

Taken for granted
Conflicts over Cambodia's freshwater fish resources
by

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1. Introduction

Cambodia ranks fourth among the world's top freshwater capture fisheries with an annual production of 300,000 – 400,000 t. It would probably be fair to say that the freshwater capture fisheries' contribution to national food security and the economy in Cambodia is higher than in any other country. This importance is expressed in the Khmer proverb "*mean toek, mean trey*" which means "where there is water, there is fish". But where there is water in Cambodia, there is not only fish. There is also common property, and a need to define access and use rights, and with it the distribution of entitlements. To govern access and use, Cambodia's freshwater capture fishery is managed by an extensive formalized system of rules. These rules define the boundary, authority, and enforcement conditions relative to the stock (water and wetlands) and flow (fish and other wild products) of these commons. Although the formal management system is a potentially suitable governance tool, its implementation is hampered by lack of enforcement, rampant environmentally unsafe fishing practices, and difficulties to handle pressure on the sector from outside forces. These elements call for urgent improvements in the actual management system and practice.

Current fisheries management rests on the separation between the commercial exploitation of so-called "fishing lots", and middle scale and family fisheries. This distinction conditions commercial and subsistence fishing activities differently based on criteria of seasonality, spatial arrangements and definitions of fishing gear categories. For all of these criteria, the rules focus on the fishing lots and treat the other categories as marginal, as the central concern of the current management system is revenue generation rather than sustainable resource exploitation and equitable rural development. However, the so-called "family fisheries" produces higher fish catches than the large-scale fisheries (Van Zalinge et al. 1998, Ahmed et al. 1998, Diep et al. 1998). This importance, and the additional significance of the subsistence sector in terms of employment and livelihood, is not reflected sufficiently in fisheries management policies. The principle of parallel modes of exploitation has also enhanced the potential for conflicts between subsistence and commercial freshwater fisheries. For example, rural dwellers living in villages located inside a fishing lot area, whatever fishing activity they may undertake, including the use of the simplest gear for household consumption, is per definition considered poaching. Though many fishing lots contain especially defined areas called "areas set aside for the people", access to them has to be negotiated often with the lot operators.

To analyze the various types and sources of conflict that affect the Cambodian freshwater fisheries, the present paper will put these in the

context of Cambodia's process of transition. Though two democratic elections were held since 1993, path-dependent mechanisms remain the driving forces that shape the process of democratic institution building. The conditions and causes that underlie the emergence of conflicts, the ways they are revealed, and finally the consequences of conflict are analyzed. The paper will then argue for a more integrated approach to fisheries management. The development of partnership relations among the various stakeholders is considered necessary in order to cope with the requirements of sustainable resource use. In first instance this implies improved communication among stakeholders at all levels, from grassroots to national, regional, and basin-wide partners. Transparency of legal and environmental information provided through efficient communication platforms is the key issue to be addressed by national governments and regional organizations at river basin level. Solutions are envisaged by addressing the "community of users and stakeholders" through co-management arrangements, supported by cross-sectoral linkages.

2. Transition in Society

The development of governance institutions for fisheries can be better understood by putting these into the context of the transition process that Cambodian society at large has been undergoing. For over a decade, Cambodia has experienced a period of rapid institutional change that can be characterized by four dimensions: a transition from war to peace, from a communist regime to a multi-party democracy, from an agrarian subsistence to an export-led economy, and from isolation to regional integration. The biggest challenge facing Cambodia in this process is the need to create 300,000 jobs per year, simply in order to absorb the growth of the active population, without large-scale damage to its natural resource base. These points will be investigated briefly below.

From war and civil conflict to peace

Armed conflict since the beginning of the 1970s has had a number of major effects. First, the country's capital base suffered great losses. The country's natural capital was greatly affected by the war and the effects of the Khmer Rouge's obsession with irrigated rice agriculture and canal building programs, which failed to recognize the relationship between the regular natural flooding and the maintenance of soil fertility (Dennis, 1990). Land mines continue to render large portions of valuable land unusable. Genocide and exodus of the most educated citizens depleted human capital. The dismantling of institutions, the legal system, family life, and of all aspects of Buddhist religion contributed to the destruction of social capital. The loss of human life and of physical infrastructure, the disruption of services, the repeated displacement of the population, the breakdown of established institutions, and the poor security led to extreme physical and psychological hardships for the whole population of Cambodia (Krishnamurthy 1999, Van de Putt 1998). The specific parameters that characterize vulnerability in Cambodia have been greatly influenced by these circumstances: the number of women-led households, the number of disabled persons, the dent in the population pyramid in the middle-age bracket, to name just a few. Second, long periods of authoritarian rule enforced by arms, have left a mark on the institutional capability to deal with negotiated change. The transition to peace has been expectedly slow and

framed by power struggles to fill emerging gaps in the institutional framework by means of informal alliances and negotiations outside legal frameworks (Basil 1998). Power structures could emerge without the limiting forces of laws, and those laws in place could easily be used to satisfy the economic aspirations of the powerful, rather than protect the rights of the powerless effectively (Sophal et al. 1999). In a society where 80% of the people depends on agriculture for a livelihood, these conflicts often revolve around the use of natural resources. A number of tenacious conflicts in this area cannot be solved appropriately due to the lack of clear and enforceable laws. Presently, there are several draft laws on wildlife and protected areas, on forestry, on land, on water, as well as on fishery and on anticorruption in the process of being submitted. Public participation in their adoption may eventually further strengthen the peace process in Cambodia. Third, war and insecurity concerns kept people out of many areas, in particular the more isolated upland and flood forest areas, which were controlled by the Khmer Rouge or the military until very recently. Pressure on these resources is fast increasing with the cessation of hostilities.

From an agrarian subsistence to an export-led economy

Since the late eighties, Cambodia has embarked on a transition to a market-economy. Especially since 1993, the government undertook a sweeping structural reform program supported by the international donor community. This led to some significant successes in terms of stabilizing the economy and initiating growth. Yet Cambodia remains one of the poorest countries in the world, with a per capita income of USD 300 (ADB 1998), while its social indicators suggest that the country is not better off now than in the late 1960's. In terms of structure, the main activity on which about 80% of the labor force depends is agriculture and related sub-sectors, which contributes about half of the country's GDP. This contribution is very erratic and can shift 10% or more from one year to the next, given the dependence of agriculture and fishery on weather conditions. This dependence is influenced by the heavy dominance of subsistence rice farming in particular, which accounts for about one third of GDP. The productivity of agricultural production remains in general far below that of the best practice country in the region. Industrial value added is low although growing, especially in the export-oriented sector of textile manufacture. Most manufacturing however remains small-scale and informal. The services sector has grown most rapidly, accounting for about 35% of GDP, and is heavily concentrated in trading, tourism, and construction. This reflects the consumption demand-driven nature of growth. Initially spurred by UNTAC¹, the continuing massive aid programs sustain the momentum of city-based demand.

Because of these specific parameters, the quality of growth has been doubtful. Much of the growth has been concentrated in Phnom Penh, which accounts for less than 10% of the population, and its impact and benefits in Cambodia's vast rural society remain shallow and thinly spread. Productivity increases in agriculture have been minimal, creating a severe strain on Cambodia's natural resources. As alluded to earlier, 14.5% of the Cambodian population is 10-14 years old, meaning that 1.6 million persons will enter the labor market within the next 5 years (NIS, 1999: 8-13). Without increasing productivity in agriculture or

¹ UNTAC: United Nations Transitory Authority of Cambodia

the massive creation of jobs in other sectors, the absorption of this influx of active population into the subsistence agricultural sector will put great stress on Cambodia's ecological base. At the center of it are the competition for land use and the conflicting strategies for water use in the central floodplains, as evidenced by the conversion of common flood forest (fisheries) to private rice lands (agriculture).

From communist centralism to multi-party democracy

After more than two decades of civil war, including several years of Khmer Rouge regime, when all socio-cultural, political and economic institutions were annulled, the transition to democratic institutions and a market oriented economy is characterized by power struggles, legal unaccountability and weak institutional frameworks. The pitfalls were made clear by the coup and its violent aftermath in 1997. More specifically, the stipulated line of transition - from political centralism to policy formulation through a free political debate - ought to have found an economic corollary in a new property regime. The pattern of elite formation however reflected a different institutional framework to negotiate change. The introduction of private property in 1989 facilitated the recycling of the old political elite as an economic one, similar to processes described in the Eastern European post-communist transition periods. In other words, the private acquisition of property was strongly related to political elites. This type of socio-economic transition has been dubbed "simulated transition", characterized by "ownership networks" that convert political into economic capital (Rona-Tass 1999). Its effects, though difficult to measure, are tangible in the new ownership structures that reflect the privatization of natural assets (land, water) that were held in common. On the brighter side, the government's professed ambition to create an equitable rural development (Royal Government of Cambodia 1997) may be strongly boosted by complementary improvements of the institutions of governance. A decentralization of decision-making processes has been initiated through the introduction of commune and village development committees, where villagers themselves select their leaders (UNDP/UNOPS/CARERE 1998). Democratic institutions may be further strengthened by the upcoming communal elections to be held by the end of the year 2000.

