multilateral Investment Guarantee Agency has agreed to provide up to \$200 million in guarantee coverage to protect the project sponsor and private commercial lenders against potential political risks associated with the Nam Theun 2.

The financing agreements pave the way for NTPC to borrow up to \$1 billion to undertake the project which includes environmental and social mitigation measures, costs associated with unanticipated impacts, and external monitoring and evaluation arrangements. NTPC has also committed an additional \$200 million in contingency financing.

NTPC is 35 percent-owned by Electricité de France subsidiary EDF International with the Lao Government and Thailand's Electricity Generating Public Co. Ltd. holding 25 percent each. The remaining 15 percent is held by Italian-Thai Development Public Co. Ltd. A project agreement, also signed in Hong Kong, confirms the obligations of NTPC and its partners in relation to the project's technical, social and environmental aspects.

Bernard Tribollet, the company's chief executive, reiterated that the signing of the agreements signalled NTPC's commitment to "full compliance" with the project's social and environmental risk-mitigation plans prepared over the past 10 years.

Somboune Manolom, permanent secretary of the Lao Ministry of Industry and Handicrafts, said the government was committed to ensuring that the project adhered to World Bank criteria. In addition to mitigating social and environmental risks, he highlighted continued involvement of local communities, regular communication with international stakeholders and the

need to ensure that project revenues are "transparently managed and directed towards priority poverty-reduction and environmental programs."

The World Bank expects the project to provide the country with additional revenue of \$150 million a year, allowing it to boost spending on basic health and education by as much as 30 percent when it starts operating in 2009. The 1,070-megawatt plant will be the biggest hydropower plant in the Lower Mekong Basin, surpassing the 720-megawatt Yali Falls plant on the Se San tributary in Viet Nam.

Too cautious?

Following board approval of the Nam Theun financing arrangements in March, outgoing World Bank president James Wolfensohn said the bank had made it clear after talks with the Lao government and the developers that "we all share the responsibility" for the project. "We have spent the best part of a decade studying the project and evaluating the risks," said Wolfensohn, who visited the Lao project area in February. "In fact, we have been advised by some independent experts that we studied it for too long and been too focused on possible risks.

"Because it involves the resettlement of people, because it impacts on not one but two rivers and because it is so vital for the future of the country, we believe these risks need the utmost attention. Our decision, after a lot of deliberation, is that the risks can be managed. In fact, one of the reasons we are involved is to help manage those risks." Jemal-ud-din Kassum, the bank's regional vice president for East Asia and the Pacific, added that the World Bank would continue to encourage public discussion and scrutiny. "Our involvement does not stop with the signing of the guarantee. That is when it really starts," he said.

Haruhiko Kuroda, president of the Asian Development Bank, said the approval of the project marked a "milestone" in Lao development planning. "If managed properly and effectively, it has great potential to bring large and lasting benefits to the people," he said. In a statement released in April, the Manila-based bank noted that stakeholders had raised concerns about the Lao Government's lack of experience with such big



Locals rely on the Xe Bang Fai for food and water.

projects and its ability to carry out the project effectively and transparently. "These concerns are recognised by the international financial institutions supporting the project, including ADB, as important and significant risks to the long-term project success," the statement said. "These risks are manageable with substantial and careful oversight."

The ADB is supporting the project with a \$50 million private-sector loan, a \$20 million public-sector loan and a political risk guarantee of up to \$50 million in maximum liabilities. The bank estimates that the project will generate about \$1.9 billion in taxes, royalties and dividends for the Lao Government over the 25-year operating period. Most of the electricity, about 5,354 gigawatt hours a year, will be exported to Thailand with up to 300 gigawatt hours supplied to Lao consumers every year.

Although the Nam Theun 2 will be the biggest hydropower plant in the lower basin at 1,070 megawatts, it will be much smaller than other plants across the mainstream of the Mekong in China. The installed capacity of the Manwan plant commissioned in 1993 is 1,500 megawatts while the capacity of the Dachaoshan plant commissioned in 2001 is 1,350 megawatts. China announced in 2002 that it had started building an even bigger 4,200-megawatt plant known as Xiaowan, expected to be commissioned between 2010 and 2012.



