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MEKONG FISHERIES NETWORK NEWSLETTER

Update on the status of the Cambodian inland capture fisheries sector with special reference to the Tonle Sap Great Lake

by N.P. van Zalinge

Cambodia has very few income generating possibilities beyond her natural resources, agriculture, forestry and fisheries, and is economically almost fully dependent on them. The author considers the inland fisheries that support a thriving industry of significant economic and social importance and with a potentially bright future. He aims at improving understanding the issues at stake for the continued sustainable utilisation of the resources.

Fish production

Reasonably accurate statistics are critical for a proper perspective on the significance of a sector for a society and economy, as well as for rational decision-making on the development of a country (for example, by weighing losses and gains from Mekong damming or other changes to the natural ecology of the Mekong River Basin).

The latest and most comprehensive independent data are largely based on MRC/DOF socio-economic and catch assessment surveys of parts of the country.

- Cambodia's **freshwater capture fisheries production** of over 400,000 tonnes per year is large, even by world standards. In fact, it is the fourth largest in the world after China, India and Bangladesh. And it is still believed to be an under-estimate. [The 2000 estimate of the National Institute of Statistics was 442,000 tonnes].

- Estimated value at the landing sites is US$ 200 million. Estimated retail value US$ 300 million.

- Exports under-estimated, but exceeding 50,000 tonnes/year. Product quality and transportation need to be improved to raise the value.

- The Tonle Sap annual catch is about 235,000 tonnes/year.

- More than 1.2 million people in the Tonle Sap area depend on fishing for their livelihood.

- **Fish diversity**: more than 100 species regularly occur in the Tonle Sap catches, although up to 200 species have been recorded in the Tonle Sap itself and over 500 in the freshwaters of Cambodia. Although no species have been found only in the Tonle Sap, there are some Mekong endemics. No known species has become extinct in the region.

Food for Thought

- A joint MRC/DOF socio-economic survey of 4.2 million people in central Cambodia estimated that the average fish consumption was 67 kg/person per year (in fresh weight equivalents, 1995/96 data).

- Nation-wide fish consumption is probably close to 40 kg/person per year.

- Most fresh fish or fish products (e.g. *prahoc*) are still very cheap and affordable by the rural poor. After rice, fish is the most important food item people buy.

- There is no other food supply – readily available and cheap – that can replace fish in the diet of the Cambodian people.

Are fish over-exploited?

Overall catches are ***higher now*** than in the past, although individual catch rates have declined, because the increase in population and number of fishers outstripped the increase in catch. Fishers perceive the strong decrease in catch-rate as "over-fishing". However, in fisheries management we refer to "over-fishing" as a situation where the same amount or more fish could be taken by fishing less. Usually we speak of over-fishing when dealing with a particular species.

The catch figures in the **Table** below refer to all species caught. Throughout, there appears to be no "over-fishing" and even if fishing pressure went up, the catch would still increase a bit. However, at the species level the situation is more complicated, as discussed below.

1. Long-distance migratory species or "white" fish (more than 60 per cent of the total catch)
Annually, migrations take place between the spawning areas in the Mekong in southern Laos and north-eastern Cambodia and the flood plains around the

Tonle Sap, south of Phnom Penh and the Vietnamese Mekong Delta and back.

Larger fish species tend to spawn later in life. Many species have strongly declined, some nearly to extinction, such as the famous Giant Mekong Catfish. This catfish is reported to spawn for the first time at an age of about 20 years. Its weight is then 160 kg or more. Clearly, very few individuals survive the heavy fishing pressure long enough to reach sexual maturity. [In the year 2000, eleven Giant Catfish were caught in the *Dai* fishery and only seven in 2001]. Thus, the later in its life a species matures, the more vulnerable it is to over-fishing.

In the dry season illegal fishing with explosives takes place in the deep pools and channels of the Mekong in north-eastern Cambodia. It strongly reduces the spawning populations of some of the bigger species.

Smaller fish species usually are early spawners. Most have not declined and dominate present catches; a good example is the Cyprinid, *Trey riel*. It spawns for the first time when about one year old. It could be fished harder and thus is not over-fished.

2. Short-distance migratory species or "black" fish (less than 40 per cent of the total catch)

Movements are much more limited, for example from flood forest to lake/river and back. Stocks have probably not declined, as these fish do not run the same gauntlet of fishing gears as do the long-distance migratory species. Snakeheads are the most important species group. They constitute the greatest value of the catch from the Great Lake fishing lots.

