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MEKONG FISHERIES NETWORK NEWSLETTER

Transnational Cooperation in the Mekong River Basin?

By Zeb Hogan

This picture, painted by Cambodian artist Srey Bandol, was created for an upcoming book on the ecology and conservation of the Mekong giant catfish and other migratory fish species. For more information, please contact the organisation in charge, Save Cambodia's Wildlife (e-mail: wildlife@bigpond.com.kh) or Zeb Hogan (zshogan@ucdavis.edu). Save Cambodia's Wildlife arranges for artists and writers to produce books on environmental education.

Animals often serve as powerful symbols of group identity. In the United States of America, for example, the salmon has emerged as a **flagship species** for regional solidarity and environmental responsibility. These symbolic animals are usually large, often endangered, and sometimes migratory. Wide-ranging species (such as the tiger) make effective flagships because they are known to a large number of people in many countries.

Endangered species can also stimulate public and political support for cooperative action to restore populations and protect habitat. In border areas, the protection of such species necessitates transnational cooperation and such cooperation has led to policy formation and the establishment of international regulatory agencies.

In the Mekong River Basin, the **Mekong giant catfish** is a model species for promotion of cooperation at the international level because:

1. The Mekong giant catfish is **well-known** throughout the Mekong River Basin. The fish is migratory, transboundary, and endemic to the Mekong River.

2. Many people believe the Mekong giant catfish is a **sacred fish**. In Thailand and the Lao PDR, a complex ritual accompanies the fishing of this species. In Cambodia, the species is called *"trey reach"* or royal fish, signifying the special status of the giant catfish in the Khmer heritage.

3. The Mekong giant catfish is **endangered**. Populations of the Mekong giant catfish have been declining for several decades. The fish, once captured throughout the basin, is now **very rare**.

4. The Mekong giant catfish is one of the only Mekong species specifically mentioned in several international **treaties** and agreements, such as the IUCN Red List of Endangered Species and the Convention on the Conservation of Migratory Species.

5. **National law** supports the conservation of the Mekong giant catfish. It is illegal to capture the Mekong giant catfish in Cambodia and Thailand.

6. Scientific techniques exist to study the giant catfish. The Thai Department of Fisheries has developed a method to **breed** this species in the captivity and studies are also currently underway to determine the status and distribution of the species in the wild.

7. While wild population of the Mekong giant catfish appear close to extinction, **research and conservation** may provide a means to restore populations of giant catfish.

8. The giant catfish probably **spawns** in northern Thailand, the Lao PDR, Myanmar, and possibly China. This is the same area that will be impacted by the controversial Mekong navigation project.

9. The Mekong giant catfish appears to **migrate** out of the Tonle Sap Lake and into the mainstream Mekong River at the end of the rainy season. This migration pattern is common among fish of the Cambodian Mekong and thus the protection of the migratory pathway may benefit an entire assemblage of migratory fish.

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Monitoring of Deep Pools in the Mekong River: The Potential of Hydro-Acoustic Methods

By Dr. Jeppe Kolding,[1] Sintavong Viravong, Sommano Phounsavath[2], Chantone Photthitai[2], Sten Sverdrup-Jensen[2] and Terry Warren[2]

The authors report on a recent pilot study on selected deep pool habitats in the Siphandone area of Champassack Province, Southern Lao PDR, using a hydro-acoustic research methodology. The information is of particular relevance to the MRC Fisheries Programme because the study builds on the deep pools issue that was one of the first Technical Advisory Body (TAB) initiatives. The tool can be used for future monitoring that is relevant beyond fisheries.

Deep pools within the mainstream Mekong have recently been recognised as key fish habitats, which are essential for ecological functioning and fisheries productivity of the Mekong Basin. These habitats are used as refuges by a large number of Mekong fish during the dry-season (Poulsen and Valbo-Jørgensen, 2001).

Some river stretches have many deep pools whereas others have only a few. The geographic separation between these deep pool "hot-spots" and major flood plain feeding habitats has been identified as an important factor in the migratory behaviour of many fish in the Mekong River.

Since mainstream deep pools are believed to attract a large proportion of the fish communities of the Mekong during the dry season, they may offer an opportunity for future monitoring purposes in relation to the environmental health and state of the fisheries. However, appropriate parameters (indicators) to focus on must be identified.