Call for regional information system



By Peter Starr

They may not always see eye to eye, but river communities and the Cambodian Government agree on one thing - the need for more communication

A public forum on fisheries in northeast Cambodia has urged regional governments to set up an information and communications system for people living in the Mekong basin. The call followed a two-day meeting of 180 representatives of river communities from Cambodia, Lao PDR and Thailand. The Northeast Cambodia Fishery Forum, held in Stung Treng in February, focussed on fisheries in the Se San, Se Kong and Sre Pok rivers. Stretching across northeast Cambodia, southern Lao PDR and the central highlands of Vietnam, these three rivers are among the Mekong's largest tributaries and together account for almost a fifth of the river's total water discharge.

In a declaration, the meeting asserted that water quality and levels of the Mekong and its tributaries had "seriously changed" in recent years, reducing both the quantity of fish and the types of species. Problems included the construction of dams, illegal fishing and the destruction of flooded forest areas. "The governments should establish a regional information and communications system, ensuring that the information is easily accessible for people living in the Mekong basin," the declaration said.

Touch Seang Tana, Secretary of State at Cambodia's Council of Ministers, acknowledged the need for information sharing. He agreed that hydroelectric dams were affecting fish populations along with other factors such as modern fishing gear and the catching of fingerlings. "There is a lot of illegal fishing in Cambodia," he told the forum.

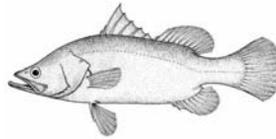
Asked about the impact of dams on the Se San River, the secretary of state questioned the accuracy of a report based on local research, noting that the figures were not clear. "When some officials visited the affected area, information obtained from the villagers was not as high as in the report. The government has a policy of cooperation with neighbouring countries. When the government talks to another country, documentary evidence at hand is needed," he said. "We need all the information out on the table."

Seang Tana, who is a member of the Economic, Social and Cultural Observation Unit at the Council of Ministers, also stressed the need for realistic approaches to cross-border issues. "It's difficult to pursue the decommissioning of dams," he said, noting that dam construction cost millions of dollars. On the other hand, "electricity is poor in Cambodia and greater supply is needed. We have to make choices."



Programme breeds the experts of the future

By Chris Barlow



Chea Tharit (seen here sampling fish larvae in the Mekong River near Phnom Penh) used the data from his studies for a Ph.D. from Nha Trang University.

Fisheries staff from around the region are using fieldwork with the Mekong River Commission to complete or further their academic studies

The Fisheries Programme of the Mekong River Commission has 100-110 "counterparts" in the fisheries agencies of Cambodia, Lao PDR, Thailand and Viet

Nam. All are engaged in field work on managing and developing fisheries and aquaculture in the Lower Mekong Basin.

Although support for post-graduate scholarships stopped in 2002 due to funding restrictions, indirect support continues with counterparts using their fieldwork to complete or further their academic studies. This is an important part of the programme's multi-faceted approach to capacity building and supporting the career aspirations of staff.

Congratulations are in order for the impressive work by dozens of counterparts who have completed their

theses while with the programme. Others are continuing their studies at universities in the region as well as Australia and Denmark. We wish them every success.

Among those to have completed theses while with the programme are:

So Nam, Cambodia, 2001-2005, Ph.D.

Molecular genetic evidence for sympatric reproductive isolation of two large migratory catfishes in the Mekong River. Catholic University of Louvain, Belgium. This thesis examines the genetics of two commercially important catfish species, *Pangasianodon hypophthalmus* and *Pangasius bocourti*. In English.

Chea Tharith, Cambodia, 2000-2005, Ph.D.

A study of fish larvae and juveniles in the Tonle Sap River. Nha Trang University, Viet Nam. The study is about the identification of fish larvae and fry from the Tonle Sap, Mekong and Bassac Rivers with information on the annual patterns of drift. In Vietnamese.

Nguyen Thanh Tung, Viet Nam, 2001-2005, Ph.D.

Assessment of species composition of fish larvae and fry at Vinh Xuong and Quoc Thai in the Mekong River. Institute of Oceanography, Nha Trang, Viet Nam. The thesis covers assessment of the catches from large dais which targeted the fry of Pangasiid catfish. In Vietnamese.

Sinthavong Viravong, Lao PDR, 2001-2004, Ph.D.