Summing up: Owing to the reduction of larger fish species in the catch and the shift to smaller sizes, the average value per kg has decreased. Thus, not only has the catch rate per fisher dropped, the value of his catch has decreased as well. Nevertheless, the overall tonnage of fish caught is still increasing. A number of larger species are over-fished, but most smaller species are not depleted at all.

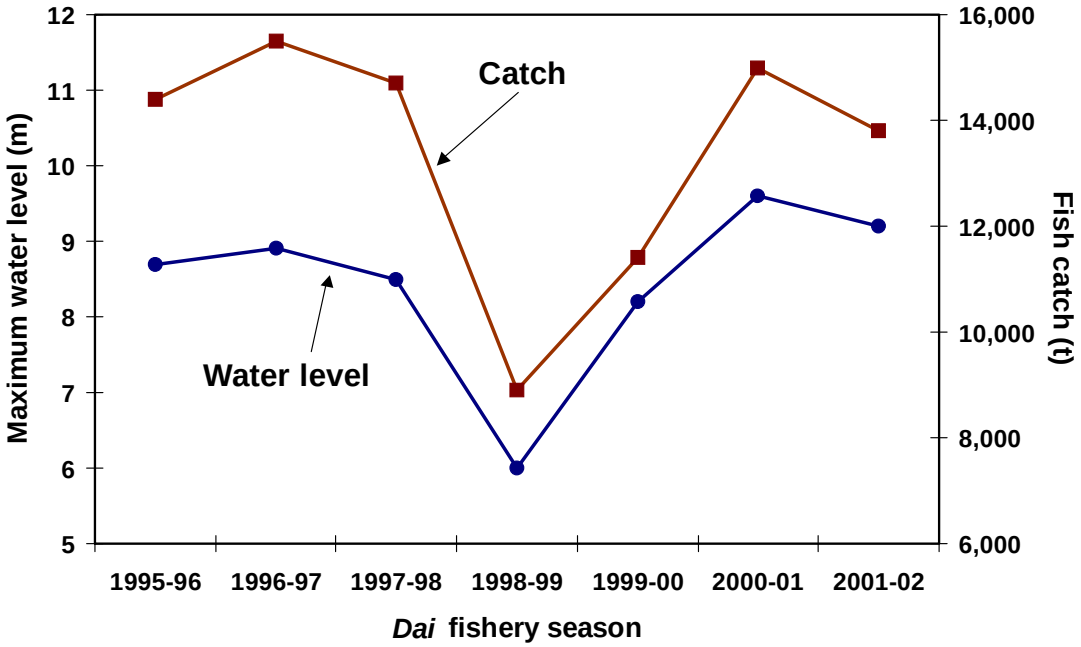
Period	Cambodian population	Fishing commune inhabitants (11.2% of total pop.	Increase in population	Great Lake fish production (tonnes)	Increase in fish catch	Fish catch / fishing commune inhabitant year	Decline in catch / fisher
1940s	3,200,000	0.36 million		125,000 t		347 kg	
1995-6	10,700,000	1.20 million	3.3x	235,000 t	1.9x	196 kg	44%

Why is the fish production so large in Cambodia?

The primary reason for the enormous quantity of fish in Cambodia is the monsoon which annually swells the river and flood waters inundate the highly productive flood plains. The temporary access to enormous quantities of food (in particular from flood forest habitats) drives the huge production of fish. White fish have evolved to synchronize their time of spawning with the onset of the monsoon, so that fry and juveniles are ready to enter the plains when they are flooded. Black fish spawn and feed in the inundated flood plains. Without the floods and the flood plains the fish catch would be only a small fraction of what it is now.

The Tonle Sap flood plain at maximum inundation varies considerably in size from year to year (roughly between 10,000-15,000 km^2). Thus, in a dry year (e.g. 1998/99) fish production is much less than in a wet year (e.g. 2000/01), because much less land is inundated. This is illustrated for the *dai* fishery in Figure 1. The relationship between the maximum flood level of the season and the fish catch shows that a permanent lowering of the average peak flood levels (e.g. due to flood controls) would result in a proportionally lower fish catch.
Fish productivity is (among other variables) related to the extent of flood plain inundation. Thus, flood controls such as irrigation, river canalization, dams and diversions have a negative effect since they lower peak flood levels.