The pilot study was undertaken in February 2002 at the initiative of the Living Aquatic Resources Research Center of the Lao PDR (LARReC) as part of the EU-funded "KNOWFISH" Project to which LARReC is a partner. The main objective of the study was to test the methodology in relation to obtaining quantitative estimates of fish biomass in the deep pool habitats. Such estimates may be applied as part of a future suite of ecological indicators to monitor fisheries and ecological health.

Hydro-acoustic Survey

A hydro-acoustic survey is a research methodology, which may be particularly useful, alone or in combination with CPUE data collection and others, for the study of deep pools in the Mekong. The methodology is non-destructive and it is possible to cover a large area within a limited period of time. The equipment needed is fairly easy to transport and handle and there are no requirements for certain supporting facilities (special boat, etc.) However, it does take some technical skills to operate and maintain the equipment, and also requires some scientific experience to interpret the survey results.

In this study, acoustic data were collected using a SIMRAD EY 500 scientific echo sounder. See Kolding (2002) for details of the methodology and the principle behind the use of the equipment. In addition to fish biomass estimates, water parameters such as dissolved oxygen, temperature, conductivity and salinity were measured.

Upstream from the Falls

The Siphandone area, immediately upstream from the Khone Falls, is one of the most well described areas within the Mekong in terms of fisheries ecology. Many deep pool habitats have been identified here. During the mid-1990s a large

number of Fish Conservation Zones (FCZ) were established by fishing communities (Baird and Flaherty 1999, Baird *et al.* 1999). Many of the FCZs have been established in deep pools, which local communities also recognise as important refuge habitats for fish. Fishing is prohibited in each FCZ all year round or severely restricted (timing and gear use).

In 2000, LARReC initiated a CPUE fisheries monitoring programme in the Siphandone area, with the aim of obtaining information on the impact of the FCZ on fish abundance and catches (Chomchanta *et al.* 2000).

For the purposes of this study, FCZ sites were selected based on their association with deep pools and the ongoing CPUE monitoring programme. During the first days it soon turned out that shallow sites were difficult to cover and yielded few fish observations, so the sampling design was somewhat altered to concentrate on places with deep pools. (See activities listed in Table 1). The depth range of the different sites varied between 5-38 m (Figures 3 and 4).

After dark surveys were performed in the Song Kham whirlpool (Ban Hat) in order to see possible differences in the fish abundance and behaviour between day and night times. Unfortunately, due to navigational problems after dark, it was not possible to monitor other sites during the night. As there was a reported upstream fish migration ongoing in the area during the field study (the first week after the new moon), two evenings were spent monitoring two possible fish movements from an anchored position in the main channel.

Indicative Results

The recent study is only a snapshot of each of the visited sites, mainly in order to test the suitability of the methodology and equipment in the Mekong River environment. Any of the quantitative results should therefore be treated as preliminary and indicative only. The study was conducted during the low water season with a relatively calm river and reduced currents compared with the high river season.

The results have been divided into two main groups: the deep pools (> 15 m) and the more shallow depressions in the river channels.

Deep Pools

From a methodological point of view, the results show that the equipment works fine in environments of more than 10 m depth with a uniform laminar current flow. Very little noise was observed, the fish echoes clearly identified, and enough individual traces accepted to carry out density calculations by various depth and segment intervals.

Shallow Areas

In waters of less than 10 m depth with turbulent flow and intermittent rapids, however, much care had to be taken when processing the data quantitatively. Furthermore, the number of individual traces found in these environments was generally low, which makes proper size frequency distributions problematic. Just performing echo-counting, however, that is simply counting the number of individual traces in areas with a little 'noise' may be a simple initial possibility to get an index of the relative fish abundance provided that the same number of 'pings' are compared. Throughout the study it was a general tendency for fish abundance to increase with the depth range of the sites (Fig. 1).

It appears that the water depth, within the ranges observed, is the single most important habitat parameter to consider, as also previously reported by local villagers (Baird *et al.* 1998, Poulsen 2001).