Life history strategies of four Mekong fish species (*Henicorhynchus siamensis*, *Probarbus jullieni*, *Helicophagus waandersii* and *Botia modesta*). Hull University, United Kingdom. This study uses information based on local ecological knowledge and other surveys to compare the ecology of four common Mekong fish species. In English.

Tuantong Jutagate, Thailand, 1998-2002, Ph.D.

Thai river sprat: biology and management in Sirinthorn Reservoir, Thailand. Deakin University, Faculty of Science and Technology, Australia. In English.

Phan Dinh Phuc, Vietnam, 2002-2004. M.Sc. (now completing Ph.D.)

Application of fishery data and aspects of the biology of major species in the management of fisheries in six inland water bodies in the Central Highlands of Vietnam. Deakin University, Australia. In English.

Douangkham Singhanouvong, Lao PDR, 2001-2002, M.Sc.

Stage one of the Fishery Impact Assessment (FIA) of the fishery resources of the lower Xe Bang Fai River. Aalborg University, Denmark. Background information from prior studies related to dam projects in Lao PDR was applied to assess the impact of the proposed Nam Theun 2. In English

Pham Mai Phuong, Viet Nam, 2002-2004, M.Sc.

Managing fish larvae/juveniles in the Mekong Delta of Viet Nam. Tromsø University, Norway. This thesis examined the implications for fisheries management of the data from the large commercial dais for catfish fry. In English.

Prak Leang Hour, Cambodia, 2002-2004, M.Sc.

Fish yield assessment by habitat: Small lakes, grassland and swamp in Kompong Chhnang Province, Cambodia. Royal University of Agriculture, Phnom Penh. Three natural habitats were compared and the standing crop in each was assessed by complete removal as an estimate of possible yield. In Khmer.

Trung Ha Phuong, Vietnam, 1997-1998, M.Sc.

Assessment and preliminary trials of nursing common carp in cages in Ea Kao Reservoir, Vietnam. Asian Institute of Technology, Bangkok. In English.

Sommano Phounsavath, Lao PDR, 1997-1998, M.Sc.

Co-management at Nam Ngum Reservoir, Lao PDR. Asian Institute of Technology, Bangkok. In English.

Malasri Khumsri, Thailand, 2001-2002, M.Sc.

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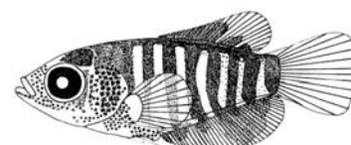
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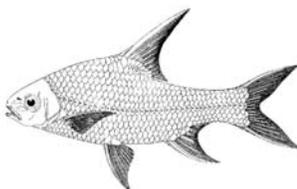
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New information products



Proceedings of the Second International Symposium on the Management of Large Rivers for Fisheries (LARS2)

These proceedings are available either as two hardback volumes or as a CD-ROM. Both products contain the edited papers from LARS2 held from 11-14 February 2003 in Phnom Penh, Cambodia. The theme of the conference was Sustaining Livelihoods and Biodiversity in the New Millennium. The papers on the CD-ROM are in PDF format.

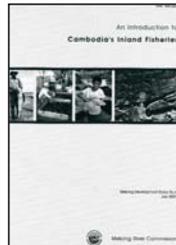


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An Introduction to Cambodia's Inland Fisheries

Cambodia relies heavily on its natural resources and agricultural land to provide food and livelihood for its 12 million people. Among the most vibrant of these renewable natural resources are the inland fisheries, which provide income and food security for millions of people. This report synthesises much of the relevant research on Cambodia's fisheries. Its easy-to-read style is complemented by numerous attractive photographs



Mekong Development Series No. 4, November 2004, 56 pages. US\$5.00



Distribution and Ecology of Some Important Riverine Fish Species of the Mekong River Basin

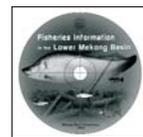


This new report complements an earlier report on fish migrations (Technical Paper No 8), which provided an overview of the general patterns of fish migrations and their significance for management. This report provides more detailed information of 40 key species which are significant in the Mekong River fishery. For each

species it provides notes on distribution, feeding, size, population structure, critical habitats, life cycle and its importance in fisheries.