Natural flood plain habitats, including inundated forests, have the highest productivity and species diversity. Hence, flood forest destruction or conversion to rice fields, etc., also has a negative effect.



Fisheries Management Measures

- **Fishery Laws**. The new Fishery Conservation, Management and Development Law was drafted with World Bank assistance in August 1999. Unfortunately, it has not been finalised yet. Moreover, the sub-decree to legalise Community Fisheries Management is still in the process of being drafted.

- **Types of fisheries**. The fisheries of Cambodia can be divided in two broad categories (limited and open access).

☐ *Limited access fisheries: the fishing lot system*

The most productive part of the Cambodian fisheries domain had been privatised for more than a century through a system of government leases, the "fishing lots". However, at present less than half remains. The other part is now open-access.

Resource rent. In the recent past the lot system provided annually over US$ 2 million in tax revenues, and more in an informal way. The open–access fisheries, however, do not contribute to public taxes.

Fishing lots vary from a simple anchoring position (*dai*) in the Tonle Sap River to a large part of the flood plain (largest Great Lake lot is 500 km^2). Their value depends on the perceived fish production.

Many fishing lots occupy relatively large areas of flood plain. The **Tonle Sap Great Lake lots** contain mostly natural habitats, but there are also rice fields and sometimes villages in them. The natural habitats comprise flood forests, shrub forest and grasslands, which are essential for the feeding and breeding of many fish species.

In the recent past open-access property rights have led to a **rapid expansion of fishing effort** in waters outside the lots. Catch rates have been falling and this has caused an increase in conflicts over fish resources. Many conflicts between lot operators and local villagers have occurred because of *different interpretations of the boundaries of the lot and the public access areas; conversion of flood forest for other uses (e.g. rice fields) by the villagers*; *illegal fishing operations by lot operators and villagers; and competing uses of water for fishing and irrigation.*

☐ *Open-access Fisheries*

Open-access fisheries have grown in the past two decades and have contributed mainly to the recent increase in fishing pressure.

Middle-scale Fisheries. A number of gears specified by the fishery law require a license (such as gillnets, seines, arrow-shaped traps, etc.)

Small-scale or Family Fisheries. The remainder of gears is free for everybody to use, although not everywhere or at any time. Gears such as small castnets, small dipnets, small gillnets, certain traps, etc. Rice field fisheries fall in this category.
Illegal Fisheries. A number of gears and methods have been declared illegal (such as brush parks, explosives, poisons, electric gears, etc.)

It should be noted that close to 200 different fishing gears and methods have been identified in Cambodia. Practically all of them are indigenous, i.e. developed or adapted in the region or the country.

Community Fisheries

On 24 October 2000, the Cambodian Prime Minister proclaimed fundamental changes in fishery policy by reducing the fishing lot areas and allowing community fishing in the areas that were released. A sub-decree on community fisheries is being drafted and a new office for community fisheries development has been set up in the Department of Fisheries (DOF).

Minor lots were abolished and important ones were reduced in area. In total, the fishing lot area was reduced by 56 per cent or over 500,000 ha. These areas were given to local fishing communities for their management. There are more than 300 of such communities with more than 600,000 inhabitants.

Except for a small core staff in the central DOF, few people in the government, provinces or in the communities have a clear understanding of what community fisheries management entails. This has led to a confused situation in the field, which is hampered by the lack of a legal basis.

An open-access situation prevails and fishing pressure has reportedly increased substantially.

Owing to the sudden introduction of community fisheries, the donors and NGOs were caught by surprise. Only MRC/DOF, FAO Siem Reap and a few NGOs were prepared to assist, but are overwhelmed by the sheer size of the exercise. Recently, the ADB has proposed to provide a major loan to the government for community fisheries development, but this will take at least another year to start, if approved.

Potential Problems:
Development Issues

Certain development plans threaten the viability of the fisheries and thereby food security, as well as the future of a thriving industry and a rich source of government revenues.

Tonle Sap. Development projects for the Tonle Sap Lake and flood plains, such as the building of harbours, roads, oil and gas explorations, etc., will have an effect on the existing ecology, as they will increase the accessibility to and the employment in the area. This will increase the population pressures on the environment through the destruction of natural habitats due to the increased needs for farmlands, fuel-wood, fishing, etc. A better alternative is creation of employment in the areas directly outside the flood plains, as this would relieve these pressures. In addition, settlements in the flood plain are disaster prone.