Big Fish Go Deepest

In general, the fish densities in most of the deep pools were high (> 10 000 f/ha when individual traces were raised by echo-integration), but with large individual variations, and interestingly also a high diurnal variation within one deep pool that was surveyed more than once (Song Kham). In all of the deep pools there was a uniform tendency for the largest fish to go deepest.

From the target strength (TS) distribution, some of the fish in the deepest pools appeared quite big. 6-9% of the individual traces were more than –33 dB, which represents large fish (probably more than 50 cm). During a hydro-acoustic survey, using the same equipment as in this study, on Lake Victoria, Africa, which contains a large population the big predator Nile perch (*Lates niloticus*), less than 1% of the individual fish traces were higher than – 30 dB (Tumwebaze 1997).

Resting Places by Day

It is not possible to attribute the individual traces to any specific kind of fish and since no test fishing was done it is therefore unknown which species were present in the deep pools at the time of the survey. Although in principle there is a log-linear relationship between the target strength (TS) and the size of a fish (Fig. 2), such a relationship is strongly dependent on the individual species and the position of the fish in relation to the acoustic beam. A very rough and general rule is expressed as follows:

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$TS = 20 \log(L) - 67 \pm 1 DB$

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Concerning fish migrations, an interesting observation was made during the repeated day and night surveys in the deep Song Kham whirlpool at Ban Hat. During two consecutive day and night surveys, more fish were observed during the day than at night. For example, on 18 February 2002 there were 10 times more fish observed in the afternoon than in the evening. Moreover, during the evening surveys there were clear signs from the shape of the individual traces that the fish were ascending fast from the bottom. As the local fishermen reported an ongoing upstream fish migration taking place while this survey was conducted, the hydro-acoustic results may indicate that the pool was used as a resting place or refuge during the day time and that the fish moved out of the area, or continued the upstream migration, at the onset of dark hours. As seen from the echograms and TS distributions (Figs. 3-6) the supposedly migrating fish were of small to medium sizes (TS -51 to –54) standing in dense concentrations close to ridges at 10-20 m depth.

Currents Flush Out Pools

From the bottom echoes and the general topography of the surveyed deep pools with often very steep walls and ridges, it appears that these are mainly composed of hard rocky substrate with very little soft deposits, even in the deepest parts. In an environment such as a river with massive downstream movements of gravel and sand, this seems to indicate that strong currents or whirls must somehow regularly flush out the pools in order for them to persist with the present topography over long time. This deduction, if valid, combined with the apparent importance of the pools for seasonal or perennial fish congregations, has important consequences for hydro-power management and constructions. If the hydro-power constructions somehow alter the natural flow regime of the river, particularly if the seasonal flush floods are reduced, it may result in siltation and consequent filling of the deep pools. In the Sesan River tributary, some important deep pool areas have been reported to become shallower during the past few years due to increased silt deposition resulting from the Yali Dam in the upper part of the Basin (Poulsen 2001).

Advantages and constraints of hydro-acoustics

The deep pools in the Mekong River appear to be well suited for hydro-acoustic monitoring, at least during the low water season with moderate current. The results during this survey have shown that the method is easily applicable with the possibility of collecting a large amount of information over short periods of time. Relative information, such as overall density estimates and general size distributions can be readily collected without doing any harm to the fish stocks. For more accurate estimates, as well as species compositions and true size frequencies it will be necessary to combine the method with some kind of test-fishing. How this should practically be performed in the FCZs and in narrow deep pools has not been considered during this study.

Systematically repeated surveys over time, covering all the main deep pool hotspots, would give quantitative information about the seasonal system dynamics (densities, size distributions, and migration of fish) and would further elucidate the importance of deep pools for the Mekong fish populations. If combined with test fishing and/or artisanal CPUE data the two methods would complement and support each other. Such quantitative information is extremely difficult to obtain by any other methods in a complex large river system such as the Mekong.

The constraints to using this methodology are mainly a question of priority, resources and capacity of the institutions involved in the monitoring and research of the Mekong River. A portable scientific split-beam echo-sounder as used in this survey is an expensive piece of equipment, and requires a certain level of technical experience to operate. There are more affordable simple echo-sounders on the market (such as fish finders) that can give a visual presentation of the bottom topography and fish echoes. More simple equipment, however, cannot store the data digitally, nor perform TS-distributions or echo-integration necessary for density calculations. It is therefore basically a matter of priority and information needs that should determine whether this methodology should be introduced in the regular surveillance of the Mekong River.