From isolation to integration into regional political and economic networks

Cambodia has been admitted recently into the ASEAN community. Expectations are that this will help it to boost its economy to comparable levels of the other member countries, especially by attracting high levels of foreign direct investment (FDI) to make up for the deficit of domestically generated capital. Nevertheless, South-east Asia is a highly dynamic region in economic terms and competition for scarce resources and investments is high. New "Tiger economies" such as Thailand and Malaysia compete with Vietnam and China, with its very low cost of labor, for attracting FDI and for limited export markets. In addition, the gap in human capacity development between Cambodia and the ASEAN countries is huge (Kato, 1998). It is not yet clear what effects the integration of Cambodia into the ASEAN will have on the management of natural resources. On the one side, a number of regional exchange networks that involved natural resource stocks and flows

were organized informally. Examples are the export of tropical timber to Thailand and Vietnam, the export of wildlife (protected snakes, turtles, tigers, bats, monkeys, etc.) to Vietnam, Hong Kong and China, the export of gems to Thailand, the export of high value species of live fish and fingerling to Vietnam, Hong Kong and Singapore. Because of their uncontrollable nature, certain of these exchanges have had devastating effects on Cambodia's natural capital base, for example the large-scale deforestation of the Mekong watershed to supply the export of logs and timber has contributed to soil erosion and increased the siltation rate of the Tonle Sap lake. Whether these exchanges will be more controlled remains an open question. On the other side, Cambodia's re-established full membership of the Mekong River Commission (1995) provides a potentially powerful tool to coordinate sustainable water use patterns in the Mekong river basin, oriented towards avoiding harmful effects of uncoordinated plans and actions.

3. The transition in fisheries

3.1 Basic parameters of fishery management

Vulnerability of flood plain fisheries

The large floodplains and extensive wetland areas surrounding the Great Lake are both highly valuable and very vulnerable. The high bio-diversity and biological productivity, in combination with the high resilience to intensive exploitation levels and climatic changes (such as unpredictable flood levels), allow these areas to offer a broad variety of livelihood opportunities to a large number of inhabitants. As Chevey reported as early as 1934: "the Tonle Sap was reported to be, on a unit area basis, nearly ten times as productive as the best fishing grounds in the North Atlantic" (Chevey 1934:3812, cited in Dennis 1990:232). More than 500 fish species (probably much more) are endemic in the Mekong River catchment area of Cambodia (Rainboth 1996). The vulnerability is due to conflicting demands of different sectors and impacts from upstream sources that make fisheries management a (Mekong) basin-wide issue (Hoggarth et al.1999). In addition, the weaknesses of the formal institutions that control and manage the fisheries are unable to avoid harmful exploitation practices at all levels (Vuthy et al.1999).

Fish production and food security

Though the official statistics largely underreport total fish production, research results suggest that actual production exceeds 400,000 tons per year (Van Zalinge et al. 1998). Not surprisingly, fish is an important part of food security in the country, especially for the rural poor. A household survey (1995/6) representative of 4.2 million people in central Cambodia found an average freshwater fish consumption rate of 67 kg/capita/year (Ahmed et al. 1998)². Nutritional and poverty baseline surveys as well as health surveys, confirm that fish is responsible for more than 75% of the animal protein intake in rural areas (Kenefick 1999, Wiroto 1997).

² It is not possible to extrapolate or generalize these data for the whole country, only for fishing areas in eight provinces around the Great Lake flood plains and the Mekong – Bassac river system.

Table 1: Cambodia. Range of the annual inland water catch in the years from 1994 to 1997 (Diep et al., 1998; Ahmed et al. 1998).

	<u>Annual catch range (tons)</u>
? Large scale fisheries	
- Fishing lots ¹	30,000 - 60,000
- Dais (bagnets) ²	15,000 - 20,000
? Middle scale fisheries ³	85,000 - 100,000
? Family fisheries ³	115,000 - 140,000
? Rice field fisheries ⁴	45,000 - 110,000
? Total	290,000 – 430,000

1. Range reflects uncertainty in actual catch levels.
2. Range shows approx. minimum and maximum values in 1994-98.
3. Based on socio-economic survey data extrapolated to the entire country.
4. Approx. 1.8 million ha x likely range of fish yields: 25 - 62 kg/ha.

Source: van Zalinge et al. 1998

Income generation & employment

The landing-site value of the total inland fish production is estimated (based on landing prices) between 150 to 200 Million USD (van Zalinge et al. 1998). This estimation excludes the fish production used for subsistence purposes, which does not enter the cash economy. Following updated calculations of the market value of fish production in the lower Mekong river basin, freshwater capture fisheries Cambodia would contribute more than 300 Million USD (Jensen 2000). The Department of Fisheries generated 1,9 million USD in 1998, of which more than three fourths were obtained from royalties of fishing lot concessions (DoF 1999:1). However, far larger amounts of income are generated from these concessions that support the underlying informal power structures (Gum 1998, CNMC and NEDECO 1998, Swift 1997).

Also in terms of employment, the importance of the fishery sector is significant yet underestimated. Figures are usually underestimated because secondary and tertiary occupations in fisheries are not revealed. The national census for example only records the main occupation. This approach somehow obscures the essence of subsistence production in Cambodia, where agriculture and fisheries are tightly intertwined as the main components. Even in areas not adjacent to permanent waterbodies or streams, fisheries - in the form of ricefield fisheries - play an important role in subsistence. For example, a household survey of 5117 households conducted in eight inland provinces along the main water bodies and inundation areas found that for 10.5% of households, fishing was the primary occupation. Yet 34.1% of households that did not cite fishing as their primary occupation, reported a part-time involvement in fisheries (Ahmed et al. 1998). A limited farming systems study³ in regular rice farming areas reveals that 13% of farm labor requirements are spent in fishing activities, however, more than 18% of the value of their subsistence production comes from fishing (CIAP 1997).

³ The farming system performance of 12 farm households were monitored in Svay Rieng (4), Takeo (5), Prey Veng (2) and Kampong Speu (1) provinces. The selection of the sample households was made on the basis of research requirements and farmers' interest in research. The results are not representative, but rather indicative, and cannot be extrapolated.

The structure of fisheries management

According to the current fishery law, the inland freshwater capture fishery is subdivided into a large scale or fishing lot fishery, a middle scale or licensed fishery, and a small scale or family fishery. The fishing lots are two-year concession periods obtained through public auction, that grant to private operators the exclusive use rights over a particular fishing ground or anchor positions of large scale fishing gear. These concessions should be operated in line with specified management prescriptions. Each lot has a “burden book” which contains the specific management program indicating timing (the start and end of the ‘open’ and ‘closed’ season), the spatial arrangements that govern exclusive and common access, and indications of the allowed type, number, and location of fishing operations. In addition, the burden book fixes the appropriate installments for payment of the concession fee. These large-scale fisheries occupy around 10.000km² of the most productive fishing areas. Many of these lots consist of large areas of floodplain containing flood forest habitats essential for the breeding, nursing, and feeding of many species.

The middle scale fishery is characterized by boundary and authority rules. Access is granted to those who pay a license (boundary), while authority rules define the types of technology that may be used. Spatial and time limits (assignment) are negatively defined, in the sense that there are no restrictions apart from exclusive areas positively assigned to fishing lot operators during the open season. While the middle scale fishery is a government revenue generating tool by way of licensing, it cannot be regarded as a resource management tool since there is no limit to the number of licenses (Degen and Thuok 1998). The family fishery is defined only by authority rules, that specify the small gear size. It can be operated anywhere and anytime, except again within the fishing lots during the open season (from October to June) and in other protected areas.

In brief, using the terminology of Ostrom (1994), boundary rules are defined for the large and middle-scale fisheries through auctions and licensing respectively, but not for family fishing. Authority rules are specified positively for all types of fisheries in terms of the admitted technology, and both positively (fishing lots) and negatively (the rest) in terms of assignment (where and when to operate). No appropriation rules that stipulate limitations to production quantity have been defined for any of the fisheries, except for the ban on fingerlings and certain protected species. A summary of this information can be found in table 2.

Table 2: Governance rules for freshwater capture fisheries

	Fishing lots	Middle-scale fishing	Family fishing
Boundary rules	Concession via auction	Licensing	None
Authority rules: assignment	Burden book specifications	Anywhere not used by fishing lots	Anywhere not used by fishing lots
Authority rules: technology	Burden book specifications	General fishery law provisions	General fishery law provisions
Authority rules: appropriation	None specific	None specific	None specific
Enforcement rules	Vested with fishery inspectors	Vested with fishery inspectors	Vested with fishery inspectors

Areas of conflict

The common property nature of the resource base of the fishery sector has spawned increasing conflicts inside the sector between the different actors seeking access. In addition, there are serious pressures and externalities from other economic sectors that impinge on the resource base or its flow of products. The use of illegal fishing gears and other stock damaging practices, the struggles over assignment rights and resource entitlements, and the absence of efficient law enforcement and the consequent use of privatized enforcement and violence characterize the internal tensions of fisheries. Privatized enforcement applies to the fishing lots, where the operators have established their own private armies⁴ that often substitute rather than complement the underpaid and understaffed fisheries inspectors. Inter-sectoral conflicts which are threatening the sustainability of the fishery, concern the use and storage of water for irrigation and navigation, the conversion of critical habitats into private farm land, the pollution of water through pesticide and insecticide use for farming, as well as effective and planned upstream dam construction.