- ***Competition for the use of the water resources of the Lower Mekong Basin***

Water demands from other sectors, such as electricity generation, water extraction for a variety of purposes and irrigation, are likely to increase with industrialisation of the region. Already, the cumulative effects of dam building and erosion in the Mekong watershed are noticeable. Pre-1965 Mekong flood levels were on average around 12 per cent higher than in the last two decades (Pakse data 1924-98). In other words the present flood plains and thus fish productivity are on average somewhat smaller than in the past (but **not** fish catches though! These depend mainly on fishing effort). In addition, annual variations have become more erratic. Eventually, environmental minimum levels of peak floods will have to be set (as high as possible), if fishery production is to be maintained at a desirable level.

Flood control measures and dam building (in particular on the mainstream) will disrupt the connectivity between spawning and feeding grounds. Flood control may block access from the river to the flood plain. A mainstream dam, such as the Sambor, will prevent the migration of adult white fish from the flood plains (e.g., Tonle Sap and others) to their spawning areas upstream (i.e., in north-eastern Cambodia). Fish ladders or similar devices will not be of help, as the migrations are huge. At peak migration times, more than 2 million fish per hour pass by Phnom Penh on their way from the Tonle Sap to the Mekong!

In Summary

The fish resources are renewable provided the natural habitats they depend on and their annual inundation are maintained. The management problems in the Tonle Sap are caused by lack of governance and public sector reform, which hinges on two main issues.

Absence of a proper legal framework, especially with regard to the community fisheries. Government staff (DOF, military, police, commune heads) are not paid wages on which they can live, hence they have to use the power of their authority to make ends meet.

The problem of over-fishing is one of perception. Overall catches are still going up, but individual fishers do not perceive this (--> the larger the number of people sharing a pie, the smaller the piece each gets). Certain fish species (the larger ones) are definitely over-fished, but others (the smaller ones) are not. No species has become extinct so far. Maintenance of high flood levels is essential for the health of the flood plains and the fish stocks.

Illegal fishing leads to conflicts as some people gain an advantage over others by breaking the law. The use of explosives, especially in the deep channels in the upper Mekong, is particularly bad as it targets spawning populations sheltering there during the dry season.

In the Tonle Sap area natural habitats are largely intact. And as long as this remains so, the depleted stocks of the larger fish species can recover, when fishing **pressure would decrease.**However, the lack of law enforcement and compliance may lead to an increase in fishing pressure and a more rapid destruction of these habitats. It is therefore essential for the DOF to convince communities in charge of fisheries management of the need the conserve the resource base **through effective habitat protection**. This is an urgent matter, as loss of critical fish habitats is usually irreversible.

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Index of seven years of Catch and Culture

Catch and Culture *has been in existence for over seven years. The Editorial Panel hopes that the* ***Reference Index*** *of keywords will be useful to track down special articles of interest. Please note that the supplements commenced in May 1998 with Vol. 3, No. 4.*

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MRC fisheries programme 2003 – 2010

A revised Fisheries Programme has been developed, reflecting the future requirements of the MRC and line agencies. The work of the Programme is recognised as valuable in inland fisheries circles worldwide and is seen as pioneering new approaches to the collection of fisheries statistics (largely based on fish consumption surveys), its local knowledge angle to fish migrations and its advances in incorporating fisheries into Mekong River modelling, that are essential for assessing the impacts of hydropower, irrigation, etc., may have on the fisheries sector in the Basin.

Important role since 1993

The MRC Fisheries Programme has been active since 1993. It has raised the awareness of the importance of fisheries as a trans-boundary issue, and as a basis for the livelihoods of millions of people in the Lower Mekong Basin (LMB). With the signing of the MRC Agreement in April 1995, the Programme initiated a range of activities covering capture fisheries and aquaculture in all four MRC member countries.

These activities have produced a considerable amount of information on all aspects of the fisheries in the LMB. Much of the information has been published in a range of technical and scientific publications. The Fisheries Programme has also produced films in local languages and in English on the Mekong River and Cambodian Fisheries, as well as an interactive CD-ROM on fish migration in the Basin. A draft version of the Mekong Fish Database (MFD) has been produced, and the final version will be available early in 2003.

Other achievements of the Fisheries Programme include the development of husbandry techniques for indigenous Mekong species, and the training of more than 10,000 people (one-third of them women) in aquaculture extension techniques.