Summing Up

In conclusion, the pilot study obtained very promising results, which demonstrate that quantitative fish biomass estimates can be obtained using hydro-acoustic equipment. Such estimates may in the long-term be applied as important indicators of ecosystem health. Based on this study, a research programme is recommended with the aim to carry out hydro-acoustic studies over one whole dry season period and eventually extending its geographic coverage to other deep pool "hot-spots" of the Basin. Ideally, such a programme should be carried out as a cooperative activity among all four riparian countries.

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Water Management Schemes and River Fisheries

Water management schemes invariably cause changes to rivers and their ecology. They interfere, to different degrees, with the natural ecological processes of the river, and have been the most significant cause of declines in many wild fisheries on all continents. This is particularly so for fisheries in flood plain rivers, such as the Mekong, where the basis of production are the annual floods and inundation of the flood plains.

These schemes generally have three major impacts on fisheries: they barricade fish migration, cause hydrological changes, and change water quality. Even so-called run-of-the-river dams cause such impacts, because all entail some level of storage, and if the river is diverted or abstracted, the effects are greater.

More water management schemes are being planned for the Mekong Basin. Ideally the impacts on fisheries will be understood, the worst schemes eliminated at the planning stage, and mitigation and management incorporated in those dams that are built. It is, therefore, necessary that fisheries personnel reasonably understand basic engineering concepts of water management schemes in order to be able to give proper inputs during the integrated planning process.

With the intention of improving the Lower Mekong Basin countries' capacity in fisheries impact assessment, the Assessment of Mekong Fisheries Component (AMFC) has recently been organising field training for counterparts in fisheries agencies. Several water management schemes, including hydropower dams, irrigation dams, flood control dikes, weirs, etc., were recently inspected in Cambodia, the Lao PDR, Thailand and Viet Nam and a range of documents on these dams are being reviewed by counterparts. These led to an obvious improvement of counterparts' knowledge as well as a broader perspective on this important subject.

The AMFC will produce Guidelines for Fisheries Impact Assessment, with practical lessons from the case studies in the Mekong River Basin. The Guidelines will be used for training and will provide advice on assessing projects, and on producing and reviewing impact assessments, with an emphasis on understanding and mitigating or managing impacts.

Import Risk Analysis for Aquatic Animals in the Mekong Basin

Because of the potential impact of infectious diseases, many countries are in the process of undertaking **import risk analysis** (IRA) to prevent the entry and spread of unwanted pathogens through trade in animal and aquatic products. The principal aim of IRA is to provide importing countries with a defensible method of assessing the disease risks associated with the importation of animals, animal products, animal genetic material, feedstuffs, biological products and pathological materials. The analysis should be transparent. This is necessary so that the exporting country is provided with clear reasons for the imposition of import conditions or refusal to import.

Dr Nguyen Quoc An from the MRC Fisheries Programme attended the First Training Workshop on *"Capacity and Awareness Building on Import Risk Analysis (IRA) for Aquatic Animals"*. This is the first meeting for 2002 of the Asia-

Pacific Economic Cooperation (APEC) Fisheries Working Group (FWG) held at the NACA Headquarters in Bangkok, Thailand, **1-6 April 2002**. The workshop was a part of the activities of the **APEC-funded project**. With NACA, as Project Implementer and Thailand's Department of Fisheries as Project Overseer, and Australia, Hong Kong China, Mexico, the Philippines and the United States as cooperating economies, this project consists of two workshops (this one held in Bangkok, Thailand, 1-6 April 2002 described here, and the other to be conducted in Mazatlan, Mexico, 12-17 August 2002).

The **three objectives** of both events are to raise capacity among regulatory officers and aquatic animals health scientists, build consensus in conducting import risk analysis for aquatic animal importation and establish networking mechanisms.

The IRA tool system is very complicated. It has not been completed since the requirements and level of risk analysis are different from country to country. Before the concept of IRA appeared, many Codes, Guidelines and Agreements were used to ensure safe trading.