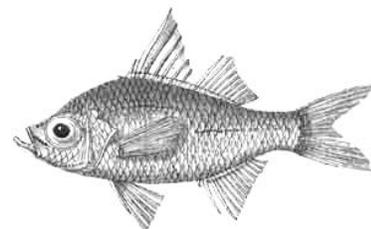
MRC Technical Paper No. 10, May 2004. 116 pages. US\$5.00

Fisheries Information in the Lower Mekong Basin CD-ROM



The Fisheries Programme has produced many publications, databases, maps and photos covering the fisheries of the Mekong. Much of it is dispersed, having been published in various places and over an extended period. Now, for the first time, we have compiled the great majority of these publications in electronic form, and produced them on one CD.

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The CD offers a vast range of information produced by the Mekong River Commission's Fisheries Programme and its counterparts including approximately 300 technical papers and reports produced over the past 10 years. It contains nine databases related to catch assessment and five databases related to migration and spawning. Each database has its own manual and/or data dictionary. There is also a selection of photos on fishing activities in the Mekong.

A bibliography section provides references for a substantial collection of fisheries related papers and books.

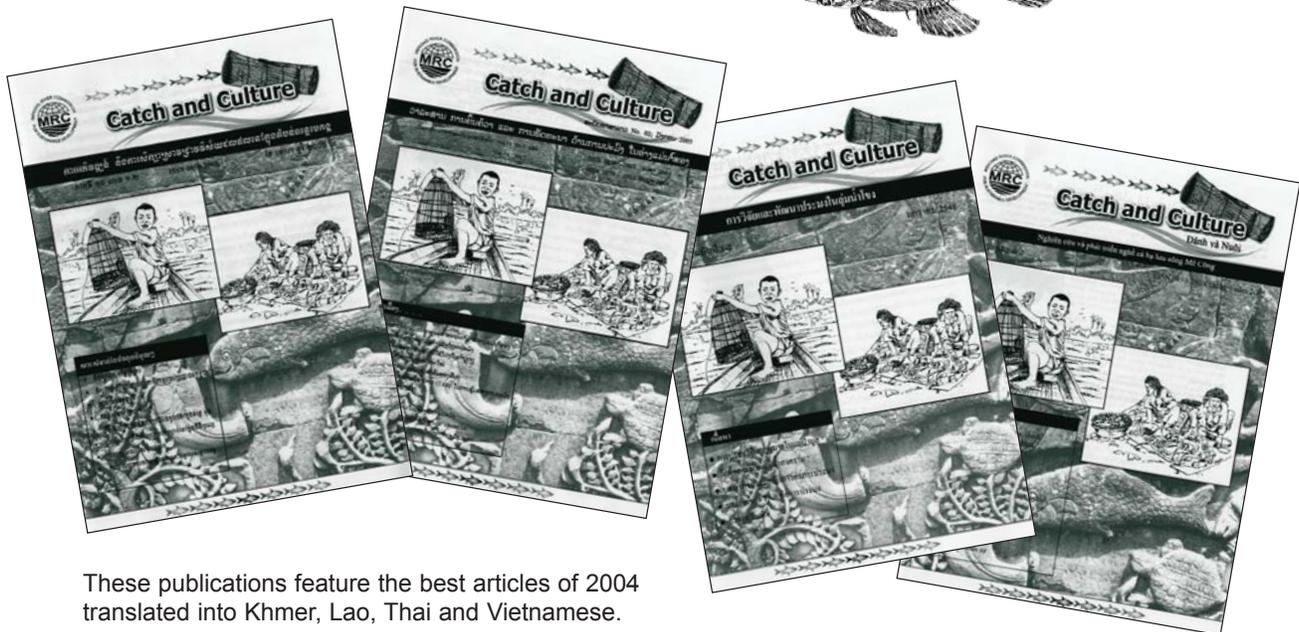
Users can also access and explore 18 pre-made maps using the ArcReader, GIS software provided.

Publication of this CD is part of the Mekong River Commission's ongoing campaign to promote awareness of the issues surrounding the fisheries of the Lower Mekong Basin.