The Programme has also developed and implemented an extensive and ongoing training course on co-management, which brings together managers from the four MRC member countries to share their experiences in managing fisheries.

The Technical Advisory Body (TAB) on Fisheries Management was established in June 2000. The TAB consists of senior officials from the line agencies for fisheries and the National Mekong Committees (NMCs).

All of these activities has resulted in an increased appreciation of the importance of fisheries, and consequently fisheries have been given a much higher focus in discussions about river and basin management.

Changing circumstances

A revision of the Fisheries Programme became necessary in 2002 when the sole external donor to the Programme reduced its contribution to the MRC. This was entirely a consequence of new policies within the donor country (in other words, it was completely unrelated to the strategic direction or outputs of the Programme).

During April-May 2002 an external Review Team visited line agencies, the NMCs and other regional and international agencies. The Government of Denmark also sent a resource person to accompany the team. The draft review report was discussed at the Fourth Meeting of the TAB in Ho Chi Minh City on 10 June and at the Ninth Annual Meeting of the Fisheries Programme in My Tho in Viet Nam on 11-12 June 2002. Comments received were incorporated in the final Review Report.

The independent review of the Programme found that it had accomplished many achievements over the past seven years. The increased awareness of the importance of fisheries was highlighted, as was the trans-boundary capacity and networking mechanisms. The data gathered were found to be relevant to the MRC's core programmes in evaluating development plans in the region. It recommended a continued emphasis on documenting and disseminating the findings.

The review also found that there was considerable room for improvement in the involvement of counterpart staff in the planning and reporting of the work of the Programme. Similarly, it suggested that more effort be made in involving senior managers in the Fisheries Departments in the "ownership" of the Programme and particularly the information coming from it.

Fisheries Programme 2003-2010

A revised Fisheries Programme has been developed based on the findings of the review, plus further discussions with the line agencies and the core programmes of the MRC. This has resulted in the document called, "MRC Fisheries Programme 2003-2010". A draft of the document was forwarded to the MRC Joint Committee and the MRC Council for endorsement in November 2002.

The document outlines the broad strategic direction of the Fisheries Programme over the next 7 years. It presents the objectives of the Programme, lists aspects of the implementation strategy, discusses the thematic areas which cross every

component in the Programme, describes the present components and also lists a range of new activities for which donor support is being sought.

New Objectives

The development objective for the Programme, derived from the MRC mission statement, is:
"Coordinated and sustainable development, utilisation, management and conservation of the fisheries of the Mekong Basin".
Operationally, it includes all the elements of the development objective of the original Programme.

The revised immediate objective is:
"Relevant fisheries information generated, communicated and used by stakeholders, riparian governments and the MRC in development planning and management".

The immediate objective places greater emphasis on the generation, communication and use of information. It recognises that information by itself is not sufficient to ensure wise development. The information has to be communicated, in user-friendly formats, to individuals and institutions that are able to use it for making informed decisions about the future. The users of the information must be involved as much as possible in its generation so that there is a sense of ownership and understanding about the relevance of the information.

Thematic areas

Components within the revised Fisheries Programme will address four thematic areas. These are fisheries ecology and assessment, enhancing livelihoods, fisheries management and communication.

Fisheries ecology and assessment are involved in developing an understanding of the ecological processes that drive fisheries production, and the assessment of impacts on the fisheries from water resource developments.

Enhancing or improving livelihoods must be a focus of all work undertaken in the Programme. Livelihoods in the fisheries sector relate to employment opportunities, income from the sale of fisheries products, non-commercial trade or barter of fisheries products, food security, and the overall role of fisheries in the life of the people in the region.

The development of fisheries management processes that ensure the sustainability of the resource and equitable sharing of it between different stakeholders is an important function of the Programme. This work must be undertaken in conjunction with the line agencies responsible for fisheries management.

Communication of information about fisheries is to ensure that governments and natural resource managers possess adequate information on and understanding of the importance of fisheries in the region. In turn, this will make sure that there is community and political support for the maintenance of healthy rivers and fisheries in the Mekong.

Implementation strategy

Strategic focus for the revised Programme includes the following aspects.