The idea to develop an IRA Manual for Aquatic Animals, which can be applied for all APEC countries, is one aim of the APEC project. The IRA Manual will include agreements and codex established by a group of countries and/or according to a specific animal species.

There were two main parts of the Asian workshop. In the first part participants became familiar with a number of regional and international agreements, treaties, codes and guidelines containing provisions with respect to aquatic animal health management. Some of these are obligatory where countries are bound to abide by their implementation, while others are voluntary.

In the second part, some participants made presentations concerning various countries (Australia, Canada and Japan), which have relatively good experience in conducting IRAs for aquatic animal. Two countries (Taiwan and the Philippines) showed how they are initiating the application of IRA, and others (Thailand and China PR) are establishing policies on aquatic animal health and/or on the private sector (New Zealand). The presentations included information on national policies and/or policy development, implementation strategies and other relevant information.

At the end, the participants were divided into three groups for discussion. The group discussion resulted in a series of recommendations and other relevant background and technical information provided during the training course. The broad range of experiences of the diverse participants from the governmental sector, scientific community, and private sector were reflected.

But to follow the IRA will not be a simple process. The IRA concerns not only pathogens of imported animal or aquatic products, but also the risks to the ecological environment, human health, etc. Many constraints when developing an IRA Manual for Aquatic Animals were considered by the participants. They were concerned that one process might take several years to fulfill. By that time, the chance for trading would be over. But ways to overcome this were suggested and it is hoped that the APEC-FWG project will be successful.

Thai Fisheries Development and Gender Issues

The Royal Thai Government recently approved a special project on **Technology Transfer for Gender and Aquaculture in North-East Thailand** worth one million Thai Baht (approx. US$42,000) for the Commercialisation of Freshwater Aquaculture in North-East Thailand. The project started in May 2002 and will continue a full year.

The **Department of Fisheries (DOF)** through the **Thai Women in Fisheries Network (TWIF)** is collaborating with the Asian Institute of Technology (AIT) and the Chulalongkorn University Social Research Institute (CUSRI) on this project. In fact, one of the main goals of the project is to build up stronger connections among the organisations involved. Although the budget is limited, it shows that the Thai Government is lending its support to a project that is studying aquaculture and fisheries technology from a gender perspective.

This project ties in well with the DOF aquaculture policy that aims to increase annual aquaculture production at the rate of 5 per cent. It has been found that subsistence aquaculture is mostly carried out by women. It has also been observed that these subsistence aquaculturalists are still not able to commercialise their operations. The Technology Transfer study will examine how the actual actors in aquaculture can develop their potential to benefit more from improved technologies. At present, with the decentralisation of governmental administration and decision-making procedures, extension systems are currently being reviewed and restructured. This study will thus be a timely contribution to the new approach to extension by running pilot projects that can be replicated elsewhere.

The study will also augment the development of Thai women's capabilities through access to aquaculture technologies and improved production and marketing systems. Women's role in maintaining the household economy has always been the pattern in the Thai family. Women have been playing a very important role in subsistence freshwater aquacuture, particularly in north-eastern Thailand. The study aims to improve the status of Thai women, who are the major actors in aquaculture development.

The study will serve as a vehicle for capacity building for the TWIF based at the DOF. The members of the Network consist of, but are not limited to, aquaculture researchers, technicians and extension workers who are interested in supporting the roles of women in fisheries. This study expects to come up with modules for more effective technology transfer for commercialising freshwater aquaculture in north-eastern Thailand. It will strengthen the Network's capability since its members are involved in the whole process of the project, from the inception through its implementation.

The study will formulate strategies, modules and recommendations to improve the transfer of technology for better commercialisation of freshwater aquaculture in north-eastern Thailand.

Gender and Fisheries Development

And what about other types of fisheries in Thailand? It should be noted that traditional small-scale inland fishers tend to identify themselves as farmers first and spend a part of their time fishing. This results in a lack of statistics reflecting so-called "full-time fishers" in inland capture fisheries. Unfortunately*, there is no data or any record in Thailand about women involved in the fisheries sector.*
Training and credit facilities are easier for men to access than for women. Therefore, decision-making regarding financial matters, the scale of the fisheries business, species selection for aquaculture and marketing rests with men, and men also have greater control over the income.