Conflicts about water use among fishing lot concessionaires and farmers are regularly reported in the media. To give some examples, as of the first few months of this year (2000), several incidents in which fishing lot guards shot at farmers have been reported. In two of these, fatalities were reported (in Battambang and Siem Reap provinces) and in several others fishermen were injured (in Battambang, Kompong Thom and Kompong Chhnang provinces). In one case a policeman hired as guard by a lot owner was the culprit in a shooting incident. Several groups of fishermen protested in front of the National Assembly and meetings between fishers, villagers, NGOs and high level authorities such as ministers and secretaries of state were held in various provinces to solve emerging conflicts. In June 1999 the issues threatened to become uncontrollable, and the Prime Minister issued a 'proclamation on the anarchy in fisheries' (Royal Government of Cambodia 1999). This manifesto addresses the need for collaboration among authorities to eliminate illegal fishing practices, intimating that soldiers are heavily involved in detrimental fishing practices.

3.2 Process of transition in fishery

After a period of 14 years (1975 – 1989) during which access to fishing grounds was governed by collective schemes, the century-old fishing lot auction system was reintroduced. As stated, the auction system determines exclusive use rights for concession periods of two years of the most productive parts of the Cambodian fisheries domain. The shift from a logic of generalized access back to what was essentially a colonial system of exploitation is significant and needs to be well understood. This requires a brief look at the nature of collective management first. Second, the paper will consider the reintroduction of the fishing lot system, and see in what sense it differs from the previous 'French' system.

⁴ Frequently, [un(der)-paid] military and police forces are hired from nearby barracks; in the West of Cambodia, such as Battambang province, many lot operators hire 'de-commissioned' Khmer Rouge.

At the time of Pol Pot's Democratic Kampuchea (DK), fishing activity took place on a very limited scale. Only a few special "fishing units", such as the one in Boeung Tonle Chhmar in Kompong Thom province, produced and processed fish that was to be supplied to leading cadre in Phnom Penh only. Earlier, the paper hinted already at the neglect of fisheries by the Khmer Rouge, evident in their obsession to clear wetlands and flood forests and destroy the colmatage canals that pace the flooding in certain provinces, all for the sole purpose of rice agriculture. During the period of the Vietnamese occupation, fish resources were exploited under the scheme of solidarity groups, a colchosa-like organization that allowed the centrally commanded state and public administration to retrieve revenues from the abundant fishery resources. In practice however, in many places access was open to all, and the collective aspect relegated to the exchange of gear and boats on the one hand, and the delivery of a certain quota of dried fish for civil servants and military on the other⁵. Especially in the period of '85 to '88, villagers were increasingly free to loosen the degree of 'solidarity' their solidarity group subscribed to. People will often affirm that in their memory, this was the best period ever for subsistence fishing: no pressure on yields from commercial fisheries yet, relatively open access, and abundance of fish due to the heavy restrictions on fishing during the prior decade.

In view of the objective of the government to establish sustainable and widespread growth, the decision to reintroduce exclusive access in 1988 is remarkable. It can only be understood on the basis of the fiscal needs of a government which had been under a sanctions regime for a decade, and which additionally lost its access to Soviet funding in the same year. In the French protectorate, the fishing lots were known both as a very lucrative source of tax income and a source of permanent conflicts. In 1961 for example, Delvert cites how conflicts between fishing lot owners and fishers induced the Royal Government of Cambodia shortly after its independence to abolish a number of fishing lots in favor of villagers (Delvert 1961). This situation can be compared to the history of fishing lots in Thailand and Vietnam, both neighbors and part of the Mekong basin. In Thailand a similar system of privatizing access to fishing grounds, known as "leasable fisheries" (Thai Fisheries Act BE 2490 [1947]), was in place. Such leasable fisheries were only installed in places with sufficient common access for local fishers, in order to keep conflict potentials low. The allocation of fishing grounds aimed in first instance at protecting the fishing grounds and obliged the lessors to preserve and rehabilitate the environment. In a lawsuit over use rights of water for rice farming next to a leased fishing ground, a High Court decision ruled in favor of the farmers. Eventually a Cabinet decision abolished this type of fishery in 1974. In Vietnam ever since the last century, the public administration leases out (through a bidding process) anchor positions or river locations for large scale fishing gear operations such as "dai" (large set bagnets), trawl operations and beach seining. There are only a limited number of licences allocated. Conflicts with small scale fishing operations are practically excluded by giving licenses only in river fishing grounds, and not in

⁵ Personal communication

fishing areas including other habitat types (flooded forests) and alternative land use (rice fields)⁶.

Considering its history of conflict in Cambodia and developments in neighboring countries, there seemed to be no evident need for re-introducing the fishing lot system and the problems already cited in 1961, apart from two reasons. First, there are the already mentioned fiscal needs of the government. Yet these could have been cushioned by systems of licenses or other alternatives. How then to understand the introduction of an auction system, in the absence of a credit market on the one hand and institutional mechanisms that allowed the prior accumulation of capital on the other? The complementary reason therefore must be found in rent-seeking activities. Leaning on Böröcz's concept of post-communist "simulated transition" (Böröcz, 1995), the auction system can be interpreted as a "simulated allocation" that allows political capital to substitute for economic capital. Even though civil servants are not allowed to participate in the bidding in principle, actual practices are an open secret. The auction process itself is not openly contested under transparent rules but rather controlled and pre-negotiated by the very administration charged to implement it (Gum 1998, Swift 1997, CNMC and NEDECO 1998). This method allows for assets distributed over a network of people to be pooled, for entrance barriers to be raised by artificially bidding up auction fees but only paying a fraction of them, and for shifting liabilities to the state as the nominal owner.

Table 3: Comparison between number of fishing lot sites and surface from 1919, 1940 and 2000

No.	Province Name	Fishing Lots in 2000 ^{c)}					Fishing Lots in 1940 ^{b)}		Fishing Lots in 1919 ^{a)}	
		Site No.	Lot No	Area (Km2)	Reserv.	Reserv. Area (Km2)	Site No	Area (Km2)	Site No	Area (Km2)
1	Battambang	12	12	1453.82	1	13.2300	17	1893.62	7	1823.52
2	Banteay Mean Chey	4	4	327.44						
3	Siem Reap	7	7	773.83	1	66.8200	19	1925.71	11	2482.72
4	Kampong Thom	7	7	1231.55	1	17.7000				
5	Pursat	7	7	544.15	4	117.1500			4	1055.89
6	Kampong Cham	13	12*	613.47			14	693.73	17	881.51
7	Kampong Chhnang	22	20**	636.86	2	11.6100	25	630.37	44	676.67
8	Kandal	19	19	1779.27			29	2144.79	7	1150.17
9	Phnom Penh	1	1	34.75						
10	Prey Veng	21	19***	1406.43			25	1730.91	10	3742.23
11	Takeo	20	20	475.65	1	6.9300	19	501.26	13	1886.91
12	Kratie	21	8****	110.70					14	647.48
Total		154	136	9387.92	10	233.4400	148	9520.39	127	14347.10

*Lot # 6 has two sites.

**Lot # 2 has three sites.

***Lot # 6 and # 13 has two sites, there is no # 7, but there is # 20

****Several lots are duplicated.

Sources: a) 1919: fishing lot maps from 1919 found in the National Archives

b) 1940: Chevry and Le Poulain 1940

c) 2000: DoF burden books of fishing lots

⁶ personal communication Mr. Nguyen Thanh Tung, Ministry of Fisheries of Viet Nam

What is clear from table 3 is that fishing lots tend to be more fragmented, and that the average area per fishing lot tends to decline. Both movements are a way of allowing more operators into the commercial sector; different sites for one lot for example, tend to be sub-leased by the concessionaire to other operators. The possible reason for this is consistent with the argument presented in the text. On the one hand, as the commons become more crowded, the privatized enforcement costs of physical expansion imposed by the institutional model of exclusion of subsistence fisheries, would tend to increase in an exponential fashion. To intensify operations (to sustain higher yields on a given surface), more capital needs to be added. As a consequence, fishing operations tend to become more capital-intensive. If all operators follow the same line, a new entrant will be forced to do the same to achieve a comparable yield. On the other hand, multiplying the number of operators multiplies the possibilities for rent-seeking. For entry-barriers not to be raised too much, for a given amount of capital the operations surface needs to become smaller. The general tendency would therefore be towards more fragmentation

4. The underlying conditions to the emerging conflict

The opposition of exclusive privatized access for commercial enterprises and open access for subsistence fishing characterizes the Cambodian fishery management system. Yet the term 'open access' is a misnomer in this case, since there is no water surface that doesn't have some kind of ownership arrangement. Subsistence and middle-scale fishing can take place in areas that have not been assigned to fishing lots and, under specific conditions, in the area of the fishing lots. In terms of assignment, most of the fishing lots comprise so-called "areas set aside for the people"⁷, which circumscribe the areas where villagers and family fishers can fish during the open season when the commercial fisheries are in operation. In practice, these areas are often recession ponds that are only visible after floodwaters have receded and the fish have finished their migration out of the floodplains. Given that the exact surface of these ponds is only visible after the floods have receded and boundary marks are generally absent, conflicts over fishing rights are frequent (Swift 1997, Swift et al. 1999). In the common property areas outside the fishing lots, a dynamic web of stakeholders negotiate local control over water surfaces and fishing grounds, and establish a set of informal rules that are not necessarily consistent⁸. These stakeholders consist of villagers, local civil authorities, military, militia, police and fish traders.