- There will be a rolling 5-year plan updated each year, so that there is a flexible, adaptable programme that learns from experience and can respond to changing needs.
- The primary focus points for programme planning and interaction will be the fisheries line agencies and the NMCs of each country.
- Linkages with the MRC core programmes will be maintained.
- Capacity-building will be an essential element of all activities.
- Gender equity will be a crosscutting issue for the Programme in the implementation, data gathering and resultant development activities.

Reformulated Components

The components currently being undertaken within the revised Programme all derive from the Danida-funded activities within the previous Programme. But there has been some redefinition of the components, to make sure that topical issues are currently being addressed. For instance, the co-management activities previously confined to reservoirs will now be expanded to cover river fisheries as well. Also, there will be a greater focus on fisheries impact assessment studies in the revised Programme.

The reformulation has resulted in three components being amalgamated into two, and two continuing more or less unchanged. The new components are as follows.

- Assessment of Mekong Capture Fisheries (AMFC): this is largely an amalgamation of the previous "Assessment of Mekong Fisheries" and "Cambodian Capture Fisheries".

- Management of River and Reservoir Fisheries (MRRF): this is the previous "Management of Reservoir Fisheries" component, but now includes the fisheries management aspects from "Cambodian Capture Fisheries".

- Aquaculture of Indigenous Mekong Species (AIMS): effectively unchanged.

- Institutional Support: effectively unchanged.

The first three components in the list above operate in all four MRC member countries. The Institutional Support component is based at the MRC office in Phnom Penh.

A range of possible new components is outlined in the "Fisheries Programme 2003-2010" document. These are listed to illustrate to new donors areas of work that are considered priorities for fisheries development and management in the region. Many are enhancements of work currently being undertaken within the Programme, while others are new fields of endeavour. All relate directly to the four thematic areas of the Programme.

The component list will be continually updated (and documented in the rolling 5-year plan) in response to the emerging needs for fisheries development in the Mekong Basin.

The MRC Fisheries Programme is entering an exciting new era. The revised Programme presents a coherent approach to identified needs in the fisheries sector in the Basin. The presently funded Danida activities have been refocussed, and will continue with assured funding up to at least mid-2005. New areas of work have been identified and new donors are being sought for these. This has already resulted in one new component on genetics of *Henicorhynchus* spp being close to finalisation, with funding support from the Australian Centre for International Agricultural Research.

In conjunction with the NMCs and the line agencies for fisheries, it is envisaged that the MRC Fisheries Programme will continue to evolve, build on the work done thus far and ensure the …

Coordinated and sustainable development, utilisation, management and conservation of the fisheries resources of the Mekong Basin.

Expert consultation on fishery statistic

Subsequent to the first joint cooperation in 1997, the MRC Fisheries Programme and the Food and Agriculture Organisation (FAO) of the United Nations in collaboration with the FAO/Netherlands Partnership Programme c
onducted an ***Ad hoc*** **Expert Consultation on New Approaches for the Improvement of Inland Capture Fishery Statistics in the Mekong Basin** during 2-5 September 2002. The consultation was facilitated by the Government of Thailand in Udorn Thani.

Objectives of Consultation

The overall objective of the Expert Consultation was to improve the state of knowledge on inland capture fisheries in the Mekong Basin. Specific objectives included (1) raising awareness of the value of inland capture fisheries; (2) providing guidance on the collection of appropriate information on inland capture fisheries; (3) assessing and developing methodologies for rapid data collection; (4) evaluating and identifying the use and utility of inland fishery statistics; and (5) establishing minimum data requirements for national and regional inland fishery management.

Inland Capture Statistics

Inland capture fisheries provide a valuable contribution to food security in many parts of the developing world and especially in the Mekong Basin. Women often play key, yet not fully recognised, roles in harvesting small water bodies, and in processing and trading fish from inland waters.

In general, the contribution that inland fishery resources make to rural livelihoods is often unknown or underestimated due to a lack of basic production and consumption information. The poor state of knowledge on these fisheries arises from the diverse nature of inland capture fisheries, the fact that the fisheries are often small-scale and diffused over large areas. In addition, much of the harvest is bartered or consumed locally and does not enter the "formal" economy.

Official statistics are often based on estimates and data may only come from scarce information. Major sources of error in these officially reported statistics

include: (1) errors in catch reporting (often field data collected are based on "recall"); (2) a reluctance to report catches (because this is linked in most countries to license fees or other forms of taxation); (3) difficulty in accessing sources of information, e.g., women and other fishers away from population centres; (4) lack of attention to small-scale fishing activities; and (5) deliberate mis-reporting.