December 2004. US\$5.00



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Fishing Gears in Songkhram River Basin

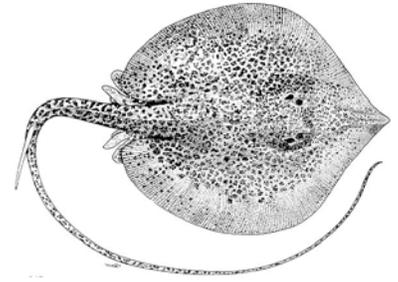


Mr Keeree Kohanantakul, Thailand Department of Fisheries, has documented the fishing gears of the Songkhram River in a new book. Many fishing gears used in the Songkhram River are based on local knowledge built up over centuries. Their designs and use reflect knowledge of fish behaviour, including feeding and movements associated with weather and moon phases, as well as local hydrological conditions. In compiling the information in the book, the author wanted to inform new generations of the initiative shown by their ancestors who invented and constructed fishing gears which do not over-exploit fish stocks like some of the modern fishing gears. This book has photos of all gears and information on their use. Soft cover, 87 pp, in Thai

Available from: Inland Fisheries Research and Development Bureau, Department of Fisheries, Thailand or Fisheries Programme, Mekong River Commission Secretariat, Vientiane, Lao PDR.



Mekong Fisheries Index



Best Mekong fishermen rewarded

Viet Nam News, 8 January 2005

Twelve fishermen in the Cuu Kong (Mekong) Delta provinces have been named the best fishermen by the southern province of An Giang and Nam Viet Ltd Co. The fishermen have each caught 500-17,000 tonnes of high quality catfish this year.

Fish breeders' manual soon

Vientiane Times, January 2005

Namxoung Aquaculture Development Centre is expecting to produce a handbook for fish breeders within the next few months, following three years of research in Lao PDR. The new manual will help fish breeders reduce their business costs as well as teach them new breeding techniques. The Centre, about 40km north of Vientiane, opened in 2002 under the Aquaculture Improvement and Extension Project with support from the Japan International Cooperation Agency. The project aims to teach livestock and fishery staff to train provincial and district officers. This year the Centre aims to produce more than four million fingerlings to supply breeders.

Fisherfolk arrested after killing rare freshwater dolphin in Cambodia

Agence France Presse, 27 January 2005

Four fisherfolk were arrested in Cambodia after they allegedly killed a rare Irrawaddy dolphin by tossing an explosive device into a river in northeastern Monduliri province. The 86kg freshwater dolphin was found dead in the Srepok River after people exploded the device to catch fish. The secretary of the provincial police chief said no one knew that there were Irrawaddy dolphins in Srepok River. Seng Teak, country director for the World Wide Fund for Nature said that the river used to be home to the Irrawaddy dolphin but they disappeared 10 to 15 years ago.

Foreign firms eye Vietnam's aquatic feed market

Asia Pulse, 28 January 2005

With aquaculture a hot industry in Vietnam, the demand for specialised feed is increasing rapidly. Foreign feed companies now produce about 400,000 tonnes a year of food for the seafood sector, but that isn't enough to satisfy the aquaculture industry. Vietnam must import between 140,000 and 150,000 tonnes of marine feed a

year from Thailand, Hong Kong and Taiwan to meet demand. Most of the 13 aquatic feed plants now operating in the country are foreign invested, says the fisheries ministry. Aquaculture areas have expanded to 1 million hectares, with annual catches now up to 1.2 million tonnes a year. Black shrimp, tilapias and basa catfish are the three major marine life species raised.

January seafood exports reach \$150m

Vietnam News Service, 29 January 2005

Viet Nam's seafood exports expanded rapidly in January by 19.8 per cent over the same month in 2004. The Ministry of Fisheries was confident of reaching its \$2.6 billion goal by the end of this year. The Fisheries Ministry has also vowed to further promote trademarks for key Vietnamese exports like basa catfish. Following a recent seminar in southern An Giang Province, the ministry selected "Top Quality Pangasius from Viet Nam" as the trademark for quality Vietnamese basa and tra catfish. Last year, seafood was Viet Nam's 4th largest export, bringing in \$2.36 billion from products such as shrimp and fish.