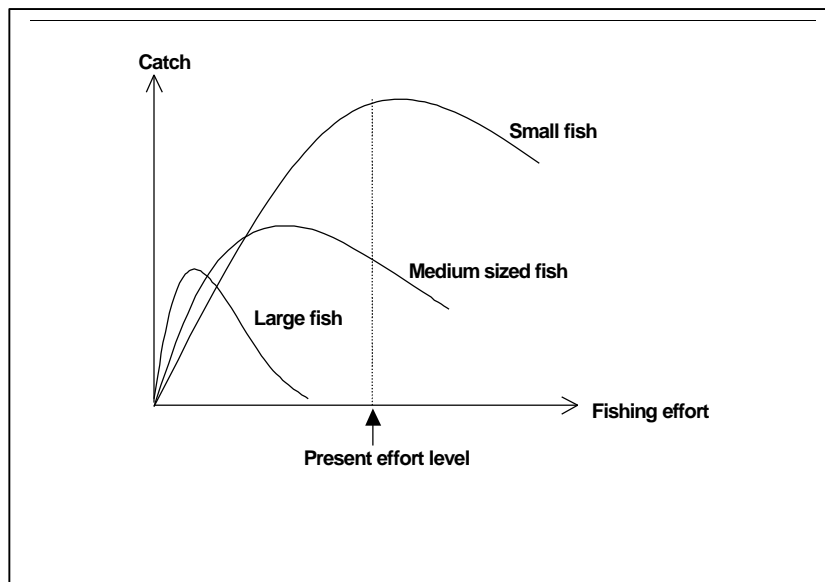
For all its complexity, the institutional framework that guides fish production in Cambodia has not been capable of minimizing conflicts, nor the threat of over-fishing. There are indications of selective over-fishing, in terms of the decrease of certain fish species that need more than one fishing season for reproduction. Other species, like small migratory white fish species that can reproduce within the limits of a one year cycle, are more resilient to fishing pressure.

⁷ This expression is a literal translation from the "burden book". These areas are usually distinguished in the fishing lot maps attached to the "burden books".

⁸ For this reason, the term "open access" is not really applicable, as it indicates no management rules at all.

For all its complexity, the institutional framework that guides fish production in Cambodia has not been capable of minimizing conflicts, nor the threat of over-fishing. There are indications of selective over-fishing, in terms of the decrease of certain fish species that need more than one fishing season for reproduction. Other species, like small migratory white fish species that can reproduce within the limits of a one year cycle, are more resilient to fishing pressure. While the total fish biomass seems to be stable, the biodiversity of the stocks is threatened (cf. Figure 1). To the extent that the component of larger species in the total catch volume is diminishing, the total value of the catch and the value per unit of effort decline, thus devaluing the profitability of fishery (Van Zalinge et al. 1998). In the end, a declining catch per unit of effort and an increasing level of conflict are complementary phenomena. The ownership of the product is only established at the moment of harvest, and there is almost no information as to the stock level of most of the species that are fished. Cambodia has opted to manage the fisheries by a system of exclusion, of which the social costs seem too high and the ecological benefits do not seem certain enough. Pressures that will further tilt the balance can be situated both on the demand and the supply side.

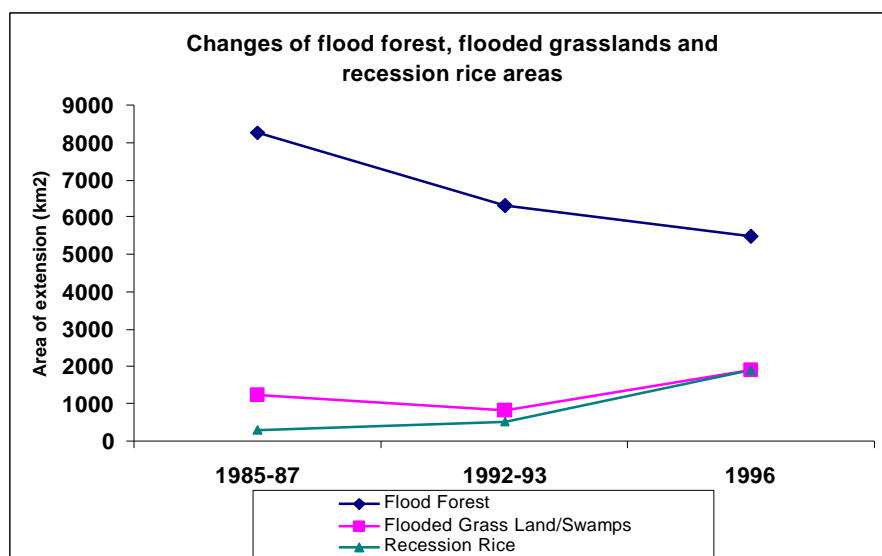
Figure 1: Cambodian Tonle Sap Great Lake and River fisheries. Hypothetical approximate state of exploitation of large, medium and small migratory fish species.



Source: Van Zalinge et al. 1998

On the demand side are the pressures on the resource stock and flow, either directly (the demand for more fish or other 'flow' products), or indirectly (the demand for alternative uses of the resource stock). The need to absorb an influx into the labor market of about 300,000 youth per year figures prominently here. First, this will be translated in an increasing pressure on marginal lands to be brought into culture, esp. the wetland areas around the Tonle Sap lake. The changes in flood forests and recession rice areas are reflected in figure 2.

Figure 2: Changes of flood forest, flooded grasslands and recession rice areas



Sources: GIS layers of land cover maps of Mekong River Commission were used for analysis

The expansion of the agriculture frontier also brings pressure in the form of a complementary demand for fuel wood. Survey results⁹ of a fuel wood saving project in Kampong Chhnang province reveal that the average fuel wood requirement for one family is 5.27 t/year. Extrapolating this figure to the whole province, a fuel wood consumption of 387.745 t per year is calculated (Baskoro n.y. [1998]:63). The fuelwood consumption of 387.745 ton/year would translate into 13.909 ha of flood forest being exploited if it were done in a sustainable fashion. The actual area, however, is bigger than that since not only flood forest wood species are converted into firewood, but mostly less yielding woods. Generally fuel wood consists of a mixture of different types of wood. However, flood forest woods are very attractive for fuel wood production, yielding 4.4 t/ha/year¹⁰ as calculated for Kampong Chhnang province (Gorse and CFSP team n.y. [1998]:15). A forecast of annual wood yield and fuel wood demand suggests a widening gap between demand and sustainable fuel wood production within the next 10 years (ibid.). Second, the pressure on fisheries will increase because of an increase of activity in the subsistence fishery sector itself ('crowding'). It has been documented that the influx of labor into the middle scale and family fishery has led to decreasing catch per unit effort rates (Van Zalinge et al. 1998). The entry barriers into fishery (in particular the family fishery) are lower than into agriculture. Neither land nor costly productive assets are necessary, and therefore the marginal costs remain low. On the other hand, the returns in the form of food and cash are immediately available, which carries a premium in an indigent subsistence environment where the future is heavily discounted. For these reasons also, fishing areas were an attractive locale to resettle refugees and internally displaced people (Degen and Thuok 1998). Third are the pressures emanating from the commercial fisheries. Concessions are extended for two years only. Even if lot operators are willing to make certain concessions to

⁹ 815 sample households from all 8 districts of Kampong Chhnang province were randomly selected from previously established "Social Energetic Context" strata (Baskoro, l. n.y. [1998a]:3).

¹⁰ compared to other wood types like deciduous forest (3.1 t/ha/y), secondary forest (1.4t/ha/y), woodshrublands (1.2t/ha/y), secondary flooded forest (1.4t/ha/y). Only evergreen forest has higher yields (5.7t/ha/y).

safeguard stock levels, they are not sure they will be the ones to benefit in the future. Similarly, an adjoining operation may not show the same restraint and benefit excessively by showing less restraint. In both cases, there is no certainty about the asset value of the use right, which incites operators to maximize their current catches¹¹.