As a result, inland capture fisheries are often ignored or undervalued by decision-makers and development agencies. Development activities may then inappropriately focus on other sectors such as agriculture, aquaculture, water extraction, hydro-electric development, navigation and land conversion at the expense of inland capture fisheries and rural communities. This results in a vicious circle that continues to impact the poorest strata in developing countries' society.

Inland Capture Fisheries

When development assistance does target the inland fishery sector, accurate information on the fishery will be required so that it can be managed in a responsible manner and so that the impact of the development assistance and fishery management programme can be assessed. Of prime importance is that the objectives of fishery management be clearly identified. Objectives of inland fishery management include, among others, (1) sustainable harvest from stock; (2) sustainable livelihoods; (3) conservation of biodiversity; (4) conservation of cultural heritage; (5) increased employment (or diversification of employment); (6) increased consumption of fish protein; (7) increased income; (8) increased recreation; (9) increased security for the poor strata of society; and (10) increased social harmony.

Fishery management programmes may address multiple objectives. It is apparent that the objectives of fishery management will greatly influence the types of information collected on a fishery.

Thus, accurate information is needed to evaluate the importance of a fishery and then to help manage that fishery towards achieving specific objectives. Better information will lead to better decisions affecting living inland aquatic resources and the people that depend on them.

The FAO is an official repository for government statistics on inland capture fisheries production. The MRC Fisheries Programme and others have made significant progress in improving the quality of information collected on inland capture fisheries and in the process have demonstrated that the officially reported production from the Mekong Basin is significantly under-estimated. To help remedy this situation, the MRC Fisheries Programme formulated a proposal on *Strengthening of Inland Capture Fisheries Information Systems in the Mekong Basin*.

FAO convened a Technical Consultation in March 2002 that developed a draft Strategy on Improving Information on the Status and Trends of Capture Fisheries that will be considered by the FAO Committee on Fisheries in 2003. The September 2002 Expert Consultation took this draft Strategy into account when developing strategies and recommendations for the improvement of information on inland fishery resources.

Target Audience

The target audience of the Consultation was both policy-makers and resources managers. It was necessary to discuss technical details on the types of data and their collection. Policy-makers were made aware of the consequences that poor information has on the development of inland capture fisheries and the people that depend on them.

Five country review papers presented by representatives of Cambodia, China, the Lao PDR, Thailand and Viet Nam were followed by expert experiences from different regions. All presentations focused on data types and collection methods; issues, opportunities and challenges; and consequences of poor information.

The immediate outcome was an increased awareness of the value of inland fishery resources and improved information collection and use.

Medium-term expectations are better decision-making by development agencies that ensure that rural communities optimally benefit from development programmes. Long-range outcomes will be the sustainable use and conservation of inland aquatic biodiversity.

Ultimately it is hoped that rural communities will benefit from the responsible development of inland waters when accurate information is available on the benefits of different uses of inland waters.

Additional information may be sought from the MRC Fisheries Programme, MRC Secretariat, P.O. Box 1112, Phnom Penh, Cambodia, Tel: (855-23) 720-979, Ext. 4030; Fax: (855-23) 720-972; and/or e-mail: **mrcs@mrcmekong.org**

Second regional training course on fisheries co-management in inland fisheries

In October 2002 the Reservoir Fisheries Component (known as MRF II) held a 8-day regional training course on fisheries co-management in urban and rural centres of Viet Nam.
This is the second event of this kind.

The **Second Regional Training Course on Co-Management in Inland Fisheries** was held during **6-14 October 2002 in Ho Chi Minh City and My Tho**. A total of 34 participants (22 men and 12 women) from the four riparian countries and others took part with 10 coming from Cambodia, 7 from the Lao PDR, 8 from Thailand and 5 from Viet Nam. Four participants from the MRC Fisheries Programme in Phnom Penh also joined the course. Sixteen Resource Persons and Support Staff contributed to the success of the 8-day training course that was held in two kinds of locales: the urban Ho Chi Minh City and the rural Delta. Therefore, those attending could participate fully and study local situation at first hand.

As well as combining the urban and rural settings, the course balanced group discussions with field work. Visited near Ho Chi Minh City was the Can Gio communal clam farming and community mangrove forestry activities. Major themes reviewed were contrasting different experiences with co-management (country by country in the Lower Mekong Basin), management planning and management costs and funding activities.