Less than 10 per cent of the farmers trained by the DOF are women. The men then train their wives. However, in the case of training on post-harvest technology including preservation and cooking, and the nutritional value of fish, more women tend to come to the training sessions. Except for this, the DOF has not been able to use women's resources to maximise fisheries production in Thailand.

Owing to cultural and traditional barriers, women do not participate in decision-making in public, even when they are involved in community activities. For example, women cannot participate in discussions regarding the financial, technical and marketing aspects of the community ponds. There are no women's representatives among the village committee members. But the secretary and accountant of the committee are likely to be women. Almost all of the fisheries development projects have not reported large-scale success due to the top-down nature of development, which does not look into women's needs.

Gender Promotion in the DOF, Thailand

Gender is still a new thing at the DOF in Thailand. Despite the fact that there are some activities focusing on women that are supposed to improve post-harvest technology including processing, an implementation plan, programme or project

that directly empowers women in the fisheries sector is not clearly defined. In fact, there is no clear idea how to address gender in the fisheries sector.

The DOF lacks data and research on gender and fisheries development and the division of labour of men and women working in fisheries activities. Without solid information on the gender roles, status and needs in fisheries, it is difficult to integrate gender in a programme or project to equally benefits men and women in the fisheries sector.

Thai Women in Fisheries Network (TWIF)

The TWIF was established (unofficially from the point of view of the DOF) in February 2000 with the support of the MRC Fisheries Programme. The Network aims at ensuring women an equitable share in the country's development of the fisheries sector. The TWIF has connections with other National Networks (in Cambodia, the Lao PDR and Viet Nam). Linkages are maintained with members from women's groups, organisations and agencies that deal with gender and related issues in Thailand. The TWIF is now a centre of gender information and is undertaking various activities to promote women in all spheres of the fisheries sector, such as arranging for training courses and workshops for gender development, conducting gender research and trying to make women visible for sustainable development.

At the TWIF meeting in October 2001 held at the DOF headquarters in Bangkok (see *Catch and Culture*, Vol. 7 No. 2, December 2001), the DOF took responsibility to serve as the focal point. The Network structure was revised at that time. The DOF is now working with the TWIF with a group of eight Fishery Biologists from the Inland Fisheries Division and other Divisions whose work is related to gender promotion. Out of 28 Divisions, ten have activities related to gender promotion either directly or indirectly.

Activities of the TWIF

In 2001, two meetings were arranged by the working group of the TWIF and the Thai National Coordinator to build up understanding about the Network among the DOF officers and to discuss future TWIF activities and the Network structure as follows:

1) Making a draft plan of the TWIF activities for 2002-2004. The four main activities aim at increasing understanding in gender and strengthening the TWIF as follows:

a. Training of Trainers (TOT) in gender analysis supported by the NCWA (National Commission of Women's Affairs)
b. Collaborating with AIT and CUSRI on the Research Project in North-East Thailand (supported by the Thai Government, May 2002-April 2003).

c. Conducting gender training programme by the Gender Trainer Team and the Fisheries Training Division (one-month training course funded in 2002 by the World Bank).
d. Fostering the integration of gender in all Components of the MRC Fisheries Programme and DOF, Thailand, and DOF Development Projects such as One Village, One Product, etc.

2) Refining the TWIF structure and selecting the new National Coordinator (Mrs Napaporn Sriputtinibondh).
3) Setting up the sub-committee, focal point and task force groups to work for the TWIF.
4) Building up linkages among organisations and agencies working on gender.
5) Participating in the Seminar on Women's Activities in Fishing Villages in Japan (November to December 2001).

New initiatives should ensure that women in fisheries are given equal opportunities to participate in development activities. They need to be offered equal access to training opportunities and other kinds of support. Women should be given the chance to take part in the planning of a development initiative that will impact on them and their families.

(The full text of this article appears in the MRC Fisheries Programme, *Report of the Third Annual Meeting of the Regional Coordinators*, Ha Noi, March 2002, pp. 49-57).