On the supply side are indirect causes that affect the stock level. Their effects are hard to quantify and even identify sometimes, because of non-local and non-linear interactions. A limited action, such as the building of a small dam a 1000 km upstream, may have unanticipated repercussions. A small species-related change might trigger an ecological system-wide response that is unforeseeable. The most readily identifiable issue is the cutting of flood forest, since flood forest is considered to be a highly critical habitat for fish (Van Zalinge et al. 1998).

In addition, extensive illegal logging and deforestation in upstream areas enhance soil erosion and contribute to increased siltation, particularly in the calm waters of the Tonle Sap, which is generally only between 50 to 150 cm deep in its flood extension areas. Findings about actual siltation rates are not very conclusive, but may have adverse environmental impacts on fish habitats in the long run.

5. Conflict (as revealed)

The social, economic, and ecological tensions that characterize the fishery sector, are revealed as conflicts in the field. This part will look at some data on the number of conflicts, and how exactly these are configured. In terms of data on the extent of conflicts in fisheries, systematized information on conflicts, complaints, court cases, and other related documentation is not available, or is incomplete and fragmented. Even so, government data show a general trend of increasing complaints. Information gathered from the administrative tribunal ('contention office') at the Department of Fishery for example, shows a steady increase in complaints over the period 1997 to 1999. In five selected provinces the number of complaints increased from a total of 168 in 1998 to a total of 356 in 1999, an increase of more than 200%. While in two river provinces the number decreased, in three floodplain provinces around the Great Lake the number drastically increased. Since widespread mistrust in authorities keeps people from complaining, and some complaints are not passed on in the administrative chain of command, these figures are certain to reflect a mere fragment of reality.

Another indication however may be had from the extent of public protest related to fishery issues. Increasingly, fishermen claim their rights and points of view publicly. For example, there have been several groups from Kompong Chhnang and Kompong Thom provinces that mobilized efforts to in front of the National Assembly protest for several weeks in December 1999 and January to February 2000, claiming the loss of customary access rights to

¹¹ As a rather extreme illustration of rent-seeking, according to reports of village and commune authorities fishing lot operators in Kompong Thom sold out areas of the fishing lot they leased, to be cleared and converted to farming. Since the land cost them nothing, all income realized from the sale of such land would amount to a pure economic rent. In Takeo province fishing lot owners proceeded to clear inundated forest converting the land into farmland in order to be able to claim legal land titles after five years of possession (Degen and Thuok 1998).

their fishing grounds to local lot owners.¹² At the same time high level meetings in Siem Reap and Battambang provinces were convened to address issues of destruction of flood forest and land conversion, and conflicts over access rights between fishers at village level and lot owners respectively (letters of complaints to the Department of Fishery).

The common denominators of the conflicts that show up in the files of the DoF contention office and public protests are competing views of the alternative use of resources and rival claims to use rights. In terms of rival claims to the resource flow within fisheries, the conflicts arise between commercial and subsistence fishing, rather than between commercial operators or between subsistence fishermen. The commercial fishery, especially the fishing lots, operate in line with the principle of revenue maximization. To be efficient, they need to maximize the yield per unit of surface –determined by the burden book - and add additional units of labor and capital until the marginal costs of these extra inputs equal their marginal benefits. This includes the use of illegal fishing technology that creates large benefits for a minimal extra cost, such as electrocution, the use of mosquito nets, dry pumping of recession ponds and the repeated sweeping of enclosed fishing areas. Patently, large benefits obtained in this way are only available for a limited time and as long as no other operators use similar technologies. In this sense, a large scale ‘tragedy of the commons’ has so far been avoided by the use of force, directed by private guards against villagers. The latter operate a different logic. Their bottleneck is not surface area or capital but labor, which is determined by household size. In this sense, subsistence fisheries will look to maximize the yield per unit of labor and add surface or capital until the marginal costs of these extra inputs equal their marginal benefits¹³. A basic problem lies here in a double sense. First, expanding the operation area is often only possible by means of poaching in the fishing lots. Second, given the limited capacities of subsistence operators in general to add capital (invest), the temptation is large to add capital in the form of illegal gear such as electrocution, which brings large extra benefits for a limited extra cost. Fishing strategies such as electrocution or poisoning are very suitable for poaching in the fishing lot because they are not only high yielding but also quick; time consuming techniques would augment the danger of detection by lot guards. Also the use of mosquito netting is widespread and an integral part of a large variety of small scale fishing gear. The following table, based on a household survey of 257 respondent households in 4 different provinces living nearby or in fishing lots near the Tonle Sap lake or Mekong river and tributaries, gives an indication of the type of problems reported and their incidence with regards to the use of illegal techniques and fishing gear. Problems were reported to either exist in the lot areas only, in the open access areas only, or in both areas without distinction.

¹² Koh Santepheap Daily, 8 January 2000; Cambodia Daily, 27 January 2000; Cambodia Daily, 3 March 2000

¹³ It is worthwhile to remember here that *“Most economies in transition have experienced rising inequalities, as liberalization typically creates new income opportunities which the rich are better able to exploit, thanks to their better physical and human capital base”* (UNDP 1997:12)

Table 4: Type and incidence of illegal fishing techniques and gear per fishing ground

Note: All figures are percentages of total number of respondents	Lot area %	Open access area %	Both areas %
Dry-pumping	19.2	0.4	9.0
Use of excessive size nets	9.0	18.0	14.3
Use of nets with excessively small mesh size	11.8	19.6	18.4
Brush-park	14.3	15.5	12.2
Electrocuting fish	13.1	14.3	42.4
Trawling river bed	9.0	26.5	6.9

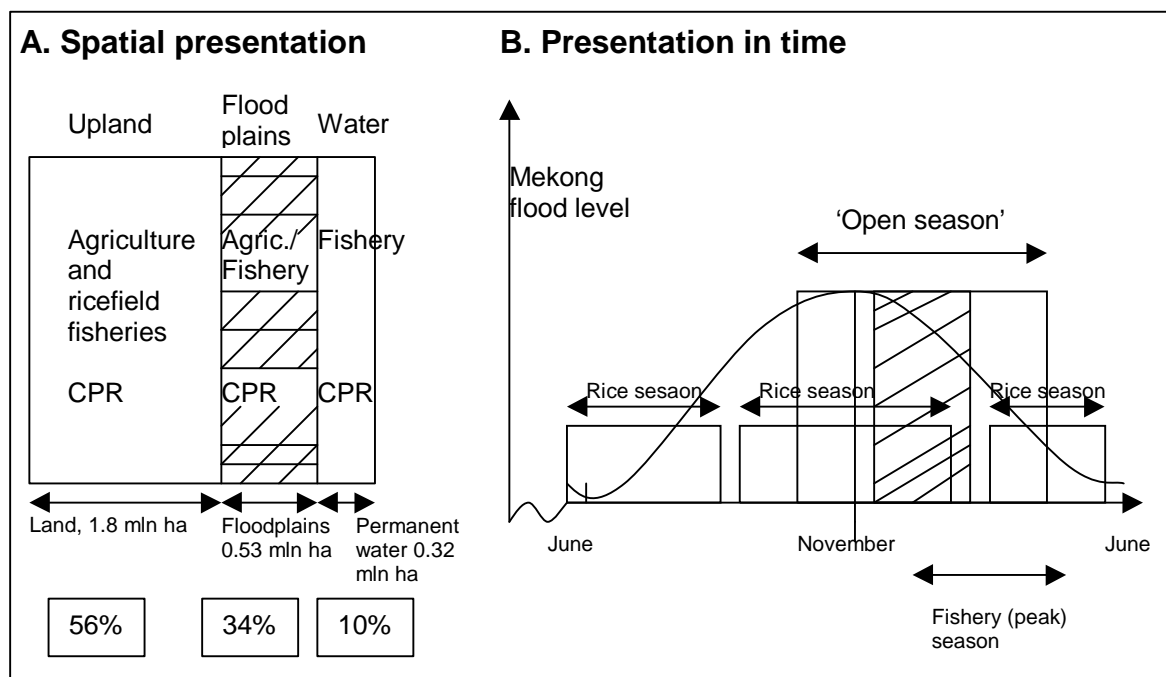
Source: Van Acker, F., Survey on governance structures and conflicts in Cambodian fisheries, 1999.

Looking at rival claims to the alternative use of resources, the thorniest issue is the utilization of land and water for farming and irrigation purposes. The type of treatment (farm)land and its associated resources may get or not during one season, highly influences the quality as a fishing ground in the next. In this sense, the clearing of fast growing plants and shrub vegetation after the period of fallow and at the end of the rainy season is the source of one of the most widespread sources of conflicts between lot operators and villagers who have their farmland in fishing lot areas. Typically, during the floods, some of this farmland is inundated; from the beginning of the floods (start of the open season) the waters 'belong' to the fishing lot. After the floods recede during the dry season, this land 'belongs' once again to the farmer. Yet it frequently happens that lot guards stop the farmers from clearing their land, since submerged shrubs are an excellent locale for fish spawning, nursing and feeding. Figure 3 gives an indication of the potential for this type of conflict, on the basis of a comparison of wetlands subjected to double use: fishing grounds in the flooded period, rice farms in the recession period.