Scientists, Fishermen Worry About Herring

Associated Press, 7 February 2005

Scientists are worried about the health of the herring population of San Francisco Bay. Fishermen also have found it increasingly difficult to earn a living in the bay's last significant commercial fishery, but argue the herring population is healthy and state restrictions are the cause of their woes. Herring spend most of the year in the Pacific Ocean but schools of the fish visit the bay for up to four weeks each in winter months. Fishermen scoop the fish up in nets and sell them to buyers in Japan, where their prized eggs, or roe, are served at sushi bars. The fish themselves are processed into animal feed. This season there have been very few herring landed. Fishermen want the state wildlife officials to let them use gill nets with narrower meshes, allowing them to catch smaller fish. Currently, smaller fish can pass through the 2 1/8-inch mesh required by the state. The fishermen want to reduce the allowable mesh size to 2 inches, a move opposed by state scientists. State biologists have fretted about the fishery's health ever since El Nino's water-warming events seven years ago decimated the herring population, which still has not fully recovered.



Fisheries capitalised for further growth

Viet Nam News, 7 February 2005

The Ministry of Fisheries will invest VND 182 billion (US\$11.5 million) to develop the fisheries sector this year. Aquaculture is earmarked to receive VND 13.5 billion and creation and development of breeding strains will receive VND30 billion.

Government to back catfish farming for export

Bangkok Post, 14 February 2005

Thailand's National Food Institute is to actively promote farming of giant catfish due to rising overseas demand. The institute will now conduct a study on developing local pangasius farms into large-scale operations and hopes to earn 10 billion baht a year in exports. The fish are currently raised in Mukdahan and Ubon Ratchathani provinces near the Mekong River. Catfish are popular in the US and Europe, where they are considered healthy and delicious.

PM bans fishing nets in Mekong's dolphin area

Cambodia Daily, 8 March 2005

Prime Minister Hun Sen has issued a directive prohibiting fishing nets in the Mekong River from Kratie province to Stung Treng in a bid to conserve the endangered Mekong dolphins. He said authorities should prohibit fishing nets, batteries for electrocuting fish, explosives and rafts made of bamboo from going through the conservation area and dolphin habitats. Eight rare dolphins died last year after being caught in nets officials said.

Landlocked areas develop freshwater aquaculture

Viet Nam News, 12 March 2005

Northern inland provinces in Viet Nam this year hope to harvest 50,000 tonnes of fish. Overcoming shortcomings in infrastructure, the freshwater aquaculture sector in Lai Chau, Hoa Binh, Yen Bai, Thai Nguyen, Tuyen Quang and Phu Tho will take advantage of available natural conditions and provide 50,000 jobs. Much of this area is suitable for aquaculture, as it comprises lakes and rivers or small ponds and rice paddy. The Da River region has more than 100 varieties of fish.

200 Fish species on the verge of extinction

The Nation, 1 April 2005

The Office of Natural Resources and Environmental Policy and Planning has said that more than 200 species of fish in the Kingdom are at risk of extinction. The ONREPP Red Data of Thailand reported that fish were the most at-risk animals globally. On the front line of species fighting to survive are sawfish, whale sharks, napoleons, the common silver barb and the Mekong giant catfish. In Thailand, 90 per cent of the locations

studies - home to 269 species of fish (133 sea fish and 136 freshwater fish) - were under threat. Amphibians such as saltwater and freshwater crocodiles and many varieties of turtles were also in danger of being wiped out by unchecked urban sprawl and road building.

Mekong Day celebrates 10 years of MRC cooperation

MRC press release, 5 April 2005

Senior government representatives from Cambodia, Lao PDR, Thailand and Viet Nam gathered in the presence of the Lao Vice Prime Minister H.E. Mr Asang Laoly and members of the international diplomatic and donor community in Vientiane to celebrate the 10th anniversary of the Mekong River Commission. The celebration was held at the MRC Secretariat in Vientiane, Lao PDR and commemorated the signing of the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, which took place in Chiang Rai, Thailand on 5 April 1995. The Chairman of the MRC Council for 2004/2005 H.E. Mr Somphong Mongkhonvilay formally named 5 April as Mekong Day and asked that communities in the region to join with the MRC each year in a celebration of Mekong Day to increase awareness of the region's progress in the wider world.