Technical Publication

Publications on various aspects of the Fisheries Programme's work have been produced in the newly developed MRC Technical Report Series. The first five issues in the series cover fisheries work, including final reports on topics identified by the Technical Advisory Body for Fisheries Management. The five reports are titled…

- Status of *Pangasianodon hypothalmus* resources, with special reference to the stock shared between Cambodia and Viet Nam
- Status of *Pangasiid* aquaculture in Viet Nam
- Mekong giant species: on their management and biology
- Deep pools as dry season fish habitats in the Mekong River Basin
- Financial analysis and risk assessment of selected fishery activities in the Mekong Basin.

These reports form a permanent record of technical work of the Fisheries Programme, and make the results available for scientific workers from fisheries and other disciplines. Several more technical publications are in the production pipeline. All reports are available from the MRC.

In addition, the papers presented at the 2000 and 2001 Technical Symposiums on Fisheries in the Mekong have been published in the first two editions of the MRC Conference Series. More than 20 papers on various aspects of fisheries and aquaculture in the Mekong Basin are reported in the 2001 Proceedings. Again, these are testimony to the professionalism of the scientists who presented their work at the Symposium.

Fisheries Programme Welcomes New Social Scientist

The Junior Professional Officer (JPO) Programme supported by Denmark offers an excellent opportunity for a young person interested in development work to gain experience and contribute expertise to developing countries. The MRC Fisheries Programme benefited from the enthusiasm of two JPOs awhile ago. Now **Mr Thomas Augustinus**, a JPO from Denmark, is working as a **Social Scientist/Natural Resource Planner** in the **Management of Reservoir Fisheries Component** headquarters in Vientiane, Lao PDR.

Mr Augustinus' background is in human geography, having spent some time studying and working abroad in Australia, Bolivia, Malaysia and Uganda. In 2001 he received his M.Sc. degree in human geography from the University of Copenhagen, specialising in **socio-economic aspects of Natural Resource Management**. As part of his curriculum, he attended a six-week course in research methodology carried out in Sarawak, Borneo, arranged by the University of Copenhagen. Also during his post-graduate years Mr Augustinus studied for a year at Monash University in Australia, mainly attending courses within the field of Development Studies and Natural Resource Management.

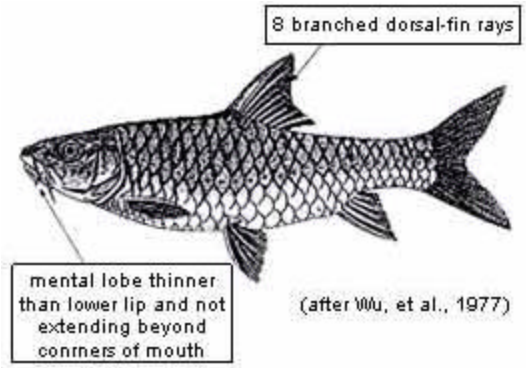
Prior to joining the MRC Fisheries Programme to deal with social science issues, Mr Augustinus spent 4 months in Uganda as an intern for CARE-International. He was working with institutional mapping, primarily looking at the role of Community-based Organisations in Protected Area Management. While in Uganda he was also engaged in a one-month consultancy for the UK (DFID) financed "Integrated Lake Management Project", reviewing local institutions and their role in the management of lake fisheries.

Welcome aboard! It is hoped that additional JPOs will join the MRC family in future.

GENUS *TOR*

The genus Tor – A Potential for Sports Fishing and Ecotourism in the Mekong Basin

In the last issue of the *Catch and Culture Supplement* (No. 16), the genus *Probarbus* was covered, a genus of highly esteemed fish belonging to the large family Cyprinidae. In this issue, we will discuss one of its closest relatives, the genus *Tor*. In fact, the two genera belong to the same sub-tribe, Tores.



Important for Upland and Mountain Communities

Members of the *Tor* genus are medium- to large-sized fish with large scales. In the Mekong Basin, they live in relatively cool mountain tributaries in Cambodia, the Lao PDR and the Yunnan Province of China and are only rarely encountered in the Mekong mainstream.