In exhibit A, the multiple use of the wetlands is presented. Cambodia has a total cultivable land base of ca. 2.3 million ha, of which – depending on the extent of floods – about 1.8 million ha is permanent agricultural land and about 0.5 million ha is floodplain. In comparison, ca. 0.3 million ha is permanently covered by water (rivers and Tonle Sap lake in the dry season). The floodplains have a multiple use: agriculture (rice) in the dry season, fisheries in the flooded season, when most of it is incorporated in fishing lots. For comparative purposes, the percentage of the active population uniquely involved in agriculture, fisheries, and involved in both agriculture and fisheries is represented below. The data on occupation cover the situation of about 4.8 million people in the central lowlands around the Tonle Sap lake (socio-economic survey (Ahmed et al. 1998). Exhibit B shows the multiple use of floodplains according to the agricultural calendar. Floods are at their highest in November, and the peak of the fishing season is from December to April. All in all there are three possible cultivating seasons for rainfed rice: one just before the floods (June-September), one during the floods when special varieties are used (floating rice) (September-January), and one that follows the receding floodwaters (February-May). The potential for the contradictory allocation of resources among alternative uses is clearly highlighted by the crowded rice and fisheries calendar on a limited space of about 500,000 ha. There, about 31 active persons/ha contend for space with each other and with

commercial operators to execute their alternative subsistence activities (1,632,000 persons/530,000 ha).

Figure 3: conflicting use of floodplains



Source: Van Acker, F., 'Cambodia's resource allocation conflicts', presentation/mimeo, Antwerp, 1999.

Following the agricultural calendar, the next type of conflict with a high incidence is the one over conflicting claims to water use rights. In general, this involves incidents relating to the storage of water or to the diversion of the natural water flow either during the flooding or recession periods. The storage of water frequently concerns reservoirs that fill up during flooding, which are then used for irrigation during the dry season. Lot operators claim that the water and the fish in it are included in the lease contract for the lot, and may resort to techniques of breaking a dam for example to prevent the storage of the water. On the other side, lot operators sometimes resort to the illegal technique of pumping dry parts of the fisheries domain that resort under their (temporary) control. Recession ponds within the fishing lot for example are sometimes pumped dry at the end of the open season (which is already the dry season for farming). This leaves no water in these ponds that could be used for irrigated agriculture during the dry season. Regarding the change of water flow, the digging of canals or small dams for the purpose of irrigation frequently occasions this. If it impedes the upcoming floods, the floods into the surface leased by the lot operator will carry less fish. If it impedes the recession of the water, this will affect the capacity of the operator to catch the fish at the time most appropriate, when these return to the main rivers with the recession movement of the water. The following table gives an indication of the type and incidence of problems households experience in the lot areas during the open season (when the lot is in operation) or closed season (when the lot is not in operation and agriculture and family fishing ought to be possible). The problems have been arranged in descending order, following

the percentage of total respondents that claimed a particular issue to be a problem in their area.

Table 5: Type and incidence of problems experienced by households in lot areas

Note: All figures are percentages of total number of respondents	
	%
Family fishing during the open season	54.7
Family fishing during the closed season	33.9
Cutting firewood/thatch grasses	24.9
Clearing flood forests for new lands	17.6
Pumping water for irrigation	13.5
Destruction of dams/dykes	13.5
Creation dams/dykes	12.2
Collecting molluscs, frogs, turtles for consumption	13.1
Clearing grasses and shrubs from fields	8.6
Maintaining an established reservoir	4.9
Planting lotus	4.9

Source: Van Acker, F., Survey on governance structures and conflicts in Cambodian fisheries, 1999.

6. Explanation of conflict and consequences

To summarize briefly at this point, the institutional framework that governs the acquisition of entitlements from the commons formed by permanent and temporary water bodies, has instituted parallel modes of access. These reflect rival modes of legitimacy (formal rules vs. customary norms) not yet resolved by a rapid societal transition. Subsistence fishing can only take place where and when no commercial operations, licensed by the state, are active. Crowding of the commons, and rival claims to resource use from the agricultural sector, have contributed to a climate of pressure (social, economic, ecological) surrounding fisheries. The institutional framework that governs fisheries is not capable of absorbing these conflicts, because it cannot be abstracted from the larger institutional framework that guides social interaction. One of its characteristics is that of a 'simulated transition', which translates practically as a high incidence of corruption and lax enforcement of rules. Conflicts tend to be resolved by the use of power rather than negotiation. This part will consider the informal institutional solution of these conflicts more closely.

Before setting off, it is worthwhile to stress that conflicts are not a franchise of the fishery sub-sector. Actually, in comparison to the agricultural sector at large where property rights are extremely opaque, use rights are quite well defined in fisheries. The problem in fisheries is rather the gap between policy and practice. At local level, power politics and the privatized enforcement of laws (or an interpretation thereof), leaves little room for the participation of villagers in the designated common areas of the fishing lots. Frequently, even in the closed season in the lot area itself, when commercial operations do not have a franchise in these areas, fishing lot operators maintain their armed guards in the lot area to "protect" the fish. For example in Kompong Thom province, the operator of fishing lot #6 closely co-operates with a military division based inside the lot area. The military protects the fishing lot area the whole year round in exchange for exclusive rights to fish trading in certain

parts of the fishing lot. In Kompong Chhnang in two fishing lots, two months before the start of the open season (1999-2000) the lot operators intimidated and threatened villagers with destroying the irrigation dikes inside the lot area¹⁴. Outside the lots the same structures of informal institutions, including militia, police, army, and different levels of local authorities, are replicated. What are supposedly common property areas, are frequently appropriated and leased out by village or commune chiefs or army commanders. Whereas fishing in a large river ought to be free for family fishing, frequently it involves the purchase of a seasonal 'license' from the local police or fisheries inspectors' post¹⁵. The feature that makes these informal power structures work in both settings, is the presence of weapons and guns, reflected in table 6. It is hard to underestimate the intimidating power of weapons on a peasant population that experienced three extremely traumatic decades. (Bit 1991)

Different parties to the conflict lean on different sources of legitimacy to sustain their rival claims. To resolve these, an interpretation of formal rules is imposed on subsistence actors within the context of the prevailing power structures. The real issue in this regard, is the lack of institutional middle-ground where the expectations regarding the intentions of others can be put in perspective via negotiations. Cambodian society does not provide institutional arrangements that allow stakeholders to participate in broader policy discussions or decisions on the local governance of the commons. A large part of the local stakeholders are categorically excluded from the decision-making processes that directly affect their socio-economic situation. However, even if there was a strong political will to broaden the participation of village level stakeholders, their effective integration into the policy formulation process would most likely be hampered by the lack of organizational capacity at those levels. In these conditions, the solutions to any conflict are largely predetermined (Leach et al. 1999).

Table 6: Presence of fishing lot guards and weapons in selected provinces around the Great Lake

Province	# of lots	# of guards	Average # of guards employed by lot owner	# weapons used by lot owner*	Average # of weapons used by lot owner	# arms per guard
Battambang	9	82	9.1	64	7.1	0.8
Bantey Meanchey	4	34	8.5	21	5.2	0.6
Kg. Chhnang	6	>51	>8.5	128	21.3	2.5
Pursat	4	42	10.5	204	51	1.2

* Note: Weapons range from rifles to machine guns and an occasional rocket launcher. Weapons of sub-lessors are not counted.

Source: Extract from Fishing Lot Inventory conducted by the Management Component of the Cambodian Freshwater Capture Fisheries of the MRC Fisheries Sector Programme, 2000

7. Consequences of conflict

The Common Property Resources (CPR) dilemma is extremely sharply outlined when it comes to freshwater fishing in Cambodia. Given the lack of coordination of strategies in conditions of 'crowding', the lack of assurance that resources not used now will be available in the future, induces all

¹⁴ Personal communication from members of local irrigation association in Phlong village.

¹⁵ Ethnic rivalry aggravates these conditions for the ethnic Vietnamese fishermen that prefer to ply the large rivers. Usually they are forced to buy a license from the police AND the fisheries inspectors.

appropriators of the resource to behave effectively as if the resource is openly accessible to all even if this is patently not the case¹⁶. In effect, each of the actors will play its dominant strategy, which is maximization of yield per unit of surface for the commercial operators and the maximization of yield per unit of labor for the subsistence operators. To the extent that this produces an appropriation rate that exceeds the recruitment capacity of fish stock, the pursuit of individual gain generates a sub-optimal outcome from the collective point of view. The nature of this sub-optimal outcome will be considered here from two different perspectives: social and ecological.