Flood Management and Mitigation Programme a first for Region

MRC Press Release, 7 April 2005

The Mekong River Commission's new Flood Management and Mitigation Programme was the focus of the Third Annual Mekong Flood Forum held in Vientiane on April 7-8. The topic of this year's forum was 'Flood Management and Mitigation in the Mekong Basin'. The Mekong River Commission's Flood Management and Mitigation Programme (FMMP) will be the first programme of its kind to operate on a regional basis, bringing together the needs of the four member countries. The new Regional Flood Management and Mitigation Centre in Phnom Penh, Cambodia will be the first time such a permanent, regional centre has been established. International experts from the MRC member countries of Cambodia, Lao PDR, Thailand and Viet Nam, Dialogue Partners China and Myanmar and from Japan, Germany, France and Nepal gathered for the two-day conference to discuss ways of managing the floods which claim many lives and cause untold damage every year in the Mekong Basin.

Fisheries sector targets reflect optimism

Viet Nam News 13 April 2005

The Ministry of Fisheries has set an ambitious target to produce one million tonnes of tra and basa catfish

annually by 2010. The ministry expects this volume to earn US\$800 million in export turnover. However tra and basa prices fell following some exports being rejected by the EU for containing prohibited chemicals. The ministry will now encourage farmers to produce catfish but warn them not to use any of the banned chemicals.

Fish get chips in high-tech research exercise

Thai News Agency website, 16 April 2005

Giant catfish being raised in the river have been fitted with passive integrated transponder (PIT) tags and microsatellite DNA markers as part of a breeding plan to ensure their continuing genetic diversity and prevent disease. It is hoped that the bred giant catfish can then be released into rivers nationwide. Over the past 20-plus years, the Fisheries Department has bred over three million giant catfish in an attempt to halt their decline. This year the department will establish a giant catfish-breeding unit in the northern province of Chiang Rai to continue with the breeding programme. Other giant catfish research programmes include the fitting of ultrasonic coded transmitters to determine their migratory habits, and the development of giant catfish farming on a commercial basis.

Mekong Delta hit by most severe salinity and drought

Vietnam News Agency, 25 April 2005

The Mekong Delta is facing the most severe drought and salinity in many decades, according to a recent survey conducted by the Sub-institute of Irrigation Research and Planning in southern Viet Nam. The survey found that a total of 1.4 million ha of agro-forestry and piscicultural land in the region has been affected by salinity and 6,000 ha by drought. Seawater has encroached 75km deep into the Vam Co Dong River, 80km into the Vam Co Tay River and between 45 and 62km into the Tien and Hau, the two main rivers in the region.

Giant catfish conflict simmers

Bangkok Post, May 5, 2005

Conflicts have been developing among local fishermen, local leaders and conservationists over the seasonal Giant Catfish Hunt. The first two groups want to

continue this "traditional" hunting and the last group demands that it end. The number of giant catfish, or pla buek, caught from the Mekong river by local people has been decreasing and only six were caught last year. Three giant catfish have been caught in Chiang Khong since this year's one-and-a half-month-long hunting season started on April 18 - two males and one female. Conservationists tried to stop fisheries officials from taking sperm from the fish for aquaculture, but the eggs from the 280kg female were taken to an aquaculture station in Wiang Chai district.

Rush to study Giant Catfish amid fears of extinction

Thai News Agency, May 7 2005

Mrs Tuenjai Deetet, a senator from Thailand's northern Chiang Rai Province has called for urgent studies into the life cycle of the Giant Mekong Catfish, warning that it could be on the brink of extinction. She said that the government should also launch a campaign against the consumption of the rare fish and she called for a halt to a controversial fertility treatment plan for the fish, saying that they should be left to breed naturally. Preservation of the catfish had to be a regional effort, and she said that the six Mekong countries, including Thailand, Lao PDR, Cambodia, Myanmar, Viet Nam and southern China, should fit microchips to the fish to help study their life cycle and migration patterns.

Villagers unhappy with bid to halt catfish hunting

Bangkok Post, 8 May 2005

Some villagers of Chiang Khong district have opposed a call for an end to the hunting of giant catfish in the Mekong River, saying it was a local custom practised for generations. Poom Boonnak, president of Hat Krai's Society of Giant Catfish Fishermen in Chiang Khong district said villagers were willing to abide by the law requiring them to get permission from the Fisheries Department prior to fishing. Mr Poom said the villagers were worried they would no longer be allowed to carry out traditional catfish hunting as a senator was campaigning for an end to it. If catfish hunting was banned, villagers would just hunt on the Lao side of the river, he said.

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