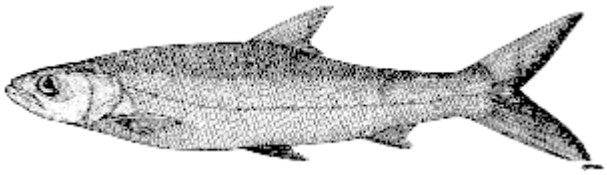
While in My Tho in the Delta, the theme highlighted was conflict management. The participants had the opportunity to conduct field work at the clam farming management board and discuss issues with members of the Agri-fisheries Cooperative in Tien Giang Province.

Lively presentations and discussions covered such topics as ecosystem management, transboundary issues, the catchment approach, information requirements, communication of information, data collection (including sex disaggregated data), local knowledge and adaptive management and learning.

This regional co-management course is the second of a series of similar events held in the riparian countries by the Reservoir Fisheries Component. The first one was held in the Lao PDR and Thailand. The next one is being planned for Cambodia in 2003.

Two rare species

Large but rare; has anyone seen these fish?



In the last issue of *Catch and Culture*, one of the most common group of species was described, fish belonging to the genus *Henicorhynchus*. This genus includes some of the most important species in terms of fisheries and livelihoods of riparian communities.

In this issue, we go to the opposite "extreme" and focus on some of the most rare and elusive species within the same family, Cyprinidae. Rare fish species are difficult to write about because most often very little is known about them.
This supplement is therefore also a request to readers of *Catch and Culture* to contribute any information they might have about these species. We will return to that at the end of the Supplement. First, let us briefly introduce some rare species.

Two of the species that qualify as some of the rarest among Mekong fishes are *Aaptosyax grypus* and *Luciocyprinus striolatus.* Apart from being members of the same taxonomic family, they are not closely related. However, they share some interesting characteristics: they are rare, large and predatory.

Mysterious *Aaptosyax grypus*

Aaptosyax grypus is possibly the most rare, and least known, species of the Mekong River. Its distribution range is concentrated around a stretch of the Middle Mekong mainstream from Kratie (Cambodia) in the south to the mouth of the Mun River on the border between the Lao PDR and Thailand. However, in the past its distribution may have covered a larger area. Local fishers in Loei have reported that the species used to occur there but that it has not been encountered for more than 10 years. It is therefore believed to have disappeared from this part of the river. One of the main reasons for its decline is the increased use of monofilament gillnet fisheries in the Mekong River. As a fast-swimming predator of the middle and upper water levels, it would be particularly vulnerable to this type of fishing gear. In addition, since its distribution area appears to be centred around the mouth of the Mun River, it may also have been effected by the Pak Mun dam.

Aaptosyax grypus can reach a length of 130 cm and weights of at least 30 kg. It is easily recognised from other members of the family. The main distinguishing character is a large knob in the lower jaw fitting into a notch in the upper jaw. Other features include a well-developed adipose eye-lid.

Large *Luciocyprinus striolatus* Dwell in Deep Pools

Luciocyprinus striolatus is a large predator living in deep pools within large mountain rivers in the upper sections of the Mekong Basin, in the Lao PDR and PR China (from where it was scientifically described in 1986). It is distinguished from the only other member of the genus by the 5-8 longitudinal black stripes on the body of the adult. Fishers have reported that this species can grow up to 150 cm. Its large size and wide mouth have provided for a fierce reputation. For instance, it has been referred to as the "monkey-eating fish"! Although it is highly unlikely that monkeys constitute part of its diet, such stories certainly add to the mystery that is already fueled by the rarity of the fish.

Because it is extremely difficult to obtain any significant data on rare species through conventional fisheries surveys, *Catch and Culture* would like to encourage its readers who have information about these species to send it to the Editor, Capture and Culture, MRC Fisheries Programme, MRC Secretariat, P.O. Box 1112, Phnom Penh, Cambodia, Tel: (855-23) 720-979; Fax: (855-23) 720-972; e-mail: mrcs@mrcmekong.org

Actually we are most interested in all fish seen anywhere within the Mekong Basin, at markets or landing sites, in people's homes, etc. We are compiling recent photographs of each species. Please send us your photographs with information on where the picture was taken and where the fish was caught.

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Contributed by the Assessment of Mekong Fisheries Component of the MRC Fisheries Programme

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