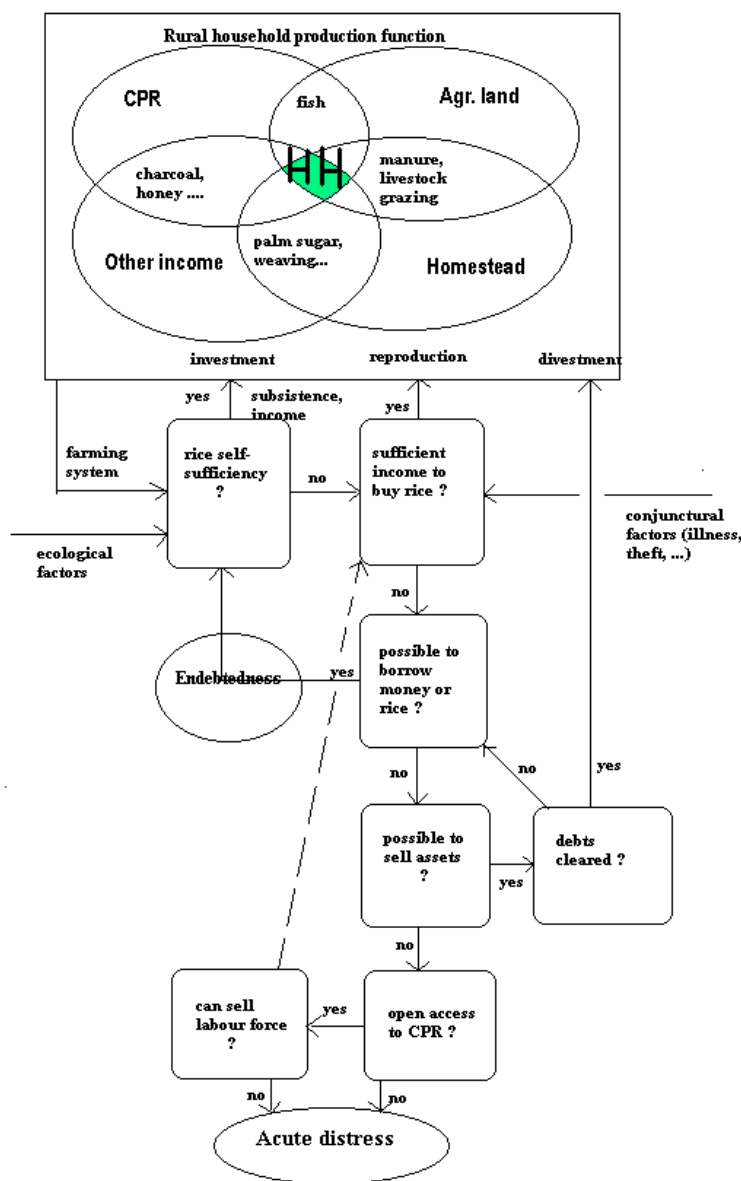
In ecological terms, the trend of habitat destruction carries the potential for the "*Bangladesh effect*", which is expressed by a significant reduction in the biodiversity of fish stocks with a more or less stable overall production of a limited number of small, low-value species (Minkin and Boyce 1994). To the extent that the availability of higher value species decreases as they are targeted first, the commercial value of the fish catch will decrease and so will the importance of fishing as an economic activity and its contribution to livelihood in rural areas in general. In the wider regional context of the lower Mekong river basin, the natural environment of the Tonle Sap lake is of utmost importance as a fish habitat. Many stocks spend part of their life cycle in the biologically rich and sheltered flood forests around the lake. Through longitudinal migrations these stocks are linked with fishing grounds in Laos and the Mekong delta in Vietnam. In this sense, the deficiencies of the Cambodian institutional setting that guide local fisheries operations, impose regional externalities.

In social terms the evolution is counteracting the postulate of "equitable rural development", which the Cambodian government posited as its guiding principle in 1997 (RGC, 1997). Locking subsistence fisheries out of the commons as a solution may be good for business in the short term, but bad for economic development in the long term. If the issue is analyzed in terms of opportunity costs, there are four main issues at hand. First, from the perspective of employment, the opportunity cost of higher entry barriers into fisheries is an increased pressure on agriculture to absorb the new labor inflow. The conflict will then simply be displaced to one that involves rival claims to alternative resource use: land conversion, water storage and irrigation etc. Second, it will push people to increase the mediation of their subsistence needs via the market. The results of a survey in four provinces involving 257 respondent households show that 76.6 % of the households engage in subsistence fishing as a primary or secondary occupation, yet 49.8% and 39.3% of these never sell any fish in the open season and closed season respectively. Creating the conditions for an increased cash-dependence without creating alternative employment that can generate the cash carries an opportunity cost in terms of human development. The demand for food is fairly income inelastic, and the cash needed for additional food purchases will be withdrawn from the more income elastic consumption categories such as education. In addition, access to common property resources constitutes a last safety net in subsistence conditions, as shown in figure 4. Third, and complementary to the former point, subsistence fishing

¹⁶ Assurance refers here to the security of expectations alluded to above.

may bring in limited cash to rural households. The income generated in this way carries an important multiplier-effect, as it widens the domestic market and may increase the domestic savings rate. On the other hand, lot owners and the related ownership networks tend to transfer their profits into the city-based service sector. Fourth, particularly the most vulnerable persons, such as landless people and female-headed households would be discriminated. Considering the economically active population at national level, 12% more women than men are active as "subsistence agriculture, fishery and related workers"¹⁷.

Figure 4: Households (HH) and the rural resource flow



Source: Van Acker, F. 1999. Hitting a stone with an egg? Cambodia's rural economy and land tenure in transition. Discussion paper No.23. Centre for ASEAN studies, University of Antwerp, Belgium, April 1999.

¹⁷ According to analysis from data sets obtained from the national census 1998.

Overall, it is important to bear in mind that Cambodia is not shifting out of the common property dilemma in a socially neutral position. As can be observed in the Lorenz curve for consumption expenditure for 1993-94 and 1996, *“the shares of the top four quintiles remained almost the same over the two periods, the poorest 20% of the population appear to have lost ground. Their relative share in national consumption fell from about 7% to 5.8% -- a decline of 17.4%. However, the situation in rural and urban areas was very different. In rural areas there was a sharp increase in inequality, with the poorest 80% of the population losing ground, and the richest improving their share in total consumption expenditure markedly.”* (UNDP, 1997:12). Without substantial changes in the fisheries management system, the actual fishing practices will continue to hamper the development of responsible partnership relations among resource users and contribute to increasing the gap between rich and poor in the rural areas.

8. Strategies for a solution?

The use rights to the best fishing grounds are distributed via a formal market mechanism. This text has presented two basic remarks to this. First, markets are underdeveloped and non-capitalist social relations that result in the unequal exercise of market power influence the functioning of markets. Second, this element adds to the more general problem of assigning entitlements to common goods via the market. In back of the conception of the market as an efficient allocator of goods and incomes is a silent assumption that the prices established take into account all the disutilities involved in the production process. Yet many of the costs incurred are socialized: they exist as externalities that affect the private costs incurred by others. One of the examples presented in this text – dry-pumping -reflects this very clearly. By pumping dry a pond that is part of a fishing lot, the operator shifts all the costs involved to the surrounding community and to a certain extent to future generations: no fish remains for them to catch, no water for irrigation or other purposes. These costs are not reflected in the auction fee or in the price of fish in the market. On the other hand, what should be social benefits that accrue to community members and future generations are privatized. When farmers abstain from cutting flood forest in the interest of future fish catches, the gains will be reflected as private benefits of a commercial operator.

The basic questions this text has pushed forward, is therefore the following: how can more of the benefits be socialized, and how can the ones that enjoy the benefits be induced to internalize more of the externalities involved? The first question addresses the postulate of "equitable rural development", the second the responsibility for resource protection and environmentally sound fishing practices and water and land use issues in general. As described above, the "user community" involves strategic actors such as lot concessionaires, national and local authorities, military and militia groups, and small scale fishermen that interact in a dynamic way which frequently bypasses the limitations of formal institutions, creating de facto informal institutions.

The answer must be found in the institutional structures that govern the collective choice level of the allocation of use rights. Social actors must make a number of choices that define three sets of rules: boundary rules (who gets

access), assignment rules (definition of access areas and timing, technology to be used, and eventually appropriation, or what and how much can be taken), and enforcement rules. In view of the unequal exercise of power that was discussed in the text, the proposition that is forwarded here goes one step further back to the constitutional choice level: rules about making rules¹⁸. What rules to use in outlining the set of collective-choice rules? The answer would be the alternative that allowed as many stakeholders as possible to be involved: a system of co-management that involves local communities¹⁹. In Co-management, local sets of actors, preferably in nested structures from local to national, define in a more autonomous way the design of constitutional-choice rules as well as collective-choice rules. While fisheries is the platform or contents of what has to be managed, co-management goes beyond fisheries as such and addresses the "distribution of powers and responsibilities" (McCay 1998:11) of stakeholders in fisheries and of representatives of other sectors that are potentially destructive to fisheries habitats.