According to the latest taxonomic publication on the genus, four *Tor* species occur in the Mekong Basin: *Tor sinensis*, *Tor tambra*, *Tor ater* and *Tor polylepis*. *Tor sinensis* and *Tor tambra* are relatively common species, whereas *Tor ater* has so far only been confirmed from the Nam Theun River in the Lao PDR, and *Tor polylepis* is only known from two specimens in the Yunnan Province of China.

However, as with so many other fish of the Mekong Region, the taxonomic status of the genus is incomplete and will likely be subject to future revisions.

Tor sinensis and *Tor tambra* can attain quite impressive sizes reaching beyond the 1-metre mark.

Identity Problem

As with so many other fish of the Mekong, the taxonomic status of the genus is incomplete and confusing. For instance, Dr Walter J. Rainboth, Department of Biology and Microbiology, University of Wisconsin Oshkosh, in his book, Fishes of the Cambodian Mekong, lists the two species: *Tor sinensis* and *Tor tambroides*. However, Dr Tyson Roberts, Fellow of the Smithsonian Institution, Washington D.C., suggests in a subsequent taxonomic revision of the genus in 1999 that *Tor tambroides* does not occur in the Mekong Basin, but is restricted to

rivers of Malaysia and Indonesia (from where it was described by Bleeker in 1854). Instead, according to Dr Roberts, the specimens from the Mekong Region, previously described as *Tor tambroides*, are in fact *Tor tambra*.

Taxonomic research on *Tor* in the Mekong is fragmentary and large areas of many remote headwaters have only been subject to limited, or no, sampling so far. As Dr Roberts also points out in his revision, information about juvenile stages of the species are particularly lacking. The genus will thus almost certainly face new revisions in the future.

Potential for Sports Fishing

Although none of the species are particularly important for fisheries on a basinwide scale, they are locally important for many upland and mountain communities, for instance in Northern and Central Lao PDR. Furthermore, the genus may offer some interesting future promises in a special branch of fisheries, the Sports fishing industry. This is supported by the fact that some members of the genus from mountain rivers of the Indian Sub-continent are popular sports fish. The most famous of them all, *Tor putitora*, or better known by its common name, **Golden Mahseer**, inhabits rivers of the foothills of the Himalayas in India, Nepal and Bangladesh. For more than a century, anglers have travelled from far away to these rivers to try to lure this beautiful and strong fish onto their hooks. As a result, an important sports fishing industry has developed in India with the main attraction being the Golden Mahseer and other members of the genus. A quick search on the internet reveals a long list of web-sites offering sports fishing tours and accommodation and encouraging sports fishers around the world to come to these Himalayan rivers to hunt for the "Mighty Mahseer".

There is every reason to believe that such a development could also take place in the Mekong Basin. The Lao PDR, in particular, with so many pristine mountain rivers, has great potential which should be investigated. But also the Northern provinces of Cambodia and the Central Highlands of Viet Nam should offer some exciting possibilities.

2002—Year of Ecotourism

The United Nations has designated the year 2002 as the **International Year of Ecotourism**. It would therefore be appropriate and timely to promote the development of sports fishing in the Mekong Basin within the framework of eco-tourism principles. Under these principles **Ecotourism**:

- **Contributes to the conservation of biological diversity.**
- **Sustains the well-being of local people.**
- **Includes an interpretation / learning experience.**
- **Involves responsible action on the part of tourists and the tourism industry.**

- **Is delivered primarily to small groups by small-scale businesses.**
- **Requires the lowest possible consumption of non-renewable resources.**
- **Encourages local participation, ownership and business opportunities, particularly for rural people.**

The development of sports fishing under these principles would add substantial value to the fisheries resources of the Mekong, particularly in mountain areas of the Basin. Furthermore, it would contribute to the increased participation of local people in development activities.

Let us conclude with a quote from an English angler and writer, H. S. Thomas, who in 1872 provided the following tribute to the Golden Mahseer in his book, ***The Rod in India***: "Pound for pound, the Mahseer is superior in sporting qualities to the lord Salmon of my native land". Maybe one day some famous author will write with similar affection about the **"Mighty Tor of the Mekong"**!

Contributed by the Assessment of Mekong Fisheries Component of the MRC Fisheries Programme. See also Walter J. Rainboth, Fishes of the Cambodian Mekong (Rome: FAO, 1996), pp. 84-85.