Above, the stress is on the word 'involve'. 'The community' in its traditional sense as a spatially small, socially homogeneous, and normative unit – if it exists - is too limited an institutional framework to address fisheries co-management issues (Agrawal and Gibson 1999). The heterogeneity of communities in Cambodia is highlighted by a number of characteristics, which have impacted on the structure of the rural economy. First, the patterns of massive displacement and migration in the recent past have affected the composition of local communities. The Khmer Rouge forcefully displaced every single Cambodian in 1975, and the aftermath of the Vietnamese invasion in 1979 led to more than 300,000 refugees in Thailand that had to be resettled after 1993. Second, the absentee ownership of crucial resources is a phenomenon more and more visible in Cambodian villages: large tracts of land owned by speculators, streams and wetlands conceded to 'lot owners' that operate via middlemen etc. Central here is the aspect of 'mutual vulnerability' in relation to the common property resource (Mearns 1995); if social actors in the community are less dependent on fisheries relative to other sources of livelihood, their income is less threatened by issues affecting the resource stock of fisheries. Third, as pointed out by the UNDP (1997) report on Cambodia, the shift to 'capitalism' led to widening wealth disparities in the countryside. The effect of a broadening heterogeneity is the increasing divergence of interests of social actors in a community, which tends to weaken shared norms and the possibility to achieve mutual gains through coordination. Referring to co-management, partnerships can be fostered only to the extent that all parties involved perceive incentives for cooperation; empowerment ideally has to address all parties of the relationship. Alluding to Sen and his work on the 'assurance problem', a growing divergence sharpens the uncertainty in the expectations the different social actors have of each other's intentions and activities (Sen, A.,1966). In this sense, the potential for endogenous cooperation

¹⁸ For the terminology involved, we refer to the work of Ostrom et al, 1994.

¹⁹ There is an increasing number of excellent and very helpful research efforts being undertaken focusing on common property management, co-management, eco-system management, role of institutions in natural resources and environmental management, path-dependency of institutions, collective action and devolution, environmental entitlements, etc. (Leach et al. 1999, McCay 1998, McCay and Jentoft 1998, Hanna 1998, Agrawal and Gibson 1999, Lindsay 1998, Meinzen-Dick and Knox 1999, Pomeroy 1999, Agrawal and Ostrom 1999, Young et al. 1999, Rona-Tass 1999). These valuable contributions have helped a lot to broaden our thinking in searching for realistic solutions in the specific setting of fisheries management in the Cambodian floodplains and the Mekong River catchment area.

is very closely linked to the potential to overcome the institutional changes and solve the assurance problem. In other words, if the transaction costs of identifying the possibilities for cooperation, of bargaining to agree on a scheme of cooperation, and of monitoring the behavior of others is higher than the potential benefits of cooperation, then no endogenous solution will be possible (Taylor and Singleton, 1993).

9. Co-Management as Solution

What remains is to outline the possibilities for co-management. From the previous, it might be clear that rural communities are heterogeneous and that the creation of joint interests may be hard to achieve. Yet it is possible; Baird (1999) has documented how local villagers in Laos – in a rather similar social and ecological environment – succeeded in elaborating operational co-management structures. Two questions prevail in the end. First, how to ensure that the benefits of cooperation are larger than the transaction costs involved in negotiating and enforcing the cooperative outcome? This question refers to the attributes of ‘community’. Second, how to support the process in an environment characterized by the transition previously outlined? This issue refers to the attributes of ‘polity’.

As to the first question, the premium needs to be on the process of lowering transaction costs in the environment of institutional transition. This can be done in several ways. First, the creation of multiplex relations. Second, the provision of a forum for negotiation. Third, the lowering of the costs of ‘search’ (identification of alternatives) by enhancing the overall information flow and transparency of processes involved. These points will be treated below. First, the creation of multiplex relations refers to the advantage of creating a web of multiple and interlocking ties. Such networks that carry multiple forms of reciprocity in multiple domains have the advantage of creating economies of scale in identifying, bargaining, and monitoring cooperation. The different social actors have the chance to observe each other in different settings (the village festival, construction of a school, cleaning of the main irrigation or colmatage canals etc.), so that ‘reputation’ becomes an asset and the loss of it a liability in terms of losing face. In this sense, any type of activity that enhances these networks has positive externalities. In that sense, strengthening the self-help capacity of the stakeholders and their capacity to organize themselves carries a valuable premium which is not necessarily restricted to the field or issue in relation to which specific activities are carried out. Second, the provision of an institutional space for negotiation is a necessary condition to lower the costs of bargaining and prevent the different opinions to be mainly settled by violence. In Cambodian society, this space has usually been provided by the structural aspects of Buddhism: the *sangkha* (community of monks), and the physical space of the pagoda. After the near total destruction of pagodas and elimination of monks by the Khmer Rouge, Buddhism is once again establishing itself as the integrative focus of Cambodian society. In addition, a host of grassroot initiatives supported by NGOs are creating new endogenous fora for discussions. In the more successful of these initiatives, it is interesting to note that Buddhist monks are

involved.²⁰ Finally, the government can endorse the creation of such institutional spaces by policy design. This point will be treated further on.

Third, broad awareness building on the basis of environmental and legal information should target all the stakeholders. In general, villagers involved in fisheries are not aware of the rules specified in the general statute law on fisheries or in the specific burden book guiding lot operations. They are not officially informed of the common access areas (very often these are also not marked by the fishery authorities), they are ignorant of rules that stipulate the timing of operations and that guide access conditions, and they are uncertain of the precise role of the different parties involved in enforcement. The provision of public information to all stakeholders is a low-cost undertaking that has a high multiplier effect in terms of reducing the incidence of moral hazard and manipulation. In one specific 'experiment' in Kampong Thom province, the simple copying of the plan of a burden book, (which indicates areas for commercial and family fishing), was sufficient to indicate to villagers the actual extent of their legally defined rights of which they had no prior knowledge. Although this might seem to sharpen the potential for conflict initially, no improvement to fisheries governance structures can be achieved without the simple start of rendering public information public. Clearly, local media have a large part to play in highlighting the prevalent legal framework and making public the instances of abuse.

In order to support the process in an environment characterized by the transition previously outlined, the Cambodian government has a large responsibility. In first instance it needs to ensure that the laws guiding fisheries are clear and up-to-date. Currently, a new statute law on fishery is in the offing. Besides that, it needs to ensure that these laws are public knowledge. The government has a large role in clarifying the legal framework and practical stipulations (e.g. the provisions of a burden book) to all stakeholders involved in the fishery sector. Second, the government needs to endorse the processes of constitutional and collective choice at local levels. The preconditions for devolution and decentralization as integral part of any co-management scheme are provided in the constitution of Cambodia. In addition, a series of institutions on the issues of environmental protection and natural resource management, forestry, and land have been drafted and if properly screened, improved, and approved may facilitate more efficient co-management processes in Cambodia. In cooperation with a number of foreign donors, the government is also setting up a hierarchical series of councils that stretch from the level of the Ministry of Rural Development to the lowest administrative unit ('phum'). These councils are to promote popular participation in particular decisions that affect the rural population.

Overall though, the government needs to subscribe to its own postulate of broad and equitable rural development. This implies all of the former elements mentioned, but also broader and long-term issues such as attention for education and primary health care and the enabling of an environment that

²⁰ In Prey Veng province 212 Buddhist temples are networking among each other and rehabilitating pagoda ponds for fish preservation purposes. These ponds function as recession ponds during the dry season and preserve the brood stock for the flooding season.

invites economic and social investment in the rural areas. In the end, it will be the combination of a more participative management of Cambodia's natural resources and the development of broader and deeper markets that will ease the pressure on Cambodia's natural resources and avert a social and ecological tragedy.

With these considerations in mind, a process of enhancing transparency and communication oriented towards the need of protecting critical fishing habitats is sure to lead to a stronger and more focused institutional framework. This will allow local users to participate more broadly in protecting habitats and in benefiting from the positive externalities yielded. At basin wide level the Mekong River Commission and its fisheries program can potentially play a crucial role in enhancing a shared vision concerning sustainable fisheries practices and management institutions²¹. On 28 March the Joint Committee of the Mekong River Commission approved the formation of a "Technical Advisory Body on Fisheries Management" with the mandate to jointly coordinate fisheries policies among the four riparian countries Cambodia, Lao PDR, Thailand and Viet Nam.

Fisheries and rice-agriculture have been taken for granted as the ancient coupled base of Cambodia's way of life. Increasingly, consciousness is rising of the threats posed to rice-agriculture, and a host of actions are being undertaken. Consciousness of the risks that affect fisheries is much slower to mature however. The sector is not visible in national statistics and accounts, because of the constant and critical under-estimations of its contribution to rural employment and income, food security, and production. Increasingly, conflicts are lifting this myopia and signaling the severity of access and appropriation problems, and the maintenance of fish stock. Sustaining a way of life that evolved over a millenium and which responds elegantly to the very peculiar geographic and agro-climatic conditions of Cambodia, will take more than a token response.

²¹ The mandate of the MRC is "to cooperate in all fields for sustainable development, utilization, management and conservation of the water and related resources of the Mekong River Basin, including, but not limited to [...] fisheries, [...] in a manner to optimize the multiple-use and mutual benefits of all riparians and to minimize the harmful effects that might result from natural and man-made activities." (Kristensen and Lien 2000)

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